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**Lin'den** [A.-S. *lind*], the lime tree, *Tilia Europaea* (order Tiliaceae), a large European forest tree, closely related to the basswood of the U. S. Its wood is soft, but valued by carvers and turners and used in making charcoal. Its bark makes the bass matting so extensively imported from Russia. Its flowers afford valuable bee-pasture. It has many varieties, some well known in cultivation in the U. S.

**Lin'derman** (HENRY), M. D., b. in Pike co., Pa., Dec. 26, 1835; studied med. and grad. at the New York College of Phys. and Surgeons; practised his profession in Pike co., Nesquehoning, and Mauch Chunk, Pa.; took an active interest in politics as a Dem.; chief clerk of the U. S. Mint at Phila. 1855-64; in 1864 he resigned and went into business in a firm of stock-brokers in Phila.; director of U. S. Mint at Phila. 1866-69; member of the Presidential convention which nominated Seymour and Blair; sent to investigate the San Francisco mint; in 1871 he was sent to Lond., Paris, and Berlin to collect information concerning their mints; in 1872 made an elaborate report on the condition of the market for silver; projected the trade dollar to make a market for the great amount of silver produced in the U. S.; author of the coinage act of 1873; Dec. 7, 1873, appointed director of all U. S. mints for 5 yrs.; pub. *Money and Legal Tender in the U. S.* His annual report for 1877 was an exhaustive review of the metallic standard and of the capacity of the mines of the U. S. to supply the world with the precious metals. D. Jan. 27, 1879.

**Lin'dley** (JOHN), PH. D., M. D., F. R. S., F. L. S., b. at Catton, Eng., Feb. 5, 1799, was the son of a nurseryman; assisted in preparing Loudon's *Encyc.*; became in 1829 prof. of bot. in Univ. Coll., Lond.; was appointed in 1860 examiner in bot. in the Lond. Univ.; edited the *Gardener's Chronicle* 1841-65. Among his works are *Structure and Physiology of Plants and Vegetable Kingdom*. D. Nov. 1, 1865.

**Lin'dsay**, BARONS AND EARLS, a family in the Scot. peerage, descended from Sir Walter de Lindsay, who in the reign of David I. acquired Ercildoune and Luffness in E. Lothian. In the 12th century the lands of Crawford in Clydesdale came into possession of the family by an intermarriage with the royal line of Scot. Sir James Lindsay of Crawford was distinguished at the battle of Otterburn. His nephew and heir, Sir David, married a sister of King Robert III., and was made by that monarch earl of Crawford. In the 15th century the earls of Crawford were among the wealthiest and most influential of the Scot. nobility. David, the fifth earl, was made duke of Montrose in 1488. In 1644 the tenth Lord Lindsay of the Byres was created earl of Lindsay, and obtained also the earldom of Crawford, extinct in the elder line. John, fourth earl of Lindsay and Crawford, b. in Oct. 1702, was a gen. in the Rus. service 1743-45, and in the suppression of the movement of the Pretender in Scot. in 1746. D. Dec. 25, 1759. A. W. Crawford, L., earl of Crawford and Lindsay, wrote *The Lives of the Lindsays*. D. Dec. 13, 1890.

**Lindsay** (Sir DAVID), OF THE MOUNT, b. in Scot. about 1490; is believed to have studied at the Univ. of St. Andrew's (1505-09), and to have travelled in It. in 1510; in 1512 was appointed "keeper" or tutor to the infant prince, who succeeded to the throne as James V. a few months later (Sept. 1513). His duties were discharged with an affectionate care, which the young king rewarded in 1538 with an appointment as king's herald, and in 1539 with knighthood and the office of "Lord Lyon, king-at-arms," in which capacity he accompanied embassies to the courts of Eng., Fr., Sp., and Den. He represented Cupar in Parl. (1542-43), and contributed to the success of that Ref. As a poet L. takes high rank, and his satires against the clergy are credited with having been the most efficient preparation for the labors of John Knox. D. before May 1555.

**Lindsay** (JOHN WESLEY), D. D., b. at Barre, Vt., Aug. 20, 1820, grad. at Wesleyan Univ. 1840; studied theol. in Union Sem., New York; entered the Meth. ministry; was tutor 1847, and prof. of Lat. and Heb. in his *alma mater* 1848-60; pres. of Genesee Coll. 1864-68; became in 1868 prof. of exegetical theol. in what is now Boston Univ.

**Lindsborg**, Kan. See APPENDIX.

**Lindsley**, LINZLE (JOHN BERRIEN), M. D., D. D., b. at Princeton, N. J., Oct. 24, 1822; ed. in Nashville, Louisville, Phila., and Paris; was elected in 1856 prof. of chem. and dean of faculty of the med. dept. of the Univ. of Nashville; in 1855 was made chancellor of that univ. After the death of Dr. Troost (1850), L. became the curator of his splendid cabinet, which in 1874 was purchased by the Ky. Library Association and thrown open to the public.

**Lindsley** (PHILIP), D. D., b. at Morristown, N. J., Dec. 21, 1786, grad. at Princeton in 1804; tutor there 1807-09 and 1812; prof. of langs. 1813; v.-p. 1817, at which time he was ordained in the Presb. Ch.; between 1820 and 1839 was offered the presidency of 10 different colls.; in 1824 accepted that of the Univ. of Nashville, which he resigned in 1850; was afterward prof. of archaeology and ch. polity in the Presb. Theological Sem. at New Albany, Ind. D. May 25, 1855.

**Line** [Lat. *linea*], a geometrical magnitude which has length, but neither breadth nor thickness. We may regard a L. as the path of a moving point, in which case the nature of the L. will depend upon the law of motion of the point. In analysis, L. are classed as algebraic and transcendental. An algebraic line is one whose rectilinear equation may be expressed by the ordinary operations of algebra; a transcendental line is one whose equation cannot be expressed by the ordinary operations of algebra.

**Lin'en** [A.-S. *lin*, "flax"], is one of the earliest of textile manufactures. Pieces are still in existence which were woven 4000 yrs. ago. The term *linen* is a generic name for cloths woven from the fibres of the flax-plant and hemp, but the use of hemp in the L. manufacture is smaller now than formerly. Jute may also be commercially considered as a sort of L. Of other substitutes which have been employed with varying degrees of success, we may name the nettle, china-grass, rhea, New Zealand flax, and Manila hemp. The flax-fibre is made up of a number of smaller fila-

ments bound together. The primary operation in their separation was termed heckling. The heckle is a many-toothed steel comb which removes the coarser fibres of the tow and partially divides the filaments of the flax. The fineness of the flax depends upon the number of hecklings it receives by instruments of increasing delicacy. Machine heckling is now most commonly used, and there are various patented inventions for this purpose. The fibres require to be united into a continuous thread before they are capable of being woven. The earliest method of doing this was by the spindle. The spinning-wheel was the next step forward. A two-spindle wheel had not been very long in use when Arkwright's cotton-spinning machinery was started. In 1787 John Kendrew and Thomas Porthouse, both of Darlington (Durham), took out a patent for this purpose. In 1788 Alexander Robb invented a loom to be driven by water, and in 1810 Joseph Crompton of Dundee one to go by water or steam. The first manufactory for weaving flax by power was set up in Lond. about 1812. According to the modern method of treatment, the fibres are first scutched or combed; broken into 3 pieces, the inner section being the best; heckled, now usually done by a rotatory machine, the flax placed on the periphery being drawn through or against a series of teeth; the short fibres drawn into one continuous thread; after having been *reeled* it is *spun*. The flax has to be kept wet during this process, for which purpose warm water is used. The spun yarn is used either for thread or for weaving. The quantity of *leas* (300 yards) contained in a pound is the method of indicating the quality of the yarns. The fullest hist. of the trade is Warden's *Linen Trade, Anc. and Modern*. [From orig. art. in *J.'s Univ. Cyc.*, by W. E. A. Axon.]

**Ling** [A.-S. *lang*, "long"], the *Molva vulgaris*, a sea-fish of the cod family, extensively caught in Europe. The ordinary L. of the Amer. waters is *Lota lacustris*, a smaller fish. There are several other fishes called L. in the U. S. and in G. Brit.

**Link** [Swe. *länk*, "ring"], a unit of measure used in land surveying. The length of a L. is 7.92 inches; a square L. is equal to .0001 of an acre.

**Linn** (JOHN BLAIR), D. D., b. at Shippensburg, Pa., Mar. 14, 1777, grad. at Columbia Coll. 1795; studied law; wrote 2 small vols. of prose and verse, and produced *Bourville Castle*, "a serious drama, interspersed with songs," 1797. Shortly afterward he abandoned the law, studied theol., was ordained in 1798, and in 1799 became assistant pastor of a Presb. ch. at Phila. In 1800 he wrote an Ossianic poem on the *Death of Washington*, and in 1803 *The Powers of Genius*, a poem of some 600 lines. In 1803 he engaged in a theological polemic with Dr. Priestley, publishing 2 pamphlets which elicited replies from Priestley, and procured for L. the degree of D. D. from the Univ. of Pa. In the yr. after his death his brother-in-law, Charles Brockden Brown, gave to the world, with a brief memoir, *Valerian*, a narrative poem, incomplete, but extending to 1500 lines, treating of the early struggles of Christianity against paganism. D. Aug. 13, 1804.

**Linnæus**, the Latinized name of CARL VON LINNÉ, the father of modern bot., b. at Rasmus, Swe., May 12, 1707, the son of a Lutheran vicar, who on account of poverty apprenticed his son to a shoemaker, but at 10 yrs. old sent him to Wexjö to school, where his fondness for natural science made him so careless of his other studies that his teachers advised the father to put him to some trade; but Rothman, the doctor of the place, took the boy into his house and gave him books upon bot. and med. science to read; sent him in 1727 to Lund, where he read books of bot., and whence in 1728 he went to Upsala. But being without money or friends he began to despair, when Olaf Celsius, prof. of divinity, took him into his own house, and introduced him to Rudbeck, whose assistant he became. In 1732 he explored Lapland under the patronage of the Acad. of Sciences, and gathered material for his *Flora Laponica*. In 1735 he took the degree of M. D. at Harderwyck, in the Low Countries; resided at Hartecamp 1735-38, under the patronage of George Clifort, a banker of Amsterdam; wrote *Systema Naturæ*, *Genera Plantarum*, *Classes Plantarum*, etc.; returned in 1738 to Swe.; was appointed in 1739 phys. to the king and prof. of bot. at Stockholm; became in 1740 prof. of med. at Upsala, and was prof. of bot. there 1741-78; was ennobled in 1757. His writings are numerous, his great work being the *Species Plantarum*. It would be hard to overestimate the importance of the work of L. in the establishment of natural science upon its modern basis. His artificial system of plant-classification, though now discarded, was simple and easily followed. L. only designed this arrangement as a key to the diagnosis of species, foresaw the importance and final prevalence of the natural system, and labored on the foundations of it. D. Jan. 10, 1778.

**Lin'net** [Fr. *linot*, from Lat. *linum*, "flax," its gen. food], a name given to various birds of the family Fringillidae (finches), but proper to those of the genus *Linota*. These birds are remarkable for the changes which take place in their plumage during the breeding season.

**Linoleic Acid**. See OLEIC ACID.

**Lino'leum** [Lat. *linum*, "cloth," and *oleum*, "oil"] is simply a manufacturer's name for oil-cloth, applied to heavy floor-cloths, made of canvas and painted with linseed oil.

**Linseed Oil**. See OIL OF LINSEED.

**Lins'ley** (JOEL HARVEY), D. D., b. at Cornwall, Vt., July 15, 1790, grad. at Middlebury Coll. 1811; was tutor there 3 yrs.; studied law, and practised until 1822, when he was licensed as a Congl. preacher; went to S. C. as a missionary; was pastor of the S. Congl. ch. at Hartford, Conn., 1824-32, and of Park st. ch., Boston, 1832-35, when he was elected pres. of Marietta Coll., O., which post he held 10 yrs.; became pastor of the Second Congl. ch. at Greenwich, Conn., 1847, and remained there until his death. D. Mar. 22, 1868.

**Lin'ton** (WILLIAM JAMES), b. in Lond., Eng., in 1812; was first engaged on the *Illustrated Lond. News*, and illustrated Jackson's *Hist. of Wood Engraving*. His hand is seen in *The Lake Country* and in the book of *Deceased Brit. Artists*; is



still better known as the author of a *Life of Paine, Claribel and Other Poems, The Eng. Republic*, etc. He was interested in the revolutionary plans of his time, entered heartily in later yrs. into the cause of the Eng. and European working-men, and was a defender of the Fr. Commune. Since 1867 Mr. L. has resided in the U. S.

**Linum** [Lat. "flax"], a genus of plants of which the common flax is the most important. It includes several flax-plants not cultivated for fibre, but sometimes grown in gardens for ornamental purposes. Among these are *L. perenne*, or perennial flax, found in the W. U. S. and growing 18 inches high, which forms tufts of slender stems with delicate blue flowers.

**Linus**, tradition says, was the first bp. of Rome after St. Peter. The dates of his life are uncertain, some giving the yr. of his death as 80, others as 78 or 67.

**Linus**, in Gr. mythology, celebrated as a minstrel, a reputed son of Apollo and one of the Muses; said to have taught Orpheus and Hercules.

**Lion** [Gr. *Λέων* (*Felis leo*)], next to the tiger the largest and most powerful of the Felidae or cat family. Two very marked varieties are known—one a tawny, full-maned creature, called the Barbary L., inhabiting the wilds of Africa; and a nearly maneless, yellow variety, found in Asia. The lioness is smaller than the male, and has no mane. Except when pressed for food, the L. is rather a lazy beast. He remains at rest during the day, and preys during the night. The natural period of its life is considered to be a little over 20 yrs., though authors have recorded its age as in "some instances that of man."

**Lippe**, or **Lippe Detmold**, a small principality of Ger., between Hanover, Brunswick, and Westphalia. Area, 445 sq. m.; is hilly, but fertile, well wooded and watered. Pop. 120,246. The prin. town is Detmold.

**Lippi** (FRA FILIPPO), an It. artist who flourished between 1412 and 1469. In 1432 he was chaplain to the nuns of S. Giovannino in Florence, and in 1457 rect. of S. Quirico at Legnaja. The best of his pictures are in Florence. They are remarkable for richness of color, vitality of feeling, and excellence of drawing. D. at Spoleto.

**Lippincott** (SARA JANE CLARKE), b. at Pompey, N. Y., Sept. 28, 1823. She wrote verses at an early age, and in 1844 began to contribute to the New York *Mirror* under the nom. de plume of "Grace Greenwood." In 1853 she was married to Leander K. Lippincott, and made an extended tour in Eng. and on the Continent. Among her works are *Greenwood Leaves, Hist. of my Pets, Haps and Mishaps of a Tour in Eng., and New Life in New Lands*. She has been frequently engaged as correspondent of New York papers, in which capacity she has several times visited the Pacific States, and resided for a time in Cal.

**Lipscomb** (ANDREW A.), D. D. LL. D., b. in Georgetown, D. C., Sept. 6, 1816. In 1842 he moved to Montgomery, Ala., and attained distinction as a minister of the Meth. Prot. Ch.; in 1860 was elected chancellor of the State Univ. of Ga., which position he held until 1874. In Aug. 1875 he became prof. in Vanderbilt Univ., Nashville, Tenn.

**Liqueur**, le-kür' [Fr. "liquor"], a name given to various highly flavored alcoholic or strong vinous liquids. The best known kinds are *curaçoa*, *absinthe*, *anisette*, *Kirschwasser* and *maraschino*, *cassis*, *kämmel*, *noyau*, etc.

**Liquidamber**. See GUM TREE.

**Liquorice**, or **Licorice**, lik'-or-is [a corruption of the Gr. *Λυκίσκος*, "sweet root"]; the dried extract of the roots of *Glycyrrhiza glabra* and *ehinata*, leguminous herbs of S. Europe, Afr., and Asia. The extract is a hard, black mass, containing a large percentage of an uncrystallizable sugar called glycyrrhizine. It is a valuable med., and is also used in flavoring chewing tobacco. The root is used in med. and in porter and stout breweries. *Glycyrrhiza lepidota* of the W. States has the flavor of true L., as have *Galium circeazans*, *G. lanceolatum*, etc., rubiaceous herbs of the U. S., which are used in domestic med. and called "wild liquorice."

**Lisaine**, a small river of Fr., rises at the S. termination of the Vosges, flows W. of the fortress of Belfort, and enters the Saône, an affluent of the Doubs, at Montbéliard. It became famous by the battle which in 1871 raged here for 3 days, between the Gers. and the Fr.

**Lisbon** [Port. *Lisboa*; anc. *Olisippo*], cap. of Port. and residence of its king, one of the most important commercial centres and one of the most beautiful harbors on earth, lies amphitheatrically on the N. shore of a bay, Rada de Lisboa, 4 m. broad, formed by the Tagus at its influx into the Atlantic Ocean. The bay forms a harbor large enough to accommodate at the same time all the fleets of Europe. The entrance to this harbor is defended by several forts. The city is 10 m. in circuit. The old city has irregular, narrow, and dark streets. The newer parts, built since the great earthquake (Nov. 1, 1755), are more regular and beautiful. The scientific insts. are very numerous; there are schools of every kind, an acad. of science, a geographical acad., a museum of nat. hist., etc. The city receives its water through the Alcantara aqueduct, a truly magnificent work. The main stream comes from the v. of Canassas, 2½ m. from L., and traverses the valley of Alcantara on 35 arches, of which the largest has a height of 20 ft. and a diameter of 107 ft. To all sides—E. through the Straits of Gibraltar into the Mediterranean, N. along the whole coast of Europe, S. along the W. coast of Afr., and W. to the countries of Amer.—the sea opens up to L. its splendid roads of commerce. Pop. 246,343.

**Lisbon**, Dak. See APPENDIX.

**List** (FRIEDRICH), b. at Reutlingen, Ger., Aug. 6, 1789; was appointed prof. in political economy at the Univ. of Tübingen in 1817, but gave up this position in 1819. Having been elected a member of the diet of Württemberg, he exposed the vices of the administration, and was condemned in 1822 to 10 months' imprisonment. He fled to Switz. and Alsace, but returned home in 1824, and was put in Asperg. As he declared that he wished to emigrate to Amer., he was

pardoned after a short time, and settled in Pa., where he wrote *Outlines of a New System of Political Economy*, in which he attacked the ideas of Adam Smith. Having discovered a rich deposit of anthracite on his grounds, he founded the towns of Tamaqua and Pt. Clinton, and returned in 1833 to Europe in possession of an independent fortune; settled first in Hamburg, then in Leipzig, and at last in Augsburg, and began to agitate for the formation of a system of railway lines as the only suitable means of transportation. D. by his own hand Nov. 30, 1846.

**Liszt**, list (FRANZ), b. at Raiding, Hungary, Oct. 22, 1811. His father put him to the piano at 6 yrs. of age. At 9 he gave a concert, and so much interested certain noblemen that he was sent for instruction to Vienna. There he studied with Czemy and Salieri; his father in 1823 took him to Paris; he gave concerts till the musical world was wild with enthusiasm. In 1824-25 the boy achieved triumphs in the provs. and in Eng. In 1848 he was made Kapellmeister at Weimar. On Apr. 25, 1865, L. received the clerical tonsure in the chapel of the Vatican, and is now an *abbé*. His devotion to the Ch. is entire; in 1869 it was reported that he had presented to the pope 20,000 francs, the proceeds of a concert at Ratisbon. His art is now consecrated to religion. L. was an admirer, patron, and friend of Richard Wagner, to whom he gave one of his 2 daughters in marriage; the other, wife of Emile Ollivier, is dead. He is a writer as well as a musician, and in the dept. of lit. as well as of art. His instrumental music has more tumult than grace, more force and noise than delicacy, and often only the mastery of instrumentation saves it from the reproach of being grotesque and fantastical.

**Litchfield**, R. R. centre, cap. of Litchfield co., Conn., 30 m. W. of Hartford, between the Naugatuck and Shepaug rivers, on high ground near a beautiful lake, the outlet of which affords excellent water-power. It was from 1784 to 1838 the seat of the most celebrated law-school in Amer., founded by Judge Tapping Reeve, and conducted after his death (1823) by Judge James Gould. It was also the seat of the first ladies' seminary in Amer. L. has 2 parks, one of which contains a fine soldiers' monument. Pop. 1880, 452.

**Litchfield**, city and R. R. centre, Montgomery co., Ill., 47 m. N. E. of St. Louis, Mo., and 42 m. due S. of Springfield; was founded 1854, incorporated 1859; is the seat of an Ursuline convent. Pop. 1870, 3852; 1880, 4326.

**Litchfield**, on R. R., cap. of Meeker co., Minn., 78 m. W. of St. Paul; has good water-power, and is the seat of a U. S. land-office. Pop. 1870, 353; 1880, 1250.

**Litchi**, or **Lichi**, li'-che (*Nephelium litchi*), a fruit of the soapberry family. The edible part is the pulp (arillus) around the seed in a scaly pod.

**Litharge**. See LEAD.

**Lithogeo**, lith'-gō (WILLIAM), b. in Lanark, Scot., in 1583; traversed of foot Central Europe, i. e. Gr. and the Tur. empire, including Egypt and Pal.; visited in a second tour the N. States of Fr., returning through Hungary and Poland, and set out in 1619 upon a third journey, bearing royal letters addressed to all kings, princes, and potentates he might encounter. Arrested at Malaga on suspicion of being a spy, he was subjected to torture; obtained his liberty through the Brit. consul, and returning to Eng. was presented at court reclining on a feather bed. He wrote a vol. of *Adventures and a Hist. of the Siege of Breda*. D. 1640.

**Lithium**, an alkaline metal which occurs in a variety of minerals, and in minute quantities in many mineral waters, all soils, and in the ashes of plants. It is silver-white, very soft, and the lightest known solid, having a specific gravity of 0.5835. Its compounds resemble those of potassium and sodium. Their most characteristic property is that of imparting a beautiful crimson color to flame. The oxide of the metal is called lithia. C. F. CHANDLER.

**Lithofracteur** was devised by Prof. Engels of Cologne. Its precise composition is not made public, further than that it consists of 525 parts of nitro-glycerine, 225 parts of silica, and 250 parts of mineral bodies, and analyses of different samples have exhibited varying results. L. is a pasty substance of dark color. Like the other compounds of nitro-glycerine, it burns quietly when ignited by a flame, and explodes violently when fired by a detonating fuse. Water dissolves the sodium nitrate, and thus sets free a certain part of the nitro-glycerine—of course a decided disadvantage. The compound has explosive properties similar to dynamite, with equal security against concussion.

**Lithography** [Gr. *λίθος*, "a stone," and *γραφειν*, to "write"] is the art of writing or drawing upon stone for the purpose of reproduction through the press. A process analogous to modern L. was invented in 1728 by Dufay, a member of the Fr. Acad. As described by him, it consisted in executing a drawing with varnish upon stone, and employing an acid to eat down the unprotected parts, thus leaving the lines in relief. A process identical in principle was accidentally rediscovered at Munich in 1796 by Alois Senefelder, and by the application of a chemical principle became the germ of the modern art. The art of L. depends upon 3 principles—the absorbent affinity of calcareous stone to water, its adhesive affinity to resinous and oily substances, and the chemical affinity of those substances to each other, combined with their repulsion of water. Hence, a drawing made upon a polished stone surface with a resinous or oily crayon or ink adheres so firmly thereto as to be irremovable except by mechanical means, and while water poured thereon is absorbed by the remaining parts of the stone, it is repelled by the crayon. When upon a surface thus prepared a colored oily or resinous substance is applied, it adheres by chemical affinity to the drawing, and not to the moist stone.

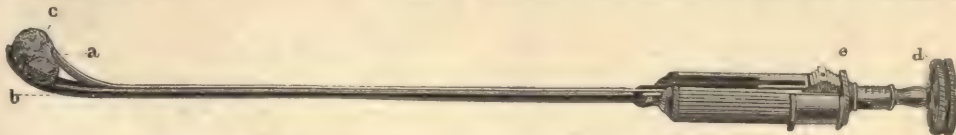
**Chromo-Lithography** is a combination of a number of stones prepared in the manner above described, each being employed for a separate color, and representing a portion of the drawing or painting which it is intended to reproduce in fac-simile.



*Zincography* is in its methods entirely analogous to L. The latest application of Senefelder's discovery is *Photolithography*, described under the head PHOTOGRAPHY.

PORTER C. BLISS.

**Lithomarge** [Gr. λίθος, "a stone," and Lat. *marga*, "marl"], a hydrated silicate of alumina, constituting a fine clay allied to kaolin.



The Lithotrite: a, b, jaws; c, stone; d, screw; e, spring-catch.

Beside these ingredients, of which they mainly consist, calculi always contain more or less animal matter. Occasionally they are found to consist almost entirely of a single ingredient, but more frequently of 2 or more different constituents arranged in irregular concentric layers. In certain conditions these ingredients solidify and form concretions. The initial process in their formation commonly takes place in the kidneys; the product then descends along the ureter into the bladder, from which it is often expelled in urinating, and thus got rid of. If it remains in the bladder, it becomes a nucleus upon the surface of which successive deposits of solid matter take place, until a calculus is formed, which in process of time may attain a formidable size. Any foreign substance introduced into the cavity of the bladder will also become a nucleus upon which incrustations of solid matter will take place. The removal of a stone by a surgical operation is the only reliable means of cure, and the earlier it is resorted to the better the chance of recovery.

**Lithotomy** and **lithotripsy** are the terms which define the two surgical operations by means of which the extraction of a stone from the bladder is effected. **Lithotomy** (λίθος, "stone," and τέμνω, "to cut") is a cutting operation by which an opening is made from the surface of the body into the cavity of the bladder at certain points where this organ lies nearest to the surface. Through the opening thus made an instrument is introduced into the bladder, the stone seized and brought away.

**Lithotripsy** (λίθος, "stone," and τρέφω, "to break down"), or **lithotripsy** (λίθος, "stone," and τρέφω, "to grind"), is a bloodless operation by which a stone in the bladder is reduced to fragments small enough to be expelled through the natural canal in urinating. The operation consists essentially in the introduction of an instrument known as a lithotrite, of adapted shape and size, through the natural canal into the bladder. With it the stone is seized and crushed by pressure exerted with the hand alone, or with a screw-power that may be applied at pleasure at the handle of the instrument. [From orig. art. in *J.'s Univ. Cyc.*, by GUNBON BECK, M. D.]

**Lithuania** [Lith. *Litua*; Pol. *Litwa*; Ger. *Litauen*] formed in the Middle Ages an independent and powerful state, comprising those large tracts of mostly low and level land which extend from the Baltic to the Black Sea, between the Niemen and the Dnieper in the N. and the Don and the Bug in the S. In the 11th century the Lithuanians were tributary to the Rus., but in the 12th they threw off the yoke. In 1386 Jagellon united L. with Poland. By the division of Poland one small part of L. came to Prus., while the rest was incorporated with the Rus. crown.

**Lititz**, Pa. See APPENDIX.

**Litmus**, or **Lacmus**, a coloring-matter obtained from *Lecanora tartarea* and other lichens. It is used for coloring L.-paper, an invaluable test in the chemical laboratory, becoming blue when wet with a liquid containing free alkalies, or red if acids be present.

**Litre**, the Fr. standard measure of capacity in the decimal system. The L. is a cubic decimetre. Four and a half L. are nearly equivalent to the Eng. imperial gallon.

**Little Christians**, a sect in Rus. which in 1888 seceded from the national Church. They practice immersion, after which they assume a new name; they have no priests, no worship of saints, etc., but worship the sacred bread, and profess to have received a divine revelation.

**Little Falls**, Minn. See APPENDIX.

**Little Falls**, on R. R. Herkimer co., N. Y., midway between Albany and Syracuse, and 22 m. E. of Utica, built against the sides of an abrupt declivity which rises some 500 ft. and overlooks the Mohawk River, which falls here 45 ft. in  $\frac{1}{4}$  m., forming a series of cascades and rapids, from which the name is derived. Pop. 1870, 5387; 1880, 6910.

**Lit'lejohn** (ABRAM NEWKIRK), D. D., b. in Montgomery co., N. Y., Dec. 13, 1824, grad. at Union Coll. in 1845; received deacon's orders in the P. E. Ch. in 1848; officiated at Amsterdam, N. Y., Meriden, Conn., and Springfield, Mass.; took priest's orders in 1850; rector of St. Paul's, New Haven, 1851-60, and since then of Holy Trinity ch., Brooklyn, N. Y. He was for 10 yrs. lecturer on pastoral theol. in the Divinity School at Middletown, Conn. In 1868 he was consecrated bp. of L. I., and in 1874 undertook the charge of the Amer. Epls. chs. on the continent of Europe. He is author of *The Philos. of Religion*, etc.

**Little Rock**, city and R. R. centre, cap. of Ark. and of Pulaski co., near the centre of the State, on the S. bank of the Ark. River, 350 m. above its mouth, 125 S. W. of Memphis, built upon the first highland reached by ascending the river, which is here 400 yards wide, and navigable 8 months of the yr. for large steamboats, smaller ones plying to Ft. Smith, 300 m. above. The rocky cliff on which the city stands, and from which it takes its name, is not more than 50 ft. above the river, while the Big Rock, commencing 2 m. above, rises abruptly some 500 ft. It has a public library,

**Lith'ophane** (Gr. λίθος, "stone," and φανος, "clear"), a sort of ornamental porcelain transparency, to be used as a window-piece or for lamp-shades, etc.

**Lithot'omy** and **Lithot'rity**. Urinary calculi are composed most frequently of substances existing in a state of solution in healthy human urine. Sometimes they are composed of substances met with only in morbid urine.

and 2 female colls., one controlled by M. E. Ch. N., and the other by M. E. Ch. S.; a convent and acad. of Sisters of Charity, U. S. arsenal, land-office, and courts, State capitol build-



State Capitol (Little Rock, Ark.).

ing, prison, asylums for deaf-mutes, blind, and insane, and a State library. Pop. 1870, 12,380; 1880, 13,138; 1885, about 25,000. [From orig. art. in *J.'s Univ. Cyc.*, by W. J. BLACKBURN, Ed. "FREE SOUTH."]

**Little Sisters of the Poor**, a R. Cath. sisterhood devoted especially to the care of those who are old and poor.

**Litt'leton**, Grafton co., N. H., on R. R. and the Ammonoosuc River, 114 m. N. of Concord and 28 m. from the base of Mt. Washington, White Mts., in which it is the most important town and a useful point of departure for tourists. Pop. tp. 1870, 2446; 1880, 2936.

**Littleton**, or **Lyt'leton** (Sir THOMAS), b. in Devonshire, Eng., early in the 15th century; studied at Cambridge and at the Inner Temple, where he became a lecturer on law. Under Henry VI. he was steward of the king's household and king's sergeant (1455), performing the duties of judge of assize in the N. circuit. Edward IV. confirmed L. in his offices, appointed him one of the judges of the court of common pleas (1466), and a knight of the Bath (1475). L.'s great work on tenures (*Les Tenures*) was written in Norman Fr. about 1481. D. Aug. 23, 1481.

**Littleton** (EDWARD), LORD. See LYTTELTON.

**Litt'ré**, le-trä' (MAXIMILIEN PAUL EMILE), b. at Paris in 1801; studied med. and the Semitic lang.; from 1830 to 1851 was one of the eds. of the *National*, and in 1854 the prin. contributor to the *Journal des Savants*. He translated from the Ger. the *Life of Jesus* by Strauss, and wrote some works on med. and on positive philos. His prin. work is the *Dict. of the Fr. Lang.* In 1871 he was elected to the National Assembly and chosen a member of the Acad. D. June 2, 1881.

**Liturg'y**. See APPENDIX.

**Liver**, Diseases of. See CALCULUS, COLIC, GALL-STONES, HEPATITIS, JAUNDICE.

**Liv'ermore** (ABIEL ABBOT), b. in Wilton, N. H., Oct. 30, 1811, ed. at Exeter; grad. at Harvard Coll. 1833, and at the Divinity School 1836; settled in Keene, N. H., 1836, in Cin. 1850; in 1857 removed to Yonkers and became ed. of the *Chr. Inquirer*, a Unit. paper in New York; since 1863 has been pres. of the Theological School at Meadville, Pa. Has been a contributor to magazines, and wrote *A Commentary on the Four Gospels*, *A Commentary on the Acts of the Apostles*, *Lectures to Young Men*, etc. O. B. FROTHINGHAM.

**Liv'ermore** (GEORGE), b. at Cambridge, Mass., July 10, 1800, ed. at the public schools; became a wool-merchant in Boston. Early in life he began to devote his leisure to historical and antiquarian researches, in which he became a recognized authority, and in the specialty of eds. of the Bible in different langs. his collection was probably the finest in Amer. He frequently wrote for newspapers and reviews upon subjects of a bibliographical or historical character, all his contributions displaying extensive research. Among these papers are an article in the *N. Amer. Review on Public Libraries* and *An Historical Research respecting the Opinions of the Founders of the Republic on Negroes as Slaves, as Citizens, and as Soldiers*, read before the Mass. Historical Society, D. Aug. 30, 1865.

**Liv'ermore** (MARY ASHTON), b. at Boston Dec. 19, 1821, daughter of Timothy Rice and wife of D. P. Liv'ermore, a Unit. minister; has written for periodicals, labored in behalf of the Sanitary Commission during the c. war, and has taken a prominent position upon woman suffrage and various social and religious questions. In 1870 she was ed. of *The Woman's Journal* at Boston.

**Liv'erpool**, next to Lond. the largest city, and without any exception the largest seaport of the United Kingdom of G. Brit. and Ire., is situated on the estuary of the Mersey, 4 m. from the Irish Sea. Its growth began in the 18th cen-



tury, and became very rapid in the latter part of it. In 1760 its pop. had increased to 25,700 souls, and its shipping to 1245 vessels, and in 1800 to 77,700 and 5000 respectively, and it has since gone on increasing. Its pop. in 1881 was 562,425. The development of its gigantic traffic, which is surpassed only by that of the port of New York, is partly due to the growth of the manufacturing industry of the neighboring inland towns and the establishment of perfect means of communication between these places and L. The Bridgewater Canal, connecting the Trent and the Mersey, was opened in 1773; the railway to Manchester in 1830, to Birmingham in 1837, to Lond. and Preston in 1838. Thus L. became the chief port of exportation from G. Brit.; nearly  $\frac{1}{2}$  of all Brit. exports are shipped from its docks. About  $\frac{1}{4}$  of all the traffic which takes place between N. Amer. and G. Brit. is carried on through its port. It is connected with Birkenhead by a tunnel under the Mersey.

L. is the most densely peopled city in Eng. In 1868 it contained 96 persons to an acre, while Manchester contained only 81, Birmingham 44, and Lond. 40. A generation ago it was also one of the filthiest and unhealthiest cities in Europe, and in the beginning of this century certain of its quarters were world-famous as the most frightful haunts of vice, crime, and misery. But L. is now fairly on the way to become a magnificent city. Its accommodations for traffic are most splendid, especially its docks, stretching along the Mersey 5 m. on the L. side and 2 m. on the Birkenhead side, and erected at a cost of £10,000,000.

**Liverpool** (CHARLES JENKINSON), FIRST EARL OF, b. in Eng. May 10, 1727, ed. at Ox.; entered Parl., and became under-sec. of state in 1761; was joint sec. of the treas. in 1763, lord of the admiralty in 1766, lord of the treas. in 1767, vice-treas. of Ire. and privy councillor in 1772, master of the mint in 1776, and sec. of state for the war dept. from 1778 to 1782, in which capacity he had much to do with determining the course of military operations in the U. S. during the closing yrs. of the Amer. war of independence. In 1784 he became pres. of the board of trade, and held that post during the 17 yrs. of Pitt's first administration. He was created Baron Hawkesbury in 1796 and earl of Liverpool 1796. He prepared a *Collection of all the Treaties of Peace between G. Brit. and other Powers from 1648 to 1783*. D. Dec. 17, 1808.

**Liverpool** (ROBERT BANKES JENKINSON), SECOND EARL OF, son of the preceding, b. in Lond. June 7, 1770, ed. at Ox.; entered Parl. in 1790; went on a special mission to Coblenz in 1791; succeeded (by courtesy) to the title of Hawkesbury in 1796; was appointed sec. of state for foreign affairs, and negotiated the Treaty of Amiens in 1801; became home sec. in 1805, and again in 1807, and succeeded to the earldom of Liverpool in Dec. 1808. On the death of Pitt (1806), and again on the fall of the Fox and Grenville administration (1807), he had refused the premiership, but accepted it on the assassination of Mr. Perceval (May 11, 1812), with the title of first lord of the treas., and remained at the head of the administration 15 yrs., until an attack of paralysis (Feb. 17) caused his resignation in Apr. 1827. D. Dec. 4, 1828.

**Liverwort**. See HEPATICÆ.

**Livia Drusilla**, a daughter of L. Livius Drusus Claudianus, b. in 56 b. c. and married early to Tiberius Claudius Nero, to whom she bore 2 sons, Tiberius and Drusus. While pregnant with the latter she made the acquaintance of Augustus, and fascinated him so much that he compelled her husband to cede her to him, while at the same time he divorced his own wife, Scribonia. Behind the bland reserve of her appearance she concealed a plan of enormous ambition and cruelty. As the yrs. passed away all the members of the large family of Augustus were ruined one after the other, and the old emp. at last found himself alone in the palace with Livia and her son Tiberius, whom he adopted and made his heir. She survived Augustus 15 yrs., but soon lost her influence under the reign of Tiberius. D. in 20 a. d.

**Livingston**, Mont. See APPENDIX.

**Livingston** (BROCKHOLST), LL.D., b. in New York Nov. 25, 1757, son of William Livingston; left Princeton Coll. to join Gen. Schuyler's staff in 1776; served on Arnold's staff, and attained the rank of col.; was private sec. to John Jay in Sp. in 1779; was admitted to the bar in 1783, became a judge of the N. Y. supreme court in 1802 and was from 1806 to 1823 a judge of U. S. supreme court. D. Mar. 19, 1825.

**Livingston** (EDWARD), b. at Clermont, N. Y., May 26, 1704, a son of Robert R. Livingston (1719-75); grad. at Princeton in 1781, and began the practice of law in New York; was M. C. 1795-1801; in 1802 was U. S. dist. atty.; was twice mayor of New York (1801 and 1802), and at the same time was a judge of a municipal court; in 1804 removed to New Orleans; in 1806 became involved in a lawsuit with regard to lands in New Orleans claimed by the gen. govt., but ultimately won the case. At the battle of New Orleans he acted as aide to Gen. Jackson. He spent many yrs. in preparing civil and criminal codes for La.; was M. C. 1823-29, U. S. Senator 1829-31, sec. of state 1831-33, minister to Fr. 1833-35; afterward fixed his residence at Rhinebeck, N. Y. His chief works are *Penal Law for Louisiana* and *Penal Law for the U. S.* His *Complete Works on Jurisprudence* have been pub. D. May 26, 1836.

**Livingston** (HENRY BEEKMAN), son of R. R. Livingston (1719-75), b. at Livingston Manor, N. Y., in 1750; raised a military co. in Aug. 1775, with which he accompanied Montgomery's expedition to Canada, and was voted a sword of honor by Cong. He became aide-de-camp to Gen. Schuyler Feb. 1776, and col. of the 4th battalion N. Y. Volunteers Nov. 1776, but resigned in 1779; was successively atty.-gen., judge, and chief justice of the supreme court of his native State; was pres. of the N. Y. Society of the Cincinnati, and appointed a brig.-gen. in the war of 1812. D. Nov. 7, 1831.

**Livingston** (JOHN HENRY), D. D., b. at Poughkeepsie, N. Y., May 30, 1746, grad. at Yale in 1762; began the study of law, but afterward studied theol. at Utrecht, Hol.; was ordained at Amsterdam 1770; became pastor of the Dut. ch.

in New York; preached at Albany, Kingston, and Poughkeepsie during the war; was appointed prof. of divinity 1784; became in 1807 pres. and prof. of theol. at Queen's (now Rutgers) Coll., New Brunswick, N. J. He wrote *Psalms and Hymns*, and was considered the father of the Reformed Dut. Ch. in Amer. D. Jan. 20, 1825.

**Livingston** (PHILIP), a signer of the Dec. of Ind., b. at Albany Jan. 15, 1716, grad. at Yale in 1737; became a merchant of New York; was speaker of the house of the colonial legislature in 1768, a member of the Continental Cong. 1774-78, and pres. of the provincial Cong. 1775. He was one of the founders of the New York Chamber of Commerce and of the Society Library, and materially aided Yale and Columbia colls. D. June 12, 1778.

**Livingston** (ROBERT R.), b. in N. Y. in 1719; became a lawyer; was judge of the admiralty court 1760, justice of the N. Y. supreme court 1763, representative in the assembly 1759-68, and com. in 1767 and 1773 to locate the boundary-line between N. Y. and Mass. D. Dec. 9, 1775.

**Livingston** (ROBERT R.), LL.D., known as "Chancellor" Livingston, b. at New York Nov. 27, 1747, a son of the preceding, grad. at King's (now Columbia) Coll. in 1765; became a lawyer; was recorder of New York 1773-75; a member of the Continental Cong. 1775-77 and 1779-81; was on the committee which reported the Dec. of Ind., but was prevented by circumstances from signing it; was sec. of foreign affairs 1781-83, chancellor of N. Y. 1777-1801; was instrumental, while U. S. minister to Fr. (1801-04), in effecting the purchase of La.; was the assistant of Fulton in perfecting steam-navigation; was one of the introducers of merino sheep into the U. S., and held various public positions. D. Feb. 26, 1813.

**Livingston** (WILLIAM), LL.D., a brother of Philip, b. at Albany in 1723, grad. at Yale in 1741; became a lawyer and journalist; removed in 1773 to Elizabethtown, N. J.; was elected in 1774 and 1775 to the Continental Cong.; became in 1775 brig.-gen. of militia; was gov. of N. J. 1776-90; was a member of the convention which in 1787 drew up the Federal const. D. July 25, 1790.

**Livingstone** (DAVID), M. D., LL.D., b. at Blantyre, near Glasgow, Scot., Mar. 19, 1813. His parents were very poor. His religious enthusiasm, however, in connection with a passion for travelling in foreign countries, created early the idea of a missionary life in his mind, and by attending an evening school and working hard he contrived to prepare himself thoroughly for his task. In 1840 he offered his services as a missionary to Afr. to the Lond. Missionary Society, and shortly after was ordained and proceeded to Pt. Natal in S. Afr. Here and on several other mission-stations he worked for 9 yrs., and sent much valuable information to the Geographical Society of Lond. and to Petermann's *Geographische Mittheilungen* in Gotha. In 1849 he made his first journey of exploration in search of Lake Ngami, which he discovered Aug. 1 the same yr. In 1853 he crossed the continent from the Zambesi to the Congo, whence he proceeded to Loando, the cap. of Angola, where he arrived in June 1854. In Sept. he returned, crossing the continent once more, this time from Loando to Quilimane, on the Indian Ocean, where he arrived May 20, 1856. He then made a visit to Eng., where in 1857 he pub. his *Missionary Travels and Researches in S. Afr.* In 1858 he returned to Afr., and, supported by the govt. and accompanied by several scientific associates, he started from Quilimane on an exploring journey up the Zambesi, which lasted 5 yrs., and during which his wife, who accompanied him, d. at Shupanga Apr. 27, 1862. In 1864 he returned to Eng., and in 1865 pub. a *Narrative of an Expedition to the Zambesi*. Shortly after he again left Eng., starting on his third great journey, on which he d. at Chitambo's v. Ulala, May 1, 1873. His corpse was brought to Eng. and buried in Westminster Abbey. His *Last Journals* were pub. in 1874. (See STANLEY'S *How I found Livingstone*, 1873.) CLEMENS PETERSEN.

**Livonia Station**, N. Y. See APPENDIX.

**Livre**, LIVRE [Fr. for "pound"; Lat. *libra*], the former Fr. standard unit of weight, was to the pound avoirdupois as 17.367 to 16. Also a former Fr. coin, superseded in 1795 by the franc, which is to the *livre Tournois* (the old standard) as 81 to 80, the Parisian L. being to these figures nearly as 100. Still other L. were in use.

**Livy** (TITUS LIVIUS), b. at Patavium in N. It. in 59 b. c., lived chiefly in Rome, where he enjoyed the favor of Augustus and maintained intimate intercourse with the young Claudius, but returned in his old age to his native city, and d. there in 17 a. d. His great work is his *Annales*, containing the hist. of Rome from the foundation of the city to the death of Drusus, 9 b. c. It consisted originally of 142 books, but of these only 35 have come down to us, embracing the periods from the foundation of Rome to the yr. 294 b. c.; from 219 b. c. to 201 b. c.; and from 201 b. c. to 167 b. c. Of the rest only a few fragments are still extant; all the so called *epitomes*, however, short extracts of or indexes to each book, have been preserved. CLEMENS PETERSEN.

**Lixivation** and **Lixivium** [Lat. *lix*, "ley;" *liquid* and *liquor* are affiliated words]. Lixivation is the method of extracting ingredients soluble in water from porous substances, like ashes or earth, by placing the latter in a receptacle (through which water may be made to percolate.

**Lizard** [Lat. *lacerta*], a name commonly used by authors as synonymous with *saurian reptile*. Popularly, it is often made to embrace some other true reptiles and a large number of tailed batrachians. The order embraces many species, representing a number of families aggregated under several sub-orders. The species are all scaly; all are produced from eggs, and none, it is believed, are truly poisonous. They are far more common in hot than in cold regions, and in the Old than in the New World.

**Llama**. See LAMA.

**Llan'o Estacado** [Sp. "staked plain"], an elevated plateau of N. W. Tex. and S. E. N. M., having an area of 44,000 sq. m. and an elevation of from 3200 to 4700 ft., the



gen. slope being northward. It has few streams and water-holes, and a sparse coating of grass in the wet season. Its scanty shrubs have enormous roots, which afford fuel.

**Llanos** [Sp. from Lat. *planus*, "level"], the name of those vast plains or steppes in the N. part of S. Amer. which surround the lower and middle course of the Orinoco. In the dry season they are scorched by the sun and nearly transformed into a desert. In the wet season they are mostly inundated, and become an immense sea. In spring and fall the L. present the most luxuriant pastures.

**Llewelyn** (loo-el'in) ap Grifith, prince of Wales, succeeded David in 1246; revolted from the Eng. crown 1256; ravaged the frontier 1262; was joined by De Montfort 1263; defeated Mortimer 1264; made peace with Henry III. 1268; was summoned to attend Parl. by Edward I., but refused to appear, 1274 and 1276; resisted an invasion of the Eng., but finally submitted; was taken to Westminster and surrendered his terrs. 1277; was reconciled to his brother David, and renewed the war with the Eng. 1282, but was surprised and killed Dec. 11, 1282.

**Llorente**, lo-ren'tá (JUAN ANTONIO), b. near Calahorra, Sp., Mar. 30, 1756; studied theol. and was ordained priest (1779); became doctor in canon law, advocate in the royal councils, vicar-gen. of the bishopric of Calahorra (1782), chancellor of the Univ. of Toledo, member of the prin. acads., commissary (1785), and sec.-gen. of the Inquisition (1789); made 2 unsuccessful attempts to correct the inveterate abuses of the Inquisition, the latter of which occasioned his imprisonment for a short time. He adhered to the Fr. intervention; was made a councillor of state by King Joseph, and director-gen. of national estates (1808), in which capacity he was charged with the suppression of the convents. On the extinction of the Inquisition its papers were placed in his hands, with a commission to prepare its hist. Charged with embezzlement, he was removed from his offices, but reinstated; was exiled on the return of Ferdinand VII. in 1814; resided for a time in Eng., and afterward in Paris, where in 1817-18 he produced his *Critical Hist. of the Inquisition in Sp.* and other works, among which was *Political Portraits of the Popes*, which obliged him to leave Paris and return to Madrid. D. Feb. 3, 1823.

**Lloyd** (THOMAS), b. at Dolobran, Wales, in 1649; ed. at Ox.; became a Quaker, and suffered persecution; accompanied Wm. Penn to Amer. in 1684, and became acting gov. with the title of pres. of the council of Pa., 1684-86 and 1690-91, and deputy-gov. 1691-93. D. July 10, 1694.

**Lloyd** (WILLIAM), D. D., b. at Tilehurst, Eng., Aug. 18, 1627; was ed. at Oriel and Jesus colls., Ox.; became a fellow 1646; took holy orders 1656; was prebendary of Ripon, Salisbury, and St. Paul's; chaplain to Charles II.; vicar of St. Mary's, Reading, and archdeacon of Merioneth; became bp. of Exeter 1676, of St. Asaph 1680, of Lichfield 1692, and of Worcester 1699. He took an active part in the troubles occasioned by the "Popish plot" of 1678, and was one of the 7 bps. who protested against the Declaration of Indulgence to Romanists and dissenters by James II., for refusing to publish which they were committed to the Tower. He wrote *Considerations touching the True Way to Suppress Popery*, a *System of Chronology*, a *Harmony of the Gospels*, and other works. D. Aug. 30, 1717.

**Lloyd's**, the name by which the first floor of the Lond. Exchange is known, being the centre where the business of maritime insurance is transacted, and where the earliest shipping intelligence from all parts of the world is posted for the information of subscribers, whether merchants, shippers, or underwriters. The establishment derives its name from Lloyd's coffee-house, which was originally the head-quarters of the board of underwriters; the name is now applied generically to similar insts. elsewhere, the most celebrated of which are the Aus. L. at Trieste and the N. Ger. L. at Bremen.

**Loach** [Fr. *loche*], a name given to fishes of the family Cobitidae, which is related to the carp family (Cyprinidae). There are no representatives of the group in Amer.

**Loadstone** [A.-S. *lædan*, to "lead"], the natural magnet, a mineral consisting essentially of magnetic iron ore, is a compound of the peroxide and protoxide of iron. It attracts the magnetic needle.

**Loan** [A.-S. *læn*, from *lhan*, "to lend"]. This term has in law 2 diverse though closely analogous significations. In one sense it denotes a delivery of money or of a chattel by one person to another for the use of the latter, for which an equivalent is to be returned at a future day. In the other sense it denotes a delivery of an article to another for his temporary use, on condition that this identical article, and not merely its equivalent in value, shall subsequently be returned to the lender. In this latter sense, though not in the former, a L. is a species of bailment.

I. If the L. be of the first kind, making the borrower responsible for the return of an equivalent in value, and the thing loaned be not money, but some article of personal property, the lender may bring an action in a court of law for the recovery of damages equal to its value, or of the sum agreed to be given in return, if default be made in rendering the equivalent at the time appointed, according to the terms of the agreement. But the thing itself to be given in return cannot be obtained by action in such a court unless it be a sum of money. In courts of equity, however, a suit may sometimes be maintained for the specific performance of such a contract, and a decree obtained requiring the delivery of the article to be given as an equivalent. But the most common L. of the class under consideration are L. of money to be repaid in money. The contract for repayment may be either express or implied. It is commonly the practice in making an express contract to evidence it by a promissory note, bill of exchange, bond, due-bill, or other written obligation, though this is not to be deemed necessary. The L. establishes the relation of debtor and creditor between the parties, and not that of bailor and bailee. Interest is computable from the time of the L. at the legal rate.

II. The second variety of L. constitutes that class of bailments technically termed in law *commodatum* (Lat. "thing lent"). The article lent is delivered to the borrower or bailee exclusively for his own use and benefit, no reward or compensation being payable to the lender for such use, and is itself to be returned to the lender. As the bailment is entirely for the advantage of the bailee, he is bound to use great diligence in caring for the article loaned, and will be responsible even for the slightest negligence if it be thereby lost or injured or impaired in value. But if the injury or loss be occasioned by inevitable accident, sudden disaster, theft, burglary, or other cause which could not be anticipated nor provided against, the bailee will incur no liability, but the bailor must bear the loss. The article may be used by the borrower for the purpose for which it was loaned, but he must not exceed the privilege given him. The property loaned is to be returned to the owner at the expiration of the time agreed upon for the continuance of the bailment, or, if no such stipulation be made, at the expiration of a reasonable time. If after the termination of the bailment the borrower refuses to deliver up the property after proper demand has been made, although it still remains in his possession, he is guilty of conversion. GEORGE CHASE.

**Loango**, kingdom of W. Afr., extending along the shore of the Atlantic from the equator to the river Congo. The coast is flat, but fertile. The inhabs. are a barbarous race. Their religion is idolatry; their morals allow the slave-trade and polygamy; their political insts. consist in an absolute despotism; they manufacture baskets, colored mats, and grass-cloth; trade in palm oil, wax, and ivory is carried on in their 2 prin. towns—Loango and Kabinda.

**Löbau**, town of Ger., in the kingdom of Sax., noted for rock-crystals called "Löbau diamonds," and for the mineral springs in its vicinity. Pop. 7372.

**Lobau**, lo-bó, de (GEORGES MOUTON), COUNT, b. at Phalsbourg, Fr., Feb. 21, 1770; enlisted in the army in 1792; became aide-de-camp to Meunier in 1793, to Joubert in 1798, to Nap. in 1805, and was made a gen. of division in 1807, after the battle of Friedland. His title of count of Lobau he received after the battle of Aspern. After the Rus. campaign he was at the head of the organization of a new Fr. army, and in the battle of Waterloo he commanded on the right wing. After the Restoration he was banished from Fr., and not allowed to return until 1818. In 1828 he was elected to the Chamber of Deputies; took a prominent part in the revolution of 1830, assumed the command of the national guard instead of La Fayette, was made a peer and marshal in 1831, and put down the insurrections of 1832 and 1834. D. Nov. 21, 1838.

**Lobeira**, lo-bá-e-rah, de (VASCO), b. in Port. about 1860; was distinguished in the military service of Ferdinand IV., king of Castile, and wrote the romance of *Anadís de Gaul*; was knighted by John I. of Port. after the battle of Aljubarrota, 1386. D. 1403.

**Lobel** (MATTHEW), known under the Lat. form *LOBELIUS*, b. at Lille, Flanders, in 1538; studied med. and practised at Antwerp and Delft after travelling through Switz., Ger., and N. It.; became phys. to the prince of Orange; settled in Eng. before 1570; made extensive botanical collections; devoted himself especially to vegetable physiology; wrote *Stirpium Adversaria Nova*, *Icones Stirpium*, and a treatise on *Balsams*. He accompanied an Eng. embassy to Den. in 1592; became botanist to James I. An important botanical genus was called *Lobelia* in his honor. D. Mar. 2, 1616.

**Lobelia**, lo-bé-le-a, a genus of plants of the natural order Lobeliaceae, of which the most important species is the *L. inflata*, or "Indian tobacco," a very common annual or biennial herb, growing wild throughout Canada and the U. S. It has a fibrous root and a straight hairy stem about a foot high. The flowers are small and of a light blue color; the leaves oval, serrated, and hairy. The entire herb, dried, is used in med. under the name *lobelia*. Its properties depend on an alkaloid, *lobelina*, which is a thick, oily, transparent, volatile fluid, with a pungent taste resembling tobacco. It is a powerful nauseating emetic, producing in full dose an effect like that of tobacco. In overdose it is a potent acro-narcotic poison. It is too severe an emetic to be used to produce vomiting, and its medicinal employment is in non-emetic doses as a relaxing agent in asthma and allied diseases. EDWARD CURTIS.

**Lobelia Cardinalis**, the cardinal flower, so named from the intense red color of the blossoms, is the most showy of our indigenous species. The low and bright blue-flowered lobelia, largely used as a bedding-plant, is *L. erinus*, from the Cape of Good Hope.

**Lobelia**. See LOBELIA.

**Lo-bos Islands** [Sp. *lobo*, "seal."], or **Seal Islands**, 3 small islands in the Pacific, 12 m. off the coast of Peru, to which country they belong, form a gathering-place for seals, and contain large deposits of guano.

**Lo-b'ster** [supposed to be cognate with the Latin *langusta*, the name of a distantly related form (*Palinurus*) of the Mediterranean and European seas generally], a name especially applied to crustaceans of the species of the genus *Homarus*, but also extended to several other kinds of very different groups. The typical L., or *Homari*, are closely related to the fresh-water crawfishes (*Astacus* and *Cambarus*) of the N. hemisphere. Three well-determined species represent the genus in different seas—viz. (1) *Homarus gammarus* or *vulgaris*, the common European L.; (2) *Homarus Americanus*, the common Amer. L., very nearly related to the preceding, abundant from N. J. northward, and particularly, in the U. S., on the coast of Me.; and (3) *Homarus Capensis*, a small L. found at the Cape of Good Hope. The N. species are much larger, the Amer., when adult, varying between 1 and 2 ft., and weighing 2 to 15 lbs., and the European generally from 8 to 10 inches, although occasionally rivaling the Amer. in size, and exceptionally, it is supposed, exceeding 3 ft. in length. They live near the coast, by preference on rocky bottoms and where algae thrive, but the Amer. spe-



cies, S. of Cape Cod, is also to be found on sandy and gravelly bottoms. In the winter they retire into deeper water, descending as low as 16 to 20 fathoms on steep coast-slopes. They swim freely, but not strongly. They feed on the roe of fish, dead fish, and such other animals as they are able to catch. The food is caught by them when on the ground, and is eaten at leisure and in a state of rest. Although voracious, they are able to live for some time without food. They shed their shells periodically in the warm months, like the crabs.

L. are very generally esteemed as an article of food, and their capture employs a large amount of capital and many men in this country as well as Europe. In this country they are almost exclusively caught in "lobster-pots," or baskets constructed on the plan of some rat-traps, having funnel-shaped ends, with a hole in the middle, through which the animal may enter, but from which he is precluded from departing by the extension of his claws. These are baited generally with fish of little or no value, and sunk to the bottom, their locations being indicated by floats.

The name, in combination with a qualifying prefix, is also popularly applied to species of the families Palinuridae and Scyllaridae, etc.

**Local Preachers**, an order of lay preachers in Methodism. In the U. S. they number about 22,000. The order was established by Wesley early in the hist. of the Methodist movement, and its members have become historically important as the founders of the denomination in the U. S., Canada, N. S., Australia, and Afr.

**Loch-rane** (OSBORNE A.), b. at Middletown, Armagh, Ire., Aug. 22, 1829; in 1846 he indulged in a popular assembly in such violent denunciations against the Eng. authorities that his father thought it advisable to send him to New York, where he arrived Dec. 21, 1846; made his way to Athens, Ga.; a temperance address delivered by him won the admiration of the late Joseph Henry Lumpkin, chief-justice of the State, who urged the boy-orator to study law; was admitted to the bar at the fall term of 1849; opened an office at Savannah Mar. 1850, and in Oct. of the same yr. moved to Macon, where he formed a professional connection with Henry G. Lamar; in Sept. 1861 was promoted to the bench of the Macon circuit; resigned in 1865; removed to Atlanta, and in Aug. 1870, upon the request of the bar, was appointed judge of that circuit; in Jan. 1871 was appointed chief-justice of the supreme court of the State, but resigned in Dec. of the same yr. and resumed practice at the bar.

**Locke** (DAVID ROSS), known under his *nom de plume* of "Petroleum V. Nasby," b. at Vestal, N. Y., Sept. 30, 1833; learned printing, was successively ed. of several newspapers, finally of the *Toledo Blade*; visited Europe, and ultimately settled in N. Y. as correspondent for Western journals. In 1880 he began to publish his "Nasby" letters. Wrote many political pamphlets, among which is *The Morals of Abolition*.

**Locke, and his Philosophy.** I. JOHN LOCKE was b. at Wrington, Somersetshire, Aug. 29, 1632. In 1651 he became a member of Christ's Coll., Ox., where he resided till 1654. Here his mind received that bent which gave him his subsequent renown as a philos. In 1664 L. was sec. of legation at Berlin; in 1667 he became acquainted with Lord Ashley, afterward earl of Shaftesbury. He directed the education of Shaftesbury's son, and that of his grandson, who became a writer in Queen Anne's reign. When Shaftesbury became lord chancellor he gave to him the office of the presentation of benefices. But both soon fell into disfavor, and from 1675 to 1679 L. was in Fr. From 1683 to 1688 he again resided abroad. The revolution of 1688 enabled him to return from Hol. to Eng., where he filled several civil offices. His last yrs. were spent in the study of the Scriptures. D. at Oates Oct. 28, 1704.

II. THE PHILOSOPHY OF LOCKE.—1. *Reasons for its Great Popularity and Influence.*—The *Essay on Human Understanding* appeared in Lond. 1690. As reasons for its popularity may be mentioned—first, the author's position, coupled with the clearness of his utterances. His English would rank among the best prose of his time, and his familiar style was a help to his popularity. Secondly, his adherence to the cause of civil and religious liberty. In his work on *Civil Government* he advocated the rights of the people against the arbitrary rule to which they were being subjected. In 1684 he was an exile on account of his too free opinions. Thirdly, the times favored such a work. The psychological field was not much explored, and in attempting it L. showed an independence which drew attention to him. At the same time good men were disposed to assume that religion could find its support in faith, without any help from philos., or even against it. And unchristian thinkers found a support for their favorite theories in the current and accepted philos. of L.

2. *What the Lockian Philosophy is.*—Its aim is "to inquire into the original certainty and extent of human knowledge." The author strives to show that there are no "innate ideas." If any of these are innate, then the expression of them—for example, "whatever is, is," or "it is impossible the same thing should be and not be"—must be accepted by all human beings. But idiots, children, and savages do not accept them, therefore they cannot be innate. Then the origin of knowledge is discussed: "Let us suppose the mind to be, as we say, white paper, void of all characters, without any ideas; how comes it to be furnished? Whence has it all the materials of reason and knowledge? To this I answer, in one word, from experience; in that all knowledge is founded, and from that it ultimately derives itself." "Our observation, employed either about external, sensible objects, or about the internal operations of our own minds, perceived and reflected on by ourselves, is that which supplies our understandings with all the materials of thinking. These two are the fountains of knowledge from whence all the ideas we have, or can naturally have, do spring." These

are called "sensation" and "reflection." "I see no reason to believe that the soul thinks before the senses have furnished it with ideas to think on."

3. *Criticism of this Philosophy.*—The first objection to it is its faulty method. The primary and essential work of the psychologist is to examine all the facts of consciousness, and to present no theory not sustained by these. But L. lays down a hypothesis of the origin of knowledge which the facts of consciousness do not sustain. Then in his treatment of innate ideas he virtually assumes rational intuitions as elements of knowledge to be the same as a conscious recognition of propositional truth. And there is a constant want of distinguishing between the condition and the cause—between the chronological condition for the development of rational truth, and the real cause of its existence at all in the mind; the former being our sensible connection with the external world; the latter, the original constitution of the soul. [From *orig. art. in J.'s Univ. Cyc.*, by J. R. HENRICK, D. D.]

**Lockhart** (JOHN GIBSON), D. C. L., b. at Cambusnethan, Scot., in 1797; studied at Glasgow Univ. 1807-10; grad. from Balliol Coll., Ox., in 1817 as LL.B.; passed advocate at Edinburgh 1816; became in 1817 a contributor to *Blackwood*; married in 1820 the daughter of Sir Walter Scott; was ed. of the *Quarterly Review* 1826-53; received in 1843 the sinecure auditorship of the duchy of Cornwall. His prin. works are *Valerius, Reginald Dalton*, novels; *Sp. Ballads, Lives of Burns, Bonaparte*, and *Scott*. D. Nov. 25, 1854.

**Lock Haven**, city and R. R. centre, cap. of Clinton co., Pa., on the right bank of the W. Branch of the Susquehanna River, equidistant between Phila. and Erie; has a State normal school and an excellent boom for the staving of logs floating in the river. Pop. 1870, 6786; 1880, 5845.

**Lockjaw**. See TETANUS.

**Lockport**, Will co., Ill., on R. R. and Ill. and Mich. Canal, 33 m. from Chicago. Pop. 1870, 1772; 1880, 1679.

**Lockport**, city and R. R. centre, cap. of Niagara co., N. Y., on the Erie Canal, 63 m. W. of Rochester, 18 m. from Niagara Falls, 25 m. from Buffalo, and 8 m., air-line, from Lake Ontario. It derives its name from a double tier of 5 locks, of 12 ft. lift each, by which boats are passed up and down the "mountain-ridge," a height of 60 ft. Some 35,000 cubic ft. of water pass this point every minute during the season of navigation, only 1/5 of which is used for lockages, the 4/5 in some part turning machinery before reaching the canal-level. There are large quarries of blue limestone. It has a union school system, embracing the entire corporation, with a central structure wherein are taught collegiate branches; 2 homes for the friendless, and a fine opera-house. Pop. 1870, 12,426; 1880, 13,522.

**Lockyer** (JOSEPH NORMAN), F. R. S., a noted Eng. astron., b. May 17, 1836; Fellow Royal Astronomical Society 1866; F. R. S. 1869; ed. of *Nature*; has written many valuable papers on astron. and spectroscopy.

**Lo'cock** (Sir CHARLES), BART., M. D., F. R. S., b. at Northampton, Eng., Apr. 21, 1799; studied at the Univ. of Edinburgh, where he grad. in med. 1821; established himself in Lond., and in 1840 was appointed phys. accoucheur to the queen, by whom he was created a baronet Apr. 14, 1857, at which time he retired from active practice. In the same yr. he was chosen M.D. of the Royal Med. and Chirurgical Society, and became in 1863 honorary pres. of the Obstetrical Society. He was a magistrate and deputy-lieut. for Kent, and in 1865 was an unsuccessful candidate for Parl. D. July 25, 1875.

**Locomotion of Animals.** See MECHANICS, ANIMAL.

**Lo'cri**, or **Locri Epizephyrii**, an anc. city of Magna Græcia or S. It., in the subsequent Rom. prov. of Brutium or Calabria Ultra, now Reggio. It was founded 710 B. C. as a colony from the Gr. Locris. L. was celebrated as the first Gr. state to adopt a written code of laws, the author of which was Zaleucus. The people were skilful and courageous in war, and addicted to poetry, philos., and music. The Locrians were long in hostility with Rhegium and Crotona, and in alliance with Syracuse. During the wars of the Roms. with Pyrrhus and with the Carthaginians, L. alternately favored all the contending parties, and suffered by turns from all, especially from the Roms., who, finally victorious, followed the example of Pyrrhus in plundering the famous temple of Proserpine. From this time L. sunk into insignificance.

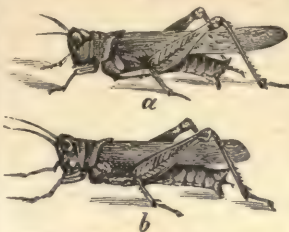
**Loc'tians** [Λοκτοί], a people of anc. Gr., divided into E. and W. tribes. Those on the E. coast, and N. of the Phodan city Daphnus, were called Epimenidi, while those farther S. were Opuntii. On the N. of the Corinthian Gulf dwelt the Ozolæ.

**Lo'eus** [Lat.]. The L. of a point is the line generated by that point when moving according to a fixed law. Thus, if a point moves in a plane in such manner that the sum of its distances from 2 fixed points is always equal to a given distance, its L. is an ellipse. The L. of a line is the surface generated by that line when moving according to a fixed law. Thus, if a straight line moves in such a manner as to touch 3 other straight lines, no 2 of which are parallel, its L. is a hyperboloid of one nappe.

**Lo'cust** [Lat. *locusta*]. By this name may be denoted the migratory L. of the Old World (*Edipoda migratoria*) and the locust of W. N. Amer. (*Catantopus epretus*). The transformations of the L., as in all the grasshoppers, are very slight, the larva differing from the adult chiefly in wanting wings; but in this state even they are said by Afr. travellers to travel great distances. The voracity of the L., and of grasshoppers generally, may be explained by the anat. of the alimentary canal, which is highly developed, the gizzard being provided with from 6 to 8 rows of horny denticulated plates situated on ridges, the whole number of teeth in some species amounting to 270. The stridulating noise this and many other grasshoppers make is produced by rubbing the thighs against the wings. The migratory L. of the Old World is widely distributed, being found all over



Afr., in W. Asia, and S. Europe, sometimes occurring in Belg. and Eng. The L. of N. Amer. is the widely distributed red-legged "grasshopper" (*Caloptenus femur-rubrum*, Fig. 1, b) with its allied species (*Caloptenus spretus*, Fig. 1, a), which inhabits the U. S. west of the Miss. River. The E. species does the most damage in N. New Eng. and Canada. The W. species (*spretus*) breeds most abundantly in the elevated portions of Col. and northward, and migrates to the plains below; it also breeds abundantly in Ia. and Minn. The young of the *spretus* are hatched in Mar. and Apr. and early in May in Tex., Col., and Kan., and at once begin their ravages. Late in the season, by the last of June, they acquire wings, becoming fearfully destructive, though most destructive before acquiring their wings. They are more active by night than by day. [From orig. art. in *J. s. Univ. Cyc.*, by PROF. A. S. PACKARD, JR., M. D.]



Red-legged Grasshopper, and its long-winged Western variety.

**Locust Tree** [Lat. *locusta*]. The L. T. is named *Robinia*, in honor of John Robin, herbalist to Henry IV. of Fr., and of his son, who first cultivated it in Europe. It received its name from Linnaeus, and belongs to the sub-order Papilionaceae of the order Leguminosae. The flowers are in pendulous racemes, and in the common L. are exceedingly fragrant. *R. pseud-acacia*, the common L., is called false acacia from the resemblance it bears to the true acacia. It has prickles at the base of the leaves, which are smooth and rarely retain dust. The roots spread out just beneath the surface, and cause the young tree to grow with extreme rapidity. The tree never attains great size in the E. States, but reaches its perfection in Ky. and Tenn., where it sometimes exceeds 4 ft. in diameter, and grows to a height of 80 ft. It has been suggested that exhausted soil may be restored to fertility by a growth of the L., its leaves soon becoming converted into mould. The wood is close-grained and compact. The color varies, but the reddish-tinted is the most valued for timber. The wood is remarkable for its strength and durability, and is considered as durable as the live-oak. Valuable as the wood is, graceful as is the foliage, and beautiful as are the flowers, the L. is yet so infested by insects as to make it objectionable. It is easily propagated by the suckers which spring up from the roots, and still more readily by the seed. There are 2 species of *Robinia* found in cultivation beside the *pseud-acacia*—viz. the *R. viscosa* and the *R. hispida*. The latter—a mere shrub—is known as the rose acacia, and is distinguished by its rose-colored, inodorous blossoms and hairy stems. The so-called honey L. belongs to the kindred genus *Gleditsia*; it has doubly pinnate leaves, and is horrid with thorns. It is highly ornamental, but its foliage is too light to afford deep shade.

**Lodge** (HENRY CABOT). See APPENDIX.

**Lo'di**, town of N. It., in the prov. of Milan, on the right bank of the Adda. L. was the theatre of one of the most brilliant exploits of the Fr. under Bonaparte. On May 10, 1790, Nap. won the victory which secured him the possession of Lombardy. The streets and piazzas of L. are, for an old town, broad, spacious, well-paved, and clean, and many of the public buildings are worthy of notice. The educational and charitable insts. are numerous. The trade and industry are remarkable. Its *majolica* has a high reputation; also its silk and linen, but the chief article is the Parmesan cheese. Pop. 25,804.

**Lo'ess** [Ger. *loess*, from *lösen*, to "loosen"], arenaceous, calcareous clay deposited in the valleys of several great rivers, as the Rhine, the Mo., the Yang-tse-Kiang, etc. This material has been usually regarded as the silt or sediment deposited by streams, but the L. of Chi. is considered by Baron Richthofen as an aerial and not an aqueous deposit—i. e. dust carried by the wind, and not silt transported by water. The L. of N. Amer. occupies the valley of the Mo., and a large area about the junction of this stream with the Miss. It is chiefly known at the W. as the *bluff deposit*, because it once filled the old excavated valleys of the prin. streams, and now in many cases forms cliffs along their courses, as it is prone to form vertical faces in weathering. Amer. geols. are almost unanimous in the opinion that the L. of the Miss. Valley is an aqueous sediment, and regard it as the equivalent of the fine silt which now renders the Mo. turbid, and which is being chiefly deposited in the Gulf of Mex. They are led to this conclusion from the character of the L. itself, and from the fact that no such accumulation of wind-borne material, such as Richthofen supposes the Chi. L. to be, are now being formed on the earth's surface. In the arid and windy regions of the interior of Amer., where dust-storms are frequent, no deposits like the L. are found. The order of nature has been so nearly uniform in all modern times that we may regard it as certain that the causes which have produced the vast accumulations of L. in Amer., Europe, and Asia are in operation now; and whatever difficulties may be encountered in the effort to analyze the process of formation of these L. deposits by aqueous action, still greater difficulties stand in the way of the theory of Richthofen.

J. S. NEWBERRY.

**Lofo'den, or Lofoten**, a group of islands stretching along the N. W. coast of Nor. They are high and rocky, with deeply indented coasts, and rising to the height of 4000 ft. The inhabs. number about 4000. They derive their importance from the rich fisheries, which form a source of

national wealth to Nor. Early in spring cod is caught; when cod-fishing is over, herring-fishing begins and continues all summer; many lobsters are caught.

**Log'an, Ja.** See APPENDIX.

**Logan**, cap. of Hocking co., O., R. R. centre, on the Hocking Canal, 51 m. from Columbus and 24 m. from Athens. Pop. 1870, 1887; 1880, 2666.

**Logan**, b. about 1730, the son of a Cayuga chief who lived at Shamokin, in Pa. He bore the name of Tah-gah-jute, but took also the name of James Logan, acting gov. of Pa., his friend. He was friendly to the whites until 1774, when a party of ruffians murdered his wife and all his children. He then lived near the O. River, having removed in 1767. After this for 6 yrs. L. and his followers kept the whole W. in terror, and slaughtered great numbers of settlers. A speech which he sent to the whites a few months after the murder of his family is preserved in Jefferson's *Notes*; but its authenticity, and still more the accuracy of its statements, are open to question. He attacked a party of friendly Indians at Detroit in 1780 while intoxicated, and was killed in the affray by one of his own relatives. A monument was erected to his memory at Fair Hill cemetery, near Auburn, N. Y.

**Logan** (GEORGE), M. D., grandson of James Logan, b. at Stenton, near Phila., Sept. 9, 1753; studied med. in Edinburgh; returning to the U. S. in 1779, served in the Pa. legislature for several terms. In 1798, during the peril of war between the U. S. and Fr., he went to Paris as a volunteer peacemaker, and was denounced for so doing by the Federalists, who procured the passage by Cong. of the so-called "Logan act," making it a high misdemeanor for a private citizen to take part in a controversy between the U. S. and a foreign power. Dr. L. was a member of the U. S. Senate 1801-07; was a member of the Philosophical Society and of the board of agriculture. D. Apr. 9, 1821.

**Logan** (JAMES), b. at Lurgan, Ire., Oct. 20, 1674; became a merchant; went in 1699 with Penn to Phila.; was long in public life as provincial sec., chief-justice, etc. of Pa.; was pres. of the council and acting gov. 1736-38; author of *Experimenta de Plantarum Generatione*, a translation of Cicerio's *De Senectute*, and other works in Lat. and in Eng. prose and verse; was the founder of the Loghanian Library. D. Oct. 31, 1751.

**Logan** (JOHN A.), b. in Jackson co., Ill., Feb. 9, 1836; on the outbreak of the war with Mex. enlisted as a private in the 1st Ill. Volunteers, of which he became quartermaster with the rank of first lieu.; was elected clerk of the court of his native co. in 1849; in 1852 grad. at the Louisville Univ. and was admitted to the bar; was elected to the State legislature in 1852, 1853, 1856, and 1857, and was prosecuting atty. 1853-57; was elected to Cong. in 1858, and again in 1860, resigning to enter the army; in Sept. 1861 was appointed col. of the 31st Ill. Volunteers; at Ft. Donelson in Feb. 1862 was wounded, and the following month appointed a brig.-gen. of volunteers; engaged at Pittsburg Landing in Apr., and in the W. until Nov. 1862, when he was promoted to be maj.-gen.; throughout the Vicksburg campaign was in command of a division of the 17th corps, and was distinguished in the siege and surrender of Vicksburg; in Oct. 1863 was placed in command of the 15th corps, which he led until the death of McPherson, when he succeeded to the command of the Army of the Tenn.; was shortly after relieved by Gen. Howard, and returned to the command of his corps, which he led until the fall of Atlanta, when the political crisis demanded his influence at home, and he did not rejoin his corps until the arrival of Sherman's army at Savannah; when, resuming his command, he retained it during the march through the Carolinas, and in May 1865 succeeded Gen. Howard in command of the Army of the Tenn. Resigned from the army Aug. 1865; was elected to the 40th and 41st Congs., and was U. S. Senator 1871-77 and 1879-85; nominated for v.-p. of U. S. by Rep. National Convention, June 6, 1884. G. C. SIMMONS.

**Logan** (OLIVE). See STOKES (OLIVE LOGAN).

**Logan** (THOMAS MULDRUP), M. D., b. in Charleston, S. C., Jan. 31, 1808, grad. M. D. in Charleston Med. Coll. 1828; is the author of *Topography of Cal.*, and contributed largely to the *Transactions of the Amer. Med. Association*; pres. of the Amer. Med. Association in 1873; became in 1875 sec. to the board of health of Cal.

**Logan** (SIR WILLIAM EDMOND), LL.D., F. R. S., F. G. S., b. at Montreal Apr. 23, 1798; grad. at the Univ. of Edinburgh in 1817, and in 1818 became partner in a mercantile house in Lond.; was 1829-38 manager of a coal-mining and copper-smelting enterprise at Swansea, Wales, and prepared geological maps of that region for the ordnance survey; in 1841 became the head of the geological survey of Canada; represented Canada in the Expositions of 1851 and 1862 at Lond., and in 1855 at Paris; was made a Knight of Legion of Honor in 1855, and knight bachelor 1856. D. June 1875.

**Log and Line**, a contrivance for measuring the speed of a vessel. It consists of a wooden float, called the log, attached to a line wound on a reel. Commencing at some fathoms from the float, the line is divided into equal parts, each of which is equal to  $\frac{1}{120}$  of a nautical mile, the divisions being marked by *knots*. To use the L. and L., the log is thrown over from the lee quarter of the vessel, and the line is then unwound from the reel as fast as the vessel sails. At the instant the first point of division passes from the reel a half-minute sand-glass is inverted, and when the last sand falls the reel is stopped. The number of equal spaces that have been unwound indicates the number of nautical miles the ship is sailing per hour.

**Logania/ceae** [from *Logania*, one of the genera], a natural order of exogenous trees, shrubs, and herbs, mostly tropical, but having a few representatives in the U. S. It is characterized by its regular gamopetalous flowers, along with opposite leaves and interposed stipules. It contains a large number of poisonous plants.

**Logansport**, city and R. R. centre, cap. of Cass co.,



Ind., at junction of Wabash and Eel rivers. Has large water-power from these rivers and Wabash and Erie Canal; is seat of a Univ. coll. Pop. 1870, 8950; 1880, 11,198.

**Logarithms** [Gr. *λόγος* and *ἀριθμός*]. The L. of a number is the exponent of the power to which it is necessary to raise a fixed number to produce the given number. The fixed number is called the *base*. Thus, in the equation  $10^3 = 1000$ , 3 is the L. of 1000, the base being 10. Any positive number except 1 may be taken as a base, and for each base there is a corresponding system of *logarithms*; there is therefore an infinite number of systems of L., but only 2 of them are in gen. use—the *Napierian* and the *common* system. The *Napierian* system, named after its inventor, Baron Napier, is the system whose base is 2.718281828...; the *common* system is the system whose base is 10.

**Uses.**—Napierian L. are mostly employed in the higher branches of analysis and in scientific investigations. Common L. are used in practical computations, where they serve to convert the operations of multiplication and division into the simpler ones of addition and subtraction. In trigonometric computations their use is almost indispensable. Computations by means of L. are made in accordance with the following principles: 1st, the L. of the product of any number of factors is equal to the sum of the L. of the factors; 2d, the L. of a quotient is equal to the L. of the dividend diminished by that of the divisor; 3d, the L. of any power of a quantity is equal to the L. of the quantity multiplied by the exponent of the power; and 4th, the L. of any root of a quantity is equal to the L. of the quantity divided by the index of the root. In applying these principles the L. needed are taken from tables called tables of L.

**General Properties of Logarithms.**—In the exponential equation  $a^x = n$  we may regard  $a$  as the base of any system of L., in which case  $x$  will be the L. of  $n$  taken in that system. The discussion of this equation indicates the following gen. properties: 1st, the L. of 1 in any system is equal to 0; 3d, the L. of the base of any system, taken in that system, is 1; 3d, in any system whose base is greater than 1 the L. of all numbers greater than 1 are positive, the L. of all numbers less than 1 are negative, the L. of 0 is  $-\infty$ , and the L. of  $\infty$  is  $+\infty$ ; 4th, in any system whose base is less than 1 the L. of all numbers greater than 1 are negative, the L. of all numbers less than 1 are positive, the L. of 0 is  $+\infty$ , and the L. of  $\infty$  is  $-\infty$ ; 5th, there are no real L. of negative numbers in any system. These gen. properties are used in analytical investigations.

W. G. PECK.

**Log'ic** [Gr. *λόγος*, "speech," "reason"] is the science of reasoning. By reasoning we understand all those mental acts that occur between the observation of facts and the broadest generalizations. The mental acts that are directly in the line of reasoning are analysis, abstraction, synthesis or judgment, generalization, and inference. Hence, all knowledge rests on either (1) observation or (2) reasoning. In the first instance we have propositions of 4 kinds: (1) identical propositions: "Common salt is chloride of sodium;" (2) the subject an individual term, the predicate an adjective: "This paper is white;" (3) the subject an individual term, the predicate a common noun: "This horse is a quadruped;" (4) the subject a common noun, the predicate an adjective: "Horses are four-footed." For anything beyond this there must be a process of reasoning, which may be either (1) demonstration, (2) induction, or (3) deduction. The word *demonstration* denotes that process in which, by analysis of any subject, displaying its nature, we make manifest properties which were not so before. The word *induction* indicates that process in which, by bringing in and examination of facts or individual instances, we generalize a proposition up to the point of its greatest comprehension, when it becomes the statement of a universal law. Having established in these ways the gen. laws, we proceed by *deduction* to establish by means of them many particular facts and subordinate truths, which are, for the most part, as a matter of fact, though by no means necessarily so, such as are not or cannot be readily subjected to the test of observation and experiment.

When, by demonstrating from a few definitions, we establish by way of induction all the gen. laws of science, the first proposition enunciating the most comprehensive truth is called the major premise; the second is called the minor premise; and the two together, with the conclusion drawn from them, constitute what is called a syllogism. Of these 3 parts all syllogisms consist. But for the most part we have in practice either (1) an omission of one of the premises, in which case we call the abridged form an *enthymeme*, or (2) several premises following each other in some regular order, and only one conclusion drawn from them; this is called a *sorites*.

Syllogisms are of 4 different kinds: (1) Individuals in a class, and classes considered as species included in a higher and more comprehending class, considered as a genus. On this relation is based what are called categorical propositions. With 2 categorical propositions for premises we have a categorical syllogism. (2) Every object sustains some relation of quality to others. It is above or below, longer or shorter, etc. than some other. From these relations there arise comparative propositions, and with comparative propositions in a syllogism it is called a comparative syllogism. (3) Most objects in nature are related to some others as cause and to others as effect. When one premise is so connected with a conclusion that if that premise is assented to the conclusion will be accepted as proven, we often state the two, as what is called a conditional proposition. This mode of stating the major premise constitutes what we call a conditional syllogism. (4) Every object in nature is a part of some collective whole. From this relation of objects there arise what are called disjunctive propositions. When the major premise is disjunctive, the syllogism itself is called disjunctive.

The utmost importance attaches to the nature and construction of categorical syllogisms. Categorical propositions

may differ in *quality*, and be either affirmative or negative. Again, they may differ in *quantity*, and be either gen. or partial. Combining the two, we have 4 varieties of propositions, called universal affirmative, universal negative, partial affirmative, and partial negative. These 4 kinds of propositions have been called by the 4 vowels A, E, I, and O. With A for major premise we may have either A, E, I, or O for minor, and thus 4 pairs of premises, A A, A E, A I, and A O, and with each pair we can have either A, E, I, or O for a conclusion; and thus 16 syllogisms differing from each other in what is called the mood of the syllogism. And in like manner we may have 16 with either E, I, or O for major premise, making in all 64 moods. Thus, for an example of A A A, we have "All S are M, all M are P; therefore all S are P;" of E E E, "No S are M, no M are P; therefore no S are P." The former is seen to be valid, and the latter invalid or fallacious. The discovery of some rules and practical tests of validity is of the utmost importance. Fallacies may be of 2 kinds—either (1) in form or (2) in diction. And first we shall speak of fallacies in form: (1) There may be no more than 3 real terms. As an example of the "fallacy of many terms" we have the following: "My hand touches the pen, the pen touches the paper; therefore my hand touches the paper." In that case the apparent fallacy is only an abridged form of the *sorites*. (2) If both premises are negative, there can be no conclusion. Thus, "S are not M. M are not P." After these premises we can have no conclusion. (3) It is necessary that the middle term should be used once at least, as either the subject of a universal proposition or the predicate of a negative one. The failure to fulfil this condition constitutes what is called an undistributed middle: "Horses are animals, foxes are animals; therefore horses are foxes." (4) Neither the minor nor the major term may be used in the conclusion as subject of a universal proposition, or as predicate of a negative one, unless it had been used in one or the other of these ways in the premises. The violation of this condition constitutes what is called "illicit process," and the fallacy is called illicit of the minor when the minor term is so used in violation of the law. But when the major term is so used, the fallacy is called illicit of the major.

We pass to the consideration of fallacies in diction. L. assumes that the words in any argument shall denote each one and the same thing throughout the argument or solution, and that lang. for the most part shall be used literally, each word describing its object or event as it is, and that no proposition shall have two propositions in one, one of which may be true, while the other is false. All the fallacies in diction may be referred to 4 classes. (1) *Ambiguous Middle*.—In this one term is used to denote one thing in one proposition and something else in another. (2) *Variation*.—This may be in quantity, condition, etc. Thus, "Money will buy whatever is for sale; a ten-cent piece is money," etc. (3) *Division and Composition*.—This fallacy consists in using a word as a collective term in one place and as a gen. in the other. (4) *Substance and Accidents*.—A property may be accidental in one premise, and yet used so as to make it essential in the other or in the conclusion. Or it may be affirmed with regard to some property, mode, or accident in a premise, and then affirmed in reference to its substance in the conclusion, and *vice versa*. This constitutes what is called the fallacy of substance and accidents. Extra-logical fallacies are of 2 kinds—fallacies in matter and fallacies in method. In regard to the matter, there are several forms of fallacy that are to be noted. The first is what is called *non vera pro vera*—the using a premise that is untrue as though it were true. Then we have what is called *non causa pro causa*, which consists in using as a premise a proposition which, though true, is not a premise to the conclusion.

The fallacies in method may also be of several kinds. First, we have what is called a begging of the question, or *petitio principii*. If an orator assumes as true or as conceded that which his auditors expect or desire to have proved, they accuse him of begging the question; that is, of assuming the very thing they want to have proved before they will assent to his proposition. The other recognized form of fallacy in method is called mistaking the issue, or *ignoratio elenchii*. One first mistakes the real proposition that is to be proved, and then, seeking proof for his supposed conclusion, does not find the proof that is required for the real conclusion which should be established; and he is said to be ignorant of the proof or to have mistaken the proof, because he had first mistaken the proposition to be proved. [From *orig. art. in J's Univ. Cyc.*, by PROF. W. D. WILSON, LL.D., L. H. D.]

**Log'os** [Gr. *λόγος*, which means "reason" and "word," *ratio* and *oratio*, both being intimately connected] has a peculiar significance in Philo, St. John, and the early Gr. Fathers, and is an important term in the doctrine of Christ.

(1) Philo, a Jewish philos. of Alexandria, who endeavored to harmonize the Mosaic religion with Platonism (d. about 40), derived his L. view from the Solomonic and later Jewish doctrine of the personified *Wisdom* and *Word* of God, and combined it with the Platonic idea of *Nous*. The L. is to him the embodiment of all divine powers and ideas. He distinguished between the L. inherent in God, corresponding to reason in man, and the L. emanating from God, corresponding to the spoken word which reveals the thought. The former contains the ideal world; the latter is the first-born Son of God, the image of God, the Mediator between God and the world, also the Messiah (though only in an ideal sense). Philo wavers between a personal and impersonal conception of the L., but leans more to the impersonal conception. He has no room for an incarnation of the L. Nevertheless, his view has a striking resemblance to the L.-doctrine of John, and preceded it as a shadow precedes the substance. It was a prophetic dream of the coming reality.

(2) St. John uses L. (translated *Word*) 4 times as a designation of the divine, pre-existent person of Christ, through whom the world was made, and who became incarnate for



our salvation (John i. 1, 14; 1 John i. 1; v. 7 (spurious); Rev. xix. 13). The Christ-L is the Revealer and Interpreter of the hidden being of God, the utterance, the reflection, the visible image of God, and the organ of all his manifestations to the world (John i. 18; comp. Matt. xi. 27). The L was one in essence or nature with God (*ὁὐὸς ἦν*, John i. 1), yet personally distinct from him, and in closest communion with him (*σπὸς τὸν θεόν*, John i. 1, 18). In the fulness of time he assumed human nature, and wrought out in it the salvation of the race which was created through him.

PHILIP SCHAFF.

**Logwood** [named from being imported in *logs*], the *Hæmatoxylon Campechianum*, a middle-sized leguminous tree of Mex. and Central Amer., the most important dyewood known. It makes many shades from black to red and lilac, according to the mordant employed. The "extract" or inspissated juice is largely prepared in its native countries, and is exported. Its coloring principle is called *hæmatoxyline*. In med., L. is a mild astringent, from the presence of tannic acid.

**Loire**, Iwar [anc. *Liger*], the largest river of Fr., rises in the Cevennes and flows in a N. W. and W. direction through the centre of Fr. to the Bay of Biscay, receiving from the right the Loir, and from the left the Allier, Cher, Indre, and Vienne rivers. It is navigable 450 m. from its mouth. Its fertile basin is called "the garden of France," of which it comprises  $\frac{1}{4}$  the area.

**Lokman**, an Ar. fabulist of very early times. His fables were pub. at Leyden by Erpenius in 1615, with a Lat. translation, and they have since been one of the commonest text-books for learning the Arabic lang.

**Lollards**, a term of reproach applied at first to a half-monastic sect which originated in 1300 at Antwerp. But the name was afterward especially applied to the Eng. and Scot. followers of Wycliffe, who were persecuted during the reigns of Henry IV. and Henry V. in Eng., and in Scot., where they were called "Lollards of Kyle."

**Lombard** (PETER) [*Petrus Lombardus*], b. near Navara in Lombardy in the beginning of the 12th century; studied theol. at Bologna and Rheims, and in Paris under Abelard, and was appointed in 1159 bp. of Paris, where he d. in 1164. He was one of the founders of the scholastic theol. of the Middle Ages. His prin. work is *Sententiarum Libri IV.*

**Lombard Architecture** denotes one of the most interesting transitions from the old Rom. to the mediæval Gothic arch., and is characterized by the introduction of the vault in the construction of the basilica and by the addition of the tower. To this group of arch. belong the cathedral of Modena, commenced in 1093, but not finished until 1184; the chs. of S. Zeno in Verona, S. Michele in Pavia, and S. Ambrogio in Milan, all from the 11th century; the cathedral of Novara from the 11th, and the cathedral of Parma from the 12th century.

CLEMENS PETERSEN.

**Lombardini** (ELIA), b. Oct. 11, 1794, grad. at the Univ. of Pavia, and devoted himself to the study of hydrology; in 1847 was appointed director-gen. of the public works in Lombardy, and held that position for 9 yrs.; in 1860 was nominated senator of the kingdom. Among his numerous professional writings are *Dell' origine e del progresso della Scienza Idraulica in Italia*, several essays on the hydrology of the Po and the Tiber, and the *Guida allo Studio dell' Idrologia fluviale dell' Idraulica pratica*.

**Lombards**, a family of the Suevic or Suabian branch of the great Teutonic race. They are first mentioned 5 A. D. In 17, led by Marobodus, they joined the Cherusci, and established Italicus as king. In 548 they appear as Arian Chrs. led by Audouin. Under his son Alboin the L. became a powerful race, ruling Pannonia. Having conquered the Gepidae and killed their king, Alboin married his daughter Rosamund. The prin. cities of N. It. were soon conquered by the L., who to skill in war added administrative capacity. Pavia was taken by them (A. D. 568). Alboin was proclaimed king of It. in Milan, and the Lombard kingdom was founded. Ravenna under its exarch remained Gr., but the remainder of the country was divided into duchies. Alboin was succeeded by Cleph (573), who during his short reign of 18 months greatly extended his dominion. For 10 yrs. the L. under 30 dukes ravaged the greater part of It., when they chose Anseric for king. Autheric (584) organized a powerful federal kingdom. After his death (591) his widow, Theodelinda, married Agilulf. Under his rule the L. became orthodox Catholics. Rotharis (636) crushed the turbulent aristocracy, and became famous by the compilation of the great code of Lombard laws, nearly 400 in number. From the reign of Rotharis the royal succession presents the usual scenes of murder, debauchery, intrigue, and dethronements common to all govts. of the time under weak monarchs, until the accession of the great Liutprand (712). He united the kingdom by subduing the refractory aristocracy. Aided by Popes Gregory II. and III., the L. were successively attacked by Pepin and Charlemagne. Desiderius or Didier had for co-regent Ratchis, who was taken from the cloister. Getting rid of Ratchis, Desiderius ruled alone. His daughter, Hermengilda, married Charlemagne, but as soon as the latter was on the throne he divorced his wife. For revenge, Desiderius supported the claims of the children of Carloman, Charlemagne's brother. Charlemagne invaded Italy (773), and Desiderius, who was made prisoner, ended his days as a monk in the monastery of Corbia. In 776 the L. govt. of dukes was replaced by that of the Franks, and in 803, by treaty between Nicephorus, the emp. of the East, and Charlemagne, all of Lombardy, with the greater part of It., was transferred to the former.

The name *Lombards* also was given during the Middle Ages to a vast number of shrewd Its., principally from Lombardy, who abounded in Lond. and Paris during the 12th century. They were principally brokers, bankers, and usurers, who advanced money on all kinds of securities. [From *orig. art. in J's Univ. Cyc.*, by CHARLES G. LELAND.]

**Lombardy**, a terr. of N. It., extending from the Alps

to the Po, and from Lago Maggiore and the Ticino, which separate it from Piedmont, to Lago di Garda and the Mincio, which separate it from Venetia. It consists of an alpine region to the N. covered with mt. ranges and containing valleys, and a large and fertile plain to the S., extending along the Po, and watered by the Ticino, Lambro, Adda, Oglio, and Mincio. This plain is one of the most prosperous parts of the kingdom of It. Large crops of wheat, maize, rice, and millet are raised. Melons, oranges, figs, citrons, peaches, olives, and mulberry trees are cultivated; also vines of inferior quality. The prin. industry is dairy-farming, which annually produces about 50,000,000 lbs. of excellent cheese. The prin. manufacture is silk of excellent quality; the annual value of this single product is estimated at \$15,000,000. The hilly region is rich in marbles. The terr., comprising an area of 9085 sq. m., with a pop. of 3,684,594, does not form a political unit at present, but is divided into the provs. of Bergamo, Brescia, Como, Cremona, Milan, Pavia, and Sondrio. Aus. ceded the terr. to the king of Sard. in 1859 by the treaty of Villafranca.

**Lombriz** (Sp. "intestinal worm"), an epizootic disease destroying young sheep in Tex. and Mex. The sheep has in its stomach and flesh multitudes of long, reddish, hair-like worms. It is best prevented by liberal feeding and good care for the breeding ewes and the young lambs. The administration of salt water, or of salt, sulphur, and copperas in equal parts, in a few small doses, will, it is asserted, destroy the worms without harming the sheep.

**Lo'mond, Loch**, the largest lake in Scot., 21 m. long, comprising an area of 40 sq. m., and situated between the cos. of Stirling, Perth, and Dumbarton. It receives the Enrick, Luss, and Fruin, and sends its waters through the Leven to the Frith of Clyde. It is studded with islands.

**London**, lun'dun, the metropolis of G. Brit., is situated on both sides of the Thames, 60 m. from its mouth. Its size is somewhat indefinite. The postal dist. covers an area of 250 sq. m. The police dist. extends still farther, covering an area of 687 sq. m., and including (in 1881) a pop. of 4,764,312. On the other hand, the parliamentary L. is much narrower. It consists of 10 boroughs, of which the city of L., although the smallest, is represented by 4 members, on account of its commercial and financial importance, while each of the other 9, although larger, is represented only by 2: Westminster, Chelsea, Marylebone, Hackney, Finsbury, Tower Hamlets, Lambeth, Southwark, Greenwich. But together these 10 boroughs represent only a pop. of about 3,500,000, and the remainder of the in-habs. of the city belong to non-metropolitan electoral dists. Generally, however, the size of the city is determined by the area under the operation of the Metropolis Local Government act, which is also adopted by the registrar-gen. for the census. According to this definition, L. covers an area of 122 sq. m., with 3,832,441 in-habs. in 1881.

In its course through the city the width of the Thames varies from 700 to 1200 ft. It is spanned by a great number of magnificent bridges, of which the most remarkable are L. Bridge, 900 ft. long, of stone, daily crossed by 25,000 vehicles; Waterloo Bridge, 1240 ft. long, consisting of 9 elliptical arches; Westminster Bridge, 1200 ft. long, consisting of 7 iron arches resting on stone piers, etc. Several tunnels under the river connect the 2 banks—the Thames Tunnel, 2 m. below L. Bridge; the Thames Subway, carried 25 ft. below the bed of the river, etc. At L. Bridge the Thames has sufficient water to admit vessels of 800 tons, and between this point and Bigsby's Hole, 6½ m. farther down, opposite Blackwall, extends the port of L., with its 28 magnificent wet docks. Ship-building yards are situated opposite Greenwich. Of other manufactures carried on to a remarkable extent are those of silk, employing about 100,000 persons; clocks, watches, carriages, jewelry, gold and silver ware, etc.; enormous breweries and sugar-refineries are in operation. The manufacturing activity of the city is chiefly carried on in the dists. S. of the river; that of carriages, however, is concentrated at Long Acre. The commerce and regular business are carried on in that part of the city which is distinctively called the *City of L.*, situated on the N. bank of the river, and forming the centre of the whole hive; it has its own police, and is said to be entered every morning by 700,000 persons, who leave it again in the evening.

The prin. thoroughfares run from E. to W., parallel with the river. The W. part is the seat of most of the public insts. and the residence of the wealthy and aristocratic classes. A prominent feature in the prospect of the city are the Thames embankments or river-quays. Of the squares, of which a great number is scattered all over the city, and of which many are planted with beautiful trees and are well cultivated, the largest are Eaton, 1687 by 371 ft.; Cadogan, 1450 by 370; Bryanston, 814 by 198; and Montagu Square, 820 by 156; the most fashionable are Belgrave, Grosvenor, St. James's, Hanover, Cavendish, and Trafalgar squares, with the Nelson Column, the statues of Havelock and Napier, and fine fountains; the most crowded, because situated in the eastern quarters and mostly surrounded by lodging-houses, are Great Ormond, Queen, Brunswick, and Mecklenburg squares. Of the public parks the most prominent is Hyde Park, comprising an area of about 400 acres between Green Park and Kensington Gardens, and containing a fine sheet of water, the Serpentine, an excellent drive, Rotten Row (*route du roi*), from Apsley House to Kensington Gardens, and the splendid Albert monument, erected on the site of the Crystal Palace of 1851. Remarkable among the other parks are the Regent's Park, comprising 450 acres, and containing a zoological and botanical garden; St. James's (59 acres), extending between St. James's Palace, Buckingham Palace, and the Wellington Barracks; Green Park (60 acres), between Hyde Park and Piccadilly, from which it is entered through a triumphal arch surmounted by an equestrian statue of Wellington; Victoria Park (300 acres), in the N. E. part of the city; Kensington Gardens, a beautiful piece of ground separated from Hyde Park by the



Serpentine; the Kew Botanical Gardens (170 acres), 5 m. from Hyde Park, on the road to Richmond, etc.

The citadel of L., the Tower, is perhaps the most interesting and most widely known of its public buildings. It is situated at the E. extremity of the city, and consists of a bewildering mass of towers, forts, batteries, ramparts, barracks, and storehouses, covering an area of 900 ft. by 800. As a fortress the Tower is not of great consequence, but it contains vast stores of war-materials. Of the royal palaces, none is very remarkable; they are more distinguished for vastness of dimensions than for elegance of arch.—viz. Buckingham Palace, Kensington Palace, St. James's, and Marlborough House. The new Westminster Palace, or the houses of Parl., stands on the left bank of the Thames, between the river and Westminster Abbey, on the site of the old palace, which was destroyed by fire in 1834. It is a vast construction, covering an area of 8 acres, containing 2 m. of corridors, 100 staircases, and 1100 apartments. Next to the Tower in historical interest, and far superior to it in architectural respects, is Westminster Abbey. The oldest parts of the present building, the choir and the transepts, were erected in the 13th century by Henry III., the nave and the aisles in the 14th and 15th centuries by the abbots, the W. front and the great window by Richard III., the famous chapel at the E. extremity by Henry VII., who also completed the interior, and the upper part of the W. towers by Wren. The present structure is 511 ft. long, 203 across the transepts, 79 across the nave and aisles; the height of the nave is 102 ft.; of the towers, 225. From the time of Edward the Confessor the kings of Eng. have been crowned here, and most of them, after Henry VII., lie buried or have their monuments here. An interesting spot of the building is called "Poets' Corner," in the E. aisle of the S. transept, in which the most illustrious men of Eng. science, lit., and art are buried or have their monuments. The cathedral of the see of L. is the ch. of St. Paul, built by Wren between 1675 and 1710. It is 500 ft. long, 180 wide, 222 high; the height of the dome is 365 ft., the diameter 145. It is the fifth largest ch. in Europe. The oldest ch. of L. is St. Bartholomew the Great, West Smithfield, built in 1102 and restored 1865-67. L. has a large number of hospitals and over 1000 charitable insts., with an annual income of about £5,000,000, half of which is disbursed for food and clothing alone. By the Elementary Education act of 1870 the city was divided into 10 school dists., represented in the central school board by 49 members. This board is authorized to provide new schools and compel the attendance of children between 5 and 12 yrs. of age. First among all educational insts. of L. stands the Brit. Museum, but the city has beside about 50 large libraries accessible to the public, excellent collections illustrative of industry and art in the Kensington Museum, the National Gallery of Paintings of all schools in Trafalgar Square, and many private collections. C. PETERSEN.

**London**, city, R. R. centre, and port of entry, cap. of Middlesex co., Ont., Canada, on the river Thames, 61 m. E. of Sarnia; is seat of a R. Cath. bp. and of Anglican bp. of Huron; has a convent, orphan asylum, hospital, and insane hospital, and is seat of Hellmuth Coll., Hellmuth Ladies' Coll., and of Huron Coll. Pop. 1881, 19,763.

**London**, R. R. junc., cap. of Madison co., O., on the Pan-Handle and Short Line R. R., 25 m. W. of Columbus. Stock sales have been held here the first Tuesday of each month for the past 25 yrs. Pop. 1870, 2009; 1880, 3067.

**London Clay**, a series of argillaceous strata, in places from 500 to 600 ft. in thickness, forming the most important member of the Lower Eocene of Eng. and the N. extremity of Fr., and underlying the city of Lond. The remains of mammals, of birds, of a sea-snake, of marine turtles, and at least 80 species of fish have been found in these beds, which also abound in shells, and have yielded a great variety of plant remains of tropical or sub-tropical aspect. The fauna and flora thus indicate that these strata were deposits in a delta or in a limited sea receiving waters flowing from a torrid region of the earth.

**Londonderry** (CHARLES WILLIAM Stewart Vane), THIRD MARQUIS OF, b. at Dublin May 18, 1778; served during the wars of the Fr. Revolution; aided in suppressing the Irish rebellion of 1796; accompanied Abercrombie to Egypt in 1801, in which yr. he entered Parl.; became col., aide-de-camp to the king, and under-sec. for the war dept. in 1803; commanded a brigade of hussars under Sir John Moore in Sp. (1808-09); was adjutant-gen. to Sir Arthur Wellesley (1809-13), distinguishing himself at Talavera and other battles, for which he received the thanks of Parl. and the order of the Bath; went as ambassador to Berlin in 1813, to Aus. in 1814, and was a member of the Cong. of Vienna in 1815; was made privy councillor, lieut.-gen., and Baron Stewart in 1814; assumed the surname of Vane in 1819 on his marriage with the heiress of that title; succeeded his half-brother as marquis of Londonderry in 1822; was made Earl Vane and Viscount Seaham in 1823, gen. in 1837, col. of life guards in 1843, knight of the Garter in 1852. Under his original name of Stewart he wrote a *Hist. of the Peninsular War*, and as marquis of Londonderry edited the *Correspondence* of his brother, Lord Castlereagh. In developing the vast estates of his wife he constructed at his own expense the harbor of Seaham. D. Mar. 6, 1854.

**London Pride** (*Saxifraga umbrosa*), a perennial evergreen plant, a native of S. Europe, frequently found in Eng. and in Ire., where it is called St. Patrick's cabbage, from its thick cluster of leaves. The stem grows a foot high, and bears small pink flowers with darker spots. Being unaffected by smoke, it grows well in the Eng. cities, especially in Lond., whence its name.

**London, University of**, incorporated in 1825, reorganized in 1836, the former univ. taking the name of Univ. Coll., and a new univ. then received a charter, which was amended in 1837, 1850, and 1858. The university proper consists of a senate and a board of examiners. It does not instruct, but examines, confers degrees, certificates, and

prizes, and sends one member to Parl. There are several colls. and schools in the kingdom affiliated with the univ. Those at Lond. are Univ. Coll., King's Coll., and New Coll.

**Long** (CRAWFORD W.), M. D., b. Nov. 1, 1815, in Danielsville, Madison co., Ga.; ed. at the Univ. of Ga., graduating with honor in 1835; began to study med. under Dr. George R. Grant in Jefferson, Ga., in 1836; grad. at the med. dept. of Univ. of Pa. in 1839; soon practised med. in Jefferson, Ga. In 1842 he conceived the idea of using sulphuric ether as an anæsthetic in surgery, and Mar. 30, 1842, performed the first operation on a patient fully etherized that is on record. He performed other operations on etherized patients in 1842, 1843, and 1845.

**Long** (JOHN D.), LL.D., b. in Buckfield, Me., Oct. 1838, grad. at Harvard in 1857; prin. of Westford Acad., Mass., for 2 yrs.; studied law, was admitted to the bar in 1861; practised in Buckfield and in Boston; was elected to Mass. house of reps. in 1875, and was its speaker for 3 yrs.; lieut.-gov. in 1879, and gov. 1880-83. Elected M. C. 1882.

**Long** (STEPHEN HARRIMAN), b. in Hopkinton, N. H., Dec. 30, 1784, grad. at Dartmouth 1809; was appointed second lieut. of engineers Dec. 1814; in the spring of 1815 was made assistant prof. of math. at W. Pt. In Apr. 1816 he was appointed topographical engineer, and was brevetted lieut.-col. in 1826; on the organization of the topographical engineers as a separate corps in 1838 he became major of that body, and in 1861 chief of topographical engineers, with the rank of col. His exploration of the Ill. and Ark. rivers in a flatboat or canoe as early as 1816 led to his subsequent expedition to the Rocky Mts., which extended over a period of nearly 5 yrs., and embraced the country between the Miss. and the Rocky Mts., one of the loftiest peaks of which bears his name. When the Baltimore and O. R. R. was commenced, L. was placed at the head of the board of engineers, and devised and patented the bridge now known by his name. Beside these works, he was engaged in the survey and construction of numerous R. Rs. In different sections of the country. After serving on a board for the improvement of the lower Miss. he was in 1856 placed in charge of that work, and under his supervision the contracts for deepening the mouths of this river were conducted prior to the c. war. D. Sept. 4, 1864.

**Longacre** (JAMES BARTON), b. in Delaware co., Pa., Aug. 11, 1794; served an apprenticeship with an engraver at Phila., and from 1819 was engaged for many yrs. in illustrating Amer. works. With James Herring he prepared the *National Portrait Gallery of Distinguished Amers.*, in which many portraits are from drawings by L. In 1844 he became engraver to the U. S. mint. He designed the modern gold coinage of the U. S., and superintended for the gov. of Chili the remodelling of the entire coinage of that country. D. Jan. 1, 1869.

**Long Branch**, R. R. centre, Monmouth co., N. J., 11 m. S. of Sandy Hook and 30 m. S. of New York. One of the prin. watering-places of the U. S., is on the Atlantic coast, and takes its name from a brook which forms a branch of South Shrewsbury River. L. B. proper is the "village," 1 m. from the sea, but the corporate limits embrace also several suburban villages. The *Shore*, where are situated the prin. hotels, has a beach with an open sea-front of more than 5 m. of high commanding bluff without the intervention of inner bays. The drives are very fine. Pop. 1880, 3893.

**Long Branch Village**, N. J. See APPENDIX.

**Longet**, Jon-zhè (FRANÇOIS ACHILLE), b. in 1811, at St. Germain-en-Laye, Fr.; studied med., and especially physiology; gained twice the Montyon prize of physiology at the Acad. of Sciences; was prof. of physiology in the faculty of med. at Paris; member of the Acad. of Med. His prin. works are *Traité d'Anatomie et de Physiologie du Système nerveux* and *Traité complet de Physiologie*. D. 1871.

**Longevity** [Lat. *longevitas*]. Most people have a vague impression that plants live longer than animals, and animals longer than men; and although this notion breaks down even on the most cursory survey of the actual state of affairs, it is not altogether a delusion, as there are plants which are young and vigorous at an age at which even the most longevous animals must die. Although the life of many species of plants lasts only 1 or 2 yrs., the age which certain species of trees attain, such as the baobab, the chestnut, the cypress, the yew, the oak, the palm, etc. is almost fabulous. The age of certain Brazilian cocoa-nut palms has been computed (from the rings visible externally on the rind, each ring denoting the growth of 1 yr.) to be between 600 and 700 yrs. Wallace's oak at Ellersley, near Paisley, Scot., is believed to be more than 700 yrs. old. The 8 olive trees on the Mount of Olives at Jerusalem existed when the Seljuok Turks conquered the city in 1099. Adanson computed the age of certain baobab trees in Afr. at more than 5000 yrs., and Humboldt calls the *Dracena draco* at Orotava in Teneriffe one of the oldest inhabs. of the earth.

In the animal kingdom we know that the L. of insects is very small, ranging from a few hours to a few weeks, but that of reptiles is considerable. A tortoise in the garden of the palace of Lambeth, Lond., perished by accident 120 yrs. old. Several species of fishes may attain a high age. A pike, caught in a lake in Suabia, was, according to a ring attached to it, about 270 yrs. old. Of birds, the gallinaceous families live only between 12 and 15 yrs.; the goose is more longevous, and the swan is known to have lived more than a century. Of mammals, the age of the domesticated animals is well known; the camel lives 40 yrs., the horse 30, the ox 20, the dog 12, the cat 10, the sheep 9, the rabbit 8, the guinea-pig 7, etc. But of non-domesticated animals our knowledge is small and vague, with the exception of a very few cases. Generally, it seems to be a rule among mammals that their L. increases with their size. Aristotle says that the elephant lives 200 yrs., the E. Indians say 300. The age of the whale is computed by the laminae of whalebone in its jaws; if this computation is correct, it attains at least 400 yrs.



How long can the human organism last, when, undisturbed by any merely temporary, local, or individual influences, it is allowed to run through its natural course and exhaust its inherent vitality without any merely incidental break or jar? The Bible puts down as the natural term for human life "threescore and ten," and hist. seems to have confirmed this term. When a man dies at 50, he is and always was said to have died early, and when a man lives to 90, he is and always was said to have lived long.

The following table, constructed by Dr. Farr, F. R. S., from the census enumerations and the registered deaths in Eng. and Wales, shows the number out of every million persons born who remain alive at the end of every yr; also the number of deaths. If the returns made to the registrar-gen. respecting the real ages of persons deceased may be depended upon, it shows that a much larger number than is generally supposed reach the age of 100 yrs. and upward:

Age.	Number alive at commencement of year.	Deaths each year.	Age.	Number alive at commencement of year.	Deaths each year.	Age.	Number alive at commencement of year.	Deaths each year.
0	1,000,000	149,480	37	558,859	6,678	73	191,956	15,469
1	850,507	153,093	38	552,181	6,756	74	176,487	15,363
2	796,827	28,238	39	545,425	6,841	75	161,124	15,136
3	768,589	18,456	40	538,584	6,931	76	145,988	14,789
4	750,133	13,315	41	531,653	7,027	77	131,199	14,319
5	736,818	9,999	42	524,626	7,127	78	116,880	13,736
6	726,919	7,768	43	517,499	7,236	79	103,154	13,021
7	719,151	6,569	44	510,363	7,348	80	90,133	12,214
8	712,592	5,458	45	502,915	7,467	81	77,919	11,320
9	707,134	4,625	46	495,448	7,592	82	66,599	10,358
10	702,509	4,028	47	487,856	7,722	83	56,241	9,352
11	698,481	3,637	48	480,134	7,857	84	46,889	8,324
12	694,844	3,431	49	472,277	7,997	85	38,565	7,300
13	691,413	3,382	50	464,280	8,141	86	31,365	6,298
14	688,081	3,468	51	456,139	8,414	87	24,967	5,346
15	684,563	3,669	52	447,725	8,590	88	19,621	4,459
16	680,894	3,957	53	439,135	8,761	89	15,162	3,653
17	676,937	4,317	54	430,374	8,959	90	11,509	2,933
18	672,620	4,720	55	421,115	9,283	91	8,576	2,310
19	667,900	5,156	56	411,592	9,609	92	6,266	1,781
20	662,750	5,583	57	401,623	10,245	93	4,485	1,345
21	657,167	5,668	58	391,373	10,593	94	3,142	989
22	651,499	5,748	59	380,785	10,958	95	2,153	713
23	645,751	5,820	60	369,827	11,338	96	1,440	500
24	639,931	5,886	61	358,489	11,737	97	940	342
25	634,045	5,950	62	346,752	12,149	98	598	228
26	628,095	6,009	63	334,603	12,572	99	370	147
27	622,086	6,065	64	322,031	13,002	100	223	92
28	616,021	6,121	65	309,029	13,430	101	131	57
29	609,900	6,176	66	295,590	13,846	102	74	33
30	603,724	6,231	67	281,763	14,244	103	41	19
31	597,493	6,287	68	267,509	14,607	104	22	10
32	591,206	6,343	69	252,902	14,925	105	12	6
33	584,863	6,404	70	237,977	15,184	106	6	3
34	578,459	6,466	71	222,793	15,369	107	3	2
35	571,993	6,533	72	207,424	15,468	108	1	1
36	565,460	6,601						

NOTE.—The rate of mortality of males of all ages is 1 in 39.91, and of females 1 in 41.85.

Cases of longevity exceeding one century are frequently recorded. Two of the highest are Peter Czartau, a Hungarian peasant, 185 yrs. old—b. in 1539, d. in 1724; and Thomas Parr, a native of Shropshire, Eng., who d. of an accident when 169 yrs. old. These instances of exceptional longevity are not so rare as commonly believed. While the average duration of life everywhere has sunk below the natural term, and philanthropists, hygienic boards, and govts. are active to repress the most obvious causes of this alarming state, certain philos. have directed their attention to the question whether it is possible to prolong the natural term itself. Haller and Buffon declared that they saw in the nature of the human organism no reason why it should be the rule for man to die at 70, and not at 100. ALFRED FLINCH.

**Longfellow** (HENRY WADSWORTH), LL.D., D. C. L., son of Stephen, b. at Portland, Me., Feb. 27, 1807; entered Bowdoin Coll. at 14, and grad. in 1825 in a class which included Nathaniel Hawthorne and several other persons afterward known in lit. During his coll. days he wrote several short poems; one of these was the *Hymn of the Moravian Nuns*. After graduation he entered the law-office of his father, but in the following yr. accepted the professorship of modern langs. at Bowdoin, with the privilege of spending 3 yrs. in Europe in preparation for that post. After studying in Fr., Sp., It., and Ger., he entered upon his professorship in 1829, and began to publish the results of his researches into European langs. and lit. His first vol. was an *Essay on the Moral and Devotional Poetry of Sp.* (1833), which included translations of the *Coplas de Manrique* and of several sonnets of Lope de Vega. A vol. of prose sketches of travel appeared in 1835 under the title *Outre Mer, a Pilgrimage beyond the Sea*, and numerous essays and critiques on literary topics were contributed to the *N. Amer. Review*. In 1835 he was elected to the chair of modern langs. and lit. at Harvard Univ., as successor to George Ticknor, and spent a yr. in European travel and study, especially in Den., Swe., and Switz. Entering upon his professorship in 1836, he soon became a resident in the historic Cragie House (Washington's headquarters), which he afterward purchased and made his home. In 1839 he pub. *Hyperion, a Romance*, and *Voices of the Night*, his first vol. of original verse, comprising the selected productions of nearly 20 yrs.; it procured him immediate recognition as a poet, and the *Psalm of Life* took rank as a popular favorite. *Ballads and other Poems* and a small vol. of *Poems on Slavery* appeared in 1842; *The Spanish Student*, a drama in 3 acts, in 1843; *The Belfry of Bruges* in 1846; *Evangeline*, a

*Tale of Acadie*, in 1847, the latter being a spirited introduction of hexameter verse. In 1845 he put forth *The Poets and Poetry of Europe*, in 1849 *Kavanagh, a Tale in Idyllic prose*, in 1850 *The Seaside and the Fireside*, in 1851 *The Golden Legend*, in 1855 *The Song of Hiawatha*, in 1858 *The Courtship of Miles Standish*, in 1863 *Tales of a Wayside Inn*, in 1866 *Flower de Luze*, in 1867-70 a translation of Dante, in 1869 *New England Tragedies*, in 1871 *The Divine Tragedy*, in 1872 *Three Books of Song*, in 1874 *The Haming of the Crane*, and in 1875 *Mortari Salutantis*, a poem read at the 50th anniversary of his class at Bowdoin Coll. He resigned his chair at Harvard in 1854, but continued to reside at Cambridge; he travelled in Europe in 1841-42 and 1868-69, on which latter occasion he received the degree of D. C. L. from the Univ. of Ox., and in 1874 received a large complimentary vote for the lord rectorship of the Univ. of Edinburgh. D. Mar. 24, 1882.

PORTER C. BLISS.

**Longfellow** (SAMUEL), b. at Portland, Me., June 18, 1819, brother of H. W. Longfellow; grad. at Harvard Coll. 1839, and Divinity School 1846; was first settled in Fall River in 1848; in 1853 became pastor of the Second Unit. ch. in Brooklyn, N. Y.; resigned his pulpit in 1860 and went abroad; is minister in Germantown, Pa. Mr. L. is a poet, and has written many hymns. His best essays were printed in the *Radical*, 1866-71.

O. B. FROTHINGHAM.

**Longfellow** (STEPHEN), LL.D., b. at Gorham, Me., June 23, 1775, grad. at Harvard 1796; studied law; was admitted to the bar 1801; practised at Portland; was a delegate to the Hartford convention 1814, M. C. 1823-25, and became pres. of the Me. Historical Society 1834. D. Aug. 2, 1849.

**Longinus**, Ion-J'nius (DIONYSIUS CASSIUS), b. about 213 A. D., probably at Athens; made extensive travels; studied at Alexandria, and taught philos., rhetoric, and gram. in Athens. The last part of his life he spent at Palmyra, at the court of Zenobia, whose political adviser he was, as well as her teacher in Gr. lit. It was partly on his instigation that the queen undertook the war against the Romans, and after her defeat L. was put to death, in 273 A. D. by the command of Aurelian. Of his numerous writings only fragments are extant, with the exception of his treatise *On the Sublime*, of which the larger part has come down to us, though in a somewhat mutilated condition.

**Long Island**, the extreme S. E. portion of the State of N. Y., is bounded on the N. by L. I. Sound, E. and S. by the Atlantic, W. and N. W. by the Narrows, New York Bay, and the E. River, which connects that bay, through the strait called Hell Gate, with L. I. Sound. The distance from the Narrows to Montauk, which forms its greatest length, is 118½ m. In breadth it gradually increases from the Narrows for about 40 m., reaching its greatest width of 23 m. Gardiner's, Fisher's, and Plumb islands belong to its political divisions.

**Geology, Soil, Etc.**—The geological structure of L. I. is composed chiefly of glacial drift. Underneath the drift there probably exists a deep deposit of clay. The outcrop of the clay occurs at many points along the N. side. The bed-rock of the island is probably the same as is visible at and near Hell Gate. There it is a dark micaceous gneiss. The drift is composed of pebbles and boulders in a matrix of fine material. On the S. side of L. I. the drift deposit has been exposed to the action of the ocean, consequently it has been ground to sand, and the fine portions, as of clay, washed out. The sands and gravels thus formed occur in layers. The process of disintegration is now going on along the shore of Montauk. The central ridge of hills, which extends nearly the length of the island, is of unmodified drift, and the undulating country northward to the Sound is of the same material. The soil of much of the S. side of the island is sandy, but is easily cultivated; portions are covered with a thick accumulation of organic matter, and are very fertile. The soil of the unmodified drift is loam. The Great South Bay and other bays extend along its S. border within the outer beach, being about 90 m. long by from 2 to 5 wide, supplied by inlets from the sea, and navigable by small craft. The coast on the N. side is indented with bays of greater depth, affording safe harborage for vessels of the largest size. Fifteen light-houses and 30 lifeboat stations guard property and life on the sea and Sound. The island is as well timbered as at the time of its discovery. The unmodified drift has forests of oak, hickory, and chestnut, and the sandy tracts bear pines of several species. A range of hills runs through the island. Of these, Hempstead Harbor Hill, at Roslyn, is 384 ft. above the sea. On the S. side, Coney Island, Rockaway, Quogue, Southampton, and Easthampton are popular watering-places, much frequented in the heats of summer. Steamboats ply to all accessible points.

**Counties, Towns, and Population.**—L. I. is divided into 3 counties—Kings, Queens, and Suffolk. The pop. of the island in 1880 was 743,957, and its area 927,900 acres.

**Principal Cities and Villages.**—Aside from Brooklyn, the cap. of Kings co. (pop. 1880, 566,603), the only other considerable villages in Kings co. are E. New York in the town of New Lots, and Flatbush in the town of Flatbush. Pop. of New Lots tp. 1880, 13,655; Flatbush tp. 7634. In Queens co., Long Island City, pop. 17,129; Flushing, 9200; College Point, 4192; Jamaica, 2922; Hempstead, 2321; Whitestone, 2530; Garden City, 574, and Woodside, 500, are the prin. cities and v. In Suffolk co. there are no cities; the prin. v. are Huntington, 2952; Greenport, 2370; Sag Harbor, 1996; Bridgehampton, 1253; Riverhead, 1757; Babylon, 2142; Bay Shore, 1615; Sayville, 1589, and Northport, 1381.

**Railroads.**—The L. I. R. R. extends the whole length of the island, with numerous branches. There are also many R. Rs. from Brooklyn to Coney Island, etc. There are in Brooklyn about 30 city R. Rs., and others projected for rapid transit, and in several of the towns of Kings and Queens cos. there are also street railways.

The island has an Indian, Dut., and Eng. history. Its Dut. name was "Lange Eylant," converted into Long Island by the Eng. Its Indian names were Paumanacke, Sewanhacky,



Wamponomon, and Matouwacks. After the Dut. discovery in 1609, James I. in 1620 granted to the Plymouth Co. L. I. and the adjacent islands. By request of Charles I., the Plymouth Co. granted a patent to Alexander, Earl Stirling, of the island and the adjacent islands, and appointed James Farret his atty. to sell the lands. The earl d. in 1640. His son and heir in 1640 surrendered the patent to the duke of York. Actual settlements began at the E. and W. nearly at the same time—at Gowanus (Brooklyn), Kings co., in 1636; Gardiner's Island, Southold, and Southampton in 1640; Hempstead, in Queens, in 1643. The island was occupied by about 15 tribes or settlements of Indians, and was a great manufactory of wampum. All of these have passed away, except some 200 Shinnecocks, a mixed breed of blacks and Indians in Southampton, and a few families of Montauks on the Indian reservation at Montauk. While there is proof that the island was coasted by the Florentine navigator Verrazzano in 1524, Coney Island is indicated as the first point at which a boat's crew from Hendrick Hudson's yacht Half-Moon went ashore in 1609, which opened the region to settlements. These began in 1611. The first land grant on L. I. was by purchase from the Indians by Jacques Beutyn and Adriane Bennet in 1636 of a tract of 530 acres in the S. part of the present city of Brooklyn, along Gowanus Cove to the New Utrecht line. The first house known to have been erected on L. I. was that of Adriane Bennet upon this tract, which was burned 1643 by the Indians in the war of that time. The first female child born in Suffolk co. was Elizabeth, daughter of Lyon Gardiner, on Gardiner's Island, Sept. 14, 1641.

Long Island, being the natural outwork against invasion, bore the brunt of the first pitched battle of the Revolution, the battle of Brooklyn or Long Island. This battle was fought on the 26th, 27th, and 28th Aug., 1776, and resulted in the defeat of the Amers. Washington saved the army by his retreat in boats to New York, screened by a thick fog. The island suffered greatly by incursions from the mainland till the peace. [From orig. art. in *J's Univ. Cyc.*, by A. J. SPOONER.]

**Long Island City**, city and R. R. centre, cap. of Queens co., N. Y., on the E. River, opposite the upper part of New York city, Blackwell's Island lying between, was formerly a part of Newtown; incorporated in 1870. Pop. 1870, 3867; 1880, 17,129.

**Long Island Sound**, an arm of the Atlantic Ocean between L. I. and the State of Conn., 115 m. long and generally 30 or 25 m. wide. A chain of small islands extends N. E. from L. I. across the Sound to the S. W. of R. I. The Sound is an important thoroughfare for steamers and coasting vessels. It has important fisheries.

**Longitude, Terrestrial** [Lat *longitudo*, "length."] The L. of a point on the earth is the angle between the meridian plane through that point and the meridian plane through some other point, taken for the origin of L. The angle included at any instant between the plane of the meridian at a place and the plane of an hour-circle through any point of the heavens is the hour-angle of that point. If the point be the vernal equinox, its hour-angle expressed in time at any place at a given instant is the local sidereal time; while if the point were one called the mean sun (which starts from the vernal equinox with the true sun, and moves in the equator with his mean motion), its hour-angle is the local mean solar time. From these definitions it follows that at any instant the difference of local times at 2 places is their difference of L. The problem of terrestrial L. is then to find at any instant of absolute time the difference of the local times of 2 places. It requires, first, the determination of the local time at each place; second, the comparison of those local times at some instant. There are many methods of determining the difference of L. between 2 places:

1. *By signals.* If observers at different places note by clocks the occurrence of some instantaneous phenomenon visible at the same instant to both, the difference of the clock-times corrected for clock-errors is the difference of L.

2. *By the motion of the moon.* There are several methods of determining differences of L., depending on the fact that the moon has a relatively rapid motion among the stars. If observers at 2 points determine some co-ordinate of the moon's position as seen from the centre of the earth, and also their local times, the change in this co-ordinate in passing from one meridian to the other is determined; and from this change and the known rate of change the time required for so much change can be computed. This time is the difference of L.

3. *By eclipses or occultations.* If at any place on the earth whose position is approximately known the phases of a solar eclipse be observed, the corresponding time at a known meridian can be computed, thus giving the difference of L. in like manner we may use an occultation.

4. *By transportation of chronometers.* If a perfect time-keeper were compared with the true time at Greenwich and then taken to any other part of the world, from its error and rate at Greenwich before starting the true Greenwich time at any instant could be computed, and its difference from the local time of the traveller's position would be the difference of L.

5. *By electric signals.* When available, the most accurate method of all is by electric signals. The details of this method, as well as of former ones, are more fully given in original article by GEN. C. B. COMSTOCK, in *J's Univ. Cyc.*

**Longmont**, GEN. R. R. Junc. on St. Vrain River, Boulder co., Col., 40 m. N. of Denver and 17 m. N. E. of Boulder City; was laid out in 1871; has a public library. Pop. 1880, 773.

**Longbards.** See LOMBARDS.

**Longstreet** (Augustus Baldwin), LL.D., b. in Augusta, Ga., Sept. 22, 1790, son of William Longstreet; received academic education from Moses Waddell, LL.D., a celebrated instructor, at Willington, S. C., grad. at Yale in 1813; studied law, and became a distinguished member of the bar, jurist, and writer of great ability; was the author of *Georgia*

*Scenes*, so celebrated for humor; was elected pres. of S. C. Univ. in 1857, subsequently pres. of Emory Coll., Ga., then pres. of the Univ. of Miss. D. Sept. 9, 1870.

**Longstreet** (JAMES), b. in S. C. in 1820; removed with his parents to Ala., from which State he was appointed to the U. S. Military Acad., where he grad. in 1842; served in garrison and on the frontiers until the war with Mex.; was engaged in all the prin. battles of the war up to the storming of Chapultepec, where he received severe wounds. For Contreras and Churubusco he was brevetted capt., and major for Molino del Rey. As adjutant of his regiment he served mostly on duty at frontier posts in Tex. (1847-52), when he was appointed capt., but remaining in Tex. until transferred to the staff in 1858 as paymaster, with the rank of major. In June 1861 he resigned to join the Confederacy, and commanded a brigade at Bull Run. Promoted to be maj.-gen. in 1862, he thereafter rendered valuable service to the Confed. cause. In command of the rear-guard of the army falling back from Yorktown, he had passed through Williamsburg May 5, 1862, when he was called back to oppose the hastily advancing U. forces. At Seven Pines he directed the main attack, and in the subsequent fighting at Cold Harbor and Frazier's Farm his division lost nearly half its numbers in killed and wounded. At the second battle of Bull Run he held the right of the line and contributed largely to the success of the day. At Antietam he commanded the right wing; the left at Fredericksburg. After the latter battle he was temporarily detached with 3 divisions of his corps to operate below the James, until recalled after the battle of Chancellorsville. In the organization of the army to invade the N. he was assigned to the command of one of its 3 corps, with the rank of lieut.-gen.; and in the battle of Gettysburg commanded the right of the line during the second and third days of the fight. The importance of impending operations in the W. caused Lee to detach L., and he arrived with his corps in time to decide the fortunes of the day at Chickamauga. The following month Bragg assigned L. to lead a movement against Burnside in E. Tenn., and in Nov. he compelled that officer to seek the intrenchments of Knoxville, which place L. beleaguered, but was compelled to abandon the siege upon Grant's victory at Chattanooga, and hastily moved to Va., where he rejoined the army of Gen. Lee; in the ensuing campaign he was severely wounded by his own troops in the Wilderness battle (May 6), and disabled for months. Returning to duty in Oct., he commanded the defences of Richmond N. of the James. The war ended, he accepted the result, and labored to promote an era of good feeling between all sections of the country. Taking up his residence in New Orleans, he was appointed (in 1869) surveyor of the port. In 1875 settled in Ga., U. S. minister to Tur. 1880-81. U. S. marshal of Ga., 1881-84. [From orig. art. in *J's Univ. Cyc.*, by G. C. SIMMONS.]

**Longstreet** (WILLIAM), b. in N. J. in 1760, but in early life moved to Augusta, Ga. He was by nature a mechanician and inventive genius. As early as Sept. 26, 1790, he had projected a boat to be propelled by steam, which he could not perfect for want of means at that time. This was afterward done by aid from private sources, and he put the boat in operation in the Savannah River in 1807, a few days after Fulton met with like success on the Hudson. L.'s boat was not constructed on Fulton's plans at all. It moved against the current of the stream at the rate of 5 m. an hour. He invented the breast-roller of the cotton-gin, which was of incalculable value. D. 1814. ALEXANDER H. STEPHENS.

**Longus**, a Gr. Sophist of the 4th or 5th century of our era, was the author of a small erotic novel, *Daphnis and Chloe*. It was translated into Eng. by G. Thornley (1657).

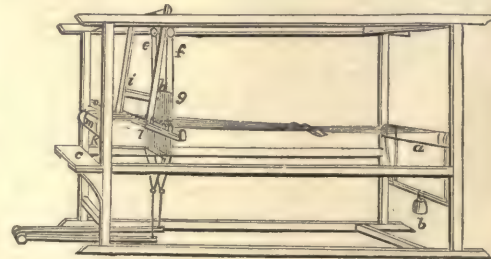
**Longview**, R. R. Junc., cap. of Gregg (formerly Upshur) co., Tex., on the Sabine River, 66 m. W. of Shreveport; incorporated in 1871. Pop. 1880, 1525.

**Longyear** (JOHN W.), b. in Shandaken, N. Y., Oct. 22, 1820; removed in 1844 to Mich.; was admitted to the bar 1846; settled at Lansing 1847; was M. C. 1861-65, a delegate to the Loyalist convention at Phila. 1866, a member of the State constitutional convention of Mich. 1867; appointed judge of the dist. court of Mich. 1870. D. Mar. 10, 1875.

**Lonsdale**, on R. R., Providence co., R. I., 7 m. N. of Providence. Pop. 1880, 847.

**Loo-Choo**, or **Lew-Chew**, a chain of 35 small islands stretching from Japan to Formosa, 400 m. off the coast of Chi. Foreigners are not allowed to visit them. The inhabs. are a mixture of Japanese and Chi., the former element being predominant. The religion is Buddhism blended with the doctrines of Confucius.

**Loom** [A.-S. *lōma*], the machine by which weaving is effected. In its simpler forms it is probably one of the earliest of human inventions. The object of weaving is the making of cloth by the intersection of materials. The portions run-



Loom.

ning lengthwise are called the warp, or chain, and those across, the woof or weft. The framework consists of 4 uprights, with 3 horizontal beams at the top, centre, and base.



At one end is the beam or yard-roll (*a*) on which the threads of the warp are wound, passing through the head, a sort of comb (*b*), and extending to the cloth-beam or breast-roll (*m*) at the other extremity of the L. Round the latter the fabric is rolled as it is woven. It is kept tight by weights suspended from the yard-roll (*b*). The treadles (*d*) are pressed by the feet; one is connected with the harness or heddle (*c*) and the other with *h, g, f*. The alternate depression and elevation of the treadle causes a corresponding movement in the harness to which it is attached. The harnesses are each formed of 2 horizontal bars, connected by many small cords of varying lengths, and united by a rope and pulley, so that the depression of the one necessitates the elevation of the other. Where the harnesses are intersected by the warp (*o*) there are loops or metallic eyes. Each separate thread is passed through the cords of one or other of the harnesses in regular order, so that the alternate warp-threads go through the loops of one heddle, while the intermediate threads are passed through the cords of the one and the loops of the other harness. When the treadle-action lowers one harness, all the warp-threads passing through its loops will be depressed, while the other harness, with all the intermediate threads, will by the same motion be raised, thus leaving between the 2 divisions a space for the passage of the shuttle, which carries the thread of the weft. As soon as it passes the action is reversed. The reed (*i*), sometimes made of small portions of split reed, but usually of flattened wires, drives the threads tightly after each intersection. The wires are fixed like comb-teeth in a frame which rests upon the shuttle-race, the warp-thread passing through the interstices. At the top is a cover with a groove along its lower side, known as the lay-cap. The weaver's seat (*e*), being hung by rounded ends, accommodates itself to the various movements of the body required by the various operations described. The movement of the batten is produced by the hand of the weaver. Such is a description of the simplest form of L., and the highly complex machines now employed are identical in principle. One great difference between the hand-L. and the power-L. is the mechanical arrangement by which the shuttle is thrown in the latter. At each side of the L., and in a line with the *shed*, is a groove. Along these *shuttle-races* the shuttle flashes, impelled by a leather and strap arrangement acting on the principle of a sling. The warp unwinding from a beam passes round a roller above it, passes through the 2 leaves of the heddles, thus forming the *shed* through which the shuttle flies, the weft is then pressed up by the batten, and the finished cloth results.

In weaving figured fabrics 2 persons were formerly necessary. In 1779 William Cheape patented a mechanical "draw-boy," as the assistant was called. This, with sundry improvements, continued in use until it was superseded by the famous Jacquard machine. The Jacquard frame can be adapted to nearly all L. The warp-threads are passed through loops in the lifting-threads, so as to be raised by the action of the treadles upon the lifting-bars; the lifting-threads hang on wires terminating in a hook. Each wire passes through a horizontal needle at right angles. It moves freely through at one side, and at the other extremity is looped on to another rod ending in a spring-box. When pushed back into this box, it presses upon a spiral spring, which restores it to its former position immediately the pressure ceases. When pressure is exerted upon any wire it is thrown out of the perpendicular, and so fails to catch upon the projection in the lifting-bar; the wires not so acted upon reach the bar, drawing the threads of the warp attached to them. It will be evident from this that by regulating the pressure upon the horizontal needles any variation of thread can be effected. For this purpose a square roller is used, with its 4 sides pierced with holes corresponding to the number of threads in the warp, in the same way as the wires and needles. A row of needles fits into a row of perforations, and each row of the latter is brought in succession against the needles by a motion received from the machinery. In the ordinary course the simple effect would be that all the wires would act, and all the warp-threads be hooked upon the projections in the bar. In order to produce the variations in the arrangement of threads required for the production of the pattern, this roller is masked with what are known as pattern-cards. These are perforated in accordance with the desired pattern, the holes, where there are any, corresponding with those of the rollers they cover. Where not perforated the card resists the action of the needle, pressing it back upon the spring, and so throwing the lifting-bar out of the perpendicular, and preventing the lifting of the warp-thread to which it is attached. The cards are looped together at the corners, and act as an endless chain, their perforations indicating the pattern. [From orig. art. in *J.'s Univ. Cyc.*, by W. E. A. AXON.]

**Loomis** (ELIAS), LL.D., an Amer. math., b. in Tolland Co., Conn., Aug. 1811, grad. at Yale 1830; prof. of natural philos. Western Reserve Coll. 1837, Univ. of City of New York 1844, and Yale Coll. 1860. Has contributed many papers on science to Amer. Philosophical Society and to *Amer. Journal of Science*; is author of a series of text-books on higher math. and their applications.

**Loomis** (JESSE ROLPH), LL.D., b. at Bennington, N. Y., Aug. 10, 1810, grad. at Brown Univ. 1835; prof. of natural sciences in Colby Univ. (Waterville, Me.) 1836-52, and held the same position in the Univ. at Lewisburg, Pa., 1853-58; Author of *Elements of Geol.* and *Elements of Physiology*.

**Loomis** (LAFAYETTE CHAS.). See APPENDIX.

**Loomis** (SILAS L.). See APPENDIX.

**Loon, or Great Northern Diver**, is a large solitary bird and a fine diver. Its loud, startling cry is well known.

**Lo'pes, or Lopez** (FERNÃO), b. about 1380, in Port.; devoted his life to the collection and study of materials for the hist. of his country and the composition of chronicles of several of her kings. Like Froissart, he visited the scenes

of battles and of other important events, and conferred much with eminent soldiers and statesmen who had participated in the wars and other public affairs of Port. His chronicles possess great literary and critical value, and are probably surpassed in merit by no historical works of the century in which they were written. The style of L. is generally less picturesque than that of Froissart, but in some cases—as, for instance, in the description of the battle of Aljubarrota, known in Port. hist. as "the battle," fought in the yr. 1386—the Port. writer has a decided superiority over the Fr. chronicler. L. is always animated with a patriotism which much enlivens his annals. The works of L. are *Chronica do Senhor Rei Dom Pedro I.*, *Chronica do Senhor Rei Dom Fernando*, and the *Chronica do Rey Dom João I.*

**Lo'pez** (CARLOS ANTONIO), b. at Asuncion, Paraguay, Nov. 4, 1790; was ed. at the ecclesiastical sem. of that city. To escape persecution by the dictator Francia, he resided many yrs. in an obscure v.; returned to Asuncion on the death of Francia in Sept. 1840; was appointed sec. of the military junta; was elected one of the 2 consuls in 1841; pres. for 10 yrs. in 1844; re-elected for 3 yrs. in 1854, and again for 10 yrs. in 1857, with power to appoint a successor by will. He governed despotically; opened the country to foreign commerce, sent a number of Paraguayan youth to Europe for education, bought several steamers as the foundation of a navy, levied a considerable army, asserted a govt. monopoly for tobacco and *yerba maté*, engaged in desultory warfare with the dictator Rosas of Buenos Ayres, was involved in diplomatic controversies with Fr., Eng., Brazil, and the U. S., narrowly escaping hostilities with the 3 latter powers. D. Sept. 10, 1862.

**Lopez** (FRANCISCO SOLANO), son of the preceding, b. near Asuncion, Paraguay, July 24, 1826 or 1827; at 19 was made gen. and commander-in-chief of the Paraguayan army, then engaged in hostilities with the dictator Rosas of Buenos Ayres; spent some months in the Argentine prov. of Corrientes, then in rebellion against Rosas. Returning to Asuncion, he was successively entrusted by his father with all the more important offices of the state. In 1853 he was sent to Europe accredited as minister to the courts of Lond., Paris, and Turin. He engaged engineers, bought steamers, contracted for the building of a railroad and the establishment of a Fr. colony, and purchased arms and materials of war; also made the acquaintance of Madame Lynch, who followed him to Paraguay and had an important influence upon his later career. In 1855 he became minister of war under his father, and the successive difficulties with the U. S., Eng., Fr., and Brazil stimulated his resolution to make Paraguay a military power. In 1862, on the death of his father (Sept. 10), L. assumed the executive power by virtue of a nomination as v.-p. made in the will of the former, and convoked a cong. by which he was elected (Oct. 16) pres. for 10 yrs. In Sept. 1864 he declared himself the protector of the "equilibrium" of the La Plata regions; inaugurated hostilities in Nov. 1864 by seizing a Brazilian merchant-steamship which was on its way to Matto Grosso, conveying the pres. of that prov., who with his suite was thrown into a prison from which none of them ever emerged. In the following month he sent a force to occupy the prov. of Matto Grosso, and early in the following yr. despatched another force across the Argentine terr. into the Brazilian prov. of Rio Grande do Sul. The refusal of the Argentine govt. to consent to this passage of troops afforded L. a pretext for hostilities against that country. In Mar. 1865 L. procured from the cong. a declaration of war against Brazil and the Argentine Republic. On May 1 a triple alliance against Paraguay, between Brazil, the Argentine Republic, and Uruguay, was signed. Early in 1866 the allies had recovered their own provs. and invaded Paraguay, where they were kept at bay for yrs. until nearly the whole male pop. of Paraguay had been impressed into military service and had perished. Always cruel and suspicious, his evil qualities were stimulated by a long succession of military failures, and by increasing habits of intemperance, until in 1868 they culminated in the arrest, torture, and execution of several hundreds of Paraguayans and foreigners on a charge of conspiracy. Driven by successive defeats to the N. extremity of Paraguay, his forces being reduced to a few squadrons, L. was surprised and killed by a Brazilian force on the banks of the river Aquidaban, along with his eldest son, a boy of 16, Apr. 1, 1870.

PORTER C. BLISS.

**Lopez** (Gen. NARCISO), b. in Venezuela in 1759; entered the military service of Sp. at an early age; was engaged in the war against the independence of his native country, attaining the rank of col. in 1822; settled in Cuba after the withdrawal of the Sp. army from Venezuela; engaged in military operations against the Carlists in N. Sp., and became gov. of Madrid and senator for Seville, but resigned. Returning to Cuba, he became an exile, and led 3 expeditions to Cuba from Amer. ports in 1849, 1850, and 1851, the last ending in his capture and execution by garrote Sept. 1, 1851.

**Lo'quat**, the *Eriobotrya Japonica*, a shrub of the order Rosaceae, a native of Japan, cultivated in parts of the U. S. Its fruit is very early and has a yellow color.

**Lorain**, O. See APPENDIX.

**Lord** (ELIAZAR), LL.D., b. at Franklin, Conn., Sept. 9, 1788; studied at Andover; removed in 1809 to New York; entered the Presb. ministry in 1812; was one of the founders of the Amer. Education Society and the New York Sunday-school Union (of which he was corresponding sec. 1818-26 and pres. 1829-36); engaged in 1818 in banking; founded the Manhattan Insurance Co., and was its pres. 1821-34; was also the first pres. of the Erie R. R.; in 1836 removed to Piermont, N. Y.; aided in founding the theological sems. at E. Windsor (now at Hartford), Conn., and at Auburn, N. Y. Wrote *Principles of Currency, Geol. and Scriptural Cosmogony*, and several other books. D. June 3, 1871.

**Lord** (JOHN), LL.D., b. at Portsmouth, N. H., Dec. 27, 1810, grad. at Dartmouth in 1833, and was agent of the Amer.



Peace Society; afterward preached at New Marlboro', Mass., and Utica, N. Y., but subsequently gave himself to historical study and lecturing; wrote several historical works and school-books.

**Lord** (NATHAN), D. D., LL.D., b. at South Berwick, Me., Nov. 28, 1793, grad. at Bowdoin in 1809, and at Andover in 1815; was 2 yrs. instructor at Phillips Acad., Exeter, N. H.; and was pastor of a Congl. ch. at Amherst, N. H., 1816-28, and pres. of Dartmouth Coll. 1828-63; wrote several pamphlets, addresses, reviews, and sermons, 2 of which, the *Letters on Slavery*, excited much comment; for he maintained the lawfulness of that institution. D. Sept. 9, 1870.

**Lord** (SCOTT), b. in Nelson, N. Y., Dec. 11, 1820; studied law in Buffalo, began practising in Livingston co., N. Y., and was elected judge in 1846. In 1872 he moved to Utica, N. Y., and in 1874 was elected to Cong. from the Oneida dist. After the close of his Congressional term he resumed his profession in the city of New York.

**Lord's Day**, a name for the first day of the week. The rendering "Lord's Day" is Wycliffe's (1380). In all the eds. of Luther's N. T. previous to his revision of 1541 he renders *Ans. Sontage*, and Tyndale (1536-34), Coverdale (1534), Cranmer (1539) follow him, and translate "on a Sondag."

**Lords, House of**. See PARLIAMENT.

**Lords Supper**. See EUCHARIST.

**Loreto**, city of It., in the prov. of Ancona, about 30 m. S. W. of the city of Ancona. The chief int. of this place is the sanctuary of Our Lady of Loreto. This building, designed by Bramante, is said to contain the house in which the Holy Family dwelt at Nazareth. According to the legend, this dwelling was borne through the air by angels, who would not leave it to be desecrated by the infidels, and deposited first near Flume on the Croatian coast; then, after several other translations, it was finally set down at Loreto. This last removal, it is asserted, took place on May 29, 1299, during the pontificate of Boniface VIII. Pop. of city, 8083.

**Loreto, Sisters of**, or "Friends of Mary at the Foot of the Cross," a Catholic religious order founded in 1812 in Ky. by Charles Nerinckx (1761-1824), a priest, have many establishments in the W. States, and devote themselves to the cause of education and the care of destitute orphans.

**Lorient**, or **L'Orient**, lo-re-ong', town of Fr., dept. of Morbihan, at the mouth of the Scorf, in the Bay of Biscay, was founded in the middle of the 17th century by the Fr. E. I. Co., whence its name, Port de l'Orient, and had an immense trade, which has declined. In 1770 it was made one of the 4 stations of the Fr. navy. Its dockyards and arsenals are extensive, and its manufactures of naval equipments are important. Pop. 1881, 37,812.

**Lorikeet**, a name applied to the numerous trichoglossine parrots of Australia and the E. Archipelago, having the tongue covered with bristly hairs, with which the birds collect honey from flowers. They are showy birds and fly in great flocks.

**Loring** (CHARLES GREELEY), LL.D., b. at Boston May 2, 1794, grad. at Harvard in 1812; was for many yrs. a lawyer of Boston; was 1857-67 actuary of the Hospital Life and Trust Co.; author of *Neutral Relations of the U. S. and Eng.* and a *Life of William Sturgis*, beside pub. addresses, etc. D. Oct. 8, 1867.

**Loring** (GEORGE BAILEY), M. D., b. at N. Andover, Mass., Nov. 8, 1817, grad. at Harvard 1838, and at the Harvard Med. School 1842; was phys. to the Chelsea Marine Hospital for some yrs.; has devoted himself since 1850 entirely to scientific agriculture and the pursuits of public life. He took up his residence at Salem; represented that city for several terms in the Mass. house of representatives and senate; was for 3 yrs. pres. of the latter body, and for many yrs. pres. of the State Agricultural Society. His public addresses are very numerous. He contributed largely to Flint's *Agricultural Reports*, to Murray's work *On the Horse*, and has written *The Farmyard Club of Gotham*. Became U. S. Com. of Agriculture in 1881.

**Loring** (WILLIAM W.), b. in N. C. about 1815; entered the U. S. A. as second lieut. in command of a detachment of mounted volunteers, and served in the Fla. war 1835-42; became capt. of mounted rifles 1846, major in Feb. 1847; commanded a regiment in the battles in the Valley of Mex.; was brevetted lieut.-col. for gallantry at Contreras and Churubusco, and col. for gallantry at Chapultepec; lost an arm at the Belen gate of Mex.; commanded an expedition on the Gila River, N. M., 1857; resigned May 13, 1861; became a brig.-gen., and subsequently a maj.-gen. in the Confed. army. Went to Egypt, and became pasha and chief of staff of khedive. Returned to U. S., 1879.

**Lorraine** (Ger. *Lothringen*), a terr. between the rivers Rhine, Saône, Meuse, and Scheldt, and forming a plateau from 500 to 800 ft. high, which leans against the Vosges with a N. and N. W. inclination. It derived its name from Lothaire II., son of the emp. Lothaire I., who received this terr. at the division of his father's dominions, and called it *Lotharii Regnum* (Lotharinga). Upper L., between the Rhine, Saône, and Meuse, was ruled for centuries by a dynasty of its own, subject either to Fr. or to Ger. authority. But in 1733 it was conquered by the Fr., and in 1737 the legal heir, Frantz Stephan IV., exchanged it for the grand duchy of Tuscany, and it was given to Stanislaus, ex-king of Poland and father-in-law to Louis XV., at whose death in 1766 it fell to Fr. The inhabs. remained Ger. in lang. and customs in the E. and N. dists., and this part of the country was ceded to Ger. May 10, 1871.

**Lorraine** (CLAUDE). See GELÉE (CLAUDE).

**Lo'ry** (Hind. *lārī*), a name given to various birds of the parrot family, but especially to those of the genus *Lorius* or *Domicella*, whose head-quarters are the islands of the Sunda-Moluccan Archipelago and Polynesia.

**Los Angeles**, city and R. R. centre, capital of Los Angeles co., Cal., on the W. bank of the Los Angeles River, 30 m. from its mouth and 482 m. S. S. E. of San Francisco.

The town was founded Sept. 4, 1781; was made a city and cap. of Cal. by the Mex. Cong. in 1836, and was the seat of the last govt. 1844-46. In the latter yr. it was captured by the combined forces of Com. Stockton and Gen. Kearny. The first discovery of gold in Cal. was made here by Abel Stearns, who came from Boston in 1829, and in 1833 sent gold-dust to the mint at Phila. It has the Univ. of S. Cal., a branch of State Normal School, a Catholic coll., and a female sem. directed by Sisters of Charity. The full name is *Pueblo de la Reina de los Angeles* ("Town of the Queen of the Angels"). Pop. 1870, 5728; 1880, 11,183; 1885, about 21,000.

**Loskiel** (GEORGE HENRY), b. in Courland, Rus., Nov. 7, 1740; entered the Moravian ministry; wrote a *Hist. of the Mission of the United Brethren to the Indians of N. Amer.*; became bp. at Hernhuth Mar. 14, 1802, and came to the U. S. in the same yr. as supt. of the Moravian chs. and pastor at Bethlehem, Pa. D. Feb. 23, 1814.

**Los'sing** (BENSON JOHN), LL.D., b. at Beekman, N. Y., Feb. 12, 1813; was employed as a watchmaker in Poughkeepsie from 1826 to 1835; was next a journalist at that place for several yrs., and in 1838 became a wood-engraver in New York. Has written numerous works relating to Amer. hist., mostly illustrated by himself, among which are *Pictorial Field-Book of the Revolution*, *Hist. of the U. S.*, *Pictorial Field-Book of the War of 1812*, *The Civil War in Amer.*, *Hist. of the U. S. for Children*, *Cyc. of U. S. Hist.*, and *Hist. of City of New York*. He resides at Dover, N. Y.

**Lothaire** I., Rom. emp. (840-856), b. about 796; shared together with his 2 younger brethren, Pepin and Louis, in the govt. of the empire during the latter part of the reign of his father, whom he succeeded in 840. On the death of Louis war broke out between the brothers, and L. was defeated in the battle of Fontenay June 25, 841. But in 843 the treaty of Verdun was concluded between them, according to which L. retained the imperial title and dignity, It., and a strip of land between Ger. and Fr., stretching from the Mediterranean to the N. Sea, and extending between the Rhine on the one side and the Rhone, Saône, Meuse, and the Scheldt on the other. L. was utterly unable to defend and govern his land. The Saracens attacked him in It., the Norsemen in the Netherlands, while the clergy, the dukes, and his own sons filled the interior with bloodshed. After dividing the country between his sons he retired to the monastery of Prüm, where he d. Sept. 29, 855.

**Lothaire II.**, THE SAXON, king of Ger. and Rom. emp. from 1125 to 1137, b. in 1075; married in 1100 Richenza, the heiress of the house of Brunswick, and received in 1106 Sax. as a fief of Henry V. At the death of this prince in 1125, L. was elected king of Ger. His reign was vigorous and fortunate. Bohemia was again brought under Ger. authority; the refractory dukes were compelled to submit; the 2 It. campaigns in defence of Innocent II. against the antipope Anacletus were successful. Nevertheless, he bought his crown and the assistance of the Ch. by surrendering the right of investiture almost wholly to the pope, and allowed the principle of heredity to establish itself with respect to the fiefs of the Crown. D. Dec. 3, 1137.

**Lothrop** (SAMUEL KIRKLAND), D. D., b. at Utica, N. Y., Oct. 13, 1804, grad. at Harvard in 1825; ordained at Dover, N. H., in 1829, and in 1834 became pastor of the Brattle st. ch., Boston; wrote the *Life of Samuel Kirkland*, his grandfather, a *Hist. of the Brattle St. Ch.*, and occasional addresses and other papers.

**Lothrop** (Capt. THOMAS), b. probably in Eng., was a freeman of Salem, Mass., in 1634, where he resided many yrs., and was representative in "general court" 1647, 1653, and 1664. He afterward settled at Beverly, founded a ch. there, represented that town 4 yrs., and on the breaking out of King Philip's war was chosen capt. of a company of militia, celebrated in N. Eng. as the "flower of Essex," nearly all of whom, with himself, were surprised and killed by the Indians at Bloody Brook, Sept. 29 (N. S.), 1675.

**Lotophagi**, or **Lotus-eaters** [Gr. *Λωτοφάγοι*], are first mentioned by Homer as a people who fed upon the sweet fruit of the lotus, of which the quality was such that all who ate of it immediately forgot their native land and all desire of return, and chose rather to dwell there and eat of the lotus still. The anc. geogs. placed the lotus-eaters on the coast of E. Tripoli, near the Great Syrtis.

**Lott** (JOHN A.), b. at Flatbush, Kings co., N. Y., in 1805; ed. at Flatbush Acad. and Union Coll., N. Y.; studied law; commenced the practice of law in Brooklyn, N. Y., in partnership with Henry C. Murphy, Esq., in 1835; belonged to the Dem. party, and was co. judge 1838-42; was elected to the assembly in 1841, State senator 1842-46, justice of supreme court 1857-65; elected to court of appeals in 1869, which was abolished in 1870, and he was chief of the commission appointed to finish up its work; member of commission appointed by Gov. Tilden in 1875 to draft a uniform law for the govt. of cities in the State; was pres. of Brooklyn, Flatbush and Coney Island R. R.; pres. of the Flatbush board of improvement. D. July 20, 1878.

**Lot'tery**, a game of chance in which prizes are drawn by lots. Two kinds of L. are generally distinguished—the class or Dut. L. and the numerical or Genoese—but both originated in It. From It. the custom spread to other countries, showing itself remunerative everywhere; and in the 16th and 17th centuries govts. generally adopted it with some modifications as a method of procuring money.

In Eng. the first L. was instituted in 1569. But although the profits of the L. were generally employed for some internal improvement of national interest, the gen. demoralization which accompanied this kind of gambling caused Parl. in 1778 to demand an annual license of £50 from every one who kept a L.-office, and finally in 1826 entirely abolished the whole inst. In Fr. the L. was introduced in 1539, and it soon became a popular passion, but in 1836 all kinds of L. were prohibited. In Ger. the first L. was established in 1669 in Nuremberg, and there they still flourish.

In the U. S., L. were formerly very commonly resorted to



as a means of raising money for some public improvement—though they were denounced as early as 1699 by an assembly of ministers at Boston as "cheats." In 1833 appeared at Phila. Job R. Tyson's *A Brief Survey of the Great Extent and Evil Tendencies of the Lottery System of the U. S.*, and a society was formed in Pa. with the purpose of working for the abolition of the inst. It was indeed abolished in Pa. and Mass. in the very same yr., in Conn. in 1834, in Md. in 1836, etc. At present it exists only in Ky. and La. as a State inst., and in most of the other States, though not in them all, the sale of tickets for foreign L. is prohibited by law, and to advertise them has been made a penal offence.

**Lotus**, or **Lotos**, [Gr. *Λωτος*], a name applied in lit. to many widely different plants: (1) To the *Zizyphus L.*, a kind of jujube tree of Barbary, whose fruit is extensively gathered as food. It is the subject of much Ar. poetry. (2) The *Melilotus Messiniensis*, a valuable forage-plant of the Levant and of the order Leguminosae. (3) The ebenaceous date-plum or pishamin (*Diospyros L.*) of Europe and Asia, much resembling our persimmon, and producing a valuable fruit. (4, 5) The fragrant blue and white Nilotic water-lilies (*Nymphaea corulea* and *N. L.*), which were greatly honored by the Egyptians, and were everywhere worshipped. They were mystically connected with their mythology. (6) The *Nelumbium speciosum*, or sacred Egyptian bean, another beautiful pink water-lily, mystically honored in Chi. and India, as well as in anc. Egypt. This is the L-flower of India. (7) A N. Afr. and European hackberry tree, *Celtis australis*, whose wood is prized by carvers and whose fruit is edible. (8) There is a large genus of clover-like leguminous plants called *Lotus* by Linnaeus, some of them forage plants. It includes the bird's-foot trefoils and other Old-World plants, which are in Europe cultivated as forage-herbs. (9) The *Nelumbium luteum*, one of our finest water-plants, known as the water-chinquapin.

**Loudonville, O.** See APPENDIX.

**Louis le Débonnaire**, or **THE PIOUS**, Rom. emp. (814-840), b. at Casseneuil in 778, a son of Charlemagne by his 3d wife, Hildegard. His elder brothers having died, he succeeded his father Jan. 28, 814; in 817 he gave each of his sons a share in his dominions, and hence arose complications which resulted in the dissolution of the empire. Lothaire received Austrasia and the title of emp.; Pepin, Aquitania; and Louis, Bavaria, Bohemia, and the dists. on the E. frontier. Bernard, a nephew of L., who had inherited It. after his father, received nothing, and revolted, but the emp. took him prisoner, put out his eyes, and gave It. to Lothaire. In 819 he married a second wife, Judith of Bavaria. In 823 she bore him a son, Charles, who received the surname of the *Bald*, and in 829 he proposed to undertake a new division of the empire in favor of his youngest son. A war broke out, which lasted to the death of the emp. Twice the father was defeated, taken prisoner and deposed by his 3 sons, but both times the avarice and ambition of Lothaire disunited the brothers, and Louis and Pepin again raised the father to the throne. Pepin d. in 838, and the emp. now proposed to give his dominions to Charles the Bald; but when he at the same moment gave It. and Austrasia to Lothaire and nothing to L., the latter revolted, together with the sons of Pepin. D. June 20, 840.

**Louis II.**, Rom. emp. (855-875), b. in 822, the eldest son of Lothaire I. After the death of Louis le Débonnaire, the empire was divided between his 3 sons, Lothaire I., Louis the German, and Charles the Bald. This division of the empire of Charlemagne was carried still further on the death of Lothaire I., his part being subdivided between his 3 sons, Louis, Lothaire, and Charles. Louis II. received It. and the title of emp. He fought successfully against the Saracens in It. He also vindicated his authority over the great It. families. Charles d. without children in 863, and L. and Lothaire II. divided his dominions; but when in 869 Lothaire II. also d. childless, Charles the Bald and Louis the German took advantage of the emp.'s being implicated in a war with the Saracens in It., and divided Lothaire's dominions between themselves. D. Aug. 13, 875.

**Louis III.**, **THE CHILD**, Rom. emp. (906-911), b. in 893, a son of Arnulf, and raised to the throne of Ger. on his father's death in 890 by Duke Otto of Saxe, Margrave Luitpold of Aus., and Abp. Hatto of Mentz, who wished to govern the country during his minority. But the state of Ger. while under their rule was miserable: the Hungarians invaded the country, and devastated it as far as Thuringia. In 908 L. assumed the title of Rom. emp., but d. in 911, and with him the Carolingian dynasty became extinct in Ger.

**Louis IV.**, **THE BAVARIAN**, emp. of Ger. (314-1347), b. in 1296, a son of Duke Louis the Severe of Bavaria and Matilda of Hapsburg. On the death of Henry VII. of Luxemburg in 1313 he was chosen emp. by a majority of the electors, while a minority chose his cousin, Frederick III. of Aus. A long war commenced between the two emps., but Frederick was defeated in the battle of Mühldorf, Sept. 28, 1323, taken prisoner, and compelled to renounce his claims. Having supported the Visconti in Milan against Pope John XXII., a quarrel arose between the pope and the emp. L. was excommunicated, but went in 1327 with an army to It., was crowned in Milan and Rome, deposed John XXII., and established Nicholas V. as antipope; but he was soon compelled to leave It., and John XXII. and his successors, supported by Fr. intrigues, continued to harass him; Ger. was placed under interdict. A diet at Reuse (July 15, 1338) declared that an emp. legally chosen by a majority of the electors needed no confirmation from the pope. This supported by the Ger. princes, the emp. prepared for a new campaign against the pope, when he suddenly d. Oct. 11, 1347.

**Louis**, the name of 18 kings of Fr.: (1) **LOUIS I.**, **LE DÉBONNAIRE**, Rom. emp. 814-840.—(2) **LOUIS II.**, **LE BÈGE** (877-879), a son of Charles the Bald.—(3) **LOUIS III.** (879-882), b. in 864, a son of Louis II., divided the country with his brother Carloman, who inherited the whole after his death.—(4) **LOUIS IV.**, **D'OUTREMER** (936-954), a son of Charles the Simple.

—(5) **LOUIS V.**, **LE FAINÉANT** (985-987), was the last king of the Carolingian dynasty.—(6) **LOUIS VI.**, **LE GROS** (1108-37). Under him the *origanisme* was first used as a national banner, and a feeling of national unity became prevalent in the population.—(7) **LOUIS VII.**, **LE JEUNE** (1138-80), a son of Louis VI.—(8) **LOUIS VIII.** (1223-26), a son of Philip Augustus.—(9) **LOUIS IX.**, **SAINT** (1226-70), a son of Louis VIII., took the cross in 1248, landed in Egypt, but was compelled to surrender with his whole army 1250. In 1270 the king embarked with an army of 60,000 men for a new crusade. He landed in Tunis, but the plague broke out in the army and he d. Aug. 25.—(10) **LOUIS X.**, **LE HUTIN** (1314-16), a son of Philip IV.—(11) **LOUIS XI.** (1461-83), a son of Charles VII., curbed the feudal houses of Fr. and added to the Fr. crown most of the countries of Charles the Bold of Burgundy after his death, 1477.—(12) **LOUIS XII.** (1498-1515), conquered first Milan and afterward Naples, but was driven out of It. after the defeat at Novara 1513.—(13) **LOUIS XIII.** (1610-43), a son of Henry IV. and Marie de Médicis, left the govt. entirely to Richelieu.—(14) **LOUIS XIV.** (1643-1715), b. at St. Germain-en-Laye Sept. 5, 1638, a son of Louis XIII. and Anne of Austria. The first part of his reign was very successful. Harbors and shipyards were constructed; the canal of Languedoc, uniting the Atlantic with the Mediterranean, was built; commercial treaties were concluded with Hol. and It.; manufactures of different kinds were established; and while the people arose from poverty to affluence, the revenues increased immensely. No less successful was Louis XIV. in the organization and development of the intellectual life of the Fr. people. The Acad. of Inscriptions and Belles-Lettres was founded in 1663, the Acad. of Sciences in 1666, the Acad. of Painting and Sculpture in 1667; the Royal Library was greatly increased; an observatory was built at Paris; and all these insts. were not only amply supported with means of subsistence, but the interest the king showed for them gave their social position dignity and influence. A new taste was created, and this taste was actually imposed on the whole civilized world. But his wars, and the Revocation of the Edict of Nantes (Oct. 22, 1685) threw the whole internal development of the country into a most disastrous confusion, and when the old king d. (Sept. 1, 1715) the whole nation felt it as a liberation.—(15) **LOUIS XV.** (1715-74), a great-grandson of Louis XIV. He looked on with cynical indifference—"après nous le déluge"—while his mistresses, Châteauroux, Pompadour, Dubarry, etc., squandered the wealth of the country.—(16) **LOUIS XVI.** (1774-93), a grandson of Louis XV., b. Aug. 23, 1754, was a good-natured, well-meaning, honest man, but his weakness hastened the approach of the Revolution and brought him on the scaffold.—(17) **LOUIS XVII.**, a son of Louis XVI. and Marie Antoinette, b. at Versailles Mar. 27, 1785, d. of ill-treatment and neglect in the prison (June 8, 1795).—(18) **LOUIS XVIII.** (1814-24), a brother of Louis XVI.

**Lotze** (HERMAN RUDOLF). See APPENDIX.

**Louis d'Or**, "Louis of Gold," is the name of a Fr. gold coin which was first struck in 1641, under Louis XIII., and has not been coined since 1795. The name, however, has continued in use, and is often given to the twenty-five-franco piece or gold Napoleon, and even to certain Ger. five-thaler pieces. The value of the Louis d'Or fluctuated very much, but may be roughly stated to be about five dollars in Federal money.

**Louis the German** [Ger. *Ludwig der Deutsche*], b. about 805, a son of the emp. Louis le Débonnaire, received by the first division of the empire of Charlemagne (in 817) Bavaria and the Slavic countries on the E. frontier, but by the treaty of Verdun in 843 he obtained the whole terr. W. of the Rhine, and became the founder of the Ger. empire; broke into Fr. in 858, and conquered the country, but the difference between the E. and W. Franks compelled L. to give up his conquests. Against the Bulgarians in the S. E. and the Normans in the N. W. he fought, not always with success. D. 876.

**Louis Napoleon**. See NAPOLEON III.

**Louis Philippe**, *le-lép'*, king of the Fr., b. at Paris Oct. 6, 1773, the eldest son of Duke Louis Philippe Joseph of Orleans. From his father he imbibed revolutionary ideas, entering the National Guard and the Jacobin Club, and renouncing his titles for the name of Citizen Egalité; but orders of arrest being issued against him, he fled across the Aus. frontier, and for more than 20 yrs. became an exile. After the fall of Nap. he returned to Paris, was reinstated in the possession of the property of the Orleans family, and took up his residence in the Palais Royal. On the outbreak of the revolution of July 1830 the Chamber of Deputies, after deposing the king, chose him lieutenant-gen. of the realm. The crown was offered him by the Chamber of Deputies, and he accepted it. His reign of 18 yrs. does not show a series of extraordinary events. Nevertheless, Fr. was not left without substantial benefits. The foundation of the kingdom of Belg., which protected the N. frontier, and the conquest of Algeria are among the most notable. But his govt. was too little *en rapport* with the feelings of the Fr. people, and the revolution broke out which deprived him of his throne. D. near Lond. Aug. 26, 1850.

**Louisburg**, a fortress built by the Fr. soon after the Peace of Utrecht (1713), upon the E. coast of Cape Breton Island, receiving its name in honor of Louis XIV. The works constructed here were of the heaviest description, and were built of stone. A town of some 3000 inhabs. sprang up, favored by the harbor. Since the existence of so strong a place threatened the colonial and Eng. fisheries, it was determined in 1745 by the legislature of Mass. Bay to strike a blow at the town. Accordingly a force of colonists landed near the town Apr. 30, 1745. An active but irregular siege was terminated June 17, 1745, by the capitulation of the Fr. But the Peace of Aix-la-Chapelle (1748) gave back all Cape Breton to Fr. The town was invested in 1758 by Gen. Amherst. After a tremendous bombardment the garrison surrendered July 26, 1758. The ruins still remain. There are about 300 inhabs., mostly fishermen. There is a light-house.



**Louisiana**, loo-e-ze-ah'na, one of the Gulf States of the

Amer. Union, lying wholly within the Miss. Valley, and the greater part of it comprised in the delta of the Miss. River, is situated between 89° and 94° W. lon. and 28° 56' and 33° N. lat.; extreme length from E. to W. 298 m.; extreme breadth from N. to S. about 280 m.; area, 48,720 sq. m. or 31,180,800 acres; bounded N. and E. by Ark. and Miss., S. and S. E. by the Gulf of Mexico and several sounds and estuaries from the Gulf, and W. by Tex.



Seal of Louisiana.

**Face of the Country.**—The N. and N. W. portions of the State rise into low hills not exceeding 240 ft. in height, and from these the land slopes gradually both toward the Miss. and the Gulf. A large portion of the delta of the Miss. is marshy, and actually below the river at high water. In all, about 8450 sq. m. is subject to inundations, though not all of it annually. Along the Miss. River much of the land is below the surface of the river at the spring freshets, and is protected from overflow by levees or artificial embankments. These levees extend 120 m. above New Orleans and 43 m. below it. They are sometimes worn and broken through by the floods, and the "crevasses" thus produced caused the submergence of hundreds of thousands of acres. Local topographers classify the lands of the State as "good uplands," "pine hill lands," usually not very fertile; "alluvial tracts," "bluff or Loess regions," "marsh lands," "the prairie regions," and "the pine flats." The whole alluvial region of the delta is very fertile, and its deep black loam will yield enormous crops; the hilly country, on the contrary, is not very productive, and some portions of it are sandy barrens.

**Rivers, Lakes, Sounds, and Bays.**—The Miss. River has a course of about 590 m. in the State, and is navigable for the largest steamers throughout its whole extent. The Red River, the second in size of the great tributaries of the Miss., enters the State in the N. W. and crosses it diagonally. Its prin. affluents in the State are the Washita, with its 2 large branches, the Tensas and the Boeuf; the Dugdemona, the Sabine Bayou, and the Bistineau River and Lake. The Sabine River forms a part of the W. boundary of the State, and the Calcasieu and Mermentau are considerable streams, the latter having several tributary bayous or sluggish streams. The Pearl River, having Bogue Chitto for a tributary, the Tangipahoa, Tickfaw, and Amite are the prin. streams E. of the Miss. There are beside these several large bayous or estuaries, which are really outlets or secondary mouths of the Miss. The prin. of these are Atchafalaya Bayou, with its series of lakes, Vermilion Bayou, Bayou Teche, which connects with it, Bayou de Large, Bayou la Fourche, and the estuaries, lakes, and bayous which debouch into Barataria Bay. The distinction between lakes, sounds, and estuaries in this State is not very marked. Lake Pontchartrain is perhaps a lake, but its waters are salt, and rise and fall with the tide; Lake Borgne is only a sound or bay; Lake Maurepas is closely connected with Pontchartrain; Sabine Lake, Calcasieu Lake, Lake Mermentau, etc. are all estuaries connected with rivers or bayous. In N. L. there are 10 or 12 lakes, which are expansions either of the Red River or its tributaries. Some of these are of considerable extent. Along the coast there are Chandeleur and Isle au Breton sounds, Bay Ronde, Garden Island Bay, East and West bays, Timbalier, Terre Bonne, Caillou, Atchafalaya, Côte Blanche, and Vermilion bays.

**Minerals, Etc.**—In the N. W. part of L. brown coal of fair quality is found in considerable quantity; iron is somewhat abundant in this region, and salt springs and salt deposits; that on Petit Anse Island has been mined to a depth of 60 ft. below the level of the Gulf, 56 ft. through solid rock-salt of the purest quality. Ochre, marl, gypsum, lead, sulphate of soda, sulphate of iron, and a very pure carbonate of lime occur in considerable quantities. In the S. part of the State there are deposits of sulphur, and at one point between the Calcasieu and Sabine rivers artesian wells have been bored and shafts sunk which demonstrate that, beginning at a point about 428 ft. below the surface, there is a deposit of sulphur 112 ft. in thickness, and which yields from 60 to 96 per cent. of pure sulphur. The more superficial strata at this point contained petroleum, but not in sufficient quantity to be worked with profit. Copper has also been found in several parishes. Among the minerals not of economic value are quartz-crystals, jasper, agates, carnelians, sardonyx, onyx, feldspar of fine quality, and meteoric stones. Fossils of various kinds have also been discovered at different points. Most of these minerals have been found in the Tertiary.

**Soil and Vegetation.**—The entire alluvial deposits furnish a soil of extraordinary permanence and fertility. The delta lands are unsurpassed for the culture of sugar-cane, cotton, rice, wheat, barley, and buckwheat, sweet potatoes and figs. The islands produce sea-island cotton equal to the best. The orange flourishes well. The Tertiary region has not so

rich a soil, but Indian corn does better there than in the alluvium. Cotton grows everywhere. A portion of the Tertiary region is covered with heavy though not dense pine forests. About 1/4 of the area of the State is too swampy and marshy for cultivation, and much of it is covered with lofty cypress trees, from which the Sp. moss hangs in graceful festoons. The other forest trees of the alluvial portion of the State are ash, sweet gum, hickory, black walnut, magnolia, live oak, Spanish, water, black, chestnut, white, and post oaks, tulip tree, Florida anise, linden, lance-leaved buckthorn, 4 or 5 species of acacia, wild cherry, pomegranate, holly, arbor vitae, tillandsia, lime, pecan, sycamore, white and red cedar, and yellow pine, and in the Tertiary, sasfras, mulberry, poplar, hackberry, red elm, maple, honey locust, dogwood, tupelo, box elder, black locust, prickly ash, persimmon, etc. Along the rivers the cottonwood, willow, basket elm, palmetto, wild cane, papaw, and wild orange are found. Of fruit trees, the peach, quince, plum, fig, orange, papaw, and olive do well; the apple and pear do not succeed so well. The grazing in the uplands generally is excellent; in the Attakapas country, along the Atchafalaya and Bayou Teche, the pasturage is unsurpassed in quality. L. like Fla., is a land of flowers.

**Zoology.**—In the forests black bears and wolves, and in the cypress swamps panthers of large size and great ferocity are occasionally met with, while the wild-cat, raccoon, polecat, opossum, otter, squirrel, 2 or 3 species of rat, mouse, dormouse, and mole are abundant. The alligator inhabits all the bayous; there are several species of turtle; lizards, horned frogs, many species of toad, the gecko, and chameleon, while rattlesnakes, vipers, moccasins, horned, and other snakes are very common. The birds of most note are the bald and the gray eagle, the king vulture, the turkey-buzzard, and other vultures, kites, hawks, owls, gulls, the pelican, cranes, herons, wild-turkeys, pigeons, partridges, wild-geese, brant, and wild-ducks generally abundant, and a great variety of smaller birds, many of them of brilliant plumage. The fish are generally those common to the Gulf.

**Climate.**—The climate of New Orleans and the lower portion of the delta is to some extent malarious. Bilious and congestive fevers are very prevalent, and the worst forms of intermittent not uncommon. The yellow fever may be considered endemic in New Orleans, though it is not epidemic oftener than once in 7 or 8 yrs. W. and N. W. L. is perhaps as healthy a region as any part of the U. S. The average temperature of the yr. is not as high as in other States and countries in the same lat.; this results from the action of cold N. winds.

**Agricultural Products.**—The most valuable crop in L. is cotton, valued at over \$20,000,000. Next to this is the sugarcane, producing more sugar and molasses by <sup>9</sup>/<sub>10</sub> than all the other States. The crop of 1879 (census of 1880) was 171,706 hogsheads of sugar and 11,696,248 gals. of molasses; rice, 23,188,311 lbs.; Indian corn, 9,889,689 bushels; cotton, 508,569 bales.

**Farm Animals.**—By the census of 1880 L. had of horses, 104,428; cattle, 470,601; sheep, 135,631; swine, 633,489.

**Levees.**—The people of L. have built and now maintain in repair more than 1500 m. or 51,000,000 cubic ft. of levees within the State limits. But for these the greater part of the delta would be a hopeless and slimy swamp.

**Railroads.**—In 1880 L. had 1281 m. of railway, costing \$44,869,349, with gross earnings, \$3,288,318; net earnings, \$984,497. The most important lines were the Louisiana and Texas, 166 m.; the Louisiana Western, and the New Orleans and Mobile.

**Commerce.**—The foreign commerce of L. is large; total exports in 1881, \$103,743,986, principally breadstuffs and cotton; total imports in 1881, \$12,213,920. The interior commerce is also heavy, both by river and railway.

**Manufacturing and Mining Industry.**—L. is not largely engaged in manufactures. In 1880 L. had 1553 manufacturing establishments (value of cotton seed oil and cake, \$3,739,466). Sugar-refining has increased since 1870, but other manufactures have languished. The mining industry of the State consists of some coal-mines, rather inefficiently worked, a little iron mined, the salt-mine of Petit Anse Island, and a sulphur-mine at Calcasieu Springs. In 1880 there were engaged in cotton manufactures 108 persons, running 120 looms, with 6086 spindles, and using 1354 bales of cotton. New Orleans had, in 1880, 915 manufacturing establishments, with capital of \$8,565,308; hands employed, 9504; wages paid, \$8,717,557, and total products, \$18,808,096.

**Finances of the State.**—The valuation of taxable property, by census of 1880, was \$160,162,439; State tax, \$1,771,084; total taxation, local and State, 4,395,876; State debt, 1881, \$12,171,940, having been "scaled" by liquidation at 60 cents on the dollar.

**Banks.**—In Oct. 1881 L. had 7 national banks, all at New Orleans, with cap., \$2,875,000; circulation, \$2,157,100; bonds to secure circulation, \$2,475,000, and deposits, \$8,478,487. There were 7 State banks and trust cos., with \$5,147,188 deposits; 1 savings bank, with \$2,397 deposits, and 5 private banks, deposits not given.

**Education.**—Number of children of school age (6-18 yrs.) in 1880, 273,845, of whom only 68,440 were enrolled in public schools; about half of whom were white; number of schools, 1669; whole amount expended, \$455,758. There are over 300 private schools, and 8 cols. with 68 instructors and 677 students, paying in tuition, in 1880, \$15,327. There are (1882) 102 newspapers and periodicals, of which 9 are daily.

**Churches.**—L. has about 1300 chs., of which the Baps. claim the largest number, having 752 chs. and 56,593 members; Meths., 217 chs. and 31,210 members; R. Caths., 107 chs.; Presbs., 50 chs. and 3218 members; Prot. Epis., 44 chs. and 2983 members, and 12 other denominations, varying from 3000 members down to 20.

**Population.**—In 1860, 708,009; 1870, 726,915; 1880, 939,946 (white 454,954, colored 484,992; including 845 Indians and 489 Chinese).



**Principal Cities and Towns.**—New Orleans, the commercial metropolis, and since the war, until 1881, the political cap. of the State, in 1880 had 216,000 inhabs. Shreveport, 8000; Baton Rouge, the cap., 7197; Natchitoches, 2785; New Iberia, 2709; Donaldsonville, 2600; Gretna, 2396; Monroe, 2070; Plaquemines, 2061; Alexandria, 1800; Franklin, 1702.

PARISHES.	*Ref.	Pop. 1870.	Pop. 1880.	PARISH TOWNS.	Pop. 1880.
Ascension	10-E	11,577	16,893	Donaldsonville	2,600
Assumption	11-E	13,234	17,010	Napoleonville	497
Avo-cles	9-D	12,926	16,747	Marksville	533
Bienville	7-B	10,636	10,442	Sparta	160
Bossier	6-B	12,675	16,042	Bellevue	8,009
Caddo	6-B	21,714	26,206	Shreveport	8,994
Calcasieu	10-B	6,733	12,484	Lake Charles	896
Caldwell	7-D	4,820	5,767	Columbia	219
Cameron	10-B	1,591	2,416	Cameron	896
Catahoula	8-D	8,475	10,577	Harrisonburgh	243
Claiborne	6-C	20,340	18,367	Homer	418
Concordia	8-E	9,277	14,914	Vidalia	449
De Soto	7-B	14,962	15,603	Mansfield	770
E. Baton Rouge	10-E	17,816	19,966	Baton Rouge	7,197
East Carroll	6-E	12,347	12,134	Lake Providence	1,129
East Feliciana	9-E	15,499	15,129	Clinton	1,129
Franklin	1-D	5,078	6,435	Winnsborough	1,129
Grant	8-C	4,517	6,188	Colfax	1,129
Iberia	10-D	9,042	16,676	New Iberia	2,709
Iberville	10-E	12,347	17,544	Plaquemine	2,061
Jackson	7-C	7,646	5,298	Vernon	83
Jefferson	11-F	17,767	12,166	Gretna	2,061
Lafayette	10-D	10,388	12,235	La Fayette	815
Lafourche	11-F	14,719	19,113	Thibodeaux	1,515
Lincoln	7-C	4,096	11,075	Vienna	368
Livingson	10-F	4,096	5,258	Port Vincent	449
Madison	8-E	8,600	13,906	Attitash	1,129
Morehouse	6-D	9,387	14,206	Bastrop	822
Natchitoches	8-B	18,265	19,707	Natchitoches	2,785
Orleans	10-G	191,418	216,090	New Orleans	216,090
Ouachita	7-D	11,582	14,855	Monroe	2,970
Plaquemine	10-C	10,552	11,575	Point à la Hache	1,129
Point Coupee	9-D	12,981	17,785	Point Coupee	1,129
Rapides	9-C	18,015	23,562	Alexandria	1,800
Red River	7-B	11,577	8,543	Coushatta	498
Richland	7-D	5,110	8,440	Rayville	216
Sabine	6-B	6,456	7,344	Mary	1,129
St. Bernard	11-G	3,553	4,405	St. Bernard	1,129
St. Charles	11-F	4,367	7,161	Hahnville	414
St. elena	9-E	5,423	7,504	Greensburgh	297
St. James	10-E	10,152	14,714	Convent	1,129
St. John Baptist	10-F	6,762	9,886	Edgard	1,129
St. Landry	10-D	25,553	40,004	Opelousas	1,676
St. Martin	10-D	9,370	12,663	St. Martinville	1,606
St. Mary's	11-D	13,860	19,891	Franklin	1,702
St. Tammany	10-F	5,536	6,887	Covington	587
Tangipahoa	9-F	7,938	9,638	Amite City	1,129
Tensas	9-E	12,419	17,815	St. Joseph	1,129
Terrebonne	11-E	12,361	17,957	Houma	1,084
Union	6-C	11,685	13,526	Farmersville	712
Vermilion	10-D	4,528	8,728	Abbeville	255
Veron	9-B	5,160	5,160	Leesville	340
Washington	9-F	3,280	5,190	Franklinton	1,129
Webster	6-B	10,005	10,005	Minden	1,113
W. Baton Rouge	10-E	5,114	7,667	Port Allen	1,129
West Carroll	6-E	10,462	2,776	Floyd	1,129
West Feliciana	9-E	10,462	19,809	Bayou Sara	710
Winn	3-C	4,354	5,846	Winnfield	133
Total		736,915	922,246		

**History.**—L. was first visited by Europeans in 1541, when De Soto with his followers came to the Miss. River. In 1673 Father Marquette and his Canadians descended the Miss. to its mouth, but established no colony. In 1682 La Salle again descended the Miss. and took possession of the country in the name of Louis XIV., giving it the name of Louisiana. In 1699 Iberville with a considerable number of colonists attempted a settlement at Biloxi. He d. soon after, and his successor in command, Bienville, led his fellow-colonists to a somewhat sunken spot on the river-bank, and there made his last stand. This was about 1706, and the new location was on the present site of New Orleans. In 1717 the prov. of L. fell into the hands of John Law, and the Miss. bubble expanded to vast dimensions—and burst. In 1718 Bienville was appointed gov., and built up the town whose site he had selected 12 yrs. before. In 1723 the cap. of the colony was removed from New Biloxi to New Orleans. The "Western Company" or "The Company of the Indies," as Law's organization was known, remained in existence for 10 yrs. or more after the failure and escape of Law, but in 1730 it surrendered its grant to the Crown, by whom the colony was managed until 1762, when the whole prov. was secretly ceded by Fr. to Sp., and for 38 yrs. was under the control of that power. In 1800 it was restored by the treaty of Ildefonso to Fr., and in 1803 it was sold to the U. S. for the sum of \$11,250,000 and the assumption of the claims of citizens of the U. S. against Fr. known as the "French spoliation claims." These were assumed to amount to \$3,750,000, so that the price of this vast terr., comprising nearly all of the present States of La., Ark., Mo., Ia., Minn., Dak. Terr., Neb., most of Kan. and the Ind. Terr., part of Col., most of Wyo., and the whole of Mont., Id., Or., and Wash. Terr., was purchased for \$15,000,000, and  $\frac{1}{4}$  of the purchase-money has never been paid by the national govt. In 1804 the S. portion of this vast tract was erected into a separate Terr. as the Terr. of Orleans. In 1810 that portion of the State lying between the Miss. and the Amite and the Pearl River was annexed to the Terr., and in Apr. 1812 the Terr. of Orleans was admitted into the U. as the State of La. Within 3 yrs.—viz. on Jan. 8, 1815—was fought the great battle of New Orleans, between the Brit. forces under Pakenham and the Amers. under Jackson, for the possession of New Orleans. The battle the Brit. were signally defeated and with heavy loss. The subsequent progress of the State up to 1860-61 was very rapid. L. promptly took a position in favor of secession. The ordinance of secession was passed in convention Dec. 22, 1860; March 21, 1861, the same convention adopted the "Confederate" const. In Apr. 1862 Farragut ascended the Miss., passed and silenced Ft. St. Philip and Jackson, and

appeared before New Orleans on the 25th of Apr., demanding and receiving its surrender. It was controlled by Gens. Butler and Banks, and after numerous conflicts, in July 1863 the navigation of the Miss. from St. Paul to the Gulf was secured to the national govt. In 1863 Gen. Banks had made an excursion into the Attakapas country, and had brought that region into subjection to the U. S. govt. In the spring of 1864, with a large force and numerous gunboats, he ascended the Red River. The campaign into the Red River region met with but partial success, and the final retreat after 2 or 3 severe battles was disastrous. In Apr. 1864 a convention formed a new const. for the State, preparatory to its readmission to the U. This const. was not recognized by Cong., and a second convention was called in Dec. 1867, and its const. was adopted Mar. 7, 1868. Under this const. L. was again admitted into the U. on condition of her ratification of the 14th amendment to the const. of the U. S. On July 9, 1868, this ratification was accomplished, and on the 13th the govt. was transferred by the military to the civil authorities. The adoption of the first const. in 1864, by a comparatively few individuals, representing only a small portion of the State, gave rise to serious disturbances, and during the 4 yrs. of military occupation which followed, there were discord and turmoil. After the adoption of the second const. in 1868, the government was still in confusion for some time. Order was finally re-established.

#### Governors.

TERRITORY OF ORLEANS.	Thomas O. Moore	1860-62
W. C. C. Claiborne	George F. Shepley	1862-64
STATE.	Michael Hahn	1864-65
W. C. C. Claiborne	James M. Wells	1865-67
Jaques Villere	Benjamin F. Flanders	1867-68
Thomas B. Robertson	Joshua Baker	1868
H. S. Thibodeaux (act.)	Henry C. Warmoth	1868-72
Henry Johnson	J. F. McEnery (claim-ant)	1872
Peter Derbigny	Wm. Pitt Kellogg (de facto)	1872
A. Bauvais (acting)	Wm. Pitt Kellogg	1874-77
Jacques Dupré (act'g)	Stephen B. Packard	1877-78
André B. Roman	Francis T. Nichols	1878-80
Edward D. White	Louis A. Wiltz	1880-81
André B. Roman	Louis A. Wiltz	1881-88
Alexander Mouton	Louis A. Wiltz	1881-88
Isaac Johnson	Louis A. Wiltz	1881-88
Joseph Walker	Louis A. Wiltz	1881-88
Paul O. Hebert	Louis A. Wiltz	1881-88
R. C. Wickliffe	Louis A. Wiltz	1881-88

#### REVISED BY A. R. SPOFFORD.

**Louisiana**, city and R. R. centre, Pike co., Mo., on the Miss. River, 115 m. above St. Louis; has a coll. and public library. Pop. 1870, 3639; 1880, 4335.

**Louisville**, important R. R. and commercial centre, the largest city of Ky., cap. of Jefferson co., situated at the falls of the Ohio River, from which it obtains its name of "The Falls City." The city (settled in 1775) is on an elevated plateau 70 ft. above low water, and with but little variety of surface for miles, and occupies an area of 124 sq. m. The most important staples of commerce are leaf and manufactured tobacco, provisions and breadstuffs, whiskeys, and various products of local manufacture. It also has an extensive trade as a distributing centre between the E. and the cotton States for miscellaneous merchandise. As the centre of trade in a State which produces about 40 per cent. of the total tobacco product of the U. S., L. controls a larger tobacco trade than any other 3 forwarding markets. The city is also the centre of the Ky. whiskey trade. It is one of the great centres for med. education in the U. S. The med. dept. of the Univ. of Louisville, founded 40 yrs. ago, has embraced among its profs. some of the most distinguished phys. and surgeons in the country. Louisville Med. Coll., the Hospital Med. Coll., a dept. of Central Univ., and the Ky. School of Med. have each a large corps of instructors. The Univ. of the Public Schools of L. embraces 3 depts.—the academic, med., and law. Among the prominent public buildings are the new city hall, U. S. custom-house and P.-O., almshouse, female high school, Ky. school for the blind, public library of Ky., the c.-h., the L. Industrial Exhibition, city hospital, and U. S. marine hospital. Among the benevolent insts. are the New Masonic Widows' and Orphans' Home, St. Mary's and St. Elizabeth's Hospital, St. Joseph's Industrial School, St. Vincent's Orphan Asylum, all Cath.; the Bap. Orphans' Home, and the German Bap. Orphan Asylum. The Public Library of Ky. is a free inst., with some 70,000 books, an extensive museum, and a fine collection of pictures and statuary. Of the cemeteries, Cave Hill, situated on a hill back of the city, is said to be the most beautiful and best arranged in the W. Pop. 1870, 100,753; 1880, 123,756; 1885, about 150,000.

**Louse** [A.-S. *lūs*; Goth. *liusan*, to "devour"]. With the same mode of development as the Hemiptera—i. e. the bed-bug, chinch-bug, etc.—the L. differs chiefly in being wingless and possessing a small, indistinctly jointed thorax, while the abdomen is large, oval, and made up of 9 segments. The elongated mouth-parts have the same plan as the beak of the bed-bug, except that the parts are softer and the labium is capable of being retracted into the upper part of the head, which therefore presents a little fold, which is extended when the labium is protruded. The louse of the head is *Pediculus humanus capitis*, while the body louse is *Pediculus corporis* (Fig. 1). The species of true sucking lice are few, but the Mallophaga or bird lice, in which the mandibles are well developed and of use in breathing, are very numerous, each species of bird having one, and sometimes two or even more, species parasitic upon it. The hen (Fig. 2,

FIG. 1.



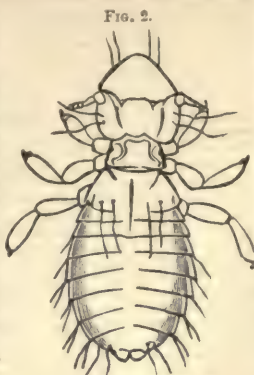
Body Louse.

\* Reference for location of counties. See map of Arkansas, Louisiana and Mississippi in article ARKANSAS.



*Goniocotes Burnettii* Pack., louse of domestic fowl), cat, dog, and sheep are sorely afflicted by these pests. [From orig. art. in *J. s. Unde. Cyc.*, by Prof. A. S. PACKARD, JR., M. D.]

**Louvain'** (anc. *Louvan*; Flem. *Leuven*; Ger. *Löwen*), city of Belg., in the prov. of Brabant, on the Dyle. In the 14th century it was one of the largest manufacturing cities in the world. But its attempt to vindicate its independence was defeated, and it lost its importance. In the 16th century its univ. was one of the first scientific insts. in Europe, but during the Fr. Revolution the univ. was suppressed for a long time, and has not regained its glory. Many buildings attest the former splendor of the city, but L. has become a quiet place, chiefly noted for its breweries and distilleries. Pop. 34,700.



Louse of domestic fowl.

**L'Ouvrière.** See TOUSSAINT (FRANÇOIS DOMINIQUE).  
**Louvois, loo-vwah', de** (FRANÇOIS MICHEL LE TELLIER), MARQUIS, b. in Paris Jan. 18, 1641; bought in 1654 the right of succeeding his father in the office of sec. of war; applied himself to the study of all the details of the business, and took charge of the whole dept. in 1666; in a few yrs. created the largest, most effective, and most brilliant army modern Europe had seen. His genius showed itself still more brilliantly when this army came to be used in war. All its movements were accomplished with an order, rapidity, and precision which doubled its effect and led to astonishing successes. To keep himself in office, and to make his office the most important in the kingdom, was his sole aim, and the advice which he offered in the king's council was often to the great detriment of the country. The devastation of the Palatinate, one of the greatest barbarities of modern times, was his plan, as also the idea of using the dragoons for converting the Huguenots. After the death of Colbert in 1683 he also assumed the administration of the finances, but he soon ruined them. The last yrs. of his life were spent in great anxiety. He had become very exacting, and the king had just made up his mind to throw him into the Bastille when he d. suddenly, July 16, 1691.

**Louvre, loov'r, Palace of** [Fr. *Palais du Louvre*], a famous building in Paris, on the right bank of the Seine, between the river and the Rue de Rivoli. King Dagobert is said to have built a castle on a portion of the site of the present building for a hunting-seat. About the yr. 1200 Philip Augustus converted this castle into a fortress, but it was not until the end of the 14th century that it was included within the walls of the city. Charles V. made many additions to the castle to fit it for a royal residence. Francis I. pulled down the old fortress-palace, and began the present building in 1528. His son, Henry II., carried the W. front to completion (now called the Vieux Louvre) and built the wing containing the Galerie d'Apollon. Henry IV. began the Long Gallery to connect the L. with the Tuileries, and completed it so far as to be able to walk through it before his death. Under Louis XIII. the central portion of the W. front and the lower story of the N. side were built. Louis XIV., by the advice of Colbert, determined to complete the palace, and a public competition of archs. was opened in order to procure designs. Those of a phys., Claude Perrault, were chosen, but jealousies and rivalries interfered with their execution, and Bernini, then greatly in favor in Rome, was sent for and the work put into his hands. Louis XIV. laid the first stone of the E. front, but Bernini made so many enemies by his insolence and conceit that he returned to It., and in 1666 Perrault was allowed to carry out his original design. He built the E. front, with its famous colonnade of 28 twin Corinthian columns flanking the grand gateway toward the ch. of St. Germain Auxerrois. He also built the S. or river front, and he left at his death designs for 3 sides of the great court (Cour François I<sup>re</sup>). Each side of this court is 408 ft. in length. Want of money, however, and the determination of the king to erect a palace at Versailles, put a stop to further work upon the L. The palace was neglected, almost abandoned, until the end of the last century, and indeed until so late as 1802 the greater part of the building was without a roof. Up to this time the L. and the Tuileries were separate, the space between them being occupied by a mass of houses with narrow, irregular streets.

Nap. I. finished the L. and cleared the surrounding streets and a large portion of the Place du Carrousel. He began the Rue de Rivoli, and carried it from the Place de la Concorde to a little beyond the Tuileries. Nap. III. continued the street by cutting through the thickest masses of houses from the Place du Palais Royal to the Hôtel de Ville, thus setting the whole vast palace clear in light and air. He repaired and restored the fronts toward the place named after himself, and he completed the edifice by raising the vast pile of building connecting the L. with the Tuileries. Thus, before the destruction of the Tuileries by the Commune in 1871 the L. and the Tuileries made one edifice, of which the complete circuit could be made on the second floor. The greater part of the L. is occupied with the collections of pictures, statues, and antiquities that constitute the Musée du Louvre. The works in sculpture—statues, busts, vases, and inscriptions—are distributed in 5 collections. CLARENCE COOK.

**Lovat, luv'at** (SIMON FRAZER), LORD, b. in Scot. about 1676, grandson of the ninth and cousin of the tenth lord, by whose will he succeeded to the title and estates. On the outbreak of the Jacobite Insurrection of 1715 he was invited by

his clansmen to espouse that cause, but preferred to take the opposite course, inducing them to follow his guidance. In the insurrection of 1745 he sent his clan under command of his son to fight for the Pretender, while he protested his own loyalty to the house of Brunswick. This double game was unsuccessful, and brought him to trial for treason, resulting in his execution on Tower Hill, Apr. 9, 1747.

**Love-Apple**, a name once given to the *Lycopersicon esculentum*, or TOMATO (which see).

**Love-feast**, a modern restoration of the anc. Agapæ. The Moravian Brethren, the various denominations of Methists, and some other bodies of Chrs. observe this custom. The Sandemanians have a weekly L.-F., eaten on Sunday.

**Lovejoy** (ELIJAH PARISH), b. at Albion, Me., Nov. 9, 1802, grad. at Waterville Coll. in 1826; became in 1827 a teacher and in 1828 an ed. at St. Louis, Mo.; studied theol. at Princeton, N. J., and in 1833 was ordained a Presb. minister; in 1836, while ed. of the St. Louis *Observer*, attacked slavery in it, and was compelled by a mob to remove to Alton, Ill.; here, on the night of Nov. 7, 1837, he was shot dead.

**Lovejoy** (OWEN), brother of Elijah P., b. at Albion, Me., Jan. 6, 1811; was present when his brother was killed, and thereafter conducted many anti-slavery meetings; was a Congl. minister of Princeton, Ill., 1838-54, and M. C. 1856-64. D. Mar. 25, 1864.

**Loveland, Col.** See APPENDIX.

**Lovell** (GEN. MANSFIELD), b. at Washington, D. C., Oct. 20, 1822, grad. at W. Pt. 1842 and entered the artill.; in the war with Mex. was wounded at Monterey; was chief of staff of Quitman's division, and severely wounded in the assault on the city of Mex.; resigned from the army in 1854, settled in New York, and was (1858-61) deputy com. and for a time acting com. of public works; in the c. war served as maj.-gen. of the Confed. army, and commanded dept. of the South at the capture of New Orleans; subsequently served in N. Miss. and Ga. campaigns, etc.

**Low** (FREDERIC F.), b. at Frankfort, Me., Jan. 30, 1828; went to Cal. 1849; was first a miner, then a merchant in San Francisco; banker at Marysville 1855; Rep. M. C. 1861-63, collector of the port of San Francisco 1863-64, gov. of Cal. 1864-68, and minister to Chl. 1869-72.

**Low** (SETH). See APPENDIX.

**Lowie, lo** (SIR HUDSON), b. at Galway, Ire., July 28, 1769; entered the army; served in the expedition to Egypt, in the Peninsular war, in Naples, and Sic.; aided in the conquest of the Ionian Islands; was present at the battle of Bautzen, and carried to Lond. the news of the abdication of Nap.; served during the following yr. as quartermaster-gen. of the army of the Netherlands, until removed by the duke of Wellington; became gov. of the island of St. Helena during the whole imprisonment of Nap.; afterward served in India; lieut.-gen. 1830; wrote a *Hist. of the Captivity of Nap. from his Journal*. D. July 10, 1844.

**Lowell**, city and important R. R. centre, one of the caps. of Middlesex co., Mass., the leading seat of the cotton manufacture in the U. S., on the Merrimack River near the mouth of Concord River, 20 m. N. W. of Boston. Its terr. comprises only 287 acres. The first cotton mill was erected in 1822-23, when the then almost uninhabited terr. now comprising the city was E. Chelmsford. Portions of Dracut and Tewksbury have been annexed, and the city was incorporated in 1836. It has a complete system of public water-works, deriving the supply from the Merrimack River; 2 public libraries, an orphan asylum (Catholic), an old ladies' home, a young women's home, and other charitable insts. The business and larger portion of the city is on low land, but on the outskirts the land is elevated. Pop. 1870, 40,928; 1880, 59,475; 1885, about 65,000.

**Lowell**, on R. R., Kent co., Mich., at the junction of the Grand and Flat rivers, 139 m. W. of Detroit and 15 m. W. of Ionia. Pop. 1870, 1508; 1880, 1538.

**Lowell** (CHARLES), D. D., b. in Boston Aug. 15, 1782, son of Judge John Lowell; ed. at Andover, grad. at Harvard Coll. in 1800; studied law, and afterward theol.; went abroad; studied in Edinburgh, and travelled in Europe; on Jan. 1, 1806, was settled over the W. Congl. ch. in Boston. Dr. L. was the father of J. R. Lowell, the essayist and poet. D. Jan. 20, 1861.

**Lowell** (CHARLES RUSSELL), b. in Boston in 1835, son of the preceding, ed. at the Boston Lat. School and at Harvard, graduating in 1854; after a time passed in European travel and study, returned to the U. S. and engaged in business pursuits; at the outbreak of the c. war was supt. of iron-works in Md.; immediately tendering his services to the govt., he was appointed (May 1861) a capt. in the 6th U. S. Cav., serving with his co. in the Peninsular campaign in Va., and subsequently in N. Va. and Md. on the staff of Gen. McClellan; on the recruitment of the 2d Mass. Cav. was appointed its col. and stationed in the vicinity of Wash. Assigned to Sheridan's command, his services in the Shenandoah Valley were conspicuous in all the engagements of that army, including the battle of Cedar Creek, where he was wounded, but would not leave his command, remaining until the final attack, in which he was mortally wounded. In recognition of his services he was appointed brig.-gen. of volunteers, to date Oct. 19, 1864. D. Oct. 30, 1864.

**Lowell** (FRANCIS CAROT), b. at Newburyport, Mass., Apr. 7, 1775, son of John (1743-1802); grad. at Harvard in 1793; became a merchant at Boston, was a pioneer in cotton manufacturing in U. S., and one of the prin. founders of the manufacturing interests of Waltham and Lowell, which city was named in his honor. D. Aug. 30, 1817.

**Lowell** (JAMES RUSSELL), D. C. L., LL.D., son of Rev. Charles, b. at Cambridge, Mass., Feb. 22, 1819, grad. at Harvard in 1838, and at Harvard Law School in 1840; commenced practice in Boston, but soon devoted himself to lit. He printed in 1841 a small vol. of poems entitled *A Year's Life*, and in 1844 a vol. of *Poems*; in 1845 *Conversations on Some of the Old Poets*; in 1848 another vol. of *Poems*, containing several directed against slavery, *The Vision of Sir*



**Laurel, A. Fable for Critics, and The Biglow Papers.** In 1851-52 he travelled in Europe; delivered in 1854-55 a course of lectures on the Brit. poets before the Lowell Inst., Boston; succeeded Longfellow in Jan. 1855 as prof. of modern langs. and lit. at Harvard, and spent another yr. in Europe, chiefly at Dresden. From 1857 to 1862 he was ed. of the *Atlantic Monthly*, and from 1863 to 1872 of the *N. Amer. Review*. He issued in 1864 *Fireside Travels*; in 1867 a new series of *Biglow Papers*; in 1868 *Under the Willows*, with which was included his *Commemorative Ode* in honor of the alumni of Harvard who had fallen in the c. war; in 1869 *The Cathedral*; in 1870 *Among my Books and My Study Windows*. Travelled in Europe 1872-74, receiving degree of D. C. L. at Ox. and LL.D. at Univ. of Cambridge, Eng. Was U. S. minister to Sp. in 1877, and U. S. minister to Eng. 1880-85.

**Lowell (JOHN), LL.D., b.** at Newbury, Mass., June 28, 1743, grad. at Harvard in 1760; was admitted to the bar in 1762, and removed to Boston in 1777; was a member of the Continental Cong. 1782-83; judge of the court of appeals 1783-89, of the U. S. dist. court 1789-1801, and a justice of the U. S. circuit court 1801-02. He was the author of the clause in the Mass. Bill of Rights which abolished slavery. D. May 6, 1802.

**Lowell (JOHN), LL.D., b.** at Newburyport, Mass., Oct. 6, 1769, son of the preceding, grad. at Harvard in 1786; was admitted to the bar in 1789; author of many papers and pamphlets upon a great variety of subjects, and was active in the founding of many of the public insts. of Boston, but would never accept office. D. Mar. 12, 1840.

**Lowell (ROBERT TRAILL SPENCE), D. D., b.** in Boston Oct. 9, 1816, son of Rev. Charles Lowell, grad. at Harvard in 1833. In 1842 took orders in Ch. of Eng.; held rectorships, and wrote *The New Priest of Conception Bay*.

**Lowell (JOHN), b.** in Boston, Mass., May 11, 1799, son of Francis C.; ed. at Harvard Coll. and in Edinburgh, and had fine scholarly tastes; spent much time in foreign travel. D. at Bombay, India, Mar. 4, 1836, and left \$250,000 to found Lowell Inst., Boston, Mass.

**Lowenthal (ISIDOR), b.** at Posen, Prus. Poland, in 1827, of Jewish parents; exhibited aptitude for philological studies, and at 17 had mastered more than the usual course of a liberal education. He then became a mercantile clerk, and on account of a poem pub. in a newspaper was obliged to flee; embarked at Hamburg and reached New York in the autumn of 1840. He was soon reduced to such destitution as to adopt the business of a street-peddler, but his accomplishments became known, and he obtained a situation as teacher of Fr. and Ger. at Lafayette Coll., Easton, Pa., where he also entered the senior class as a student, graduating in 1848, after which he became a teacher of langs. at Mt. Holly Collegiate School, N. J. Having become a Chr. in 1851, he entered Princeton Sem. in 1852; contributed to the *Biblical Repository*; was in 1855 tutor at the coll. of N. J., and in Aug. 1856 went to India as a missionary of the Amer. Presb. Board to the Afghans. He soon learned Per., Cashmiri, Hindostanee, Arabic, and the Afghan lang., into which he translated the N. T., and had nearly completed a dict. of that lang. when he was accidentally killed at Peshawur, Apr. 24, 1864.

**Lowndes, lowndz (RAWLINS), b.** in the Brit. W. I. in 1732; removed in childhood to Charleston, S. C., and became a lawyer; in 1766 was appointed one of the crown judges; was an early friend of colonial independence; in 1778 became pres. of S. C.; was for a time a prisoner in the hands of the Brit.; after the war vigorously opposed the Federal const. and defended the Afr. slave-trade. D. Aug. 24, 1800.

**Lowndes (THOMAS), b.** at Charleston, S. C., in 1765, son of the preceding; was well ed., and was M. C. 1800-05. D. July 8, 1843.

**Lowndes (WILLIAM JONES), LL.D., b.** at Charleston, S. C., Feb. 7, 1782, son of Rawlins; studied in Eng. and grad. at Charleston Coll.; admitted to the bar in 1804; M. C. 1810-22, and held other important positions. D. Nov. 27, 1822.

**Lowth (ROBERT), D. D., b.** at Winchester, Eng., Nov. 28, 1710; his father, Rev. William Lowth (1661-1732), was chaplain to the bp. and prebendary in the cathedral; grad. at New Coll., Ox., in 1737; took holy orders; in 1741 became prof. of poetry at Ox., and delivered a course of lectures on the *Sacred Poetry of the Hebrews*, the foundation of his later work on the same subject; became bp. of St. David's in 1766; was translated to the see of Ox. the same yr. and was appointed bp. of Lond. in 1777; declined the archbishopric of Canterbury in 1783. His prin. works were *Prælectiones de Sacra Poesi Hebræorum* and a poetical Translation of Isaiah. D. Nov. 3, 1787.

**Lowville, on R. R., cap. of Lewis co., N. Y., 1½ m. W.** of Black River; settled in 1797, incorporated 1847; has an acad., founded in 1808. Pop. tp. 1870, 2805; 1880, 3188.

**Loyola, lo-i-la (IGNATIUS), b.** in Guipuzcoa, Sp., in 1491, in the castle of Loyola, whence his surname; his original name was INIGO LOPEZ DE RECALDE. In his youth served as a page in the court of Ferdinand the Catholic; afterward entered the military service, remaining till his 30th yr.; having been wounded in the leg at the siege of Pamplona in 1521, and being feeble and suffering, he read a life of Christ and various sacred legends, and by degrees the man of the world found himself transformed into the Chr. disciple. He divided his goods among the poor, made a pilgrimage to a shrine of the Virgin Mary, to whom he dedicated his armor, declaring himself at the same time *her knight*, and retired to the hospice of Manresa. Ten months later he embarked from Barcelona for Pal., but being maltreated by the guardian of the Sepulchre he returned in 1534, by way of Venice, to Barcelona. Two yrs. afterward, having entered the superior schools, he prepared himself for giving popular instruction. Being accused of witchcraft before the Inquisition, he was arrested; on his release, in 1538, he went to Paris to study theol. There, in 1534, together with several more, both Frenchmen and Spaniards, he formed the project of founding a new Catholic religious order. In

1537 the company met in Venice, and thence made a first journey to Rome to obtain permission to establish the new order and receive a blessing upon it. Pope Paul III. received them with kindness, and on Sept. 27, 1540, gave to Ignatius and his companions the provisory, and in 1543 the definitive approbation of the order of Jesuits. L. was named first gen. of the order in 1541, and soon gave himself to the religious training of the young, and was very successful in bringing Jews over to the Chr. faith and in reforming lost women. He d. on the 31st of July, 1566, was beatified in 1590, and canonized by Pope Gregory XV. in 1622. His feast is celebrated on the 31st of July, the anniversary of his death. He wrote 2 small works in Sp.—*The Constitution of the Order of Jesus and Spiritual Exercises*. His *Life* has been written many times, but those of Roswede, Maffei, and Bouthours are specially quoted. [From orig. art. in *J. s. Univ. Cyc.*, by PROF. ANGELO DE GUBERNATIS.]

**Lo'zier (CLEMENCE HAMED), M. D., b.** Dec. 11, 1812, in Plainfield, N. J.; moved to New York 1814; taught a school for young ladies for 11 yrs.; studied med., and grad. at the Syracuse Coll. 1833; helped found the New York Med. Coll. and Hospital for Women and Children in 1863, and is dean and prof. at that inst.

**Lubbock (FRANK R.), b.** at Beaufort, S. C., Oct. 16, 1815; went to Tex. in 1836; was chosen sec. of the house of reps. in the extra session of the first cong. 1838; was twice appointed comptroller; was co. clerk of Harris co. 1843-56; elected lieut.-gov. in 1856 and gov. in 1861; joined the Conf. army; took part in all the actions on Red River; served on the staff of Pres. Davis in Richmond; was captured, and imprisoned at Ft. Delaware from Apr. to Dec. 1865; became treas. of the city of Galveston.

**Lubbock (SIR JOHN), BART., M. P., F. R. S., F. S. A., b.** in Lond. Apr. 30, 1834, ed. at Eton; became a banker in Lond., and introduced improvements into the system of banking; became early interested in ethnology, physics, and natural science. He succeeded to the baronetcy in 1865, in which yr. he put forth *Pre-historic Times, as Illustrated by Anc. Remains and the Manners and Customs of Modern Savages*, a work which was "epoch-making" in the anthropological sciences. In 1870 he issued *The Origin of Civilization and the Primitive Condition of Man*. His *Origin and Metamorphoses of Insects*, *On British Wild Flowers considered in Relation to Insects*, etc. bear witness to the versatility of his researches. He is vice-chancellor of the Univ. of Lond. In 1865 and 1868 he was an unsuccessful candidate for Parl. in the Liberal interest; was elected for Maidstone in 1870; has spoken on financial and educational topics, and procured the passage of several important acts.

**Lubbeck [Ger. Lübeck], a free Hanse-town and an important commercial port of the Ger. empire, is situated on the Trave, 10 m. from its entrance into the Baltic, and has 51,055 inhabs. It is almost wholly surrounded with water. To the W. and N. the Trave makes a large curve, forming an extensive harbor; to the S. and E. runs the Wakenitz, joining the Trave to the S. of the city. It is still partly surrounded with walls, and contains many old-fashioned houses and chs., which remind one of the Middle Ages. The industry is very lively. Breweries, manufactures of tobacco, cloth, and linen, cotton, and silk weaving factories are in operation. Still more important is the commerce, on account of the location of the city, between Hamburg and the Baltic. The prin. items of importation are wood, potash, tar, hemp, copper, and tallow from Rus.; timber, iron, copper, and steel from Swe.; corn and spirits from Prus.; wine from Fr.; the wine trade is very important.**

L. has a democratic const. Its govt. consists of a senate of 14 members and a municipality of 120. This govt. rules a terr. of 114 sq. m. with 63,571 inhabs., which forms an independent member of the Ger. empire. It was the head of the Hansa, but its power decreased with the Hansa. On June 27, 1867, it concluded a military convention with Prus. May 15, 1868, it entered the Zollverein, and in 1871 the Ger. empire.

**Lübke (WILHELM), b.** at Dortmund, Westphalia, Jan. 17, 1820; studied at Bonn and Berlin; wrote in 1853 *Die mittelalterliche Kunst in Westfalen*, and in 1855 *Geschichte der Architektur*; was appointed prof. of arch. at the Building Acad. of Berlin in 1857; travelled in 1858-60 through It., Fr., and Belg., and became prof. of art-hist. at Zurich in 1861, and at Stuttgart in 1866. His *Grundriss der Kunstgeschichte* and *Geschichte der Plastik* are very useful hand-books.

**Lubricants [Lat. lubricare, "to make smooth"], or Unguents, are of many kinds. As a solid L., plumbago, graphite, or black lead is the only material in common use; it is usually applied mixed with tallow or oil. It is best adapted for lubrication of bearings moving slowly under very heavy pressures. Tallow alone, or mixed with plumbago or with red or white lead, is an excellent L. under similar conditions. Lard is sometimes applied in such cases. All of the animal and vegetable non-drying oils are good unguents. The best of the oils for heavy pressures is summer-strained sperm. Lard oil is excellent for the bearings of machinery. Of the vegetable oils, olive is one of the best. Colza and rapeseed oils are good L. The siccative or drying oils, of which linseed oil is an example, cannot be used as unguents. Mineral oils are now coming into extensive use as L. The best mineral lubricating oils are those which, having been subjected to fractional distillation at high temperature, have been freed from all of the more volatile constituents. Crude petroleum is a good unguent under light pressures. The majority of the lubricating oils sold under trade names or trade-marks are mixtures of oils having a good body with others of less value. A mixture of mineral and lard oils is commonly used, and is a good lubricator. The oils of commerce frequently contain traces of the acids used in their purification. When this is the case they are likely to injure delicate machinery if applied as a L. They may be purified by chemical treatment, or they may be clarified by placing in the vessel containing them a quantity of rusty iron or of other neutral absorbent of acids. Soap is**



used as an unguent between surfaces of wood. [From orig. art. in *J. S. Univ. Cyc.*, by Prof. R. H. THURSTON.]

**Lubricators** [Lat. *lubricare*, "to make smooth"], apparatus by means of which lubricating materials are applied to rubbing surfaces in machinery. As lubricants are sometimes solid, sometimes semi-fluid, and sometimes liquid, L. are of several kinds. Those intended for applying solid lubricants, such as tallow, lard, or axle-grease, consist frequently of a simple box supported above the part to be lubricated, with a hole of a size which is greater or less according to the greater or less viscosity of the material employed and the freedom with which it is desired to apply it, leading down to the "bearing," through which the lubricant gradually finds its way. With hard tallow it is sometimes found advisable to apply a plate above the mass, which, being pressed down by a spring, forces the lubricant downward more rapidly.

**Lucanus** (MARCUS ANNEUS), b. at Cordova, Sp., in 39 A. D., a nephew of the philos. Seneca; came early to Rome; received an excellent education; distinguished himself by his poetical talent. He joined the conspiracy of Piso, was betrayed, turned informer in order to save his own life, but was nevertheless ordered to be put to death by the emp., and committed suicide in 65 A. D. Of his works, only *Pharsalia*, an heroic poem in 10 books, is still extant, but it is either unfinished or incomplete; it treats of the c. wars between Cæsar and Pompey, and begins with the passage of the Rubicon, but breaks off abruptly in the midst of the Alexandrian war.

**Lucas** (JOHN B. C.), b. in 1762 in Fr.; studied law at the Univ. of Caen; came to the U. S. in 1784, and became a farmer near Pittsburg, Pa., and in 1792 was elected to the legislature; was a judge of the common pleas; M. C. 1803-05; in 1805 was appointed judge of the U. S. courts at St. Louis, Mo., and held that office until 1820; was also (1805-12) a com. of land-titles. D. Sept. 1842.

**Lucas** (PAUL), b. at Rouen, Fr., Aug. 31, 1664, son of a goldsmith; visited Gr., Asia Minor, Syria, and Egypt as a dealer in precious stones; engaged in the naval service of the Venetians; participated in the siege of Negropont 1688; became capt. of an armed vessel which cruised against the Turks; returned to Fr. 1696; sold a fine collection of medals and curiosities to the royal cabinet; again visited Egypt, and ascended the Nile 1700; went by sea to Tripoli; joined a caravan which traversed Armenia and Per.; was robbed at Bagdad; taken prisoner by a Dut. privateer; reached Paris 1703; wrote his adventures under the title *Voyage au Levant*; travelled again in the E.; wrote a second vol. of travels and other works; was sent by the govt. on new antiquarian expeditions to the E. 1714 and 1723; went to Sp. 1736. D. May 12, 1737.

**Lucas** (ROBERT), b. at Shepherdstown, Va., Apr. 1, 1781, a descendant of William Penn; in 1800 went to O.; served in the war of 1812-15 as capt., and afterward lieut.-col. U. S. A. and brig.-gen. of O. militia on frontier; was pres. of convention which nominated Jackson for Pres. in 1832; gov. of O. 1832-36; gov. of Ia. Terr. 1838-41. D. Feb. 7, 1853.

**Lucana**, look'kah, formerly a duchy, which at some periods formed an independent republic and at others was given as a kind of pension to royal or semi-royal persons, now a prov. of the kingdom of It., comprising an area of 577 sq. m. with 280,399 inhabs., between Tuscan, Modena, Massa, and the Gulf of Genoa. Its soil is fertile. The prin. products are wine, oil, and silks. Paper, glass, linens, and cottons are manufactured. Cap. Lucera.

**Lucera**, city of Central It., the chief town of the prov. of Lucera, lying on the Serchio, about 15 m. N. E. of Pisa. L. is situated in a most fertile plain, surrounded, except on the E., by spurs of the Apennines. The streets, narrow and crooked, are well paved, and the private dwellings are often spacious and elegant. The public buildings contain many choice works of art, especially pictures by Fra Bartolomeo and other great masters. The cathedral was erected in the 11th century. The town is supplied with water by a superb aqueduct about 3 m. in length. Silk was manufactured here as early as the latter part of the 11th century. In 1300 the republic had her emporiums of silken stuffs at Paris, Lyons, Bruges, etc., and somewhat later 30,000 of the inhabs. of L., already known as the *Industria*, were said to live by this manufacture. Even now the silk and olive oil of L. are especially prized. Beautiful villas abound in the neighborhood, and the celebrated Bagni di Lucera are still a favorite summer resort for foreign residents in It. Pop. 68,068.

**Lucera** (PAULINE), b. at Vienna Apr. 25, 1842. The original name was LUCAS. Her parents were Jews of humble origin and condition. She owed her musical instruction to the kindness of a professional singer. In 1859 she appeared at the Oldnitz theatre as Elvira in the opera of *Ervant*, and at once became famous. In Nov. 1865 she married Baron von Rohden, who was killed in the Franco-Prussian war of 1870. In 1872 L. appeared in New York at Acad. of Music.

**Lucie** (STEPHEN BLAZEK), U. S. N., b. at Albany Mar. 25, 1827; entered the navy as midn. Oct. 19, 1841; became passed midn. in 1847, lieut. in 1855, lieut.-commander in 1862, commander in 1866, capt. in 1872, commodore 1881, brevet rear-admiral 1884, and same year pres. of U. S. Naval War College, Coaster's Harbor Island, R. I.; in action several times in 1864 and 1865, while commanding the iron-clad Nantucket and the steamer Pontiac of the S. Atlantic blockading squadron. Wrote a work on seamanship which has been adopted as a text-book at the Naval Acad.

**Lucern** [Fr. *Lucerne*], or **Purple Medick**, the *Medicago sativa*, a leguminous forage-plant, a native of Europe, where, as in Amer. and other regions, it is extensively sown. It should be planted in drills. It is perennial, and cut several times in the season. In Cal. it is known by the Sp. name of *alfalfa*, and is much prized.

**Lucerne**, luk-ern' [Ger. *Lucern* or *Lucern*], city of Switz., cap. of the canton of the same name, on the Reuss. Its chs. and the celebrated monument called the Lion of Lucerne,

carved in the solid rock after a model of Thorwaldsen, in remembrance of the Swiss guard butchered in Paris Aug. 10, 1792, are remarkable. A very brisk transit trade is carried on here. Pop. 17,850.

**Lucerne, Lake of** [Ger. *Vierwaldstätter See*, "Lake of the Four Forest Cantons"], a lake of Switz., inclosed by the cantons of Uri, Unterwalden, Schwyz, and Lucerne. It is 22 m. long, from  $\frac{1}{2}$  to 2 m. broad, and very beautiful.

**Lucian**, loo'she-an, SAINT, b. at Samosata in Upper Syria about 250; became a Chr. teacher at Edessa and Antioch, inculcating a doctrine similar to that afterward known as Arianism; was 3 times excommunicated as a heretic; ultimately retracted his heterodox doctrines, and d. a martyr at Nicomedia in the persecution of Maximian, about 310. Author of a revision of the Septuagint much valued by the Eastern churches.

**Lucianus**, a Gr. humorist of first rank, b. at Samosata in Syria in the first half of the 2d century of our era. The exact dates and circumstances of his life are not known; devoted himself to lit., philos., and rhetoric; travelled through Asia Minor, Gr., It., and Gaul, studying and teaching, and afterward settled in his native city. In his old age he received a position as procurator of a part of Egypt from the emp. Commodus. His works are very numerous, and of a miscellaneous character, poetical, critical, biographical, rhetorical, etc. The most remarkable are his dialogues, treating, generally in a satirical, though sometimes in a serious way, subjects of mythology, philos., and life.

**Lucifer** [Lat. "light-bearer"] primarily signifies the planet Venus, as the morning star. By an error of the commentators the name has been often applied to Satan.

**Lucifer**, bp. of Cagliari, Sard., appeared at the Council of Milan in 354 as the legate of Pope Liberius, but opposed the Arians in so violent a manner that the emp. Constantius threw him into prison. After the death of Constantius he was liberated, and took up his residence in Syria, but here too he deepened the controversy between the R. Cath. Ch. and the Arians. Disapproved by his friends, he left Antioch and retired to Sard., where he founded the sect of the Luciferians, and d. about 370.

**Lucilius** (CAIUS), b. at Suessa of the Aurunci in 148 B. C.; served in the Numantine war under Scipio; lived on familiar terms with Africanus and Lælius, and d. at Naples in 103 B. C. He was the founder, if not the inventor, of the *satira*, that peculiar Roman form of poetry in which Horace, Persius, and Juvenal excelled. Only fragments of his *Satira* are extant.

**Lucina**, the goddess of light, hence by a special metaphorical application the goddess of childbirth, was generally identified either with Juno or Diana. Her festival was celebrated on Mar. 1.

**Lück'e** (GOTTFRIED CHRISTIAN FRIEDRICH), D. D., b. at Egeln, near Magdeburg, in the Prus. prov. of Sax., Aug. 23, 1791; studied theol. at Halle and Göttingen, and became prof. at Bonn in 1818, and in 1827 at Göttingen, where he d. Feb. 14, 1855. Wrote *Grundriss einer neuestenamentlichen Hermeneutik*, *Commentar über die Schriften des Evangelisten Johannes*, etc. His fine theological library was purchased for Harvard Coll.

**Luckner**, look'ner (NICOLAUS), b. in 1722 at Kampen, Bavaria; served first in the Bavarian army, then in the Prus. army, distinguishing himself in the Seven Years' war, and at last in the Fr., which he entered in 1763 as a lieut.-gen.; in 1791 was made a marshal of Fr., and in Feb. 1792 was appointed commander, first of the army of Alsace, then of that of the north. In June he took Menin and Courtray, but retired suddenly to Lille. In July he was appointed commander-in-chief of the corps of Biron and La Fayette, and fought successfully against the Aus. at Longwy (Aug. 19), but a few days afterward he was replaced by Kellermann, and called before the bar of the Convention, because he had not punished Gen. Jarry, who, when evacuating Courtray, had set fire to the city. He was ordered not to leave the city, and lived quietly for some time, but in Sept. 1793 the payment of his pension was suspended, and when he made demands for his money he was guillotined, Jan. 3, 1794.

**Lucknow**, luk'nôw [Hind. *Laksmanavate*], city of Brit. India, the cap. of the prov. of Oude, is situated on the Goomty, an affluent of the Ganges, 610 m. from Calcutta, at an elevation of 360 ft. above the sea. The whole central part of it consists of narrow and crooked streets, sunk several ft. into the ground, and lined with huts of mud or bamboo, thatched with straw or palm-leaves. The commercial part has brick houses surrounded with gardens. In the E. quarters are several mosques and palaces, among which the Imambara is the most remarkable. The buildings erected under the auspices of Claude Martin are very gorgeous. From 1775, and to the incorporation of the kingdom of Oude with the Brit. dominions, L. was the cap. of the country. The mutiny of 1857 broke out at L. early in May. It was not until Mar. 19, 1858, that the city, which had been fortified by the insurgents, was repossessed by the Brit. Pop. 261,485.

**Lucretia**, loo-kree'she-a, the wife of Lucius Tarquinius Collatinus, was celebrated as much for her virtue as for her beauty. Sextus Tarquinius, a son of Tarquinius Superbus, the king of Rome, and a kinsman of her husband, became passionately enamored of her, and forced her to yield to his wishes. When the infamous deed became known it aroused the indignation of the whole people, and L.'s funeral became the occasion of a gen. revolution, by which the republic was established.

**Lucretius**, luk-kree'she-us (TITUS LUCRETIVS CARUS), b. according to Jerome (in the *Eusebian Chronicle*), in the yr. 95 B. C., and d., according to Donatus, 55 B. C., or, according to others, 52 B. C. His death seems to have been sudden, and is supposed to have been by suicide, through derangement occasioned by the effects of a philer administered to him. (See Tennyson's poem, *Lucretius*.) Very little is known in regard to his education, career, residence, or fortunes. He was a Rom. citizen of noble extraction, and probably



studied at Athens, and obtained there his intimate acquaintance with the Gr. poets and philo. His poem, *De Rerum Naturâ*, which received Cicero's revision, has come down to us entire, although apparently unfinished by its author. It contains 6 books, with upward of 7000 lines in all, is regarded as the completest exposition of the phys. system of Epicurus, and embodies the theories of Democritus, together with the hedonic doctrine of Aristippus. Among Eng. translations are those of John Mason Good, and of J. S. Watson, pub. in "Bohn's Library;" that of Thomas Busby, and that of Charles Frederick Johnson.

WILLIAM T. HARRIS.

**Lucullus**. The exact dates of his birth and death are not known, but he was quite a young man when he distinguished himself in the Social war and gained the favor of Sulla, whom he accompanied as questor to Gr. and Asia on the breaking out of the first Mithridatic war, in 88 B. C. After the great victory in 68 B. C. over Mithridates and Tigranes at the river Arsanias, the legions declined to follow L. farther, and he had to lead them into winter quarters in Mesopotamia. Next yr. Mithridates reopened the war with some successes over Triarius, the Rom. legate in Pontus, but when L. wished to lead his army against him, the soldiers, seduced by Gabrio, deserted him, and Pompey earned the glory of having brought the Mithridatic wars to a final close. Disgusted, L. returned to Rome, retired into private life, and spent his time in luxurious indolence. He was enormously rich, and the magnificence of his dinners became proverbial. D. about 57 B. C.

CLEMENS PETERSEN.

**Lud'dington**, city, on R. R., cap. of Mason co., Mich., on Lake Mich., at outlet of Père Marquette Lake and River, 84 m. from Milwaukee, with which it is connected by steamers; has a fine harbor on the lake. Pop. 1880, 4190; 1884, 5493.

**Lud'low**, Vt. See APPENDIX.

**Ludlow** (EDMUND), b. at Maiden-Bradley, Eng., in 1620, ed. at Ox.; entered the Parliamentary army as a volunteer on the outbreak of the c. war; became a col. of cav.; was one of the members of the high court which condemned Charles I.; protested against Cromwell's assumption of the protectorate, and agitated against him in favor of a republic; retired to Switz. at the approach of the Restoration, and spent the rest of his life there, only returning to Eng. for a brief period in 1688; wrote *Memoirs*. D. in 1693.

**Ludlow** (FITZTHUGH), b. at Poughkeepsie, N. Y., in 1837; commenced writing for the New York press in 1855; wrote in 1857 *The Hashesh Eater*, describing the pleasures and pains attending the use of that drug, to which he had been addicted; wrote for *Harper's Magazine* short stories, which were reprinted under the title of *Little Brother and Other Tales*; subsequently wrote *The Opium Habit*, giving his personal experience with opium. D. Sept. 13, 1870.

**Ludlow** (ROGER), b. in Eng., of good family; settled at Dorchester, Mass., 1630; was assistant gov. of the colony 1630-34; went to Conn. 1635, where he was for 19 yrs. a magistrate or deputy gov., and was appointed one of the coms. of the United Colonies; settled at Fairfield 1639; removed to Va. with his family 1654. The place and time of his death are unknown.

**Ludolphus** (Jon), b. at Erfurt, Ger., Jan. 15, 1624; studied lang. in his native place and at Leyden; travelled in 1647 in Fr. and Eng.; accompanied Queen Christina of Swe. in 1649 to Rome, where he made the acquaintance of some Abyssinians, by whose aid he studied the Ethiopic lang.; visited Swe. and Den.; settled in 1652 in Gotha. He wrote a *Rhetoric Ethiopica*, grams. and dict. of the Ethiopic and Amharic langs., and was the founder of the study of Ethiopic in Europe. D. Apr. 8, 1704.

**Ludwig II.**, king of Bavaria, b. Aug. 25, 1845, succeeded his father, King Maximilian II., Mar. 10, 1864. He is a man of genius, of romantic nature, an artist, with very fantastic ideas of his personal dignity as a king. In the affairs of Ger., however, he has played an important and noble part. At the outbreak of the Franco-Ger. war in 1870 he sided immediately with Prus. Also in the internal Bavarian politics he has shown himself master of the situation. But he dislikes to devote himself steadily and with consistency to the daily business of governing. He lives mostly in solitude in his magnificent palaces, and here he busies himself with art, especially with music. On account of this passion for music the composer Richard Wagner gained a considerable influence over him during the first yrs. of his reign, but the result was that there broke out among the people frequent riots against Wagner, and in 1866 the king was compelled to send the composer from the court.

**Lugano, Lake of**, situated on the frontier between Switz. and It., and between Lago Maggiore and Lago di Como; is of irregular shape, 20 m. long, 1½ m. broad. Through the river Tresa it sends its waters into Lago Maggiore, which lies 200 ft. lower.

**Luini**, loo-ee'ne, or **Lovini** (BERNARDINO), b. at Luino on Lago Maggiore, some say in 1460, others say later. Nearly everything concerning this artist has been in dispute—the time of his birth, the time of his death, his relation to Leonardo da Vinci, the genuineness of his works. His finest work, both in oil and fresco, is in Milan, Saronno, Como, and Lugano.

**Luitprand**. See LOMBARDS.

**Luke**, SAINT. *Life*.—St. Luke was of Gentile descent. He was from Antioch, the cap. of Syria, where for the first time Christianity took root in a heathen country. L. belonged to the lettered class of the people; of all Paul's companions, he was probably the only one who was possessed of a scientific and literary education. An old tradition maintains that he was one of the two disciples whom Jesus accompanied to Emmaus on the day of his resurrection. We meet him for the first time at the moment when Paul, having arrived at Troas on his second missionary voyage, prepares himself to cross over to Europe and undertake missionary travel through Gr. After the foundation of the ch. in Philippi, it seems as if L. remained in that city in order to take care of the young ch. He remained with

Paul during his 2 yrs. imprisonment at Cæsarea, and during this time he gathered the information and the materials of which he composed his 2 works. After these 2 yrs. he went with Paul to Rome, and participated in the shipwreck, which he has described in Acts xxvii.; he arrived at Rome with the apostle in the spring of 62, and lived with him during the first period of that captivity, with which the book of the Acts ends. He then left Paul and returned, for the time being, to the Orient. We find him once more in company with Paul and as a prisoner in the Second Epistle to Timothy. The second captivity is here referred to, which Paul suffered in the yr. 66 or 67, and which terminated with his martyrdom. According to a tradition L. preached the gospel in Achaia and Boeotia, and Nicephorus Callistus in the 14th century tells that he was hung on an olive tree in Gr. at the age of 80 yrs. From the testimony of Jerome it seems certain that his ashes were brought from Achaia to Constantinople by orders of Constantius in 356.

*Works*.—Two books are ascribed to L. by Chr. antiquity—the third of the canonical Gospels and the Acts of the Apostles. It is incontestable that the author of the third Gospel and the Acts must be sought among the assistants of St. Paul. The whole hist. of Jesus by L. is a demonstration of the reality of those 2 great principles which form the basis for all St. Paul's preaching—viz. the universality of the salvation and its entire gratuity. But in his 2 writings he defends a cause much higher than that of St. Paul: he pleads the cause of God himself. In the Epistle to the Romans, we are told that the Jews even claimed that God had not the right to withdraw the salvation from them and give it to the Gentiles, since he had bound himself to them by inviolable promises. The aim of L. is to demonstrate that God has accomplished faithfully his promises, by the apostles preaching first to the Jews and then to the Gentiles, and that it is not God who has broken his engagements with his people, but the people who have rejected their God. The idea of the book of the Acts is by no means to give the biography of Peter or Paul, or any other man. Like the whole Script., the book refers to the great subject of the reign of God. It contains the hist. of the apostolical foundations—the foundation of the Ch. among the Jews by St. Peter; the providential preparation for the preaching among the Gentiles; the foundation of the Ch. among the Gentiles by St. Paul; these foundations were accomplished at the end of St. Paul's first captivity, with which the Acts end. Thus, the plan of the 2 works is—from Nazareth to Capernaum, from Capernaum to Jerusalem, from Jerusalem to Antioch, and from Antioch to Rome. And as a true historian L. traces the progress of the faith in Christ from the individual to the Ch., and from the Ch. to the centre of the world's scene. [From orig. art. in *J. l'Enr. Cyc.*, by PROF. FREDERIC GODET, D. D.]

**Luling**, Tex. See APPENDIX.

**Lull** (RAMON), Latinized RAIMUNDUS LULLIUS, b. at Palma in Majorca, or at Barcelona, in 1235; d. at Boughia in Algeria in 1315. L. led a dissolute life till the age of 30, when he renounced the world and devoted himself to philo. and religion. He was a *mercator laicus*. After many pilgrimages L. settled in a hermitage on Mt. Rota, near Barcelona, and studied Latin and Arabic, Hebrew and Chaldee, theology and philosophy. Here he formed his system of religious and philosophical belief, and produced his first literary compositions. His works in Catalan are very voluminous, but we only know a few minor poetical compositions and *Reynard the Fox*, designed for the political instruction of rulers, but wholly different from the *Dut. and Fr.* fables with the same title. The religious romance, *Evast and Blanquerna*, was written in Lat. Critics divide L.'s Lat. works into 4 parts: those composing or expounding his philosophical system, *Ars Magna* or *Lulliana*; those relating to religion, polemical treatises against Averroes and his followers, and writings of a more or less autobiographical character. He passed the latter half of his life as an itinerant apostle of philosophical and religious truth. He even made several voyages to Moorish Afr., where he convoked the leading Moslem doctors and exposed the fallacies of Averroes and the hollowiness of the pretensions of Mohammed. In the last of these missions, at the age of 80, he was put to death at Boughia by a mob as an enemy to the religion of the Prophet. L.'s cardinal principle, the unity of all knowledge or the supremacy of reason, permeates all his writings, and he aimed to show not only that Chr. doctrine was not irreconcilable with philo., but might be demonstrated by it. He was also enlightened in his views of education, and labored for the introduction of the study of Heb., Chaldee and Arabic into the univ. courses of instruction. (See HELFFERICH, *Raymond Lull and die Anfänge der Catalonischen Literatur*.) GEORGE P. MARSH.

**Lumba'go** (Lat.), or **Crick in the Back**, is a subacute rheumatism, often very severe, and seated in the lumbar region. Strong liniments, rubbing with the hand, the application of the electrical brush, and cupping are all useful. A mild diaphoretic often affords relief.

**Lump-Fish**, or **Lump Sucker** (*Cyclopterus lumpus*), a fish of N. seas, of clumsy shape, studded with tubercles, and having its ventral fins formed into a sucker.

**Lumpkin** (JOHN H.), son of Wilson, b. in Oglethorpe co., Ga., June 13, 1812, grad. at Yale in 1832; studied law, and was admitted to the bar in 1834; became a member of the State legislature in 1835; in 1838 was elected solicitor-gen. of his judicial circuit; was M. C. 1843-51, then went upon the circuit court bench. D. in 1860.

**Lumpkin** (JOSEPH HENRY), LL.D., b. in Oglethorpe co., Ga., Dec. 23, 1799, grad. at Princeton with high honor in 1819; studied law; was admitted to the bar in Oct. 1820; in 1825 was a member of the legislature in the heat of the controversy between Gov. Troup and the Federal authorities growing out of the conflicts between the "old" and the "new" treaty with the Creek Indians; sustained the gov. and maintained the rights of Ga. Having become a member of the Presb. Ch. in 1826, he frequently made public ad-



dresses upon temperance, Sunday-schools, and Bible societies. In 1845 was elected chief-justice of the State supreme court; was for many yrs. a trustee of the State Univ.; organized the Phi-Kappa; founded the Lumpkin Law School. D. June 4, 1867.

**Lumpkin** (WILSON), brother of Joseph Henry, b. in Pittsylvania co., Va., Jan. 14, 1783. His father moved to Oglethorpe co., Ga.; was elected to the State legislature, and re-elected several times; was M. C. from 1815 to 1817, and again from 1827 to 1831; in 1823 was a U. S. com. to mark the boundary-line between Ga. and Fla.; in 1831 was elected gov. of Ga., and re-elected in 1833; was U. S. Senator from 1838 to 1841, and was for many yrs. one of the trustees of the State Univ. D. Dec. 28, 1870.

**Lu'na**, the Lat. name for the moon, and in the Rom. mythology the goddess of the moon. She had several sanctuaries in the city, among others a temple on the Palatine, which was lighted up every night, but she was never reckoned among the great deities.

**Lu'nacy**. See INSANITY.

**Luna, de** (PEDRO), antipope. See BENEDICT XIII.

**Lunar Caustic**. See NITRATE OF SILVER.

**Lunar Cycle**. See CALENDAR.

**Lun'dy** (BENJAMIN), b. in Hardwich, N. J., Jan. 4, 1789. His parents, as also their ancestors, were members of the Society of Friends. He served an apprenticeship at the saddler's trade in Wheeling, Va., then a thoroughfare for slave-traders. After his marriage he settled in St. Clairsville, O., where he pursued his trade for a little more than 4 yrs., accumulating a competency, and formed, with the assistance of 5 others, a "Union Humane Society," which in a few months enrolled nearly 500 members. This was followed by an appeal to the philanthropists of the U. S. on the subject of slavery, recommending the formation of kindred societies. In the fall of 1819 he took his stock to St. Louis, Mo., that by its sale he might give himself to the cause which he had espoused, but he lost by the venture nearly all his property. At that time the "Missouri question" was agitating the nation, and he devoted himself to an exposition, in the newspapers of Mo. and Ill., of the evils of slavery; he removed to Mt. Pleasant, and there commenced (Jan. 1821) a monthly publication, *The Genius of Universal Emancipation*, which was afterward transferred to Jonesborough, Tenn., and thence (in 1824) to Baltimore, Md., assuming a weekly form. In 1828 he made a pedestrian tour to the Middle and E. States, to awaken an interest in behalf of the oppressed. In the winter of 1828-29 he was nearly killed in Baltimore by a notorious slave-dealer. It was found impracticable to continue the weekly issue of the paper, and he restored the *Genius* to its monthly form, making Wash., D. C., the nominal place of its publication, but printing it as opportunity presented in divers places while traveling. In 1836 he started a weekly anti-slavery journal in Phila. entitled *The National Enquirer*. In 1837 he relinquished the charge of the *Enquirer*, intending to go West, but all his papers, books, clothes, etc., deposited in one of the rooms of Pennsylvania Hall, were destroyed by the incendiary burning of that building. In the winter of 1838-39 he removed to Lowell, La Sa. Co., Ill., intending to publish the *Genius* in that locality, but d. a few months after. The world was thus deprived of one of its most intrepid, devoted, self-sacrificing philanthropists, who deserves to be ranked among the most distinguished advocates of negro emancipation on either side of the Atlantic. D. Oct. 22, 1839. [From orig. art. in *J.'s Univ. Cyc.*, by WILLIAM LLOYD GARRISON.]

**Lundy's Lane, Battle of**. About noon of July 25, 1814, intelligence reached Gen. Brown, commanding the Amer. forces at Chippewa, that a movement was being undertaken by the Brit. Gen. Drummond against our depot of supplies at Ft. Schlosser. In order to divert the enemy from his purpose, Gen. Scott was ordered to advance upon the enemy's posts at Queenstown. Scott had advanced some 2 m. when he observed a small party of the enemy, which retired on his approach. Continuing his advance he learned that in rear of a narrow belt of woods the enemy, under Gen. Rial, were posted in strong force upon an eminence near Lundy's Lane. Detaching Major Jesup to operate on the left flank of the enemy, Scott advanced through the woods, a severe struggle, lasting upward of an hour, ensuing. Meantime Jesup advanced to a position from which he turned the left of the enemy's line, capturing some prisoners, among whom were Gen. Rial and his staff. Continuing to move in the increasing darkness, he succeeded in placing himself on the right of Ripley's brigade, which, with Hindman's artill. and Porter's volunteers, had now arrived, with Gen. Brown in command. Drummond had also arrived with reinforcements. It was finally determined to dislodge the enemy from his strong position, and an assault was ordered, which drove the Brit. from their guns, which were now turned against them; the hill was occupied and held against 3 desperate attempts of the enemy to regain their lost pieces and ground. The struggle was terminated at midnight by the withdrawal of the Brit., Gen. Drummond being wounded. During these charges Gens. Brown and Scott had both received severe wounds, and the command devolved upon Gen. Ripley, who withdrew the army to its old encampment on the Chippewa. But the Amers. were forced to abandon the trophies of their valor for lack of means of transportation.

**Lung Fever**. See PNEUMONIA.

**Lung-wort** (*Pulmonaria officinalis*), a perennial herb of the borage family, found chiefly in Europe. It derives its name from a fancied resemblance of the spotted leaves to diseased lungs. It has a creeping root and rose-colored flowers changing to blue.

**Lunt** (GEORGE), b. at Newburyport, Mass., Dec. 31, 1803, grad. at Harvard in 1824; studied law in Boston, and practised at the bar in his native town. He was several times elected to both branches of the State legislature, and was from 1849 to 1853 U. S. dist. atty. for Mass. He wrote

several small vols. of poetry, and in 1857 became ed. of the Boston *Courier*. Beside 2 novels, he has written *Three Eras of N. Eng., Radicalism in Religion, Philos., and Social Life, and Origin of the Late War*.

**Lunt** (WILLIAM PARSONS), D. D., b. in Newburyport, Mass., Apr. 21, 1805, was ed. in Boston; grad. at Harvard Coll. in 1823; entered Cambridge Divinity School in 1825; was ordained in 1828 pastor of the Second Congl. Unit. ch. in Quincy, Mass., in 1835, and there remained till his death, which occurred on a visit to the Holy Land, at Akabah, on the Red Sea, Mar. 20, 1857. He compiled a book of hymns, *The Chr. Psalter*. O. B. FROTHINGHAM.

**Lupercalia** [Lat.], a festival anciently held in Rome and other It. towns on the 15th of Feb. in honor of the god Lupercus. The original design was to propitiate the god and secure fertility to the flocks and fields. The festivities had an indecent, rude, and savage character.

**Lupine** [Lat. *lupinus*, from *lupus*, a "wolf"; Ger. *Wolfsbohne*, "wolf-bean"], a name given to the herbs and shrubs constituting the large genus *Lupinus* of the order Leguminosae. The U. S. have very numerous species.

**Lupuline, or Lupulite**. See HOPS.

**Luray Cavern**. See APPENDIX.

**Lurch'er** [Welsh, *lloch*, "lurking"], a variety of dog, chiefly bred in Europe for the service of poachers. It is strongly marked with greyhound characters, but has far greater sagacity and far better scent than any greyhound, and is distinguished by great fidelity. It is very swift, and is voiceless when coursing.

**Lusatia**, lu-sa'she-a [Ger. *Lausitz*; Fr. *Lusace*], an anc. terr. of Ger., bounded by Bohemia, Sax., Brandenburg, and Silesia. Originally it formed 2 independent margraves, Upper and Lower L., which in 1635 came into the possession of Sax., but by the Cong. of Vienna in 1815 the greatest part of the terr. was transferred to Prus., Sax. retaining only the portion which forms the present circle of Bautzen.

**Lusitania**, the name of the south-westernmost of the 3 provs. into which the Iberian peninsula was divided by the Roms., comprising the present Port. S. of the Douro and large parts of the adjacent provs. of Sp. It derived its name from the Lusitani, who dwelt between the Tagus and the Douro. Its cities were Olisipo, the modern Lisbon, and Emerita Augusta, the modern Merida.

**Lustration** [Lat. *lustratio*], in anc. Gr. and Rome, a ceremonial purification by water, fire, or the blood of sacrificial victims. Among the Roms. and Its., towns, cities, fields, flocks, armies, navies, temples, altars, private persons and the whole people were the frequent subjects of L.

**Lustrum**, a religious ceremony for the purification of the whole people of anc. Rome, performed upon the Campus Martius once every 5 yrs. by one of the censors. Hence the period of 5 yrs. is often called a *lustrum*.

**Lutes** [Lat. *luto*, to "daub"; *lutum*, "clay"]. This term applies to a class of compositions used for 2 purposes—the one being the making gas-tight or vapor-tight joints in apparatus used for holding or conveying gases or vapors, as in processes of distillation; and the other the coating externally of fragile vessels that are to be exposed to high heats. For the first use modern chemists are enabled to substitute almost altogether tubes, bands, and sheets of india-rubber, so that luting compositions are seldom used. There is one highly important case, however, in the arts in which they are still employed. This is for the lids of gas-retorts. (See GAS-LIGHTING.) In the laboratory, in cases in which the heat to be applied is below 400° or 500° F., *linseed meal* is much used; with water it makes a very plastic adhesive mass; with *glycerine*, instead of water, this mass will not dry and crack. If pressure is to be resisted, the composition may be applied in some mass to the joint, a band of cotton cloth rolled around it, and the whole then bound around with twine. Clay and *glycerine* make a useful L. also. Great numbers of similar compositions are known in the laboratory. (See U. S. *Dispensatory*.) [From orig. art. in *J.'s Univ. Cyc.*, by PROF. H. W. H. W. D.]

**Luther** (MARTIN), b. Nov. 10, 1483, at Eisenbeben, whence his parents, a mining family in humble circumstances, removed shortly after to Mansfeld. In 1497 he went to Magdeburg, and next yr. to Eisenach, in order to frequent a Lat. school, making his way in these places by begging his meals in rich people's houses, and earning a little money for lodging and clothes by singing in the choir of the cathedral. In 1501 he entered the Univ. of Erfurt. In 1503 he grad. as M. A., and next yr. began to give lectures on the physics and ethics of Aristotle. But a violent sickness which befell him, and, more than anything else, the incidental acquaintance he made with the Bible, threw his mind into such anxieties that on July 17, 1505, he became a monk. Restored to peace with himself, he continued his theological studies, and on May 2, 1507, received the consecration as priest. Next yr. (1508) he was appointed prof. of philos. at the Univ. of Wittenberg, and in 1510 he made a pilgrimage to Rome. In 1517 the Dominican friar John Tetzel approached the Sax. boundary, selling indulgences. Against this scandal L. drew up his 95 theses, the pith of which is that the pope has no power at all to forgive sin, and nailed them (Oct. 31, 1517) on the ch.-door in Wittenberg. The sensation which this proceeding caused was immense. Tetzel had to flee, and the commotion spread with incredible rapidity over all Ger. L. was summoned to Rome, but refused to go. Cardinal Cajetan arrived in Ger., and demanded that he should retract, but this, too, he refused. Meanwhile, the papal envoy to the Sax. court, Miltitz, succeeded in persuading him to be silent about the matter for the future, and a reconciliation seemed possible, when the famous disputation between Karlstadt and Eck, held in Leipzig from June 27 to July 16, 1519, once more drew L. into the conflict. The pope sent a bull of anathema against him June 15, 1520, but the profs. and students of the Univ. of Wittenberg burned the bull outside the Elster gate; and



now followed, in the same yr., his 2 celebrated writings—*Address to the Chr. Nobles of Ger.* and *Prælatum de Capitulato Babylonica Ecclesia*—in which he openly and with great precision defined his position both to the Ch. and to its doctrines. On Apr. 5, 1521, Charles V. opened at Worms the first diet which he held in Ger., and L. was ordered to attend. All his friends endeavored to persuade him from going, but he determined to obey the order, and on Apr. 17 he appeared before the diet. The impression which he produced was most powerful. In order to withdraw him from the violence of his enemies, a troop of soldiers belonging to the elector of Sax. took him prisoner on his return from Worms, and brought him to the castle of Wartburg, where he spent nearly a yr. (from May 4, 1521, to Mar. 7, 1522) in concealment. During his residence here he accomplished the translation of the Bible, of which the N. T. appeared in 1522. But when he heard of the excitement which reigned in Wittenberg, and the disturbances which took place there under the leadership of Karlstadt, he immediately left his place of safety and repaired thither. He now developed a most astonishing practical activity, reorganizing the Sax. Ch., laying out a new liturgy, providing new books for the schools, both for the teacher and the pupils (the Great and the Little Catechism), preaching several times each week, and all the while keeping up a most extensive correspondence with the scholars and princes of his country. But in all this business he appears everywhere great. No less pleasant is the impression which his private life makes, such as it appears in his *Table-Talk*. On June 13, 1525, he married Catharina von Bora, a nun, and the marriage proved exceedingly happy. D. Feb. 18, 1546. CLEMENS PETERSEN.

**Lutheran Church (LUTHERANISM).** I. *Definition and Name.*—The result of the union of the conservative with the progressive in reformation, as distinct from revolution, was the L. C. Lutheranism is the system of faith and life taught in God's word and confessed in the Augsburg Confession and in the creeds consonant with it. The L. C. has been distinctively called Protestant and Evangelical, and (in the *Formula of Concord*) "Reformed."

II. *Distinctive Characteristics of Lutheranism and of the Lutheran Church.*—1. The material principle of Lutheran Protestantism is the saving truth of Christianity as it lies centred in the doctrine of justification for Christ's sake alone, by faith alone.

2. The formal principle is the sole authority of Holy Script. as the rule of faith and guide of life.

3. The Lutheran method of using the rule of faith is historical. The Chr. Ch. is the living witness of the truth.

4. The doctrines of God's word shape the individual assurance of faith and the confession of the Ch., and originate and develop her polity, worship, and practical life.

5. The Protestantism of the Reformed or Calvinistic chs. has laid as its fundamental doctrine the absolute and sole primary causality of God. In it there is but one real cause of whatsoever comes to pass, the foreordination of God. All other causes are also effects, and no more than phenomena of the final cause. Election is the material principle, and justification is secondary and dependent.

6. While Calvinistic Protestantism holds with the L. C. that Holy Script. is normative, it has yet isolated the Scripts. from the historic development of the Ch., and subjected its interpretation far more to an undefined subjectivism and rationalizing tendency.

7. "In Reformed Protestantism the formal principle is controlling; in Lutheranism, the material. In the Reformed system Script. is regarded more as the exclusive source of doctrine; in the Lutheran system, as the norm of the doctrine, which grows out of the analogy of faith. In consequence of this, a pure tradition possesses in Lutheranism a greater validity."

8. "Lutheran Protestantism is the antithesis to the Judaism of the Rom. Ch., and thereby the doctrine obtained a Gnosticizing character; the Reformed is the antithesis to the pæanism of the Rom. Ch., and thus the doctrine received a Judaizing ethical character."

9. "Reformed Protestantism is the protestation against all deification of the creature. Hence it emphasizes the absoluteness of God and the exclusiveness of his will—its material principle—with which coheres the exclusive emphasizing of Script. as the positive normal principle."

10. "The material principle of Zwingli is the glory of God; his formal principle is the Script., yet in such sense that he explains that the internal word is independent of the external, and denies all creaturely causality on the part of the creature in salvation."

11. "The Reformed system begins at the top, and goes downward; the Lutheran begins below, and ascends. The centre of gravity in the one was the objective, in the other the subjective. In the one everything saving and salutary lies in the Ch.; in the other, it lies in the decree. The Lutheran system, with its faith reposing on the historical fact of the redemption, holds the mean between Calvinism and Romanism—between the transcendent idealism of the one and the external realism of the other."

12. "The distinction between the systems consists in the diverse form of the consciousness of salvation, as the result of which the Reformed theol. goes back to the eternal decree; the Lutheran is satisfied with justification by faith."

13. "The whole Reformed Ch. structure is on the one side determined by this motive of opposition to mysteries, which tends to a denial of all instrumental distribution of grace—and this it derives from Zwingli—and on the other side it is distinguished by the evangelical, theocratical motive, the glorifying of God in the Ch., which it derives from Calvin."

14. "All these diverse presentations have as their basis the common supposition that the difference is not merely an external one, but is a difference in principle. The essential part of the difference hinges upon the elements of the Reformed doctrine, which reciprocally condition each other: the absolute causality and the sole primary causality of God,

which excludes means of grace in the strict sense, on the one side, and on the other side an assurance of a state of salvation, grounded in an inscrutable decree—an assurance reached by the individual actual life as the result of the divine operation."

III. *Rise and Early History of the Lutheran Church.*—Her earliest annals are interwoven with the personal and official history of Luther. His internal conflicts, his theses, the Leipsic disputation, the attraction of Melancthon into his mighty orbit, his era of storm and pressure (1520-21), the bull, the Diet of Worms, the hiding at the Wartburg, the outbreak of radicalism at Wittenburg under Karlstadt (1522-25), the Peasant war and Anabaptist sedition (1529), the controversies with Henry VIII. and Erasmus (1523-36)—all had within them potencies for the future of the L. C. The Lutheran Reformation showed its unfolding strength in the empire at the Diet of Nuremberg (1522-23); in the extension of the evangelical doctrine (1522-24); at the second Diet of Nuremberg (Jan. 14, 1524); at the convention of Ratisbon (1524), called to resist it; in the growing decision of the evangelical states (1524); in the Torgau confederacy (1526). With the yr. 1526 the estates began to use the right to regulate ecclesiastical matters in their own terms. In the yrs. (following 1526-29) a number of the Lutheran state chs. began to be established and organized. Nor was the blood of martyrs wanting to hallow the work of brave confession (1523-29). The pure faith reached the palace as well as the humble home, and asserted its power by the very side of persecutors.

IV. *Early Ecclesiastical Conflicts.*—The Reformation in Ger. Switz., under the leadership of Zwingli, had been advancing with elements of generic affinity with the work of Luther, and with marks of specific diversity from it. The origin and internal tendencies of their systems led to the sacramental controversy (1525-29). The Lutheran doctrine of the Lord's Supper is one which depends upon methods of interpretation with whose validity the whole distinctively Lutheran system stands or falls. The Catholic party hoped at the Diet of Spire (1529) to regain what they had lost 3 yrs. before. Against this the evangelical princes made their solemn protestation (Apr. 19, 1529), which gave them the name of *Protestants*, and appealed to the emp., to a free council, and an assembly of the Ger. nation.

V. *The Augsburg Confession; Prologue and Epilogue.*—Philip of Hesse endeavored to bring about an accord between the Zwinglian and the Lutheran theologians by a colloquium held at his castle at Marburg Oct. 1-3, 1529. Fourteen articles stated the agreement of the parties. In the 15th the Zwinglians conceded that the body and blood of Christ are in the sacrament, but denied the objective character of the presence. A convention was held at Schwabach later in the same month, at which Luther presented a confession in 17 articles, based upon the 15 of Marburg. Charles V., after his coronation, came to Augsburg, whither he had summoned a diet, and there (June 25) was presented the Augsburg Confession, the first of the distinctive confessions of the L. C. A confutation of the Confession was presented Aug. 3. The defence of the Confession against this paper, the Apology by Melancthon, is the second of the Lutheran symbols.

VI. *Political and State Movements (1530-53).*—The Prots. now formed a defensive alliance at Schmalkald (1530), to last 6 yrs. This aided in bringing about the religious peace of Nuremberg (July 23, 1532). Paul III. (1534-49) professed to call that gen. free council which had been so ardently desired. It was convoked for May 23, 1537, at Mantua. In anticipation of the possibility of a council, Luther drew up certain articles of the points which were to be held above all concession—the Lutheran ultimatum. These were considered at Schmalkald (Feb. 1537). The Schmalkald Articles form the 3d of the distinctive confessions of the L. C. The council was never held. The Nuremberg "Holy League" (July 10) of the Catholic princes might have brought on a bloody war, had not the political difficulties of the emp. made it absolutely necessary that he should conciliate the Prots. All processes against the Prots. were arrested for 18 months by the Frankfort Suspension (1539). All hope of a better understanding had not yet vanished, but the guilty passions of some of the Lutheran princes were preparing the way for deadly injuries to the cause of truth. Under the lowering of the great storm which was coming, Luther d. Feb. 18, 1546. The pope had finally consented to call a gen. council in Trent. The emp. used the rivalry of some of the Prot. princes to separate them from the Schmalkald confederacy. The war of Schmalkald was sprung upon the Prots. Then came the imposition of the Interim (1548), and the political prospects of the L. C. in Ger. reached their hour of profoundest darkness. At this crisis deliverance came. In the heart of the elector Maurice, the betrayer for a time of the Ref., the slumbering sense of honor was aroused. Breaking from the bonds of the emp., who had used him as his right hand in the repression of Protestantism, he turned fiercely upon him. The treaty of Passau (1552) guaranteed the Lutheran states equal rights with the Catholic till a new council should be convened. The religious Peace of Augsburg (Sept. 25, 1555) withdrew the limitation as to time.

VII. *The Lutheran Reformation Outside of Germany.*—In N. Europe the Lutheran Confession found a home among the Scandinavian races. In E. Europe Lutheranism and Calvinism reached the Slav and Magyar races together. The Lutheran Ref. was triumphant in Swe. (1527) under the influence of Gustavus Vasa. In Den. and Nor. the Lutheran organization was confirmed by the Diet of Odense (1539), and by the middle of the century the lands of the Baltic coast and Courland, Livonia, and Estonia were Lutheran.

VIII. *Doctrinal Controversies in the Lutheran Church in the Sixteenth Century.*—The internal questions which agitated the L. C. were determined in the *Formula of Concord* (1577), which closes the collection of the confessions which appeared under the title of the *Book of Concord* (1580).



**IX. Church Polity.**—In her ecclesiastical const. the aim of the L. C. was to avoid the hierarchical subjection of the State to the Ch., and the Cæsareo-papal lording of the State over the Ch. The former she perfectly secured; in the latter she was not always so happy, and in various ways the political complications of the time embarrassed the practical application of her principles.

**X. Worship and Art.**—A perfect freedom was claimed for the Ch. in all the purely human regulations of worship. A thorough conservatism was observed. The expressive ornaments of the altar and the innocent usages dear to the people were retained. The Romish perversion of the mass, all rites that taught or insinuated unsound doctrine, were thrown out, and the evangelical mass, the pure communion service, remained. The pulpit became a power. The people heard God's word and uttered his praises in their own tongue. The biblical festivals of the Ch. yr. were retained. Painting and statuary hallowed their gifts for the sanctuary.

**XI. Hymns.**—The hymns for the people were one of the grandest achievements of the Lutheran Ref. Holy song was wide-reaching, incapable of exclusion, soft, mighty, and irresistible.

**XII. Church Music.**—The congregational singing was a revival of the Ambrosian choral over against the priestly Gregorian chant. It was choral, for the people and the choir blended into one in this form of song.

**XIII. Practical Life.**—The Chr. life was one of humble, joyous assurance. The clergy were marked by devotion to the pastoral work, and by fidelity in the pulpit and in the religious instruction of the young. Without a severe ch. discipline they trained the people in the fear of God, in personal honor, and in the domestic and civil virtues.

**XIV. Theological Science.**—The nature of the times gave prominence to polemic theol. The ploughshares were beaten into swords. Luther, Melancthon, Flacius, etc. are still unforgettably names. The centres of theological culture were the univs. of Wittenberg, Tübingen, Strasbourg, Marburg, and Jena.

**XV. Transitions of Lutheran Established Churches in the Sixteenth Century.**—The Crypto-Calvinistic designs had intended a gen. removal of the L. C. from its first foundations. Crypto-Calvinism was unionism deriving its special features from the times. Its designs were thwarted, yet the Palatinate under Frederick III., Bremen, and Anhalt were transferred by their civil rulers to the Calvinistic communion.

**XVI. The Lutheran Church in the Seventeenth Century.**—1. Hesse Cassel, the earldom of Lippe, the court of the electoral house of Brandenburg, became Calvinistic. Various attempts at union accomplished nothing.

2. The L. C. had undergone the ordeal of a war of polemics; she was to undergo the trial of a comparative internal repose. She now reached her mediæval period, rich in construction, comparatively poor in origination, by the ordinary law of historic progress. Within the determined orthodox rose various questions. The controversy on syncretism originated in the views of George Calixtus. With pietism in its early stages are associated the names of Spener and Francke.

3. The age is brightened by the works of many of the noblest representatives of Christianity. Among them are Arndt (*True Christianity*), Gerhard (*Meditations and School Pietatis*). The lovers of mysticism treasure Jakob Böhme and Gottfried Arnold.

4. The century was rich in hymn-writers. Those of the earlier part were marked by the old objectivity; those of the later by subjectivity. We remember Paul Gerhard.

**XVII. The Lutheran Church in the Eighteenth Century.**—1. *Before "the Illumination."*—After the death of Spener and Francke pietism degenerated very rapidly. There arose a generation of Lutheran divines as pious as the pietists, as orthodox as their opponents, who showed that true piety is orthodox, and that true orthodoxy is pious.

2. *Church Polity.*—The (politico-) episcopal system of polity had claimed at first to be simply a necessity. This transmuted itself into the assertion of a principle. It was supplanted by the territorial system. A third system, the collegial, detached from the political abuse of it, is more in accordance with the original position of the L. C.

3. *Worship.*—The hymn-writers of this era show the influence of the spirit of Spener. The degenerating pietism corrupted the music of the Ch. This tendency was met by John Sebastian Bach, who was "the greatest master of all times," the lover of the anc. choral. Handel (d. 1759) gave his ripest yrs. to oratorio (*Messiah*).

4. *Missions.*—The new life of the purer pietism showed itself in establishing missions among the heathen. At the Dan. mission at Tranquebar (1704) labored Zeigenbalg (d. 1719). From Halle went forth Schwarz (d. 1700). Callenberg founded at Halle (1728) an inst. for the conversion of the Jews. Hans Egede (1721) went to Greenland.

5. *The Rationalist "Illumination."*—From the middle of this century rationalism, claiming the title of "Illumination," or enlightenment, made rapid progress. It was intensified by causes of wide extent and great potency, and revealed itself in every great communion of W. Christendom. Rationalism is infidelity in various degrees, under the forms of Christianity. The supranaturalism which met it was under the latent influence of the thing it combated, as the Eng. apologetics of the century showed tinges of the deism with which it fought. The higher philos. and national lit., though in seeming affinity with rationalism, were yet in their antagonism to its prosy doctrines, its plausible shallowness, emptiness, and self-sufficiency, its invincible foes in their deepest and final workings.

**XVIII. The Lutheran Church in the Nineteenth Century.**—1. *Reaction of Church Life.*—The revolutionary excesses of Fr. and the providences growing out of them by development or counteraction, which marked the opening yrs. of the 19th century, had tended to sober men. All deep thinking tends as a finality against scepticism. Reason is the

cure of unreason. Kant, Fries, the Fichtes, Schelling, Hegel, Herbert, Schopenhauer, Ulrici, Lotze, Von Hartmann, in virtue of helping to earnest thinking, work in one school.

2. *Union and Separation.*—Frederick William III. began in 1817 the movements looking to the union in one state Ch. of the Lutheran and Reformed. Strong opposition rose on the side of many earnest Lutherans. Frederick William IV. released the clergymen who were imprisoned, and a free L. C. was organized. Separation also arose within the separated, on questions affecting the const. of the Ch., in which Huschke represented the conservative, Diedrich the radical view. A decision of the gen. synod of 1859 adverse to the view of Diedrich led to his separation from the synod (1861). A free Lutheran conference of the friends of separation from the unionistic state chs. was held 1874, at Eisenach, the object of which was to promote a better understanding and a more perfect sympathy.

3. *Confederations.*—Various confederations attempted to co-operate with or supplement the union, so as to bring into practical co-working the elements which had been joined but not united in it.

4. *Distinctive Lutheranism within and without the Union.*—Within the union distinctive Lutheranism still remained a power. Many Lutherans remained within the union to fight the battle for truth there, and to obtain a restoration of the guaranteed rights of the Ch. Lutheranism outside of the union was represented in the gen. Lutheran conference.

5. *Hymns and Music.*—The awaking consciousness of the Ch. led to efforts to correct the state into which rationalism had brought the hymns, the music, the service, and the popular religious lit.

6. *The Theology of the Nineteenth Century.*—The Prot. theol. of Ger. is represented (1) in the older and in the historic-critical rationalism; (2) in the old supranaturalistic schools, embracing rational supranaturalism, the stricter or supranatural supranaturalism, and the pietistic supranaturalism; (3) the mediating theol. whose father is Schleiermacher; (4) Lutheran theologians of the Confession.

7. *Practical Life.*—With the reviving doctrinal life came the spirit of missions. The outgrowths of the life of inner missions are so numerous that their names would fill pages.

8. *Statistics.*—The total number of Lutherans is probably about 40,000,000, including the Lutherans in the union chs.

C. P. KRAUTH.

**Lutheran Church in the U. S. I. The Era of Beginnings and Dependence.**—1. The first Lutheran immigration into Amer. was from Hol. A little band of Dut. Lutherans came (1621-26) to what was then called New Amsterdam and is now New York. In 1644 a number of N. Gers. were added to them, but their worship was conducted in private houses. Strong efforts were made to lead them to conform to the Calvinistic Ch. of Hol. The Eng. took the city in 1664, and freedom of religion was accorded the Lutherans.

2. *The Swedish Lutherans* came next. Gustavus Adolphus had designed to open in Amer. a place of refuge for the persecuted Prots. of Europe, and Oxenstiern attempted after the death of the king to carry out his plan. Fifty Swe. immigrants, with their preacher, landed (1638-37) on Del. Bay, and bought land of the Indians. Torkillus, the first pastor, d. in 1645. Campanius, their next minister, led in the great work of missions among the Indians. In our own day a new and immense influx of Scandinavian nationalities has taken place, making now a pop. of about 1,500,000 in U. S.

3. *The Ger. Lutherans*, last in coming, were destined to be the mightiest element of the future growth of the Ch. a. *In the North.*—They began to settle in Pa. in 1680. Immigration began on a large scale in 1710. The congregations in Phila., Providence, and New Hanover sent a deputation in 1733 to beg for ministers and other aid. The petition was regarded with special interest by C. A. Francke, who sent a man destined to become the patriarch of the L. C. in Amer., Henry Melchior Muhlenberg. b. *In the South.*—The Salzburger were driven from their homes in the dead of winter (1731-32) by the Romish abp. Count Firmian. Aided by Eng. Chrs., 42 families of them came to Ga. with their preachers, Bolzius and Gronau. They gave the name of Ebenezer to the colony they established. Rabenhorst came with a new band in 1752, and established the first Lutheran congregation in Charleston, S. C. In the early part of the 18th century many Gers. went from Pa. and other parts of the colonies to N. C. Immense immigrations in the later era have come from Ger. The Ger. pop. of this country may be estimated at 7,000,000, and the Lutheran is the largest of the religious bodies among which they are divided.

II. *Era of Synodical Organization.*—The Ger. Evangelical Lutheran Ministerium of Pa. and adjacent colonies was organized Aug. 14, 1748. The dates of the formation of the earlier synods are as follows: Synod of N. Y., 1785; S. C. Corpus Evangelicum, 1787; N. C., 1803; O. and adjacent States, 1818; Md. and Va., 1820; Tenn., 1820; S. W. Pa., 1825; Va., 1830; Hartwick, 1830; Synod of the W., 1835; Eng. Synod of O., 1840. The present number of synods is about 54. A great event in this era was the organization in 1847 of the synod of Mo., O., and other States. It has been by pre-eminence the representative of Lutheran orthodoxy. The "Old Lutherans" from Prus., forming the Buffalo synod, have fought and endured, and the synod of Mo. has shared in the same spirit of earnestness. This synod has done much for gen. and theological education. The Synodical Conference of 1871 is the outgrowth mainly of its work. One of the most persistent of the antagonistic bodies has been the Ia. synod, which was formed in 1854. It is unserved in the acceptance of the confessions of the Ch., but considers them safeguards of its liberty as well as of its purity, and therefore considers the questions left undetermined by them as open questions.

III. *Efforts at General Organization.*—In 1820-21 the Gen. Synod was organized; in 1863 the Gen. Synod of N. Amer. (S.); in 1867 the Gen. Council; and in 1872 the Synodical Conference. The Gen. Synod is unionistic, but with ele-



ments of a more churchly character; the Gen. Synod of the S. has a larger relative strength of the conservative element; the Gen. Council, strictly Lutheran in confession, has failed to satisfy in the practical application of its principles in discipline on the "four points," the tendency which has found embodiment in the Synodical Conference. The "four points" are pulpit and altar fellowship, Chiliasm, and secret societies.

IV. *Internal History*.—1. *Pietism*.—The L. C. in Amer. has been throughout its entire hist. sympathetically affected by the condition of the Ch. in Ger. The mighty influence of the better pietism has been felt all through its hist., and is felt to this hour. But pietism here, as elsewhere, has shown its innate dangers.

2. *Rationalism* in the L. C. in Amer. never came to sufficient strength to avow itself, but moved furtively, showing itself rather as an ignoring of the true than as an avowal of the false. The position of those most widely suspected of affinity with it was indeterminate and a matter of dispute. But while the Ch. as a whole remained true to the orthodoxy which forms the common basis of nominal Protestantism, a great deal of looseness was allowed in regard to the anc. distinctive orthodoxy of historical Lutheranism.

3. *Unionism*.—Partly from pietistic, partly from rationalistic sources, and most largely from the dominant tendencies of the sect-life of Amer., the unionistic tendency has been shown in some extreme cases, even to the degree of proposing an organic fusion of the L. C. with some other Ch. The great controversies of the most recent period have turned upon these unionistic tendencies. The Gen. Synod warmly encourages them; the Synodical Conference rigorously opposes them; the Gen. Council also earnestly opposes them, but has allowed the possibility of exceptions to the ordinary mode of applying the rule.

4. *The Growth of Church Consciousness* has been a marked feature of the later life of the Ch. The Gen. Synod in 1880 arose from this reviving consciousness. In the earliest hist. of the Ch. in Amer. an unreserved acceptance of the *Book of Concord* was required, but a special prominence was assigned to the Augsburg Confession. The intermediate time was one of laxity. An immense majority of the Ch. in Amer. accepts the entire body of the Confessions *ex animo*.

5. *The Literature and Educational Work* of the Ch. in Amer. have labored under many disadvantages. Nevertheless, she has names of great lustre in the gen. depts. of science, lit., and theol. The L. C. is an educating Ch. From an early period in this country she has aimed at educating her people, and especially her ministers, and theological sems., colls., and higher schools show her earnestness in this work.

V. *Practical Life*.—In her const. in this country the L. C. has combined the congregational and synodical elements. The preaching in the L. C. is marked in the main by simplicity and power. The young people of the Ch. who give evidence of a desire to live as Chrs. are instructed in the catechism. Liturgies are in use in every part of the Ch. Many chs. have been reared within a recent period. The Ch. is growingly active in the work of missions and in the spheres of beneficence. (See HAZELIUS, *Hist. of Amer. Lutheran Ch.*)

C. P. KRAUTH.

**Lutz, von** (JOHANN), b. in Bavaria Dec. 4, 1836, a son of a schoolmaster; studied jurisprudence, and was appointed sec. to the cabinet of King Louis II. in 1866. In 1867 he became minister of justice, and Dec. 20, 1869, minister of public education and worship. In this position he rendered great services to the Ger. empire.

**Lut'zen**, a small town of Prus., prov. of Sax., famous for the 2 battles which were fought in its vicinity. On Nov. 16, 1632, the Swe. king, Gustavus Adolphus, fell here in a battle with Wallenstein, the gen. of the imperial army; the Swedes were victorious. On May 2, 1813, Nap. defeated the Prus. and Rus. armies.

**Lu Verne**, R. R. Junc., cap. of Rock co., Minn., on W. bank of Rock River, in S. W. corner of State. Pop. 1880, 679.

**Luxembourg**, lük-sun-boor', de (FRANÇOIS HENRI DE MONTMORENCY-BOUVILLÉ), DUKE, b. at Paris Jan. 8, 1628; entered a military career under the auspices of the great Condé, and distinguished himself so much in the battle of Lens (Aug. 20, 1648) that he was made a *maréchal-de-camp*. In the wars of the Fronde he fought against the court, but after the peace of the Pyrenees (Nov. 7, 1659) he was pardoned, and married (Mar. 17, 1661) the heiress of the house of Luxembourg, whose name he assumed. In the wars against Sp. and Hol. he fought under Turenne; was made a *lieut.-gen.*, and displayed great military talent. He was one of the 8 marshals created after the death of Turenne in 1675; captured Valenciennes and Cambrai, and defeated William of Orange at Mont Cassel Apr. 11, 1677, and at St. Denis, near Mons, Aug. 24, 1678. After the Peace of Nymwegen, Louvois removed him from service, accusing him of having sold himself to the devil and attempting to poison his wife. The case lasted 14 months, and although he was acquitted (May 14, 1690), yet he was banished from the court and from Paris. After nearly 10 yrs. of disgrace he was appointed commander-in-chief of the army of Flanders (Apr. 19, 1690), defeating the prince of Waldeck at Fleurus, July 1, 1690, and William III. at Steenkerke, Aug. 3, 1692, and at Neerwinden, July 29, 1693. The campaign of 1694 brought no great results. D. Jan. 4, 1695.

**Luxemburg**, a terr. situated between Rhenish Prus., Fr., and Belg., and consisting of an elevated tract on the slope of the Ardennes, with a rugged surface often covered with dense forests of oaks, and with a soil not very fertile. The region is rich in minerals: coal, iron, copper, and lead are mined; marble, slate, and freestone are quarried. Tolerably good crops of corn, flax, hemp, hops, and wine are raised, and horses, cattle, and sheep of good breed are reared; cloth, earthenware, nails, and leather are manufactured, and much cheese, oak-bark, and timber exported. The Belg. prov. of L. contains the 3 dists. of Arlon, Neufchâteau, and Marche, and comprises an area 1705 sq. m. with

309,118 inhabs., most of whom speak Fr. The grand duchy of L. comprises an area of 998 sq. m. with 209,570 inhabs., most of whom speak Ger. It is not a prov. of Hol., but united to that kingdom by a personal union, the king of the Netherlands being also grand duke of Luxembourg.

**Luxemburg**, cap. of the grand duchy of Luxembourg, on the Elze or Aisette. By the treaty of Lond. in 1867 it is declared neutral ground. It has large manufactures of wax, breweries, distilleries, tanneries, and an extensive trade in gold and silver wares, china, etc. Pop. 16,679.

**Luzerne**, lü-zärn', de la (Chevalier ANNE CÉSAR), LL.D., b. in Paris in 1741; ed. for the military service, and was aide-de-camp to his relative, the duke de Broglie, during the Seven Years' war, attaining the rank of *maj.-gen.* of cav. (1762), with the colonelcy of the *généralistes* de Fr. He afterward abandoned the military career for diplomacy; was sent as minister to the court of Bavaria 1776, and to the U. S. after the recognition of Amer. independence in 1778. He arrived at Phila. Sept. 21, 1779, where he resided 4 yrs. In 1780 he contracted on his own responsibility a loan for the relief of the Amer. army, then suffering the utmost destitution. In 1782 he obtained the postponement of the ratification by Cong. of the Amer. treaty of peace until that between Eng. and Fr. should be signed. On his return to Fr. in 1783 he bore with him the most honorable testimonies of esteem from Cong. and from individuals. Harvard Coll. conferred upon him the degree of LL.D., and Pa. gave his name to one of her cos. On the organization of the Federal govt. (1789) the sec. of state, by direction of Washington, addressed a letter to him conveying the thanks of the nation for his services. D. at Lond. Sept. 14, 1791, being then Fr. minister to the Eng. court.—His elder brother, CÉSAR GUILAUME, b. July 7, 1738, became bp. of Langres 1770, and cardinal 1817; was a noted theological writer, and defender of the liberties of the Gallican Ch. D. June 21, 1821.

**Luzon**, loo-zon', or **Lucón**, the largest of the Philippine Islands, in the Malayan Archipelago, belonging to Sp., and situated between the Chi. Sea and the Pacific Ocean, between lat. 12° 30' and 18° 40' N., and between lon. 119° 45' and 124° 10' E. Area, 51,300 sq. m. Is of volcanic origin, having several active volcanoes, among which is Mayon; earthquakes are frequent. The ground is elevated and mountainous, but the soil is of exceeding fertility, and the climate being hot and moist, the luxuriance of the vegetation is almost unequalled. Forests of ebony, cedar, gum trees, and iron-wood, interspersed with orange, citron, cocoa, bread-fruit, and tamarind trees, cover the mts. to their tops. Climbing plants and parasites wind from tree to tree. Rice, wheat, maize, sugar, cotton, indigo, tobacco, coffee, ginger, pepper, and vanilla are raised in abundance. L. is entirely free from beasts of prey; oxen and buffaloes are employed in agriculture; sheep, goats, and swine are reared. Pheasants, ducks, etc. swarm all over the island, and fish are abundant. Of minerals, gold, iron, copper, coal, and marble are found. Mother-of-pearl, amber, coral, and tortoise-shell are exported, together with rice, sugar, hemp, and tobacco; which last article yields an annual profit of nearly \$5,000,000. The pop. of L., which numbers 2,500,000, consists partly of negroes, who live in a savage state, are idolaters, and are believed to be the original inhabs. driven back by the Tagals and Blaisers, 2 Malayan races which form the bulk of the pop. These are R. Caths., and open to progress and civilization. Many Chl. have settled here, but few Spaniards. The trade, which is very considerable and increasing every yr., is mostly in the hands of Eng. and Amer. merchants. Manila is the prin. town.

**Luzu'la** [It. *luciola*, a "glow-worm"], a perennial genus of pseudo-glutaceous plants, commonly called wood-rushes, belonging to the family Juncaceae, and differing from the *Juncus*, or rush proper, in the form of the leaves, which are flat, soft, usually hairy and grass-like, and in the 3-seeded capsule. There are numerous species found in the woods of Europe and 5 in the U. S.

**Luzzatto** (MOSE CHAYIM), called BEN-JACOB, b. at Padua, It., in 1707, of Jewish parentage; became a mystic writer, compiled a second book of *Zohar*, and announced himself as the Jewish Messiah. Excommunicated and forced to leave It., he settled at Amsterdam, and went in 1744 to Pal. His writings are poetical, philosophical, moral, and devotional. D. May 1747.

**Luzzatto** (SAMUEL DAVID), b. at Trieste, Aus., in 1800, of Jewish descent; received a brilliant education, and became the most popular historian of his people. He was liberal in his views of the O. T. exegesis, of which science he was prof. in the rabbinical school at Padua from 1829 to his death. He wrote Heb., Ger., Fr., and It., and is regarded as one of the chief restorers of Heb. lit. He wrote a *Heb. Gram.*, *Fr. Notes on Isaiah*, *Heb. Notes on the Pentateuch*, and It. translations of Job and Isaiah, with a Heb. commentary, beside *Dialogues on the Cabala*, the *Zohar*, etc. D. 1865.

**Lycaanthropy** [Gr. *λύκος*, "wolf," and *άνθρωπος*, "man"], a kind of madness in which the patient fancies that he is a wolf. In not a few instances this fancy has become epidemic, and hundreds of persons have, in their delusion, become cannibals, going upon all fours, living in the forests, and howling like wolves. In 1600 there were hundreds of people executed in the Jura for L.

**Lycaon**, in Gr. mythology, a king of Arcadia. He and his sons, 50 in number, were changed into wolves by Zeus as a punishment for their impiety. When Zeus visited them they set before him a dish in which they had mixed the entrails of a boy they had murdered, but the god knew it, and avenged himself on them.

**Lycaonia**, a small terr. of Asia Minor, between Galatia, Cappadocia, Cilicia, and Phrygia. Its prin. town was Iconium, the present Konieh. After being conquered by the Roms. it was annexed to the prov. of Cappadocia. It was visited by Paul and Barnabas in their first journey. They were at first regarded as gods, but afterward Paul was stoned. The inhabs. then spoke a lang. of unknown affinities.



**Lyceum** [Gr. τὸ Λύκειον, named from the neighboring temple of Apollo Lyceus], the largest of the three great gymnasia of ancient Athens. Aristotle made use of the L. as a place for teaching philos. His instructions were given while walking in the groves which surrounded the L.; hence his philos. was called *Peripatetic*. The L. stood on the E. side of the city, outside the gates. In Fr. the public schools for secondary instruction have the name of lyceum (*lycée*).

**Lychnis**, lyk'nis [Gr. λυχνος, a "light" or "lamp"], a genus of pinks familiar in Europe and the U. S. as the corn-cockle (*L. githago*), the scarlet lychnis (*L. Chalcedonica*), sometimes called the Maltese cross, and the common mule-pink or rose campion (*L. coronaria*).

**Lyca**, lish'e-a [Gr. Λυκία, an anc. region of Asia Minor of small extent, lying on the Mediterranean, between Mts. Taurus on the N., Climax on the E., and Dædala on the W., the adjoining regions across the mts. being Phrygia, Pamphylia, Pisidia, and Caria, the chief rivers, Xanthus, Limyrus, and Glauclus, and the most noted cities, Xanthus, Patara, Pinara, Olympus, Myra, Tlos, and Dædala on the W., the anc. name of the country was Milyas, the inhabs. being of 2 races, Solymi and Tremilæ or Tremilæ. It was a favorite region with Homer. Apollo was often called Lycian Apollo from his temple at Patara. The Solymi, the earliest inhabs. and of Semitic stock, were conquered by the Tremilæ, who are said to have come from Crete and took the name of Lycians. The Lycians were conquered by Harpagus, the gen. of Cyrus. They took part in the revolt of the Asiatic Grs., were subdued and made a satrapy of Per. Alexander the Great subdued the country; it was afterward attached to the Syrian empire, and was given to the Rhodians by the conquering Romans. Soon afterward it became independent as a republican confederation of cities, but ultimately became a Rom. prov., with Myra as the cap. In the great c. war on the death of Cæsar, L. espoused the cause of Octavius and Antony, and was conquered by Brutus. In modern times L. has been explored by Sir Charles Fellows (1838-46). The Lycian lang. belongs to the Zendic subdivision of the Iranian family; the date of the chief monuments ranges from 530-335 B. C.

**Lycophron**, lyk'o-fron, an Alexandrian grammarian and poet, b. at Chalcis in Eubœa, lived at the court of Ptolemy Philadelphus, who intrusted him with the arrangement of the works of the comic poets contained in the Alexandrian library. Wrote a work on comedy and numerous tragedies. Only *Cassandra* or *Alexandra*, a monologue of 1474 iambic verses, is still extant.

**Lycopodium** [Gr. λυκος, a "wolf," and πούς, "foot"], a genus of club-mosses. It is the typical genus of the order Lycopodiaceæ. The powder called lycopodium is composed of the sporules of *L. clavatum* (which is common in both the Old and the New World) and of other species. It is extremely inflammable, is used in fireworks for making a white flame, and in theatres for artificial lightning. In pharmacy it is used as a pill-powder, and in the nursery as a dressing powder for infants. The species are evergreen, and 2 or 3 are extensively sold for Christmas decoration.

**Lycurgus**, the Spartan legislator, lived in the 8th century B. C., and was a son of King Eunomos; ruled for some time the country during the minority of his nephew, but was afterward compelled to emigrate; visited Asia Minor, where he became acquainted with the Homeric songs; Crete, where he studied the laws of Minos; Egypt and other countries; and became on his return the founder of those insts. by which was developed in Sparta one of the most striking types of national character which hist. contains. Spartan society was divided into 2 classes—the slaves, helots, who performed all the labor and had no rights, and the citizens, Spartans, who were exempted from labor, and owned and ruled the land. The individual was subordinate to the state, and lived only for the state. The Spartan had no talent, no passion, no plan of his own; he was merely a tool. Only well-formed children were allowed to live; the weak or deformed were exposed. At the age of 7 yrs. the boy was taken from his mother and ed. by the state, which subjected him to the severest discipline. When he was 30 yrs. old he was allowed to marry, but the state chose his wife, and he continued to live in garrison till his 60th yr.

**Lycurgus**, an Attic orator, b. at Athens about 396 B. C.; belonged to Demosthenes' party; held several responsible positions in the city. When Alexander demanded that the Athenians should deliver him up, they boldly refused. D. at Athens 323 B. C.

**Lydda** [Gr. Λύδδα], an anc. town of Pal., within the tribe of Ephraim, on the road from Jerusalem to Joppa. In the O. T. it bears the name of Lod. It was destroyed by Cestius Gallus in his march against Jerusalem, rebuilt as cap. of one of the 9 tetrarchies of Judæa, and became the seat of a celebrated Jewish school of the law. Later it received the name of Diospolis; was the seat of a bishopric, and the birthplace of the martyr St. George, the patron of Eng. It figured during the Crusades, and is still an extensive town (*Lud*).

**Lydia**, lid'e-a, a country of Asia Minor, situated between Ionia, Caria, Phrygia, and Mysia, was famous for its wealth. Pactolus ran through it, and Croesus was one of its kings. The cap. was Sardis. On the defeat of Croesus by Cyrus it became a dependency of Per.

**Lydian Stone**, a siliceous slate of a velvet-black color, used as a touchstone for testing gold and silver.

**Lyell** (Sir Charles), BART. D. C. L., F. R. S., F. G. S., b. at Kinnordy, Forfarshire, Scot., Nov. 14, 1797; ed. at Exeter Coll., Ox., grad. in 1819; studied law, and was called to the bar, but soon devoted himself to scientific researches, especially in geol. His earliest labors consisted in an extensive personal examination of the deposits of Forfarshire, Dorsetshire, and Hampshire, concerning which he pub. several papers. In 1832 he was appointed prof. of geol. at King's Coll., Lond.; married in the same yr. the eldest daughter of Leonard Horner; became pres. of the Geological Society

in 1836, and again in 1850; delivered a course of geological lectures at Boston, Mass., in 1841; travelled in Canada, N. S., and the U. S. as far S. as Ky. He was knighted in 1848, and created a baronet Aug. 22, 1864. Wrote *Principles of Geol.*, *Elements of Geol.*, and *Manual of Elementary Geol.*, *Student's Manual of Geol.*, etc. D. Feb. 22, 1875.

**Lygodium** [Gr. λυγώδης, "flexible"], a genus of climbing ferns. *L. palmatum* is found in the U. S., from Mass. to the Gulf States, and is much prized for purposes of decoration.

**Lykens**, on R. R., Dauphin co., Pa., 44 m. N. E. of Harrisburg. Pop. 1880, 2154.

**Lyly**, or **Lilly** (JOHN), b. in the Weald of Kent, Eng., in 1553 or 1554; grad. at Magdalen Coll., Ox., in 1573. His *Euphues the Anat. of Wit* (1579) and *Euphues and his Eng.* (1580) attained great popularity in his own times. L. also wrote 9 court-plays. His life was mostly spent at Elizabeth's court. D. in Nov. 1606.

**Lyman** (CHESTER SMITH), b. at Manchester, Conn., Jan. 13, 1814; studied astron. without a teacher, constructing astronomical and optical apparatus with his own hands, and computed complete almanacs for 1830 and 1831, and tables of eclipses for 15 yrs. ahead. He grad. at Yale 1837; taught school 2 yrs., studied theol. at Union Sem., N. Y., and at New Haven 1840-42; was pastor of a Congl. ch. at New Britain, Conn., 1843-45; went to the S. I. in 1845; taught the Royal School, having as pupils 4 of the recent occupants of the Hawaiian throne; became a surveyor in Cal. 1847; was one of the earliest to send to the E. States accounts of the discovery of gold; settled at New Haven 1850, where he engaged in scientific pursuits, and was one of the revisers of Webster's *Dict.* for the ed. of 1864; became in 1859 prof. of industrial mechs. and physics in Yale Coll., and took an active part in organizing the Sheffield Scientific School, in which he also taught astron. Since 1870 his professorship has been that of astron. and physics. He has pub. articles in the *Amer. Journal of Science* and elsewhere, and made various useful inventions.

**Lyman** (PHINEAS), b. at Durham, Conn., about 1716, grad. at Yale Coll. in 1738; was tutor there till 1741; became a lawyer at Suffield; was appointed mag.-gen. and commander-in-chief of the Conn. forces in the Fr. war; built Ft. Lyman (since called Ft. Edward), N. Y.; succeeded Sir William Johnson in command at the battle of Lake George; was engaged in the attack upon Ticonderoga, the capture of Crown Pt., the surrender of Montreal, and the expedition against Havana (1763). D. 1775.

**Lyman** (THEODORE), b. in Boston Feb. 19, 1792, grad. at Harvard 1810; visited Europe 1814; wrote *Three Weeks in Paris*; studied law, and made a second European tour, on returning from which he wrote *The Political State of U.*; wrote an *Account of the Hartford Convention*, in defence of that political demonstration, and *The Diplomacy of the U. S. with Foreign Nations*. He served in both branches of the legislature, became brig.-gen. of militia, and was mayor of Boston 1833-35. He was a liberal benefactor to the State Horticultural Society and the Farm School, and was the founder of the State Reform School at Westborough, to which he gave \$82,000. D. July 17, 1849.

**Lyman** (THEODORE), See APPENDIX.  
**Lyman** (THEODORE BENEDICT), D. D., b. near Boston Nov. 27, 1815, grad. at Hamilton Coll. in 1837, and at the Gen. Theological Sem. of New York in 1840; ordained deacon in Christ ch., Baltimore, in Sept. of the same yr., and early next month became rector of St. John's ch., Hagerstown, Md., where he remained until he entered upon the rectorship of Trinity ch., Pittsburg, Pa., in Apr. 1850; continued in charge of that parish until May 1860, when he went to Europe and remained nearly 10 yrs., having charge for a short period of an Amer. ch. in Florence, and later was for several yrs. rector of the Amer. Epis. ch. in Rome. Upon his return to Amer. in 1869 he became rector of Trinity ch., San Francisco, and was in charge of that ch. when elected assistant bp. of N. C. in May 1873.

**Lyneh** (PATRICK NILSON), D. D., b. at Cheraw, S. C., Mar. 10, 1817; studied theol. in the Catholic sem. at Charleston and in the Coll. of the Propaganda at Rome; was ordained priest in 1840; became rector of the sem. at Charleston, vicar-gen. of the diocese in 1850, and bp. of Charleston in 1858. He built several chs., including the fine cathedral of St. Michael; founded an Ursuline convent, an orphan asylum, and many schools. Wrote theological and scientific essays, and participated in Vatican Council of 1869-70, supporting dogma of infallibility. D. Feb. 23, 1882.

**Lyneh** (THOMAS, JR.), one of the signers of the Dec. of Ind., b. in Prince George parish, S. C., Aug. 5, 1749; was ed. at Eton and Cambridge, Eng., and studied law in the Temple, Lond. In 1772 he returned to S. C.; became in 1775 a capt. in the provincial troops; was sent in 1776 to Cong. to succeed his father, who d. in that yr., but his health failing, he soon left Cong. In 1779 he sailed for W. I. on account of his health, but the ship was never again heard from.

**Lyneh** (WILLIAM F.), b. in Va. in 1801, entered the naval service in 1819; became a lieut. in 1828, and conducted in 1848 an official survey of the Jordan and Dead Sea, the results of which were given in his *Narrative*; wrote *Naval Life, or Observations Afloat and on Shore*; became commander in 1849, capt. in 1856, resigned in 1861; was com. in the Confed. service. D. Oct. 17, 1865.

**Lynehburg**, city and R. R. centre, Campbell co., Va., on the S. bank of James River; is situated on the sides of a hill rising abruptly from the river, with a splendid view of the Blue Ridge and the Peaks of Otter, 30 m. distant. It has magnificent water-power, while in the immediate vicinity vast deposits of coal and iron are found; contains a hospital and orphan asylum. Pop. 1870, 6825; 1880, 15,950.

**Lynch Law**, the practice of trying and punishing men for alleged crimes and offences with which they are charged by unauthorized persons, who unjustifiably attempt to administer what they may deem to be justice, without regard



to the forms or sanctions of law, and in violation of the right of the proper legal authorities to bring alleged offenders to trial. In times of especial turbulence and disorder it has sometimes happened in the hist. of this country, especially in the W. and S. States, that members of the community have taken the execution of the law into their own hands, and by the organization of so called "vigilance committees" have endeavored to suppress crime by the vigorous and effective though illegal methods of L. L. Many instances of this kind have occurred in the mining dists. of the W. States. The origin of this phrase has been variously accounted for. It is usually derived from a Virginian farmer named Lynch. It is said that in the early hist. of this State it became the practice in its W. dists., by reason of their distance from the courts of law, to refer legal controversies to the leading men of the neighborhood, to try criminal offenders before them, etc., and that this man exercised these unauthorized judicial functions so commonly that he became well known as "Judge Lynch." His name was readily transferred to the illegal method of administering justice which he adopted. The real origin of the term "lynch law" is doubtful. (See Wheeler's *Pict. of the Noted Names of Fiction*, title "Judge Lynch.")

**Lynde**, IRLD (WILLIAM DICK), b. at Sherburne, N. Y., Dec. 16, 1817, grad. at Yale 1838; was admitted to the bar in New York 1841, and removed the same yr. to Milwaukee, Wis.; was appointed atty.-gen. of Wis. 1844, U. S. dist. atty. 1845; was M. C. 1847-49, mayor of Milwaukee 1860, member of the State legislature 1866, of the State senate 1868-69, and was again chosen to Cong. 1874 and 1876.

**Lyndhurst** (JOHN SINGLETON COPLEY), BARON, b. at Boston, Mass., May 21, 1772, son of the artist J. S. Copley; was carried to Eng. in 1774; grad. at Trinity Coll., Cambridge, in 1794, and became a fellow of Trinity; visited the U. S. in company with Volney; was called to the bar at Lincoln's Inn 1804, became a sergeant-at-law in 1813, chief-justice of Chester 1817, entered Parl. in 1818, was knighted and made solicitor gen. 1819, was counsel of George IV. in 1820 in the trial of Queen Caroline; became atty.-gen. in 1823; sat in Parl. for Cambridge Univ. 1826, and was made master of the rolls; opposed Catholic emancipation; was raised to the peerage as Baron Lyndhurst and appointed lord chancellor in 1827, holding that office until 1830, a second time 1834-35, and again 1841-46; was chief baron of the exchequer 1830, and lord high steward of Cambridge Univ. 1840. D. Oct. 12, 1863.

**Lyons**, city and important R. R. centre, Essex co., Mass., on the N. side of Mass. Bay, being nearly at what may be called the N. chop of Boston Harbor, about 10 m. N. E. of Boston. The harbor is not good, and only used for coastwise trade; it is defended from the sea by the peninsula of Nahant. It has a fine city hall, an ornamental common, one of the most beautiful cemeteries in N. Eng., a beautiful soldiers' monument, a hospital, and public library. This city is one of the foremost in the country in the manufacture of ladies' boots and shoes. It was here that the iron manufacture was first set up in the country; the relics of the old forge still remain. L. made the first response to the call for troops in 1861. First settled 1629; incorporated 1850. Pop. 1870, 28,233; 1880, 38,274.

**Lynx** (Gr. *λύξ*), a genus of the Felidae or cat family, distinguished from the true cats by wanting the first upper premolar tooth, and by other slight anatomical peculiarities. They have also shorter and stumpy tails.

**Lyön** (CALEB), LL.D., b. at Lyondale, N. Y., Dec. 7, 1822, grad. at the Norwich Univ. 1841; travelled in Europe; was appointed by Pres. Polk consul at Shanghai, Chl.; visited Mex., Brazil, Chili, Peru, and other countries on his return; was in Cal. in 1849; sec. to constitutional convention; made another tour in Europe, visiting Egypt and Pal.; was elected to the N. Y. assembly, and afterward to the senate; was M. C. 1853-55, and gov. of Id. 1864-66. D. Sept. 1875.

**Lyön** (MARY), b. at Buckland, Mass., Feb. 23, 1797; became a school-teacher at Shelburne Falls, Mass., in 1814; taught 1821-24 in the acad. at Ashfield, Mass., in 1824-28 in the Female Acad. at Londonderry, N. H., and then until 1834 in the ladies' sem. at Ipswich, Mass. Her great work was the founding of the Mt. Holyoke Female Sem. at S. Hadley, Mass., of which she was prin. from 1837 to 1849. (See her *Life*, by Pres. HITCHCOCK.) D. Mar. 5, 1849.

**Lyön** (MATTHEW), b. in Ire. in 1746; emigrated to New York in boyhood; worked on a farm in Conn. for some yrs.; removed to Vt.; became in 1775 lieut. in a co. of "Green Mountain Boys"; became paymaster-col. of militia, member of the legislature, and assistant judge; built mills, established a forge, made paper from basswood, manufactured types, and issued a paper called *The Scourge of Aristocracy*; was elected to Cong. in 1797 as a Jeffersonian; was in Oct. 1798 convicted of libel against Pres. Adams, fined \$1000, and imprisoned 4 months in Vergennes jail, during which time he was re-elected twice; narrowly escaped expulsion, first as a convicted felon, and afterward on account of an altercation on the floor of the House; removed to Ky. in 1801; was immediately elected to the legislature, and to Cong. from 1803 to 1811; built gunboats for the war of 1812, and became bankrupt; was appointed by Pres. Monroe in 1820 U. S. factor among the Cherokee Indians in Ark., from which Terr. he was elected delegate to Cong., but before taking his seat d. Aug. 1, 1822.

**Lyön** (NATHANIEL), b. at Ashford, Conn., July 14, 1819, grad. at W. P. 1841; promoted to be first lieut. 1847, capt. 1851. From the siege of Vera Cruz to the capture of the City of Mexico he bore an active part, being wounded at the Belen Gate; brevet capt. for gallantry. Returning to New York at the close of the war, he sailed thence to Cal., remaining on the Pacific coast some 5 yrs.; served in Kan. during the political troubles, and was engaged on frontier duty until Feb. 1861, when he was placed in command of the U. S. arsenal at St. Louis; was appointed a brig.-gen. of volunteers May 17, and in June succeeded Gen. Harney in

command of the dept. Embarking (June 13) at St. Louis, he reached Jefferson City on the 15th, and after securing the State archives he proceeded to Booneville, where he broke up an encampment of some 2000 or 3000 State guards, and continued his march to Springfield, where he was compelled to remain by the superior force of the enemy, who now overran S. Mo.; being apprised of an advance of the enemy in 2 columns, he moved out (Aug. 1), hoping to defeat the column from the S. before it could unite with that coming up from the W. The following morning he defeated McCulloch at Dug Spring, who united with the other wing, and the whole body advanced toward Springfield, to which place L. had fallen back. Arriving at Wilson's Creek on the 7th, he proposed to surprise them here; on the 9th he again moved out from Springfield and fought the battle of Wilson's Creek on Aug. 10. After being twice wounded, placing himself at the head of a regiment whose col. had fallen, he was struck by a minie ball and almost instantly killed. By will he left almost his entire property to the govt. to aid in preserving the U. A series of letters written by him during and subsequent to the Kan. troubles were pub. in 1862, entitled *The Last Political Writings of Gen. Nathaniel Lyon*. D. Aug. 10, 1861. [From orig. art. in *J.'s Univ. Cyc.*, by G. C. SIMMONS.]

**Lyons** (Fr. *Lyons*; anc. *Lugdunum*), next to Paris the largest city of Fr., and the most important manufacturing place of the country, is situated at the confluence of the Saône and the Rhone, and consists of a central part and a number of suburbs. It is the capital of a department of Rhone, and is strongly fortified. The quays along the rivers are beautiful. Twelve bridges span the Saône, seven the Rhone. Among the public buildings the most remarkable are the Hôtel de Ville, the Palais des Beaux Arts, the cathedral, in Gothic style of the time of Louis XI.; the ch. of St. Nizier, of the 14th century, etc. The educational and benevolent insts. of the city are numerous. The dye-works, foundries, glass-houses, potteries, tanneries, and breweries of L. are extensive. Its manufactures of jewelry, hats, fine liquors, and chemicals are important, and its trade in its own manufactures is brisk; it communicates by canals with Bordeaux, Paris, Marseilles, Geneva, and the Rhine. But its prin. business is its silk manufacture, in which branch of industry it is hardly surpassed by any other place in the world. The average annual value of raw silk imported is estimated at \$60,000,000; of manufactured silk exported, at \$76,000,000. The city is very old. The anc. *Lugdunum* was colonized in 43 b. c. Under Augustus it became the cap. of the prov. of Gaul. During the early Middle Ages it belonged to the abb. of Lyons, but in 1307 it was incorporated with the kingdom of Fr. by Philip the Fair. During the Revolution it suffered terribly. Again in 1814, 1815, 1830, and 1831 it was much disturbed by riots. These ceased after the completion in 1834 of its fortifications. Pop. 376,613.

**Lyons**, city and R. R. centre, Clinton co., Ia., on the Miss. River. There is a steam-ferry to Fulton, Ill. Pop. 1870, 4068; 1880, 4095.

**Lyons**, Kan. See APPENDIX.

**Lyons**, R. R. centre, cap. of Wayne co., N. Y., on the Erie Canal, midway between Syracuse and Rochester, having good water-power; is a great peppermint-oil mart. Pop. 1870, 3350; 1880, 3820.

**Lyons, Gulf of**, a large bay formed by the Mediterranean on the S. coast of Fr. It receives the Rhone. Marseilles and Toulon stand on its shores.

**Lyons** (EDMUND), FIRST BARON LYONS of Christchurch, b. at Burton, Eng., Nov. 21, 1790, descended from Gov. John Winthrop of Mass.; entered the Brit. navy in childhood; became mdpn. in 1803; served in the E. I.; became commander in 1812, and post capt. in 1814. In 1828 he was engaged in the blockade of Navarino, Gr., then held by the Turks, and conveyed King Otho to Athens on the formation of the new kingdom; was knighted, and resided there as minister for 14 yrs. In 1849 he became minister at Berne, and in 1851 at Stockholm. At the outbreak of the Crimean war he was appointed second in command of the Black Sea squadron, became commander-in-chief in Dec. 1854, and distinguished himself by services which procured him a peerage in 1856. D. Nov. 23, 1858.

**Lyons** (RICHARD BICKERTON PEMELL), G. C. B., D. C. L., SECOND BARON LYONS, b. at Lymington, Eng., Apr. 26, 1817, ed. at Winchester School and Christ Church, Ox.; appointed attaché at Athens 1839, at Dresden 1852, at Florence (residing at home) 1853; sec. of legation there 1856, and envoy to Tuscany 1858; was envoy at Wash. Dec. 1858-65, ambassador at Constantinople Aug. 1865, at Paris July 1867. He was sworn a member of the privy council 1865.

**Lyra, de** (NICHOLAS), b. at Lyre, Normandy, Fr., about 1270; studied in the Franciscan coll. at Verneuil and at the Univ. of Paris; became a doctor of theol. and an eminent lecturer upon biblical interpretation. He held the most eminent posts in the Franciscan order, and his commentaries upon the Scriptures were used by the Reformers. His great work was the *Postilla perpetua in universa Biblia*. He also wrote a work *On the Coming of the Messiah* (1309), in reply to the Jews. D. at Paris Oct. 23, 1340.

**Lyric Poetry**. See APPENDIX.

**Lysander**, a Spartan gen., defeated the Athenians off the promontory of Notium. His term of command having expired, he was replaced by Callieratidas, but Callieratidas was defeated in 406 b. c. in the battle of the Arginusæ; and as it was against the Spartan laws that the same person could hold an office twice, Aracus was nominally placed at the head of the fleet, while in reality L. held the command. He routed and captured the Athenian fleet at Egospotami, and early in the next yr. (404 b. c.) took Athens, thus ending the Peloponnesian war. When, in 395 b. c., he was sent against the Egeonians, he was killed while besieging Haliartus.

**Lysias**, ish-e-as, a Syrian nobleman of the blood-royal, whom King Antiochus Epiphanes, on setting out for Per., appointed guardian of his son and regent of the kingdom,



and as such he waged a formidable war with the Jews. He was defeated by Judas Maccabæus near Emmaus (B. C. 166), and was repulsed near Bethsura in the following yr., but took that fortress A. C. 163, and laid siege to Jerusalem, but was forced to treat with the Jews by an insurrection at Antioch. L. was killed soon after by the populace of Antioch, who had rebelled in favor of Demetrius Soter.

**Lysias**, an Athenian orator, b. in Athens in 458 B. C.; went with Athenian colonists to Thuri; returned to Athens in 411; was imprisoned by the Thirty; escaped to Megara, and returned in 408, after the overthrow of the Thirty, and d. in 378. Thirty-five of his orations are still extant.

**Lysimachia**, lis-i-mă'ke-a (Gr. *Λυσία*, "release," and *μαχία*, "strife," but more probably named from King Lysimachus), a genus of herbaceous perennial plants mostly with yellow flowers, belonging to the primrose family.

**Lysimachus**, b. at Pella, Macedonia, about 360 B. C.; served in the army of Alexander the Great, and received Thrace on the death of Alexander in 323. In 306 he assumed the title of king, and having defeated Antiochus in the battle of Ipsus in 301, he united a large part of Asia Minor to his dominions. In an expedition he undertook in 292 against the Getæ, N. of the Danube, he was taken prisoner with his whole army, and received his freedom only by giving his daughter in marriage to the king of the Getæ. After the murder of his son Agathocles, the pop. of Asia Minor rose in insurrection, and in the battle of Corus (281) L. was killed.

**Lysippus**, b. at Sicyon, flourished in the 4th century B. C.; celebrated for his statues of Alexander the Great, he being the only sculptor to whom Alexander would sit.

**Lysitra**, an anc. city of Asia Minor, was the native place of Timothy, the scene of Paul's miracle of healing a lame man, of the attempted worship of Paul and Barnabas as Jupiter and Mercurius, and of the stoning of the former. Its site is uncertain.

**Lytle** (WILLIAM HAINES), b. at Cin. Nov. 2, 1826, grad. at Cin. Coll.; studied and practised law; during the Mex. war he served as capt. of Volunteers, returning at its close to O. and resuming his profession; elected to the State legislature, and soon after chosen maj.-gen. of militia. At the outbreak of the c. war served as col. of the 10th O. Volunteers, in command of which regiment he was in the campaign of 1861 in W. Va., at Rich Mountain and Carnifery Ferry, commanding a brigade at the latter battle, where he was severely wounded, Sept. 10, 1861. Returning to the field as soon as his wounds would permit, he commanded a brigade under Gen. O. M. Mitchell during the latter's operation in Ala.; at the battle of Perryville, Ky. (Oct. 8, 1862), he was dangerously wounded and made prisoner, but soon exchanged and promoted to be brig.-gen. of volunteers Nov. 1862, continuing in active service thereafter in the W., and while leading a charge at the battle of Chickamauga was killed, Sept. 20, 1863.

**Lyttelton** (EDWARD), D. C. L., BARON, b. at Mounslow, Eng., in 1589, grad. at Ox. 1609; became chief-justice of N. Wales 1621; entered Parl. 1626; recorder of Lond. 1631, solicitor-gen. and knight 1634, chief-justice of common pleas 1640, lord keeper of the great seal 1641; raised to the peerage Feb. 18, 1641; escaped with great seal to Charles I. at York May 1642; required by Parl. to return it or lose his place 1643; first com. of treas. Mar. 1644; commissioned to raise regiment of foot-soldiers May 1644. D. Aug. 27, 1645.

**Lyttelton** (THOMAS), LORD, son of George Lyttelton, first baron (1709-73), b. in 1744; at the age of 16 was regarded almost as a prodigy by several of the ablest writers and most erudite scholars in Eng.; became dissipated and dissolute in his habits; lost the favor of his father; an alienation between them ensued; his marriage proved to be unhappy, and a separation followed. He was returned to the House of Commons in 1768; lost his seat on a contest early in Jan. 1769, and on the death of his father in 1773 took his seat in the House of Lords; d. suddenly in 1779. While in the House of Commons as well as in the House of Lords he was greatly distinguished for vigor of thought, elegance of language, and for the force and power of his speeches. His style, tone of political sentiments, and other points of coincidence have led to the hypothesis, entertained by many, that he was the author of the *Letters of Junius*. A very important fact in support of the hypothesis is that he was voted out of his seat in the Commons by the Tory administration early in Jan. 1769, and just before the appearance of Junius's first letter to the *Public Advertiser*. The deep personal interest Lord L. had in the questions growing out of his own contested seat might account for that surpassing special knowledge of the parliamentary law of Eng. on such subjects exhibited with such extraordinary effect by Junius in his discussion of the Wilkes and Luttrell case with Sir William Blackstone. The first of Junius's *Letters* which thoroughly attracted the attention of the leading minds of the kingdom were those in which he so completely felled Sir William Blackstone on a question of parliamentary law. He was at that time a member of the Commons, and, siding with the ministry, justified the action of the House in excluding Wilkes because of his alleged disability, and in seating Luttrell, against whom a majority of the electors had voted. The pointed and wounding strictures of Junius upon this very able and erudite judge's position called forth from him a reply in pamphlet form, in which he cited the celebrated case of Walpole as a precedent in point. In a very few days his assalant was upon him again through the columns of the *Advertiser*, utterly demolishing the shelter under which the great commentator had sought refuge, and showing with unquestionable proofs that the precedent cited, so far from sustaining the position for which it had been brought forth, left it without the slightest ground to stand upon. The *Letters of Junius* produced a deeper and more lasting impression upon the popular mind in G. Brit. in the cause of liberty than any anonymous writings ever did before or have done since in any age or country. To this it may be added, the probability is that

no part of the great work of Junius was better executed than that in which he undertook to be "the sole repository of his own secret." If so, it certainly "perished with" him. His political principles, however, still live, and will live forever.

A. H. STEPHENS.

**Lytton** (EDWARD GEORGE EARLE **Lytton Bulwer**), FIRST BARON, See **BULWER**.

**Lytt'ou** (EDWARD ROBERT **Bulwer-Lytton**), EARL, eldest son of the novelist, b. in Eng. Nov. 8, 1831, was ed. successively at Harrow, under private tutors, and at Bonn, Ger., where he devoted himself to modern langs.; entered the diplomatic service in 1849 as attaché to his uncle, Sir Henry Bulwer, minister at Wash.; was transferred in the same capacity to Florence in 1852, and to Paris in 1854. As paid attaché he was sent to the Hague in 1856, to St. Petersburg in 1858, to Constantinople and to Vienna in 1859. He was acting consul-gen. at Belgrade in 1860, and was employed on a mission for preventing the renewal of hostilities between the Turks and the Servians (1862). He was made second sec. of legation, and in Jan. 1863 was sent to Constantinople as first sec.; was *chargé d'affaires* for brief intervals in 1863 and 1864; sec. of legation at Athens in 1864, and at Lisbon in 1865, where he was *chargé d'affaires* several times, and at Madrid in 1868; became sec. of embassy at Vienna; at Paris in 1872, where he acted twice in 1873 as *chargé d'affaires*; received the appointment of ambassador at Lisbon in Dec. 1874; in May 1875 declined the governorship of Madras, and was viceroy of India 1876-80, during the last Afghan war. He married in 1864 a niece of the late earl of Clarendon, succeeded to his title as Baron Lytton on the death of his father, Jan. 18, 1879, and was promoted to an earldom on his return from India. His first appearance as an author was under the nom. de plume of "Owen Meredith." *The Wanderer*, a Collection of Poems in Many Lands, and *Lucille* established his reputation. Wrote *Tannhäuser*, or the *Battle of the Bards*, etc.

## M.

**M**, a labial consonant, of the class called liquids. In the Rom. notation it stands for *mille*, 1000. As an abbreviation it represents *mille*, noon (*meridies*), *metre*, *Marcus*, the Fr. title *Monsieur*, etc. **M'** stands for 10,000; **M'** for the Rom. name *Manius*. For its usual meanings in combination with other letters, see ABBREVIATIONS.

**Maabar**, a kingdom existing during the Middle Ages on the Coromandel coast of India, occupying nearly the same territory as the modern presidency of Madras.

**Maas**. See **MEUSE**.

**Mab** [Cymric, "a child"], an imaginary being, who in Eng. folk-lore shares with Titania the honor of being queen of the fairies.

**Macadam** (JOHN LOUDON), b. at Ayr, Scot., Sept. 21, 1756; came to New York in 1770; was during the Amer. Revolution a loyalist; made a fortune as agent for the sale of vessels brought into port as prizes; returned to Ayrshire, Scot.; became a magistrate and deputy lord lieut. of the co., and as trustee of roads introduced the system of road-making called by his name. He addressed in 1811 a memorial on the subject to the House of Commons, which led to the adoption of his system and to his own appointment as surveyor of roads in the Bristol dist., where in 1816 he commenced *macadamizing* the highways. During his lifetime nearly every travelled route in G. Brit. was a monument of his success. Wrote *A Practical Essay on the Scientific Repair and Preservation of Public Roads, Remarks on the Present State of Roadmaking, and Observations on Roads*. D. Nov. 26, 1836.

**McAdoo** (WILLIAM GIBBS), A. B., A. M., b. Apr. 4, 1890, near Knoxville, Tenn., grad. at E. Tenn. Univ., Knoxville, 1845; was a member of the Tenn. legislature 1845-46; an officer in the Mex. war 1847; entered the law; was atty.-gen. of the Knoxville judicial dist. 1851-60; removed to Ga. in 1862; was capt. in the Confed. service; appointed judge of the 20th judicial dist. of Ga. 1871. Wrote with Prof. H. C. White of Ga. *Elementary Geol. of Tenn.*

**McAlister** (Gen. MILES D.), b. in New York in 1834, grad. at the U. S. Military Acad. July 1856, and entered the army as brevet second lieut. of engineers; received his full appointment of second lieut. Dec. 1856; promoted to be first lieut. May 1861, capt. Mar. 1863, and major of engineers Mar. 1867. His first service was at Ft. Taylor, Fla., where he remained a yr., whence he was transferred to New York, and at the outbreak of the c. war was engaged in repairing Ft. Mifflin, Del. During the Peninsular campaign (1862) he was chief engineer of the 3d corps of the Army of the Potomac, and engaged at Yorktown, Williamsburg, Fair Oaks, and Malvern Hill; in the Md. campaign at S. Mountain and Antietam. In Oct. 1862 was transferred to Ohio as chief engineer of that dept., and engaged in fortifying Cin., Newport, and Covington, and in constructing bridge-trains; during the siege of Vicksburg was selected by Gen. Grant to serve under him, and on the surrender of that place was assigned to duty at the Military Acad. as assistant prof. of engineering; in July 1864 was transferred to the S., and as chief engineer of the division of W. Miss. participated in the siege and capture of Fts. Morgan and Gaines, Ala.; received the brevets of major and lieut.-col., and for services at the siege of Fts. Gaines and Morgan that of col. and brig.-gen. After the close of the war he superintended the defences of Mobile and Pensacola, and the work of improving the mouths of the Miss. River, where he introduced various new methods, and designed a boat especially adapted to the work, which has since been in operation with eminent success. D. Apr. 23, 1869.

**McAlister** (MATTHEW HALL), LL.D., b. at Savannah, Ga., Nov. 26, 1800, ed. at Princeton Coll.; became a renowned lawyer and politician in his native city; was appointed in 1827 U. S. dist. atty. for Ga.; was in 1833 active in opposition



to nullification: was several times elected to both branches of the legislature, in which he obtained the establishment of the court for the correction of errors; was some yrs. mayor of Savannah; was a noted protector and friend of the colored people, and was defeated by a very small vote in 1845 as Dem. candidate for the governorship. In 1850 he removed to Cal. with his family; entered upon the practice of law in San Francisco, and was from 1855 to 1862 the first U. S. circuit judge of Cal. In this capacity he rendered eminent services by his decisions upon land-titles, which were then in the utmost confusion, and also by his energetic action in suppressing the "Vigilance Committee" by an appeal to the naval authority. He resigned his judgeship 1862, and d. Dec. 19, 1865.

**McAlpine** (WILLIAM J.), b. in New York in 1812; received a high academic education, and commenced engineering in 1837 under John B. Jervis, with whom he remained until 1839, having been employed upon the Del. and Hudson Canal and R. R. and upon the State canals. He succeeded Mr. Jervis as engineer of the Erie Canal enlargement, E. D., until 1846, when he was called upon to construct the dry dock at the Brooklyn navy-yard; in 1852 was elected State engineer of N. Y.; in 1854-56 was R. R. com. of the State, and made a report on principles and practice of railway construction and management; for 2 yrs. was acting pres. and engineer of the Erie Railway, and later engineer of the Galena and Chicago and of the O. and Miss. railroads; constructed Albany and Chicago water-works, and planned those for Brooklyn, New Bedford, etc.; in 1870 presented plans for improvement of the cataracts of the Danube, which were adopted by Aus.

**Macao**, city and seaport on the coast of Chi., in the prov. of Quang-Tong, belonging to Port., and situated on a peninsula at the mouth of the Canton River, 40 m. from Hong-Kong. The Port. established a factory here in 1517, and made it the seat of an extensive trade. But since the establishment of the Eng. at Hong-Kong its commerce has much decreased. The coolie-trade was the chief business until abolished in 1874. Its situation is delightful. Camoens wrote his *Lusiad* here. Pop. 77,230.

**Macaroni** [*It. maccheroni*]. **Vermicelli** [*little worms*], **Fedellini**, and **Italian Paste** are all forms of the same familiar substance, used for culinary purposes. They are made from varieties of wheat such as are grown in Rus., It., and Cal. The wheat is ground by a peculiar process, being first wet and then heated. The flour resulting is coarse. It is mixed with warm water and worked into a uniform paste. This paste is forced by a press through holes in an iron plate. If the holes are small, *vermicelli* is formed. A still finer sort is *fedellini*. Large pipe-shaped cylinders constitute *macaroni*. When the paste is rolled thin and cut into various shapes, *Italian paste* is the result. After moulding the M. is partially baked. It is the prin. seat of this manufacture.

**McArthur** (Gen. DUNCAN), b. in Dutchess co., N. Y., June 14, 1772; removed in childhood to W. Pa.; was a volunteer in Harmar's and the succeeding Indian campaigns in Ky. and O. from 1790 until Wayne's victory (1797), after which he settled near Chillicothe, O., as a surveyor; acquired large property in land; was chosen to the legislature (1806), became maj.-gen. of militia (1806), col. of O. volunteers May 7, 1812; was second in command at Hull's surrender; made brig.-gen. in the U. S. A. Mar. 12, 1813; was second in command of the army of the W. under Gen. Harrison, whom he succeeded in 1814, when he projected and partially executed a plan for the conquest of Upper Canada; was joint com. with Gen. Cass to treat with the O. Indians for the sale of their lands within the State (1816-17); served in the legislature 1815-21, was speaker 1819, M. C. 1823-29, and gov. of O. 1830-32. D. Apr. 28, 1839.

**McArthur** (Gen. JOHN), b. in Erskine, Renfrewshire, Scot., Nov. 17, 1826; worked as a blacksmith till 23 yrs. of age, then settled at Chicago as a boiler-maker. He entered the U. army in 1861 as lieutenant-col. of the 12th Illinois Volunteers; was soon promoted to col., commanded a brigade at Ft. Donelson, and was made brig.-gen. of volunteers Mar. 21, 1862; was wounded at Shiloh; commanded a division under McPherson in the Vicksburg campaign, and under Gen. A. J. Smith at the battle of Nashville, and was made brevet maj.-gen.

**Macartney** (GEORGE MACARTNEY), K. B., FIRST EARL OF, b. at Lissanore, near Belfast, Ire., May 14, 1737, grad. at Trinity Coll., Dublin, 1757; studied law at the Middle Temple, Lond.; entered Parl.; was sent as envoy to Rus. 1765; signed a commercial treaty with that power 1766, which was disavowed by the foreign office; pub. *An Account of the Russ. Embassy*; became chief sec. to the viceroy of Ire. 1769; wrote *A Sketch of the Political Hist. of Ire.* (1773); was appointed gov. of the Brit. Antilles 1775; was carried a prisoner to Fr. 1779; appointed political resident at Madras 1780; gov. of that prov. June 21, 1781; distinguished himself for administrative qualities; aided in driving the Dut. from the Coromandel, took Trincomalee in Ceylon, and held Madras against the Fr. squadron until the peace of 1783. Involved in a rivalry with Warren Hastings, he was recalled in 1785. A few yrs. later he was selected as first Brit. ambassador to Chi.: was received by Kien-Lung, emp. of Chi., in Mantchooria, Sept. 14, 1793, and returning to Peking opened negotiations for a commercial treaty, demanding the right to establish factories at Peking and 3 other cities, free trade between Macao and Canton, and a fortified post in the latter port. Offended at the pressure put upon him, Kien-Lung suddenly broke off the conferences. After experiencing some dangers the embassy arrived at Macao in Dec.; sailed for Java in Mar. 1794; sent thence to India tea-plants and other useful Chi. plants, which were soon naturalized there. Lord M. was made an earl in the Irish peerage Mar. 1794, was sent as minister to It. 1795, became a baron of the United Kingdom 1796; went as first Brit. gov. to the Cape of Good Hope 1797. D. Mar. 31, 1806.

**Macaulay** (THOMAS BABINGTON), BARON MACAULAY OF ROTHLEY, b. at Rothley Temple, Leicestershire, Eng., Oct. 25, 1800, son of Zachary Macaulay and grandson of Rev. John Macaulay. The mother of Lord M. was Selina Mills, of Quaker descent. His early education was of a religious type, but this influence was modified by visits to the authoress, Hannah More. At the age of 12 he was placed under the tutelage of a Mr. Preston at Shelford, made rapid progress in the classics, and in 1818 entered Trinity Coll., Cambridge, where he gained the chancellor's medal in 1819 for a poem on *Pompeii*, and again in 1820 for a poem on *Evening*; took the second Craven scholarship in 1821, and bore off the palm at the "Union" debating society from many competitors. He took his bachelor's degree in 1822, was chosen to a fellowship the same yr., and passed his time until 1826 at Lond. and Cambridge. His debut as a writer was made in the columns of the *Quarterly Magazine*, to which he contributed his poems *Ivry* and the *Spanish Armada* (1824); but his essay on *Millon*, pub. in the *Edinburgh Review* for Aug. 1825, first revealed him to the world as an aspirant for the highest honors in the modern science of criticism. For 30 yrs. thereafter he was a constant writer for the *Review*. M. took his master's degree in 1825; was called to the bar at Lincoln's Inn Feb. 1826, and soon devoted all his energy to the service of the Whig party. In 1828 he was appointed by the Whig govt. a com. of bankruptcy, and in 1830 Lord Lansdowne procured his election to Parl. from the "pocket borough" of Calne. His first public appearance as an orator had been made in 1826, at the annual meeting of the Anti-Slavery Society; his first speech in Parl. was in favor of the repeal of the civil disabilities of Jews (Apr. 5, 1830), and his second against slavery in the W. I. (Dec. 13). In the debates on the Reform bill M. took a prominent part, and in the election to the reformed Parl. was returned for the town of Leeds. In 1833 he was appointed sec. to the board of control, but in 1834 resigned that office and his seat in Parl. to accept the post of legal member of the supreme council of India. During his residence at Calcutta he wrote several of his essays upon European topics. Returning from India in 1838, he was elected to Parl. from Edinburgh, and was sec. of war in the Melbourne ministry, finding leisure to write his *Lays of Ancient Rome* (1842). He was a member of the opposition during the 5 yrs. of Tory supremacy (1841-46), and on the return of the Whigs to power (1846) received the post of paymaster of the forces, but was defeated at the election of 1847, and thus found himself at leisure to give form to his long projected *History of England*. Never perhaps were high expectations better satisfied than by the first 2 vols. of Macaulay's *History*, which appeared in 1848. The third and fourth vols. did not appear until 1855. In 1849 M. was chosen lord rector of the Univ. of Glasgow, and announced his retirement from political life, but was returned to Parl. in 1852 by his former constituency of Edinburgh. In 1857 he was made a peer of the realm under the title of Baron Macaulay of Rothley, and in the same yr. was chosen a foreign associate member of the Fr. Acad. of Moral and Political Sciences. D. Dec. 28, 1859. (See biographies by G. O. TREVELYAN and J. C. MORRISON.) PORTER C. BLISS.

**Macaw**, a name given to a large number of tropical Amer. birds of the parrot family (Psittacidae), constituting a rather well-marked group, and according to some authors a sub-family, called *Macrocerinae*. They are easily tamed, but hard to instruct, and seldom become good talkers; but they are large and handsome birds, of very bright plumage, and usually of gentle disposition.

**Macbeth**, or **Macbethad MacFingh**, a king of Scot. in the 11th century, the hero of one of Shakespeare's tragedies. He was son of Fingh, from whom he inherited the prov. of Moray, and married Gruoch MacBoedhe, a granddaughter of King Kenneth MacDuff. In a war with King Duncan MacCrinan, Macbeth killed that prince, in 1059, after which he was proclaimed king of Scot. His reign is chronicled as a time of prosperity. In 1054 Malcolm MacDuncan, eldest son of King Duncan, invaded Scot. and defeated Macbeth near Dunsinane. He was killed at the battle of Lumphanan, Aberdeenshire, Dec. 5, 1056.

**Maccabees**. See Jews.

**Mac'cabees, Books of**, are 5 in number: THE FIRST BOOK narrates the hist. of Mattathias and his 3 most famous sons, comprising the hist. of the Jews from 175 to 135 a. C. The Heb. original is lost, and an anc. Gr. version is the oldest text now known.

THE SECOND BOOK begins 4 yrs. earlier than the first book, with which it is partly a parallel hist. Its author professes to follow in the main the narrative of one Jason of Cyrene, an eye-witness of the recorded events.

THE THIRD BOOK has nothing to do with the Maccabees, but gives an account of the sufferings and deliverance of the faithful Jews of Alexandria during the reign of Ptolemy Philopator.

THE FOURTH BOOK treats of the philos. of morals and religion from a Jewish-Stoical standpoint, and contains illustrations derived from the narrative of the second book of Maccabees.

THE FIFTH BOOK is a compilation of some historic value. **McCall** (Gen. GEORGE ARCHIBALD), b. in Phila. Mar. 16, 1802, grad. from W. Pt. and entered the army as second lieutenant of inf. 1822; first lieutenant, 1829, capt. 1836, major 1847. In addition to the routine of garrison-life, McC. served for 5 yrs. (1831-36) on the staff of Gen. Gaines, and in 1836 and 1841-42 was actively engaged in Fla. against the Seminoles. In the war with Mex. he won the brevets of major and lieutenant-col. for gallantry in the battles of Palo Alto and Resaca de la Palma; subsequently served as chief of staff to Gen. Patterson. Appointed inspector-gen., with the rank of col., in 1850, he resigned from the army in 1853. In the c. war he organized the Pa. Reserve Corps, and was commissioned, May 15, 1861, by the State a maj.-gen. of Pa. volunteers. Two days later he was appointed brig.-gen. of U. S. volunteers, but retained command of the Reserve Corps, a por-



tion of which was engaged in the action and occupation of Dranesville, Dec. 30, 1861. In the Va. Peninsular campaign of 1862 he was engaged with his command at Mechanicsville, Gaines's Mill, and Frazier's Farm, being taken prisoner at the latter battle and held until Aug., when he was exchanged; he resigned Mar. 31, 1863, and retired to his farm near West Chester, Pa., where he d. Feb. 25, 1868.

**McCallum** (DANIEL CRAIG), b. at Johnston, Renfrewshire, Scot., Jan. 21, 1815; came to Amer. with his parents at an early age; settled at Rochester, N. Y., and became an arch. and builder; in 1851 invented the inflexible arch truss bridge; was gen. supt. of the New York and Erie R. R. 1855-56; on Feb. 11, 1862, was appointed military director and supt. of R. Rs. in the U. S., and "for faithful and meritorious services" was brevetted brigadier and major-gen. In June 1865 he was mustered out of service, and in 1866 made a valuable report upon the military R. Rs. under his charge during the war. D. Dec. 27, 1878.

**Macalulba** (Arabic), a mud-volcano 6 m. N. of Girgenti, Sic., rises 147 ft. above the plain and 804 ft. above the sea, has numerous small craters, and casts up stones and mud. Gas is pouring out. Sulphur, salt, and petroleum are obtained. Earthquake-shocks are frequent.

**McCarthy** (JUSTIN), b. in Cork, Ire., Nov. 22, 1830; received a liberal education; became connected with a Liverpool newspaper 1853; parliamentary reporter for the *Lond. Star* 1860; was its chief ed. 1864-68; spent 3 yrs. (1868-70) travelling and lecturing in the U. S., where he became connected with the *New York Independent*, and wrote much for the leading magazines. Returning to Lond., he became a radical writer, novelist, and historian; was elected to Parl. 1880; was a leader of Irish Home Rule party. Wrote *A Hist. of Our Own Times, History of the Four Georges*, etc.

**McCaull** (JOHN), D. D., LL.D., b. in Dublin, Ire., in 1807, ed. at Trinity Coll., Dublin, where he became classical tutor and examiner; was appointed in 1838 prin. of the Coll. of Upper Canada; became in 1842 v.-p. of King's Coll., Toronto, in 1849 pres. of the Univ. of Toronto, and in 1853 pres. of Univ. Coll. and vice-chancellor of the Univ. of Toronto. Wrote *Britanno-Roman Inscriptions and Chr. Epitaphs of the First Six Centuries*.

**Macchiavello** (NICCOLÒ), b. in Florence, Italy, May 3, 1469. Little is known of his early yrs. The second and third periods, on the contrary, which exhibit the statesman and the author in full activity, merit special consideration. As sec. of the republic for 14 yrs. and 5 months (July 14, 1498-Nov. 8, 1512) the home and foreign correspondence devolved upon him, also the records of the councils and of the debates of the Signoria, the drafting of public treaties with foreign states and princes, 23 foreign legations, and numerous internal missions. He not only knew how to fulfil his duties ably, but also to carry out by their means his own political ideas and patriotic sentiments with regard to the liberties of the citizen. In his office of sec. he always showed himself an eager and jealous defender of popular rights. Finding in the employment of mercenary troops one of the greatest obstacles in the way of freedom, he undertook to organize a national militia, and in a measure succeeded. The triumph of the Medici and of the imperialists naturally brought a change in the govt. of the republic. Not only was M. deprived of his office by decree, but he was restricted to the Florentine terr. for a yr., and forbidden to enter the palace of the Signori. But the Signori afterward, feeling the need of his services, frequently suspended this prohibition. The 14 yrs. of M.'s secretaryship are the purest and most glorious of his life. But his formidable book, *Il Principe*, will always cast a sinister shadow upon his character. *Il Principe* has had many apologists and many assailants, but the name of "Macchiavellian," as applied in it to malicious craftiness, did not perhaps originate until after the circulation of this work, and the fame of the author will never come forth entirely unspotted. The suspicion will always remain that M., before becoming chancellor of the republic, then freed from the yoke of the Medici, had aspired to become the chief councillor of a Medicean tyrant. The third period of M.'s life, in which he appears essentially as an author, embraces the 2 preceding, or rather sums up their contradictions. *I Discorsi sopra la prima Deca di Tito Livio*, several passages in his Florentine hist., and some letters show us the republican spirit of the Florentine sec.; the new duties accepted from the same Medici who had put him to torture, his gross *Comedie*, and other letters and sayings represent him as the humble servant of princes and the corrupter of public morals. Most powerful in intellect, but neither great nor noble in character, equally capable of good and of evil according to the caprice of his exalted genius, he could find pleasure in boasting that he had at the same time taught princes to be tyrants and the people to exterminate them. M. d. poor, June 22, 1527. His death was regretted by none.

**McClellan** (Gen. GEORGE BRINTON), b. in Phila. Dec. 3, 1826, son of Dr. George McClellan; grad. at the Univ. of Pa. 1842, from W. Pt. 1846, and commissioned brevet second lieutenant of engineers; served in the Mex. war at the siege of Vera Cruz and in the battles of Cerro Gordo, Contreras, Churubusco, Molino del Rey, and Chapultepec, winning the brevets of first lieutenant and capt. At the close of the war he returned to W. Pt., where he remained until 1851, when he was assigned to duty in the construction of Ft. Del.; accompanied, in his engineering capacity, the expeditions to explore the sources of the Red River and the N. Pacific R. R.; promoted to be capt. of cav. in 1855 in that yr., he went to Europe as a member of a military commission to visit the seat of war, and upon his return wrote *Organization of European Armies and Operations in the Crimea*. In 1857 he resigned from the army, and was chief-engineer and v.-p. of the Ill. Central R. R. 1857-60, being chosen pres. of the St. Louis and Cin. R. R. in the latter yr. On the outbreak of the c. war in 1861 his services were enlisted by the gov. of O. in organizing the volunteers called for by the

first proclamation, and he was placed in command of the dept. of the O., and commissioned maj.-gen. of O. volunteers Apr. 23, 1861. On the 14th of May following the Pres. appointed him a maj.-gen. in the U. S. A., and directed him to disperse the Confed. force occupying and threatening to overrun W. Va. By a well executed movement he defeated the enemy, and on the 14th of July reported W. Va. clear. The thanks of Cong. were tendered him, and after the battle of Bull Run he was called to Wash. and (July 25) placed in command of a division comprising the dept. of Wash. and dept. of N. E. Va.; 3 weeks later he was assigned to command the dept. of the Potomac, and Aug. 30 the Army of the Potomac. Upon the retirement of Lieut.-Gen. Scott the command of the army of the U. S. fell upon him, which he retained until Mar. 11, 1862. On Mar. 6 he had made an advance upon Manassas, only to find the enemy gone, and embarked his army for Fortress Monroe; the siege of Yorktown lasted until May 5, when followed the disastrous campaign known as the Peninsular campaign, resulting in the retreat of the army to the James July 4-5, 1862, and final withdrawal the following month to the relief of Gen. Pope in N. E. Va., leaving McC. for a short time without any distinct command. After the defeat of Pope (Aug. 29-30), McC. was (Sept. 2) placed in command of the capital and the troops for its defence, which latter he reorganized, and followed Lee into Md., the battles of S. Mountain and Antietam ensuing, Sept. 14-17; the delay which followed created dissatisfaction in Wash., and on the 7th of Nov. he was relieved of his command at Warrenton, and Gen. Burnside ordered to succeed him. Proceeding to N. J., he took no further part in the war. On Aug. 31, 1864, he received the nomination of the Dem. national convention for the Presidency. The election occurred on Nov. 8, when Lincoln was almost unanimously re-elected by the States participating, McC. receiving only the votes of N. J., Ky., and Del. On the day of election he resigned his commission as maj.-gen., and in the spring of 1865 sailed for Europe, where he made an extended stay. Returning in 1868 he superintended the construction of the Stevens floating battery, also of the railway bridge across the Hudson, and in 1870 was appointed chief engineer of the dept. of docks of New York city, which latter office he resigned in 1872. Wrote military reports, text-books, and manuals. Gov. of N. J. 1878-81. [From orig. art. in *J's Univ. Cyc.*, by G. C. SIMMONS.]

**McClelland** (ROBERT), b. at Greencastle, Pa., in 1807, grad. at Dickinson Coll., Pa.; was admitted to the bar in 1831; practised law in Pittsburg, Pa., and Monroe, Mich.; won distinction by his ability in the Mich. constitutional convention of 1835; was speaker in the State legislature in 1843, M. C. 1843-49, gov. of Mich. 1852-53, sec. of the interior under Pres. Pierce 1853-57, since which time he practised law at Detroit. D. Aug. 30, 1880.

**McClernand** (JOHN A.), b. in Breckenridge co., Ky., May 30, 1812; his father dying in 1816, his mother removed to Ill., where he, in addition to farming, found time to study law, and was admitted to the bar in 1832. In the Black Hawk war he served as a private; in 1835 started the *Democrat*; was elected to legislature in 1836, also in 1840 and 1842, and to Cong. from 1843 to 1851. Removing to Jacksonville in 1851, he was sent to Cong. from that dist. in 1859, but resigned on the outbreak of c. war and engaged in raising the brigade which bore his name, and which he commanded at Belmont, having been appointed brig.-gen. of volunteers May 17, 1861; at Ft. Donelson he commanded the right of the U. lines; promoted to be maj.-gen. Mar. 1862, he commanded a division at the battle of Shiloh; in Jan. 1863 relieved Gen. Sherman in command of the expedition for the capture of Vicksburg; commanded the expedition which stormed Arkansas Post; in command of 13th corps, was engaged in Vicksburg campaign until relieved in July, to date June 18, 1863. Resigned Nov. 30, 1864.

**McClure** (Sir FRANCIS LEOPOLD), D. C. L., LL.D., F. R. S., b. at Dundalk, Ire., in 1819; entered the navy at the age of 12; accompanied Sir James Ross in his Arctic expedition of 1845; was engaged in Capt. Austin's expedition of 1850 in search of Sir John Franklin, with the rank of lieut., and made a sledge-journey of 760 m. along the N. shore of Parry Sound; was made commander the following yr., and sent on the expedition under Sir Edward Belcher; rescued Capt. McClure from a 3 yrs.' imprisonment in the ice near Melville Island, but subsequently had to abandon his own ship and 3 others; returned to Eng. Sept. 1854, and in 1857 took command of the expedition despatched by Lady Franklin which ascertained the fate of her husband; was knighted in 1860, employed in 1861 in surveying a route for a N. Atlantic telegraph, became a rear-admiral Oct. 1871, and supt. of Portsmouth dockyard 1872. He wrote *The Voyage of the Fox in the Arctic Seas to discover the Fate of Sir John Franklin and his Companions*.

**McClintock** (JOHN), D. D., LL.D., b. at Phila. Oct. 27, 1814; grad. at the Univ. of Pa. 1835, in which yr. he began preaching as an itinerant in the N. J. conference of the M. E. Ch.; was elected prof. of math. (1836) in Dickinson Coll. at Carlisle, Pa., prof. of anc. langs. 1839; aided in translating Neander's *Life of Christ*; prepared (in connection with Prof. G. R. Crooks) several elementary classical text-books; was ed. of the *Meth. Quarterly Review* 1848-56; sent to Europe in 1856 as delegate to the Wesleyan Meth. Conference of Eng., and to the Evangelical Alliance at its Berlin meeting; was pastor of St. Paul's ch. New York 1857-60; became pastor of the Amer. chapel in Paris in 1860; performed excellent service in diffusing a knowledge of the merits of the Amer. war, gaining the aid of Count Gasparin and other noted writers. Returning to the U. S. in 1864, he was again for a few months pastor of St. Paul's, New York, which he resigned on account of broken health; became in 1866 chairman of the Central Centenary Committee of the M. E. Ch.; upon the foundation by Daniel Drew of a theological sem., was chosen its first pres., and superintended its successful opening at Madison, N. J., in 1867. In his nu-



merous works, including a translation of Bungener's *Hist. of the Council of Trent* (1855), he gave proof of that eminent scholarship, in which he had no superior within his Ch. But the great work of his life, projected as early as 1833, was the *Cyc. of Biblical, Theological, and Ecclesiastical Lit.*, which he edited until his death, with the co-operation of Dr. James Strong. In this vast undertaking McC. undertook the treatment of the whole dept. of systematic, historical, and practical theol. D. Mar. 4, 1870.

**McCloskey** (JOHN), D. D. CARDINAL, b. at Brooklyn, N. Y., Mar. 30, 1810; received his early classical training in New York; grad. at Mt. St. Mary's Coll., Emmitsburg, Md.; studied theol. in the R. Cath. sem. connected with the same inst.; was ordained a priest in St. Patrick's cathedral, New York, Jan. 9, 1834; spent 2 yrs. attending lectures at Rome, and another yr. in Fr.; became on his return assistant pastor, and soon afterward pastor, of St. Joseph's ch., New York; was appointed in 1841 first pres. of St. John's Coll. Fordham, N. Y.; returned the following yr. to his pastoral charge; was appointed coadjutor to Bp. Hughes Nov. 23, 1843; consecrated under the title of bp. of *Axiere in partibus infidelium* Mar. 10, 1844, and on the division of the diocese of N. Y. was installed in Sept. 1847 as first bp. of Albany. He administered that diocese 17 yrs., erected a splendid cathedral, founded at Troy a well-equipped theological sem., built a large number of chs., founded many charitable and religious insts., and introduced numerous monastic orders and lay communities. On the death of Abp. Hughes he was appointed his successor, May 6, 1864. To the completion of the magnificent cathedral on Fifth Avenue he contributed \$10,000, and visited Rome in 1874 to procure materials for it. Became cardinal-priest 1875.

**McClure** (ALEXANDER K.), b. in Perry Co., Pa., Jan. 9, 1828; was apprenticed at the age of 15 to the tanning trade, and in 1846 he went to Phila. and worked as a journeyman tanner for a few months. Returning to his native co. in the fall of the same yr., he established the *Juniate Sentinel* at Mifflin. In 1852 he purchased the *Chambersburg Repository*. In 1857 he was elected to the lower house of the State legislature; was returned in 1858, and in the following yr. was chosen State senator. He held many positions of trust during the war; returned again to the legislature in 1864 as representative, and again in 1872 as senator from Phila. In 1874 he ran as Reform candidate for mayor of Phila., but was defeated. In the spring of 1875 he founded the *Phila. Times*, an independent daily newspaper.

**McClure** (ALEXANDER WILSON), D. D., b. at Boston May 8, 1808, grad. at Amherst Coll. 1827, at Andover Sem. 1830; was pastor of a Congl. ch. at Malden 1833-43; preached at St. Augustine, Fla. (1841-44); edited for several yrs. the *Chr. Observatory* and the *Puritan Recorder* at Boston; preached again at Malden; was 3 yrs. pastor of the Grand st. ch., Jersey City; was sec. of the Amer. and Foreign Chr. Union and chaplain at Rome, whence he returned in 1858. He wrote 2 vols. of the *Lives of the Chief Fathers of N. Eng.*, the *Bi-Centennial Book of Malden*, etc. D. Sept. 20, 1865.

**McClure** (Sir ROBERT JOHN LE MESURIER), C. B., b. at Wexford, Ire., Jan. 28, 1807, ed. at Winchester and Sandhurst; entered the navy as a mdpn.; joined the Arctic expedition under Capt. Back (1836) as a volunteer; was appointed lieut. on his return, and supt. of the Que. dockyard; took part in Sir John Ross's Arctic expedition (1848), and took command in 1850 of another exploring expedition, which discovered the N. W. passage, for which service he was knighted, received a captaincy and a reward of £5000. From his journals Capt. Sherard Osborn prepared *The Discovery of the N. W. Passage*. D. Oct. 14, 1873.

**McClurg** (JOSEPH W.), b. in St. Louis co., Mo., Feb. 22, 1818, ed. at Oxford Coll., O.; taught school in Ia. and Miss. 1835-37; went to Tex. in 1841, and practised law; settled as a merchant at St. Louis 1844. During the c. war he was col. of the Osage regiment, and afterward of a cav. regiment; was a member of the Mo. State convention 1862, of the Baltimore convention 1864, and delegate to the Phila. Loyalist convention of 1866; served in Cong. 1863-69, and was gov. of Mo. 1869-72.

**McCook** (ALEXANDER McDOWELL), b. in Columbiana co., O., Apr. 22, 1831, grad. at W. Pt. in 1852; was actively engaged against hostile Indians until 1857, when after a yr.'s leave of absence he was assigned as instructor of inf. tactics at W. Pt. On the outbreak of c. war he was appointed col. of the 1st O. Volunteers, which regiment he commanded at the first battle of Bull Run. Reorganizing his regiment he was recommissioned col. in Aug.; appointed brig.-gen. of volunteers in Sept. 1861, and assigned to the command of a brigade in the dept. of the Cumberland; commanded a division at the battle of Shiloh and siege of Corinth, 1st army corps at the battle of Perryville, 20th army corps at Stone River and Chickamauga, and the troops for the defense of Wash. July 1864. Received brevets from major to maj.-gen. U. S. A. Resigned his commission as maj.-gen. Oct. 1865, and in Mar. 1867 became lieut.-col. of inf.

**McCook** (DAN), b. in Carrollton, O., July 22, 1834, grad. at Florence Coll., Ala., 1857; served in the war for the U. as col. 52d O. Volunteers and as brig.-gen.; was at the battles of Perryville, Chickamauga, Mission Ridge, and in the Atlanta campaign, and was killed at Kenesaw Mountain July 17, 1864.

**McCook** (EDWARD M.), b. in Steubenville, O., in June 1834; accompanied Gov. Medary to Minn. as private sec. 1856; went to Pike's Peak 1859; was a member of the Kan. legislature 1860; served in the war for the U., attaining the rank of brig.-gen. Apr. 27, 1864, and brevet maj.-gen. in 1865; was minister to the S. I. 1866-69, gov. of Col. Terr. 1869-71, and reappointed 1875.

**McCook** (EDWIN STANTON), brother of Gen. A. McD. McCook, b. in New Lisbon, O., about 1840; took an active part in the war for the U., attaining the rank of brevet brig.-gen. of volunteers; sec. and acting gov. of Dak. Terr.; was assassinated at Yankton, Dak., Sept. 11, 1873.

**McCook** (ROBERT LATIMER), b. in Columbiana co., O., Dec. 28, 1827; studied law at Columbus, O.; practised at Cin.; raised a regiment of Gers. for the war in 1861 (9th O. Volunteers); commanded a brigade in W. Va. under Gen. Rosecrans, distinguished himself at Rich Mt., Carnifex Ferry, and Mill Spring; was appointed brig.-gen. of volunteers Mar. 21, 1862, and was in command of a division in Thomas's corps of Gen. Buell's army, when he was murdered by guerrillas while lying sick in an ambulance near Salem, Ala., Aug. 6, 1862.

**McCormick** (CYRUS HALL), b. at Walnut Grove, Va., Feb. 15, 1797; removed in 1845 to Cin., O., and in 1847 to Chicago. His father in 1816 invented a reaping-machine. The son invented another in 1831, patented it in 1834, and has since greatly improved it. In 1859 he established the Theological Sem. of the N. W. at Chicago (Presb.), and since that time endowed a chair in Washington and Lee Coll., Lexington, Va. D. May 13, 1884.

**McCormick** (RICHARD C., JR.), b. in New York 1832; received a classical education; went into business in Wall st. in 1850; travelled in Europe and Asia Minor, and wrote a *Visit to the Camp before Scutopolis, St. Paul to St. Sophia*, etc.; trustee of New York public schools 1857-61; chief clerk of dept. of agriculture 1862; sec. of Ari. 1863, gov. of that Terr. 1866-69; was delegate in Cong. from Ari. 1869-75; U. S. commissioner-gen. to Paris Exposition 1878, and received there a decoration of the Legion of Honor.

**McCosh** (JAMES), D. D., LL. D., b. in Scot. in 1811, was ed. at the univs. of Glasgow and Edinburgh; wrote while a student in the latter an essay on the Stoic philos., which obtained for him the honorary degree of M. A.; was ordained a minister of the Ch. of Scot. at Arbroath 1835; removed to Brechin 1839; took an active part in the questions which brought about the disruption of the Scot. Ch. and in the organization of the "Free Church" 1843; wrote *The Methods of the Divine Government, Physical and Moral*, which was a skilful theological application of Sir William Hamilton's philos.; was appointed prof. of logic and metaphysics in Queen's Coll., Belfast, 1851; wrote, in connection with Prof. G. Dickie, *Typical Forms and Special Ends in Creation and Intuitions of the Mind*, 2 works which received their argumentative complement in *An Examination of Mill's Philos.* He was elected pres. of the Coll. of N. J. at Princeton 1868; wrote as text-books *The Laws of Discursive Thought* and a treatise on *Logic*; delivered lectures on *Christianity and Positivism* before the Union Theological Sem. in New York. Wrote *The Scot. Philos., Biographical, Expository, and Critical, from Hutcheson to Hamilton*, and a brilliant reply to Prof. Tyndall's address at Belfast, etc.

**McCosh** (SAMUEL ALLEN), D. D., D. C. L., b. at Carlisle, Pa., Nov. 9, 1804, studied 1 yr. at W. Pt., grad. at Dickinson Coll.; became a lawyer, but took orders in the P. E. Ch.; held rectorships in Reading, Pa., and in Phila., and in 1836 was consecrated bp. of Mich. He was deposed from the ministry Sept. 3, 1878.

**McCoun** (WILLIAM T.), b. at Oyster Bay, N. Y., in 1786, ed. in New York; studied law; was soon a prominent lawyer, and continued in successful practice till May 1831, when he was appointed vice-chancellor of the first circuit. He was the first incumbent of the office, and held it till Sept. 1846, having then reached the age fixed by the const. as the limit of judicial service; soon after, under the const. of 1846, he was elected justice of the supreme court for the second dist., and retired at the end of his term. D. July 18, 1878.

**McCraury** (GEORGE W.), LL. D., b. at Evansville, Ind., Aug. 29, 1835; removed to that part of Wis. Terr. which became State of Ia.; ed. in a W. acad.; studied law, and was admitted to the bar in 1855; was elected to the State legislature in 1857, and served in the State senate from 1861 to 1863, holding the position of chairman of the committee on military affairs; was M. C. in 1868, and re-elected 4 times in succession, serving on the naval committee, the committee on the revision of the laws, and as chairman of committee on elections; he was sec. of war 1877-79, and then U. S. circuit judge.

**McCulloch**, mak-kul'loh (BEN), b. in Rutherford co., Tenn., 1814; his early yrs. were mostly passed in hunting; went to Tex. to join the expedition of David Crockett, but arrived after the death of the latter at the Alamo; served as a private in the battle of San Jacinto, and subsequently in the Mex. war commanded a co. of Tex. rangers, and was distinguished at Monterey, Buena Vista, and the capture of the city of Mex.; appointed U. S. marshal in 1853, and com. to Ut. 1857. On the outbreak of the c. war he espoused the S. cause, and, repairing to Tex., received the surrender of Twiggs at San Antonio. Appointed brig.-gen. soon after, he commanded in Mo. at Dng Springs and at Wilson's Creek; and in the battle of Pea Ridge, while in command of a division, was killed Sept. 7, 1862.

**McCulloch** (HENRY), b. at Kennebunk, Me., in 1811, ed. at Bowdoin Coll.; removed to Ind. in 1835; was pres. of the State bank of Ind. from May 1855 till May 1863, when, at the instance of the sec. of the treas., Mr. Chase, he was called to administer the duties of the newly created bureau as comptroller of the currency; on the retirement of Mr. Fessenden was appointed his successor as sec. of the treas., which portfolio he held until Mar. 1869, when he returned to Ind. He afterward engaged in the banking business in Lond. U. S. Sec. of Treasury 1884-85.

**McCulloch** (JOHN RAMSAY), b. at Whitburn, Scot., Mar. 1, 1789; became ed. of the *Scoteman*, an organ of liberal political opinions at Edinburgh, and one of the eds. of the *Edinburgh Review*; wrote the article on political economy in the supplement to the *Encyc. Britannica* (1824), in which he anticipated the opinions of the "Manchester school" of advocates of free trade; republished this article in 1825, with additions and modifications, under the title *Principles of Political Economy*; was prof. of that science in the Univ. of Lond. 1828-32; edited Adam Smith's *Wealth of Nations*; wrote a *Dict. of Commerce*, a *Statistical Account of the Brit. Em-*



*pire, a Diet., Geographical, Statistical, and Historical, of the Various Countries in the World, The Lit. of Political Economy, etc.* He was in 1845 elected one of the 8 foreign associates of the Fr. Inst. of Moral and Political Sciences; became in 1838 comptroller of the royal stationery office, and received a pension of £300 for eminent services to lit. D. Nov. 11, 1864.

**McCurdy** (JONATHAN), b. at Nassau, N. S., July 25, 1809, admitted to the bar in 1835; removed to Halifax in 1849, and became solicitor-gen. in 1860; was a delegate at the Que. conferences of 1861 and 1862 on the union of the provs. and the Intercolonial Railway, being chief com. of railways for N. S.; was for yrs. connected with the Halifax press, and an advocate of colonial union. He was long a member of the legislative bodies both of N. S. and of the Dominion of Canada; was at one time leader of the Liberal opposition in the upper house, and became in 1870 a judge of the supreme court of N. S.

**McCurdy** (CHARLES JOHNSON), LL.D., b. at Lyme, Conn., Dec. 7, 1797, grad. at Yale in 1817; became a lawyer; was often in the Conn. legislature, in which he was speaker 3 yrs.; lieutenant-gov. 1845-46; U. S. minister to Vienna 1851-52; was 1856-67 upon the bench, first in the superior and then in the supreme court of Conn.

**McDonald** (CHARLES J.), b. at Charleston, S. C., July 9, 1793, grad. at Columbia Coll., S. C., in 1816; was admitted to the bar 1817, and settled in Milledgeville, Ga.; was elected solicitor-gen. 1822, judge of the circuit court 1825. Having settled in Macon, he was a member of the legislature from Bibb co. 1834, and a member of the State senate 1837; was elected gov. 1839, and re-elected 1841. He was a member of the Nashville convention in 1850. In 1857 he was elevated to the bench of the supreme court of the State, which position he held with ability and distinction until his death, Dec. 16, 1860. He was reared in the State Rights school of politics, and was a most distinguished statesman.

**Macdonald** (SIR JOHN ALEXANDER), K. C. B., D. C. L., b. in Scot. 1815; removed in 1820 to Kingston, Canada, with his father; was called to the bar 1835; was elected to the provincial Parl. 1844, and successively held the posts of receiver-gen. and member of the executive council. He was 1847-50 com. of crown lands and member of the cabinet. He was 1854-62 atty.-gen. of Canada, part of the time premier; minister of militia 1862-64, atty.-gen. 1864-68, holding also from 1865 the ministry of militia. In 1868 he received the title of minister of justice, and was premier 1869-73; became the leader of the conservative party in Canada, and was in 1866 chairman of the coms. who in Lond. arranged the terms of confederation.

**Macdonald** (JOHN SANDFIELD), Q. C., b. at St. Raphael, Canada, Dec. 12, 1812; was called to the bar in 1840; was in the provincial Parl. 1841-67, and its speaker 1852-54; solicitor-gen. 1849-51, atty.-gen. of Canada in 1868, and in 1867 became atty.-gen. of Ontario. D. June 1, 1872.

**McDonough**, mak-don'oh (Commodore THOMAS), b. in Newcastle co., Del., Dec. 23, 1789; entered the U. S. N. as midpn. in 1800, served in the expedition to Tripoli, under Decatur, 1806-04; became lieutenant 1807, commander July 24, 1813; gained the victory on Lake Champlain Sept. 11, 1814, over a superior Brit. squadron, for which he was promoted to capt.; received a gold medal from Cong., and from the State of Vt. an estate on Cumberland Head, in view of the scene of the engagement. D. Nov. 16, 1825.

**McDougall**, mak-doo'gal (ALEXANDER), b. in Scot. in 1731; came to Amer. with his father about 1755, and settled near New York, where he engaged in several mechanical vocations; was in 1769 a printer, and imprisoned by the colonial govt. (1770) for a libellous address. He took an active part in the popular movements preliminary to the Revolution; was appointed col. of the first N. Y. regiment, brig.-gen. Aug. 1776, and maj.-gen. Oct. 20, 1777; was engaged in the battles of Long Island, White Plains, and Germantown, and in the N. J. campaign; commanded the posts on the Hudson 1778-80; was minister of marine for a short time early in 1781; was elected a delegate to Cong. from N. Y. in that yr., and again in 1784; elected to the N. Y. senate 1783. D. June 8, 1786.

**McDonald** (JAMES A.), b. in Bethlehem, N. Y., Nov. 19, 1817; became in 1851 a lawyer of Pike co., Ill.; atty.-gen. of Ill. 1842-44; was a civil engineer; went on an exploring expedition to Cal. *via* the Rio Grande and the Gila 1849; atty.-gen. of Cal. 1850, M. C. 1853-55, U. S. Senator 1861-67. D. Sept. 3, 1867.

**McDowell** (IRVIN), b. at Columbus, O., Oct. 15, 1818, ed. at the Collège de Troyes, Fr., and at W. Ft., where he grad. 1838. Appointed second lieutenant of art. in the army; adjutant at W. Ft. 1841-45; aide-de-camp to Gen. Wool 1845, as adjutant-gen. of his division, in the war with Mex., and subsequently of the army of occupation. At the battle of Buena Vista he gained the brevet of capt., and in May 1847 was appointed brevet capt. and assistant adjutant-gen. Served as adjutant-gen. of various depts. until 1861, having been promoted to brevet major in 1856. Ordered to Wash. in Feb. 1861, he served until May as inspector of troops, in organizing and mustering volunteers. Appointed brig.-gen. May 14, he was 3 days later assigned to the command of the dept. of N. E. Va. and the defences of Wash. on the Va. side of the Potomac, and on May 27 to the Army of the Potomac, which he commanded at the battle of Bull Run, July 21. On the accession of Gen. McClellan to command, McD. was placed in command of a division of the Army of the Potomac, and on the reorganization of that army (Mar. 1862) of the 1st corps of that army, and made maj.-gen. of volunteers; of the dept. of the Rappahannock Apr. 1862; of the 3d army corps (Army of Va.) Aug. 1862, and during Gen. Pope's campaign in N. Va. was engaged at Cedar Mountain, Rappahannock Station, and second Bull Run. In July 1864 placed in command of the dept. of the Pacific; of dept. of Cal. June 1866, dept. of the E. 1868; became maj.-gen. U. S. A. in Nov. 1872, and in Dec. commander of the division of the S. Retired Oct. 15, 1882.

**McDuffie** (GEORGE), b. in Warren (then Columbia) co., Ga., in 1738, grad. at S. G. Coll., Columbia, in 1813; was admitted to the bar in 1814, and commenced practice at Edgefield, S. C. In 1815 he was elected to the S. C. legislature, in 1821 to Cong., and continued in the House of Reps. from 1821 to 1835, during which time he took an active and prominent part in all public questions. In 1835 he became gov. of the State; was elected in 1843 to the Senate of the U. S., and took an active part in the proceedings of that body until 1846, when he resigned in consequence of failing health. His early political writings are collected in a volume called *The Crisis*. To Gov. McD. was due the credit of the reorganization of the Coll. of S. C. He was for many yrs. a maj.-gen. in the State militia. D. Mar. 11, 1851.

**Mace** [Lat. *maceis*], the dried arillus or inner coat investing the shell of the nutmeg, which is the kernel of the nut of *Myristica fragrans*, a tree of the Spice Islands (order Myristicaceae) now naturalized in other hot regions. M. of inferior quality is also produced by *M. fatua* of the same regions. It is used as a spice and as an aromatic stimulant in med. It yields a volatile oil upon distillation, and a buttery fixed oil when subjected to pressure. The oil of M. of commerce is generally the fixed oil of the nutmeg, which is harder than the true oil of M. M. appears in commerce as a mass of flat, dry branching plates of an orange brown color, and a taste and smell resembling those of nutmeg.

**Macedonia**, mas-e-do'ne-a, an anc. kingdom of S. E. Europe, comprised, when it first became known to hist., the dists. extending between Epirus and Illyria on the W., Pæonia on the N., Thracia, from which it was separated by the river Strymon, on the E., and Thessaly on the S. The country was rich in gold and silver, and produced wheat, wine, and oil. The cap. was Pella. The inhabs. were an Illyrian race, which here mingled with Thracian and Gr. settlers. Gr. had planted many colonies in these regions, as Potidæa, a colony of Corinth, Chalcidice of Eubœa, and Amphipolis of Athens. Gr. became the prevailing lang., but the Macedonians were never acknowledged by the Grs. as countrymen. When Xerxes invaded Gr. he compelled Alexander, king of M., to follow him as his vassal, but after the battle at Platæa the country became independent. A century and a half later Philip II. conquered Gr., and Alexander the Great (336-323) made M. the most powerful empire of his time. But on the death of Alexander his empire dissolved into 4 kingdoms. A quarrel between Philip V. and Athens gave the Roms. an opportunity of interfering, and Philip was defeated at Cynoscephalæ in 197 B. C., as was Perseus at Pydna in 168 B. C. After an uprising against the supremacy of the Roms., M. was made a Rom. prov. in 146. In the Middle Ages the name went out of use.

**McFerrin** (JOHN BERRY), D. D., b. June 15, 1807, in Rutherford co., Tenn.; was admitted as a preacher into the Tenn. conference of the M. E. Ch. 1825; spent 14 yrs. in pastoral work, including 2 yrs. as missionary to the Cherokee Indians; edited the *S. W. Chr. Advocate* at Nashville, Tenn., 1840-58; was book-agent of the M. E. Ch. S. 1858-66; became corresponding sec. of the board of missions in 1866. Wrote the *Hist. of Methodism in Tenn.*

**McGee** (THOMAS D'ARCY), b. at Carlingsford, Ire., Apr. 23, 1825; came in 1842 to Boston, where he wrote for the Boston *Pilot*, and became its chief ed.; became Lond. correspondent of the Dublin *Freeman's Journal*, and afterward was sec. of the Irish confederation and an ed. of the *Nation*. In 1848 he fled to New York, where he was 1848-50 ed. of the New York *Nation*, and afterward of the *Amer. Celt*; went to Montreal, Canada; ed. the *New Era*, disavowed republicanism, became a royalist; entered the provincial Parl. in 1857; became in 1864 pres. of the executive council, and in 1867 minister of agriculture. He denounced the Fenian movement, and was assassinated at Ottawa Apr. 7, 1868. His prin. works are *Irish Settlers in Amer.*, *Prot. Ref. in Ire.*, and *Hist. of Ire.*

**McGill** (JOHN), D. D., b. in Phila. Nov. 4, 1809; emigrated in childhood to Bardstown, Ky.; grad. at St. Joseph's Coll.; was admitted to the bar; practised law in New Orleans and in Ky.; studied theol. at Baltimore and Rome, and in 1830 took priest's orders in the R. Cath. Ch.; preached in Lexington, Ky.; edited the *Catholic Advocate*, and in 1850 was consecrated bp. of Richmond, Va. He took a prominent part in the Vatican Council. D. Jan. 14, 1872.

**McGillivray** (ALEXANDER), a Creek chief, son of Lachlan McGillivray, a Scotch trader, by the half-breed daughter of a Fr. officer, b. on the Coosa River, near the present city of Wetumpka, Ala., about 1740; was well ed. at Charleston, and was for some time engaged in commercial pursuits at Savannah; returned to his tribe, in which at the time of the Revolution he had become a leader. After the war, in which he took little part, he induced the so-called "Muscoogee Confederacy," embracing Creeks, Seminoles, and other tribes, to become allies of the Sp. colonial govt. of W. Fla.; was the commissary of that govt. among his countrymen. In 1790 he visited New York by invitation of Washington; was received with honor; signed a treaty ceding to the U. S. the disputed terr. on the Oconee River, and by a secret article of same instrument received appointment of U. S. agent, with rank and pay of brig.-gen. D. Feb. 17, 1793.

**McGready** (JAMES), b. probably in Pa. about 1760, was ed. at Jefferson Coll.; became a Presb. minister in N. C.; removed to S. W. Ky. in 1796, where he directed a revival of religion which began in 1797, lasted for some yrs., and organized in July 1800 the first camp-meeting. The religious movement thus begun was carried on by young men who were ordained to the ministry without a regular education in theol. This step gave rise to opposition, and the ecclesiastical difficulties culminated in 1810 in the organization of a new Ch. called the Cumberland Presb. Church.

**MacGregor**, R. R. jun., Clayton co., Ia. Pop. 1870, 2074; 1880, 1602.

**McGuffey** (WILLIAM H.), D. D., LL.D., b. in Pa. in 1800; went in youth to Trumbull co., O.; grad. at Washington



Coll. in 1825; was prof. in Miami Univ. 1836-39, pres. of O. Univ. 1839-45, prof. of moral philos. in the Univ. of Va. 1845-73. Wrote many popular school-books. D. May 5, 1873.

**Machias**, Me. See APPENDIX.

**MacInvalne'** (CHARLES PETTIT), D. D., LL.D., D. C. L., b. at Burlington, N. J., Jan. 18, 1798, grad. at Princeton in 1816; took orders in the P. E. Ch. 1820; officiated at Georgetown, D. C.; was chaplain at W. Pt., N. Y., and prof. of ethics and hist. 1825-27; became rector of St. Ann's, Brooklyn, N. Y., in 1827; prof. of the evidences of revealed religion in the Univ. of the City of New York in 1831; was consecrated bp. of O. in 1832; was pres. of Kenyon Coll. 1832-40, and afterward pres. of the theological sem. at Gambier, O. Wrote many works, among which are *Evidences of Christianity*, *The Truth and the Life*. D. Mar. 12, 1873.

**McIntosh**, mak'in-tosh (Gen. JOHN), brother of Lachlan, b. in Ga. about 1745; distinguished himself in the war of the Revolution in the S. States, attaining the rank of lieutenant-col.; settled in Fla. after the war; was imprisoned by the Spaniards at St. Augustine and at Havana, and was maj.-gen. of Ga. militia in the service of the U. S. at Mobile 1814-15. D. Nov. 12, 1826.

**McIntosh** (Gen. LACHLAN), b. at Borlaim, near Inverness, Scot., Mar. 17, 1727. His father, John More McIntosh, accompanied Oglethorpe to Ga. in 1736 with 100 of his tribesmen, and settled at New Inverness (now Darien), in what is now McIntosh co. Lachlan had few opportunities for education, but, aided by Gov. Oglethorpe, studied math. and surveying; was a surveyor in the Altamaha region; became col. of the 1st Ga. regiment and brig.-gen. in the war of the Revolution (1776); killed Btton Gwinnett in a duel May 1777; commanded the W. Flt. 1778, and led an expedition against the Indians of the O. Valley; was actively engaged in the siege of Savannah 1779, and in the defence of Charleston 1780, where he became a prisoner of war. He was a member of the Continental Cong. 1784, and com. to treat with the S. Indians 1785. D. Feb. 30, 1806.

**McIntosh** (WILLIAM), b. in Ga. about 1796; was an educated Cherokee Indian; became a Meth. minister; was one of the best interpreters the Cherokees ever had, and was an efficient missionary. He joined the Ark. conference in 1841, and was a member of the Indian mission conference at the time of his death, Dec. 1858.

**Mackay** (CHARLES), LL.D., b. in Perth, Scot., in 1812, was ed. in Lond., Brussels, and Aix-la-Chapelle; was on the staff of the Lond. *Morning Chronicle* 1834-43; ed. of the *Glasgow Argus* 1844-47; was long editorially connected with the *London Illustrated News*; lectured in the U. S. in 1858, and was a war-correspondent of the Lond. *Times* in the U. S. 1862-65. Is best known by his songs, some of which were set to music composed by himself. His prin. works are *Songs and Poems*, *Memoirs of Extraordinary Popular Delusions*, *Town Lyrics*, *Under Green Leaves*, and *Lost Beauties of the Eng. Lang.*

**McKay** (JAMES J.), b. in N. C. in 1793; became a lawyer; was State senator 1815-31; was at one time U. S. dist. atty. for N. C.; was a representative in Cong. 1831-49; became chairman of the committee of ways and means, and leader of the Dem. party in the House of Reps., and received the vote of his State delegation in the Baltimore convention of 1848 as candidate for the Vice-Presidency of the U. S. D. Sept. 14, 1853.

**McKean** (THOMAS), LL.D., a signer of the Dec. of Ind., b. at Londonderry, Pa., Mar. 19, 1734; admitted to the bar 1757, and early held important public trusts in Del. and Pa. He was sent to the gen. Cong. of 1785, where he took a bold stand for popular rights. He became in 1765 judge of the quarter sessions and the orphans' court, and sole notary and tabellion public for Del. In 1771 he was made collector of the port of Newcastle, and was 1774-83 M. C. from Del., pres. of Cong. in 1781; pres. of Del. 1777, although he had for some yrs. been a citizen of Pa. He wrote the const. of Del. in a single night, with no book for reference, and it was adopted unanimously on the following day. He was (1777-99) chief-justice of Pa., and its gov. 1799-1808. D. June 24, 1817.

**McKeesport**, R. R. centre, Alleghany co., Pa., 14 m. from Pittsburg, and on the left bank of the Monongahela and at the mouth of the Youghiogheny River, both of which are navigable for steamboats. It is the centre of an extensive coal-mining dist. Pop. 1870, 2523; 1880, 3212.

**McKendree** (WILLIAM), D. D., b. in King William co., Va., July 6, 1757. He early entered the army of the Revolution; was an adjutant and commissary, and witnessed the surrender of Cornwallis. He joined the Meth. itinerant ministry in 1778. In 1801 he was sent over the Alleghanies into Ky, and became one of the prin. founders of his denomination in the W. In 1806 he was elected bp.; his subsequent course embraces a large portion of the hist. of Amer. Methodism, especially in the W., where he was venerated as one of the most able and saintly men in the annals of his denomination. McKendree Coll., founded at Lebanon, Ill., in the yr. of his death, will cause his name to be long remembered. D. Mar. 5, 1835. ABEL STEVENS.

**Mackenzie** (Sir ALEXANDER), b. at Inverness, Scot., about the middle of the 18th century; came to Canada when young; entered the service of the N. W. Fur Co.; passed 8 yrs. at Ft. Chippewyan on Lake Athabasca, where he formed a project of an exploring expedition to the N. Ocean; spent a yr. in Eng. in the study of astron. and navigation; set out from Ft. Chippewyan June 3, 1789, with 4 canoes and a party of 12 persons; discovered and explored to lat. 69° the great river to which he gave his name, and in a second expedition from Ft. Chippewyan, begun in Oct. 1792, reached the Pacific at Ft. Menzies in July 1793. Returning to Eng. in 1801, he wrote *Voyages from Montreal through the Continent of N. Amer. to the Frozen and Pacific Oceans*; was knighted in 1802. D. Mar. 12, 1820.

**Mackenzie** (ALEXANDER SLIDELL), originally named SLIDELL, b. in New York Apr. 6, 1803; entered the navy in 1815; cruised in the Mediterranean and on other stations;

became lieut. 1825, commander 1841, serving on the W. I., Brazilian, Pacific, and Mediterranean squadrons, and took in 1837 the name of MACKENZIE in honor of a maternal uncle. In 1842 he was placed in charge of the U. S. brig Somers, sent to the W. African coast, and on the return voyage an intention of mutiny said to have been discovered on board led to the hanging from the yard-arm (Dec. 1, 1842) of 3 young men, one of whom, a mdpm., was a son of the sec. of war, John C. Spencer. Though his conduct was approved by a court of inquiry, and he was acquitted of blame by a court-martial, the difference of opinion was not set at rest. He was ordnance officer at the siege of Vera Cruz during the Mex. war, and commanded the artil. division which stormed the town of Tabasco June 16, 1847. He wrote *A Year in Spain*, and *Lives of John Paul Jones*, *Oliver Hazard Perry*, and *Stephen Decatur*. D. Sept. 13, 1848.

**Mackenzie** (Sir GEORGE), b. at Dundee, Scot., in 1636, ed. at the univs. of Aberdeen and St. Andrew's; studied law 3 yrs. at Bourges, Fr.; was admitted to the bar at Edinburgh in 1656; unsuccessfully defended the marquis of Argyll on his trial for treason 1661; became judge of the criminal court, M. P., and K. C. 1677. His conduct as criminal prosecutor in the persecution of the Covenanters caused him to be stigmatized by the title of "Bluddy Mackenzie;" was memorable for the witchcraft trials over which he presided. He was an elegant scholar, and one of the first Scotchmen to write the Eng. lang. correctly. He wrote *A Moral Essay upon Solitude*, *Institutions of the Laws of Scot.*, *A Vindication of the Govt. of Charles II.*, etc., and was the chief founder of the Advocates' Library at Edinburgh. D. May 2, 1691.

**Mackenzie** (HENRY), b. at Edinburgh in Aug. 1745, ed. at the univ. of that city; became an attorney of the Scot. court of exchequer; put forth anonymously in 1771 a novel, *The Man of Feeling*, which enjoyed great popularity, and was followed in 1773 by a second part, issued under the author's name, as *The Man of the World*. Another novel, *Julia de Rouvigné*, appeared in 1777. In 1779-80 he edited a literary paper, *The Mirror*, for which he wrote a series of essays; in 1785-87 he conducted *The Lounger*; wrote several political tracts, 3 tragedies, some biographical sketches, etc. In 1804 he received the lucrative appointment of comptroller of taxes for Scot., and during his declining yrs. made his house in Edinburgh the centre of literary and political society. D. Jan. 14, 1831.

**Mackenzie** (ROBERT SHELTON), M. D., LL.D., D. C. L., b. at Drew's Court, Ire., June 22, 1809, ed. at Fermoyn; studied med. in Cork and Dublin; became a school-teacher at Fermoyn; was in 1829 an ed. in Staffordshire, Eng.; was 1829-52 a successful *littérateur* of Lond.; came in 1852 to New York, and was connected with various journals, and became in 1857 the foreign and literary ed. of the *Phila. Press*. He prepared annotated editions of various Brit. and other authors, and wrote *Titan*, a novel; *Bills of Blarney*, *Life of Charles Dickens*, *Life of Sir Walter Scott*, etc. D. Nov. 21, 1881.

**Mackenzie River** rises in Great Slave Lake and flows in a N. N. W. direction to the Frozen Ocean. It is navigable from its mouth to Ft. Simpson, where there are rapids, above which it is again navigable to Great Slave Lake. Its 3 head-streams are the Peace, Athabasca, and English rivers.

**Mack'erel** (Old Eng. *mackerel*; Fr. *maquereau*, a "pander," because it was once believed to bring together male and female fishes of other species), a name of various salt-water fishes of the genus *Scomber* (family Scombridae). Gloucester and Yarmouth, Mass., are the great Amer. centres of the M. fishery. Their fleets visit all parts of the coast from the Carolinas to the Bay of Chaleurs, according to the season of the yr. Sp., Sp. Amer., and the S. and W. of the U. S. are the great markets for salted M.

**Mack'ey** (ALBERT GALLATIN), M. D., b. at Charleston, S. C., in 1809, grad. in 1832 at the Med. Coll. of S. C., where he became demonstrator of anat. in 1838, but in 1844 devoted himself wholly to lit., chiefly in connection with Masonry, his prin. works being *The Mystic Tie*, *The Symbolisms of Freemasonry*, and the *Encyc. of Freemasonry*. He established a Masonic monthly at Charleston in 1850, a quarterly in 1858; learned several anc. langs. by private study; lectured upon the Middle Ages.

**MackIn'ney**, on R. R., cap. of Collin co., Tex. It is in a rich grain and stock-raising section, and has an acad. Pop. 1870, 508; 1880, 1479.

**Mack'intosh** (Sir JAMES), M. D., LL.D., F. R. S., b. at Aldourie, Scot., Oct. 24, 1745, grad. M. A. in 1764 at King's Coll., Aberdeen, and M. D. at Edinburgh 1787; went to Lond., and in 1791 pub. his *Vindiciae Gallicae*, an eloquent defence of the Fr. Revolution, which won him the favor of the Whig leaders; in 1795 was called to the bar at Lincoln's Inn; delivered in 1799-1800 his brilliant *Lectures on the Law of Nature and of Nations*; was knighted 1809, and was recorder of Bombay 1804-06; judge of admiralty 1806-11; returned to Eng. and entered Parl. in 1813; was prof. of law and gen. politics at Haileybury Coll. 1818-24, still taking an important place in parliamentary business; in 1830 became a com. of Indian affairs. Among his more important works are a brief *Hist. of Eng.*, extending only to the reign of Elizabeth, but completed by Wallace and Bell; a *Dissertation on the Progress of Ethical Philos.*, a *Life of Sir Thomas More*, and a great number of articles, chiefly pub. in the *Edinburgh Review*. He had long projected an extended hist. of Eng. from the time of James II. to the Fr. Revolution, of which a fragment appeared after his death, comprising an account of the Revolution of 1688. As a parliamentary orator he did not fill the expectations based upon his forensic achievements, among which was the memorable defence of Peltier. (See his *Memoirs* by his son.) D. May 30, 1832.

**MacKnight** (JAMES), D. D., b. at Irvine, Scot., in 1721, studied at the univs. of Glasgow and Leyden; became minister of a Scotch ch. at Maybole in 1753, at Jedburgh in 1760, and in Edinburgh in 1772. He wrote a *Harmony of the Gospels*, *The Truth of Gospel Hist.*, and *A New Translation of the Apostolical Epistles*. D. Jan. 13, 1800.



**McLane** (Louis), b. at Smyrna, Del., May 28, 1786; entered the navy as midpn. at the age of 12, and cruised a yr. with Com. Decatur; pursued studies at Newark Coll.; studied law, and was admitted to the bar 1807; served as a volunteer in 1814; was Rep. in Cong. 1817-27, voting against the admission of slavery in Mo. or in the Terr.; was chosen Senator 1827; sent by Pres. Jackson as minister to Eng. May 1829; returned in 1831 to accept the post of sec. of the treas.; was transferred in 1833 to the dept. of state in consequence of his refusal to sanction the removal of the deposits from the Bank of the U. S.; retired to private life June 1834, settling in Md.; was pres. of the Baltimore and O. R. R. 1837-47; accepted the mission to Lond. to settle the Or. difficulty June 1845; was delegate to the constitutional convention of Md. 1850-51. D. Oct. 7, 1857.

**McLane** (Robert Milligan), son of the preceding, b. in Del. June 23, 1815; resided with his father at Lond. 1828-31; studied in colls. at Wash., D. C., and Baltimore, Md.; grad. at W. P. 1837; served in the army in Fla., in the Cherokee country, and in the N. W.; resigned 1843; was admitted to the bar at Baltimore the same yr.; was a member of the Md. legislature 1845-47, M. C. 1847-51, minister to Chi. 1853-55, and minister to Mex. from Mar. 1859 to Nov. 1860; negotiated a treaty giving Pres. Juarez the benefit of an Amer. loan and other substantial advantages, and purchasing Lower Cal. for a sum of several millions of dollars. The treaty was never ratified, but the policy of intervention in Mex. affairs was carried out by U. S. N., in capturing several vessels of war belonging to reactionary govt. of Miramon. After return from Mex. practised at Baltimore bar; gov. of Md. 1864-85; became U. S. Minister to Mex. Mar. 23, 1885.

**McLaren** (Edward William), D. D., b. Dec. 13, 1831, at Geneva, Ontario co., N. Y., grad. at Jefferson Coll. in 1851, and at the W. Theological Sem., Pittsburg, in 1860; went to S. Amer. as a missionary; returned in 1863, and became pastor to the Second Presb. ch., Peoria, Ill.; moved in 1866 to Detroit, Mich., as pastor to the Westminster ch.; entered the Epis. Ch. in 1872; became rector of Trinity ch., Cleveland, O., and was elected bp. of Ill. 1875.

**McLean** (John), LL.D., b. in N. J. Mar. 11, 1785; settled with his parents in Warren co., O., in childhood; worked on a farm until 16; commenced studying law at Cin. in 1803; was admitted to the bar, and began practice in 1807; served in Cong. from 1813 to 1816, when he became a judge of the supreme court of O.; was com. of the gen. land-office in 1822, P. M.-gen. in 1823, associate justice of the U. S. supreme court in 1829; was distinguished for the ability of his charges to grand juries, of which a notable example was one (Dec. 1838) concerning unlawful combinations against a foreign govt., elicited by certain aspects of the Canadian "patriot war." His decision in the "Dred Scott case" (1857) was given to the effect that slavery has its origin in force, not in right, nor in gen. law, to which it is opposed, but in local law, which cannot be respected by the national courts. In 1848 his name was brought before the Buffalo "Free Soil" convention as a candidate for the Presidential nomination, and in 1856 he was the leading competitor of Fremont for the Rep. nomination. He again received some votes in the Chicago convention of 1860. He prepared 2 vols. of *Reports of U. S. Circuit Court*. D. Apr. 4, 1861.

**McLean** (John), D. D., LL.D., b. in Princeton, N. J., Mar. 3, 1800, grad. at the Coll. of N. J. in 1816, and at the Princeton Theological Sem. in 1821; in 1822 was made teacher of math. and natural philos. at the Coll. of N. J., in 1823 prof. of math., in 1829 prof. of anc. langs. and v.-p., and in 1853 pres., from which position he retired June 1868. He contributed to the *Princeton Review*, and pub. pamphlets on education, temperance, etc.

**McLeansborough**, Ill. See APPENDIX.

**McLeod**, mak-low'd (Norman), D. D., b. at Campbelton, Scot., June 3, 1812; ed. at Edinburgh, Glasgow, and in Ger.; became minister of the National Kirk, parish minister of Loudoun (1838-43), of Dalkeith (1843-51), in Glasgow (Barony parish) 1851; established schools and meetings for the workmen, and labored with zeal and success; became chaplain to the queen for Scot.; ed. the *Edinburgh Chr. Magazine* 1850-60, *Good Words* 1860-72; wrote *The Earnest Student*, *Parish Papers*, *Eastward*, and *Peeps at the Far East*, a narrative of travels in India, etc. D. June 16, 1872.

**McLure** (William), b. in Ayr, Scot., in 1763; settled in Lond. as partner in a commercial house; emigrated to the U. S. in 1796; was one of the coms. on the Fr. spoliation claims in 1803; became interested in geol., which he studied in Europe, and conceived the plan of making a geological survey of the U. S.; crossed the Alleghanies 50 times and visited nearly every State of the U. S., travelling chiefly on foot. He presented geological memoirs to the Amer. Philosophical Society in 1809 and 1817, the latter accompanied by the first geological map of the U. S., thereby gaining the title of "father of American geology." Settling in Phila., he gave his books and collections to the Acad. of Natural Sciences of that city, of which inst. he was pres. from 1817 until his death. He resided in Sp. 1819-24; engaged in an attempt to establish a coll. on an agricultural basis; made an attempt of the same kind at New Harmony, Ind., where he bought a large tract of land and resided several yrs.; went to Mex. for his health in 1827, returned in 1828, and resided there until his death. He left \$20,000 to the Acad. of Natural Sciences, and was a liberal benefactor of the Amer. Geological Society, of which he was pres. in 1828. While in Mex. he wrote *Opinions on Various Subjects*. D. Mar. 23, 1840.

**MacMahon**, mahk-mah-on', de (Marie Edme Patrice Maurice), duke of Magenta, marshal of Fr., b. at the château of Sully, near Autun, June 13, 1808; entered in 1825 the military school of St. Cyr; served in Algeria; returned after the July revolution to Fr., and was present at the siege of Antwerp. Once more transferred to Afr., he distinguished himself as a capt. at the storming of Constantine; received the command first of a battalion, then of a regi-

ment, of the foreign legion; became col. in 1845, and brig.-gen. in 1848. As such he stood at the head of the administration, in first of the prov. of Oran and then of that of Constantine. In 1852 he became gen. of division, and in 1855 he was recalled in order to assume the command of a division in the Crimean war. He took part in the storming of Malakoff, and distinguished himself so much that he was created a senator. In this position he refused to vote for the Safety bill which was proposed in consequence of the Orsini conspiracy (1858), and which placed Fr. under a reign of the bayonet. In 1857 he fought again in Algeria, and in 1859, in the campaign against Aus., he led the left wing of the army in the battle of Magenta, June 4, 1859; Nap. commanded the centre. The emp. was very hard pressed by the enemy, but MacM. came to his support and won the battle. For this exploit the emp. made him marshal of Fr. and duke of Magenta. In the battle of Solferino (June 24, 1859) he also played a conspicuous part. After the war he received the command of the division at Lille, and in 1864 he succeeded Pelissier in the position of gov.-gen. of Algeria. His administration was beneficial. At the beginning of the war against Ger. in 1870 the marshal received the command of the 1st corps, consisting chiefly of Afr. troops, and forming the right wing of the first line, nearest to the frontier, with head-quarters at Strasbourg. He was defeated in the battle of Wörth, and at Sedan he was severely wounded and gave up the command. Immediately after the conclusion of the armistice in the spring of 1871 he was entrusted by Thiers with the command of the army of Versailles. He put down the revolution of the Commune in Paris in 1871, and in May 1873 the Legitimists, clericals, and Bonapartists agreed in overthrowing Thiers, and MacM. accepted the presidency of the republic. His govt. was aiming at the re-establishment of the power of Fr. He resigned Jan. 30, 1879. [From orig. art. in *J's Univ. Cyc.*, by AUGUST NIEMANN.]

**McMaster** (Gilbert), D. D., b. in Ire. Feb. 13, 1778; came in infancy with his parents to Pa.; grad. at Jefferson Coll. in 1809; studied theol.; was ordained to the Presb. ministry in 1808; was a pastor at Duaneburg, N. Y., 32 yrs., and at Princeton, Ind., 1840-46; wrote several religious treatises, sermons and addresses, and for periodicals. D. Mar. 17, 1864.—His son, ERASTUS D. McMASTER, D. D., b. in Pa. in 1806, grad. at Union Coll. 1827, was pres. of S. Hanover Coll., Ind., 1838-45, of Miami Univ. 1845-49, prof. of theol. in the New Albany Sem. 1849-66, and author of several religious treatises. D. Dec. 10, 1866.

**McMichael** (Morton), b. in N. J. Oct. 20, 1807, became a journalist and magazine writer in Phila. in 1824; in 1844 became editor-in-chief of the *North American Journal*. Was mayor of Phila. 1865-68. D. Jan. 6, 1879.

**MacMinville**, on R. R., cap. of Warren co., Tenn.; has a city park, and is the seat of the MacMinville Female Acad. and of the Cumberland Female Acad. Pop. 1870, 1172; 1880, 1244.

**McNab** (Sir Alan Napier), BART., b. at Niagara, Canada, Feb. 19, 1798; became a midpn. in 1813; served in the naval expedition against Sackett's Harbor and other Amer. ports of Lake Ontario; joined the army as ensign; was present at the capture of Ft. Niagara and at the battle of Plattsburg; studied law; practised at Hamilton; was journal clerk to the assembly of Upper Canada; elected a member of that body in 1829; became its speaker at a later period; commanded the Canadian militia on the Niagara frontier during the insurrection of 1837-38, with the rank of col.; routed the insurgents near Toronto Dec. 7, 1837; seized, burned, and sent over Niagara Falls the steamer Caroline; was knighted 1838; became speaker of the legislature of united provs. of Canada in 1844; was prime minister 1854-56; made a baronet Feb. 1858. D. Aug. 8, 1862.

**McNeill** (Sir John), G. C. B., D. C. L., LL.D., b. at Colonsa, Scot., 1795; appointed assistant envoy at the court of Per. in 1831, and envoy in 1836; became prominent through his prediction of aggressive designs on the part of Rus., a subject which he treated in numerous pamphlets and essays as well as in a vol. entitled *Progress and Position of Rus. in the East*. Returning from Per. in 1844, he was employed in many civil and military commissions in Eng. and Scot., and became a member of the privy council (1847) and chairman of the poor-law board. D. May 1883.

**McNutt** (Alexander G.), b. in Va. in 1801, was ed. at Washington Coll., Va.; removed in 1824 to Jackson, Miss.; afterward a lawyer of Vicksburg. In 1835 he was sent to State senate; gov. of Miss. 1837-41. D. Oct. 22, 1848.

**Macomb**, Ill. See APPENDIX.

**Macomb** (Alexander), b. in Detroit Apr. 13, 1782; appointed a cornet of cav. in 1799; transferred to the inf. in 1801, and to the engineers in 1802, in which latter corps he attained a lieut.-colonelcy in 1810, and at the time of the declaration of war with G. Brit. (June 1812) was acting adjutant-gen. of the army; but preferring active field-service, he was appointed in July col. of the 3d Artill., and was distinguished at Ft. Niagara and Ft. George; promoted to be brig.-gen. in Jan. 1814. On Sept. 11, with 1500 men and a small number of militia from N. Y. and Vt., he fought the battle of Plattsburg, defeating a largely superior force of Brit. veterans, under Sir George Prevost, for which he received the thanks of Cong. and a gold medal; was also brevetted maj.-gen. and commanded a military dept. in the N. W. 1815-21. Upon the reorganization of the army in the latter yr. he was retained as chief engineer of the army, with the rank of col. In May 1828 he succeeded Gen. Brown as maj.-gen. in command of the army. Author of a *Treatise on Military Law and Courts-Martial as Practised in the U. S.* D. June 25, 1841.

**Macon**, city and R. R. centre, cap. of Bibb co., Ga., at the head of navigation on the Ocmulgee River, 80 m. S. E. of Atlanta; has a city park and fair-grounds, and is the seat of Mercer Univ. (Bap.) and of the Wesleyan Female Coll. Rose Hill Cemetery, on the banks of the Ocmulgee,



14 m. below the city, is one of the most beautiful in the U. S. Pop. 1870, 10,810; 1880, 12,749.

**Macon**, Macon co., Ill., on R. R., 11 m. S. of Decatur. Pop. 1880, 798.

**Macon**, Miss. See APPENDIX.

**Macon** (NATHANIEL), b. in Warren co., N. C., in 1757; studied at Princeton, and afterward served as a private soldier of the Revolution under Col. John Macon, his brother; was in the State legislature 1780-85; opposed the U. S. const., and twice declined the office of U. S. P. M.-gen.; was M. C. 1791-1815, and was speaker 1801-06; U. S. Senator 1816-28, being (1825-28) acting pres. of the Senate. In 1835 he was pres. of a State constitutional convention, and in 1836 a U. S. elector. His term of consecutive service in Cong., 37 yrs., exceeds that of any other Amer. statesman. D. June 29, 1837.

**Macon City**, R. R. centre, cap. of Macon co., Mo., 170 m. N. W. of St. Louis, has an acad. Pop. 1870, 3678; 1880, 3046.

**MacPherson**, R. R. junc., cap. of MacPherson co., Kan., 36 m. S. of Salina. Pop. 1880, 1590.

**McPherson** (EDWARD), LL.D., b. at Gettysburg, Pa., July 31, 1830, grad. at Pa. Coll. in 1848; was for a time a journalist of Harrisburg, Pa.; M. C. 1859-63, clerk of the U. S. House of Reps. 1863-69, sec. of the Union national committee 1860-64; he has since been a journalist at Gettysburg, Pa. Wrote a *Political Hist. of the U. S.* during the civil war, a *Political Manual*, and other works. Was ed. of *Phila. Press*, and was, in 1882-83, clerk of U. S. House of Reps.

**Macpherson** (JAMES), b. at Ruthven, Inverness-shire, in the Highlands of Scot., in 1738; entered King's Coll., Aberdeen, 1752; studied also at Marischal Coll., Aberdeen, and at the Univ. of Edinburgh, where he pub. a "heroic poem" entitled *The Highlander*. After teaching the Ruthven school he became a tutor in the family of Mr. Graham of Balgown, and made some essays in versification, which he showed to John Home as translations of Gaelic poetry. The circumstance was communicated by Home to Drs. Hugh Blair and Alexander Carlyle, and by their advice M. pub. *Fragments of Anc. Poetry collected in the Highlands of Scot., and translated from the Gaelic or Erse Lang.* (1760). The little book met with great success, and, encouraged by the ready belief of his dupes, M. produced *Fingal, an Anc. Poem in Six Books, together with Several other Poems composed by Ossian, Son of Fingal, translated from the Gaelic lang., and Temora, An Anc. Epic Poem, in Eight Books, etc.*, by which he gained a European reputation. These so-called "poems" were received with enthusiasm, and the mythical bard, Ossian the son of Fingal, took his place in biographical dicta. as the rival of Homer and Virgil. Not long after the Eng. critics began to call for the original Gaelic of Ossian in order to test the correctness of the translation, but the excuses put forth for its absence were evidence that the poems "never existed in any other form than that which we have seen." M. found it expedient after the publication of *Temora* to absent himself for a time from Scot., and spent nearly 2 yrs. in travelling through the Amer. colonies; took up his residence in Lond. (1766), wrote an *Introduction to the Hist. of G. Brit. and Ire.*, and issued a prose translation of the *Iliad* of Homer cast in Ossianic mould. In 1775 M. pub. a *Hist. of G. Brit. from the Restoration to the Accession of the House of Hanover*. He was employed by the govt. to write a pamphlet, *The Rights of G. Brit. asserted against the Claims of the Colonies*, and another entitled *A Short Hist. of the Opposition during the Last Session of Parl.* M. was an able pamphleteer, and in reward for his services he obtained the lucrative agency for the nabob of Arcot in his negotiations with the govt. He built a residence at Belleville, Inverness, where he d. Feb. 17, 1796. At his own request he was buried in Westminster Abbey, the monument being erected at the expense of his estate.

PORTER C. BLISS.

**McPherson** (JAMES BIRDSEYE), b. in Sandusky co., O., Nov. 14, 1828, grad. at W. Pt. at the head of his class July 1, 1853, and was appointed brevet second lieutenant, corps of engineers; was retained at the Acad. as assistant instructor of engineering till Sept. 1854, when he was assigned to duty in New York as assistant engineer on the defenses of that harbor and of the improvement of the Hudson River; in 1857, having previously (Dec. 1854) been appointed second lieutenant of engineers, he was placed in charge of the construction of Ft. Del., and subsequently of the defenses on Alcatraz Island, San Francisco harbor, Cal.; in 1858 was promoted to be first lieutenant, and in 1861 was ordered to Boston, where he was engaged in organizing a corps of engineer troops; in Aug. 1861 he was made capt. of engineers, and in Nov. was chosen by Gen. Halleck as aide-de-camp and assistant engineer of the dept. of the Mo., with the rank of lieutenant-col.; in May 1862 was promoted to be col. and A. D. C., brig.-gen. U. S. volunteers, and maj.-gen. in Oct. 1862. His career from the capture of Ft. Henry in 1862 up to the surrender of Vicksburg in 1863 is told by Gen. Grant in his letter recommending McP. to be a brig.-gen. in the regular army: "He has been with me in every battle since the commencement of the rebellion, except Belmont. At Fts. Henry and Donelson, Shiloh, and the siege of Corinth his services were conspicuous. At the second battle of Corinth his skill was displayed in successfully carrying reinforcements to the beleaguered garrison when the enemy was between him and the point to be reached. In the advance through Central Miss. he commanded one wing of the army with all the ability possible to show. In the campaign and siege terminating with the fall of Vicksburg he filled a conspicuous part. His corps, the advance always under his immediate eye, were the pioneers in the movement from Pt. Gibson to Harkinson's Ferry. From Harkinson's Ferry to Jackson the 17th army corps marched on roads not travelled by other troops, fighting the entire battle of Raymond alone, and the bulk of Johnston's army was fought by this corps entirely under the management of McP. In the assault of the 22d of May

on the fortifications of Vicksburg, and during the entire siege, Gen. McP. and his command took unflinching laurels. He is one of the ablest engineers and most skilful generals." Upon this recommendation McP. was (Aug. 1, 1863) appointed a brig.-gen. in the regular army. In Feb. 1864 he accompanied Sherman's raid to Meridian as second in command, and in Mar. was assigned to command the dept. and army of the Tenn., to the reorganizing of which he devoted several weeks, preparatory to the invasion of Ga.; during this campaign his services were invaluable; at Resaca, Dallas, and the almost daily severe fighting up to and including Kennesaw Mountain, he was conspicuous. In the battles before Atlanta he commanded the left grand division, and on the 22d of July 1864 he was killed. [From orig. art. in *J's Univ. Cyc.*, by G. C. SIMMONS.]

**McPherson** (JOHN RODERIC), b. in Livingston co., N. Y., May 9, 1833; engaged in farming and stock-raising, and settled in 1858 in Hudson City, N. J., where he dealt in stock. He was the originator of the great buildings used by the Central Stockyard and Transit Co. at Harsimus Cove, N. J.; also of the abattoir and stockyard of Phila.; and the inventor of a new stock-car. He was alderman of Hudson City 1863-69, and State senator from Hudson county 1872-74. Elected U. S. Senator for N. J. Jan. 24, 1877.

**McRae** (JOHN J.), b. in Wayne co., Miss., about 1810, grad. at the Univ. of Miss. in 1834; became a lawyer; served in both branches of the legislature; U. S. Senator 1851, gov. of Miss. 1854-58; and was in Cong. 1858-61. D. May 30, 1868.

**Macready**, mak-kree'de (WILLIAM CHARLES), b. in Lond., Eng., Mar. 3, 1793. His father, a theatrical manager and lessee, sent his son to Rugby, but his projected career was cut short by pecuniary embarrassments, and at the age of 17 the youth essayed the stage. His success was due to hard work rather than to genius. He visited the U. S. for the third time in 1849, during which the Astor Place riot in New York occurred. D. Apr. 27, 1873. Mr. M. was one of the last of the great Shakespearean actors, a good scholar, a man of fine literary taste, of high professional ambition, of elevated character.

**Macrinus** (M. OPELIUS), Rom. emp. from Apr. 217 to June 218, b. in 164 of humble parentage at Caesarea, in Mauritania; entered the service of Plautianus, the favorite of Septimius Severus; received different appointments in the imperial household; became prefect of the praetorians, and was chosen emp. by them after the assassination of Caracalla. Shortly after his accession he was defeated by the Parthians, and lost his influence with the army. The praetorians rose in rebellion, and the emp. fled in disguise, but was discovered and put to death.

**Macrobius** (AMEROSIUS AURELIUS THEODOSIUS), a Lat. grammarian, flourished in the 5th century, but of his personal life nothing is known. Of his writings are extant *Saturnaliorum Convivorium Libri VII.*, *Commentarius in Ciceroe in Somnium Scipionis*, and an extract of *De Differentiis et Societatibus Graeci Latiniq. Verbi*. M. is the first pagan writer who mentions the massacre of the children of Bethlehem by Herod.

**McTyeire**, mak-te-ir' (HOLLAND NIMMONS), D. D., bp. of the M. E. Ch. S., b. in Barnwell co., S. C., grad. at Randolph-Macon Coll., Va.; joined the Va. conference in 1845; in 1846 took charge of St. Francis st. ch., Mobile; served the chs. at Demopolis, Ala., and Columbus, Miss.; was then transferred from the Ala. to the La. conference, and was stationed in New Orleans; in 1854 was elected ed. of the *New Orleans Chr. Advocate*, in 1858 of the *Nashville Chr. Advocate*. During the war he was transferred to the Montgomery conference, and was pastor in Montgomery, Ala., when in 1896 he was elected to the episcopate. Wrote several works, among which are *Manual of the Discipline* and the *Duties of Masters*.

**MacVeagh**, mak-va' (WAYNE), b. at Phenixville, Pa., Apr. 19, 1833, ed. at Yale; admitted to the bar 1856; became dist. atty. of Chester co., Pa.; capt. of cav. 1863, when invasion of Pa. was threatened; chairman of Rep. central committee of Pa. 1863; appointed by Pres. Grant minister to Constantinople 1872; resigned 1873; leading member of U. S. "MacVeagh commission" to La. 1877 to investigate political affairs; appointed U. S. atty.-gen. by Pres. Garfield Mar. 5, 1881; resigned same yr.

**McVickar** (JOHN), D. D., b. in New York Aug. 10, 1787, grad. at Columbia Coll. in 1804; took orders in the P. E. Ch. in 1811; became prof. of moral philos. and rhetoric in Columbia Coll. in 1817, which post he retained until 1864. Wrote *Outlines of Political Economy*, *Memoir of Rev. E. D. Griffin*, *Early and Professional Years of Bp. Hobart*, etc. (See his *Life*, by his son.) D. Oct. 29, 1868.

**McWhorter**, mak-hwuer'ter (ALEXANDER), D. D., b. in Del. July 15, 1734, grad. at Princeton 1757; studied theology; was installed pastor of the Presb. ch. at Newark, N. J.; went on a mission to N. C. in 1764, and was sent there again in 1775 by Cong. to persuade the royalists of the W. cos. to join in the Revolution; became in 1778 chaplain of Knox's artill. brigade; accepted in 1779 the pastorate at Charlotte, N. C., and the presidency of Queen's Museum Coll., then called Liberty Hall; lost his library by the invasion of Cornwallis; returned to Newark 1781; aided in drawing up the const. of the Amer. Presb. Ch. in 1788; was for 35 yrs. a trustee of Princeton Coll.; prominent in collecting funds in N. Eng. for rebuilding the coll. after the conflagration of 1802; put forth 2 vols. of *Sermons*. D. July 20, 1807.

**McWillie** (WILLIAM), b. near Liberty Hill, S. C., Nov. 17, 1795; served in the war of 1812 as adjutant to his father, Col. Adam McWillie; grad. at S. C. Coll. 1817; studied law, and was admitted to the bar 1818; served for many yrs. in both houses of the State legislature; settled in Miss. as a planter 1845; was M. C. from that State 1848-51, and gov. 1858-60; took an active part in the political agitations of the Confed. movement. D. Mar. 3, 1869.

**Madagascar**, the largest of the Afr. islands, 1030 m. long, 250 m. broad, and comprising an area of about 230,000



sq. m., is situated in the Indian Ocean, between lat.  $11^{\circ} 57'$  and  $25^{\circ} 42' S.$ , and between lon.  $43^{\circ} 10'$  and  $50^{\circ} 25' E.$ , and separated from Afr. by the Mozambique Channel, 250 m. broad. From the coast the surface rises in the same manner as on the Afr. continent, in terraces, broader and more gently sloping on the W., narrower and divided by wall-like cuts on the E. side. The interior forms a plateau from 3000 to 4000 ft. high, traversed from N. to S. by a mt.-chain whose peaks rise from 6000 to 12,000 ft. The climate is very different in the low coast-regions, where the heat is intense and a fever prevails, dangerous not only to Europeans but even to the natives of the interior; and in the more elevated parts, where the thermometer seldom rises above  $85^{\circ}$ . The rainy season lasts from Dec. to Apr. Iron and rock-salt abound; coal is said to exist in some places. Ebony, mahogany, different kinds of gum trees, figs, cocoa-nuts, breadfruit trees, plantains, and bananas are frequent. Rice is extensively cultivated, and forms the prin. article of food; also yams and arrowroot. The cotton-plant has been introduced from the Peejee Islands, the sugar-cane from Mauritius, and the coffee tree from Java, and they thrive well; the cultivation, however, was started by Europeans, and is still carried on by foreign labor. The silkworm is indigenous, and is reared on the *Tapia edulis*; the cocoon is often used by the natives as an article of food. The aye-aye is peculiar to the island; cattle, both wild and tame, and generally humped as in India; sheep with fat tails and covered with hair, as in the Cape of Good Hope; swine, wild-hogs, dogs and cats, small leopards, monkeys; large but generally not venomous serpents; immense crocodiles, venerated by the natives, are numerous. Pop. about 5,000,000. The govt. is a military despotism. The religion is idolatry, and Christianity, although adopted by many, especially among the Hovas, has not succeeded in eradicating certain old customs, such as infanticide and polygamy. Nevertheless, in 1871 there were 150 schools in operation, the number of Chrs. was estimated at 300,000, and in 1874 the Ch. of Eng. appointed a bp. for M. The prin. city is Tananarivo.

**Madar**, or **Mudar**, the *Calotropis (Asclepias) gigantea*, a large plant of the E. I., now naturalized in the W. I. also. Its fibre is used for making cloth and cordage, and the bark of its root to cure leprosy, elephantiasis, syphilis, etc.

**Maddaloni** (*Magdalunum*), town of S. It., in the prov. of Caserta, about 15 m. N. from Naples. Its chief interest for the visitor is the grand Carolino aqueduct, built about 1755, which brings the waters of the Tiburno to Caserta (3 m. from M.), where they form a fine cascade that supplies the lakes and fountains of the royal palace gardens. There is a military school in this town; also the Giordano Bruno Inst. for boys. It was at M. that Gen. Bixio in 1860 met the flying Bourbon troops after the battle of Volturno, and drove them into the fortress of Capua. Pop. 20,016.

**Madder** [Sax. *meudere*; Fr. *garance*; Ger. *Krapp*, *Krapprwurzel*], the root of different species of *Rubia*, chiefly *Rubia tinctorum*. The main supply of commerce is from Hol., though the plant was originally a native of S. Europe and Asia Minor. The most important coloring matter contained in M. is ALIZARINE (which see), now chiefly obtained artificially from coal tar. PURPURINE (which see), *pseudopurpurine*, and *purpurinehydrate* are also present. *Garancine* is a commercial product obtained from M., containing its coloring principles in a more concentrated form. The method consists in boiling with sulphuric acid somewhat diluted, which abstracts much useless material, and the residue constitutes but about  $\frac{1}{2}$  of the original M. *Madder-Lakes*.—These costly preparations are little used except for pigments by artists. They are prepared by dissolving alum in a solution of M. and then precipitating with an alkaline carbonate. (See DYING.) [From orig. art. in J's Univ. Cyc., by PROF. H. WURTZ, PH. D.]

**Madaira**, mah-dee'ra, an island belonging to Port., in the N. Atlantic Ocean, between lat.  $32^{\circ} 30'$  and  $32^{\circ} 53' N.$ , and lon.  $16^{\circ} 40'$  and  $17^{\circ} 20' W.$  Area, 317 sq. m. M. is of volcanic origin, though earthquakes occur very seldom. The ground is high, the average elevation 2000 ft., and the surface mountainous. The coasts are steep, precipitous, and afford few harbors. In the interior the land rises still higher (Pico Ruivo 6050 ft.). But it is everywhere intersected by deep and fertile valleys. The climate is equable, average heat in the summer being  $74^{\circ}$  and in the winter  $64^{\circ}$ . In the valleys tropical plants are grown—rice, sugar, coffee, bananas, pineapples, and oranges; on the more elevated fields vines, chestnuts, and wheat are cultivated, and the table-land is covered with fine forests and extensive pastures. The pop., 131,906, is a mixture of Port., Moors, and negroes. Since the grape disease in 1852 the vine-cultivation has declined, but the coffee tree has taken the place of the vine. The cap. is Funchal. M. was discovered in 1416.

**Madaira**, a great navigable river of Brazil, S. Amer., is formed by the confluence of the Beni and Marmora, rising in Bolivia, flows N. E. 700 m., and enters the Amazon.

**Madaira-nut**. See WALNUT.

**Ma'dia** (Chilese, *madia*) **Oil**, the fixed oil from the seeds of *M. sativa*, a composite-flowered annual herb of Chilean origin, now cultivated in Europe. The oil is valued as a lubricant. The oil-cake is used as food for live-stock.

**Mad'ison**, Dak. See APPENDIX.

**Madison**, on R. R., cap. of Morgan co., Ga., 103 m. W. of Augusta and 68 m. from Atlanta. Pop. 1880, 1974.

**Madison**, city, cap. of Jefferson co., Ind., on R. R. and the O. River, 90 m. below Cin., does a large business in pork-packing and the provision-trade; is connected by steamer with Cin. and Louisville. Pop. 1870, 10,709; 1880, 8945.

**Madison**, on R. R., Morris co., N. J., 28 m. W. of New York, is the site of Drew Theological Sem. (M. E.), attached to which is a beautiful park of 95 acres. Pop. 1880, 1756.

**Madison**, city and R. R. centre, cap. of Wis., and of Dane co., 75 m. W. of Milwaukee, on an undulating isthmus between Lakes Mendota and Monona, 788 ft. above the sea

and 210 ft. above Lake Michigan. The capitol is situated in a park of 13 acres. The city contains the State Univ. and a



State Capitol (Madison, Wis.).

commercial coll. Near the city is located an insane asylum. Pop. 1870, 9176; 1880, 10,324. [From orig. art. in J's Univ. Cyc., by DAVID ATWOOD, ED. "STATE JOURNAL."]

**Madison** (JAMES), D. D., b. near Port Republic, Va., Aug. 27, 1749, grad. at William and Mary Coll. 1768; studied law, and was admitted to the bar, but abandoned that profession for the ministry of the P. E. Ch. In 1773 he was chosen prof. of math. in William and Mary Coll., and became pres. in 1777. He visited Eng. in 1775, and again in 1777, where he pursued a course of study at Lond. in several advanced branches of science; kept the coll. open during the war of the Revolution; became prof. of natural and moral philos. 1784, was consecrated first bp. of Va. by the abp. of Canterbury Sept. 19, 1790, and continued to discharge his duties as collegiate pres. and prof. until his death. He prepared several occasional addresses, a *Eulogy on Washington*, a large map of Va., etc., and some papers in Barton's *Journal* and in the *Transactions* of the Amer. Society, vols. II., III., and IV. D. Mar. 6, 1812.

**Madison** (JAMES), 4th Pres. of the U. S., b. at Pt. Conway, Prince George co., Va., the residence of his maternal grandparents, Mar. 16, 1751; was the eldest of the 7 children of a wealthy planter; studied Lat., Gr., Fr. and It. under the tutelage of the parish minister; entered the Coll. of N. J. in 1769, and grad. in 1771, but remained for several months pursuing a course of reading, allowing himself but 3 or 4 hours of sleep; returned to Va. in 1772, and continued for 2 yrs. an incessant study, nominally directed to the law, but really including theol., philos., and gen. lit. His attention was then absorbed by the impending struggle for independence, with which was closely connected in Va. a local controversy on the subject of religious toleration. The Ch. of Eng. was the established state religion in Va., and other denominations labored under serious disabilities. M. took a prominent stand in behalf of the removal of all disabilities; was elected to the Va. convention in the spring of 1776, and procured the passage of an amendment to the Declaration of Rights as prepared by George Mason, substituting for the term "toleration" a more emphatic assertion of religious liberty.

In the same yr. he was elected to the Va. assembly; was chosen in Nov. 1777 a member of the council of state, and in Mar. 1780 took his seat in the Continental Cong. He was made chairman of the committee on foreign relations, and wrote an able memorandum for the use of the Amer. ministers in Fr. and Sp., establishing the claims of the U. S. to the terra. between the Alleghany Mts. and the Miss., and to the free navigation of that river. In 1783 he was chairman of the committee on ways and means, and the prin. author of the system of revenue then adopted. As a member of the Va. legislature 1784-86 he participated in that revision of the statutes which effectually abolished the remnants of the feudal system, and state support given to the Anglican Ch. His *Memorial and Remonstrance* on the latter subject was one of his ablest state papers. In Jan. 1786 he proposed a meeting of State coms. to devise measures for more satisfactory commercial relations between the States; represented Va. at the Annapolis meeting which issued the call for the national constitutional convention (Sept. 1786); was a delegate to that convention, which met May 1787; was one of the chief framers of the const. of the U. S., and perhaps its ablest advocate in the *Federalist*. He was a member of the first 4 Congs., 1789-97, in which he maintained a moderate opposition to Hamilton's financial policy; declined the mission to Fr. and the secretaryship of state, and, gradually identifying himself with the Rep. party, became from 1792 its leader. During the administration of John Adams M. remained in private life, but was the author of the "Resolutions of 1798" adopted by the Va. legislature in condemnation of the Alien and Sedition laws, as well as of the "Report" (1800) in which he defended those resolutions. The reaction in public sentiment which seated Jefferson in the presidential chair was largely owing to the writings of M., who was made sec. of state, a position which he filled with such ability as to make him the natural successor in the chief magistracy.

Chosen Pres. by an electoral vote of 122 to 53, M. was inaugurated Mar. 4, 1800, at a period when the relations of the U. S. with G. Brit. were becoming embittered, and his first term was passed in diplomatic quarrels, resulting in a declaration of war, June 18, 1812. In that yr. M. was re-elected to



the Presidency by 128 electoral votes to 89 in favor of George Clinton. The war was prosecuted 3 yrs., marked by alternate success and defeat in Canada, by victories at sea, by the burning of the national capitol at Wash. Aug. 1814, by the opposition movement in N. Eng. which culminated in the Hartford convention (1814), and by the battle won at New Orleans (Jan. 8, 1815) after a peace had been signed at Ghent (Dec. 24, 1814), which left the original cause of dispute in abeyance. In 1815 a commercial treaty was negotiated with G. Brit., and in Apr. 1816 a national bank was incorporated by Cong. M. yielded the Presidency, Mar. 4, 1817, to his sec. of state and friend, James Monroe, and retired to his ancestral estate at Montpelier, where he passed the evening of his days. He took pleasure in promoting agriculture as pres. of the co. society, and in watching the development of the Univ. of Va., of which he was long rector and visitor. In extreme old age he sat in 1829 as a member of the convention called to reform the Va. const., though he was too infirm to participate in the active labor of revision. A valuable diary kept by M. at the time of the formation of the Federal const. was purchased for \$30,000, and printed by order of Cong. as *Reports of the Debates in the National Convention of 1787*; his *Complete Works* have been pub. (See his *Life and Times*, by W. C. Rives, unfinished, and the *Letters and other Writings of James Madison*.) He conciliated the esteem, not only of friends, but of political opponents. D. June 28, 1836. PORTER C. BLISS.

**Madison University**, at Hamilton, N. Y., has 2 distinct corporations—an educational society and a univ.—which supplement each other, and 3 schools—an acad., a coll., and a theological sem. The SEMINARY, an inst. of the Bap. Ch., was opened May 1, 1820. COLGATE ACADEMY was opened in 1832 as a preparatory school, and in 1853 was chartered as the "Grammar School of Madison University." It has a drill course of 3 yrs. in classical and scientific study. The COLLEGE, which by way of eminence is M. U., was organized in 1832, but was not chartered till Mar. 1846. It has all the usual courses of coll. study. In 1850 the univ. had no endowment, it having been the policy to rely on annual gifts and collections. But the removal controversy brought new issues and made a change of policy necessary. Yet up to the close of the war only \$2,000 had been secured. Since that date considerable additions have been made; the endowment has been increased to \$393,000, and the whole value of property is over \$500,000, and no debt.

**Madisonville, Ky.** See APPENDIX.

**Madon'na** [It., originally equivalent to *madame*], a title of the Virgin Mary, and given especially to artistic representations of her.

**Mad'o'qua** (*Neotragus saltiana*), an Abyssinian antelope, about 2 ft. long and barely 14 inches high.

**Madras**, one of the 3 presidencies of Brit. India, extends from Cape Comorin, lat. 8° 4' N., to Nagpoor, lat. 21° 10' N., and is bounded N. by the presidency of Bombay and the Nizam and Berar dominions, N. W. by Bengal, E. and S. E. by the Bay of Bengal, S. by the Indian Ocean, and W. by the Ar. Sea. Area, 136,856 sq. m. Pop. 31,672,613. The surface forms a plateau sloping down from the centre on both sides, inclosed E. and W. by the Ghaut, and S. by the Neilgherry Mts. and traversed by the Godavery, Kistnah, and Cavery. The rivers, which flow westward to the Ar. Sea, expand at their mouths, become shallow, and form lakes. The soil is sandy along the coast, and mixed with salt in the interior; there are, nevertheless, very fertile dists. The great forests yield teak and other kinds of wood. Sugar, cocoa-nuts, tobacco, indigo, and cotton are produced. Iron, copper, lead, manganese, silver, and coal are found.

**Madras**, cap. of the presidency of the same name, has 397,552 inhabs., and is situated on the Coromandel coast, extending for a distance of about 7 m. along the shores of the Bay of Bengal. Its location is very unfavorable. Nevertheless it has, as the seat of the highest govt. authorities, attained great importance. In the centre of the straggling town, immediately on the sea, stands Ft. St. George. To the N. of this fort, separated from it by a large esplanade, the so-called Black Town is situated, the seat of the European wealth. On the other side of the fort, to the S., and separated from it by the Kuam River, the Mohammedan part of the city is situated, the so-called Tripplikam. The suburbs, inhabited by the Hindoos, consisting of narrow streets with miserable houses, extend along the W. side of these prin. parts of the city, and form a half circle of great breadth around the kernel of M. consisting of the Black Town, the Tripplikam, and the citadel situated between them. Ft. St. George, with its system of bastions, is built in the form of a half circle, the coast forming the diameter. To the N. W. of the fort the Kuam forms an island. The beautiful light-house, 128 ft. above the level of the sea, is situated between the citadel and the Black Town. Other noteworthy buildings are the ch. of St. Andrew's, the mint, the observatory, the Military Orphan Asylum, the univ., and the palace of the nuwáb. The numerous residences of the European officials are palatial structures. Parks and gardens surround the houses. In spite of its low position and the absence of good river-water, the city is well provided with water from a number of wells. A peculiar feature of M. is the difficulty of landing. The imports of M. consist principally of cotton goods, corn, wine, spirits, metals, sugar, silk, horses, and jewelry; the exports, cotton, saltpetre, and pepper.

**Madrid**, mah-drid' (Sp. mah-dreed'), the cap. of Sp. and of the prov. of Madrid, a part of New Castle, is situated nearly in the centre of the country, in lat. 40° 25' N., lon. 3° 42' W., on the left bank of the Manzanares, a small stream which joins the Jamara and flows to the Tagus. The site offers no commercial or industrial advantages, nor has it any special military importance; and the surrounding plateau—2300 ft. high and once covered with forests, but now, with the exception of the immediate neighborhood of the city, naked and arid—suffers from a very harsh climate. The S. W. (or old) part of the city contains many narrow,

crooked, and ill-kept streets, but the central and E. parts consist of straight, broad, well-kept streets, lined with handsome houses, magnificent palaces, and elegant public buildings. Among the public squares, of which M. numbers 72, the most interesting, at least at present, is Puerta del Sol, once forming the E. entrance of the city, but now occupying nearly its centre. The bull-fights take place in Plaza de Toros, just outside Puerta de Alcalá, but the old building, erected by Philip V., and accommodating 12,400 persons, was taken down in 1874, and a new one was commenced a little farther to the N. Among the numerous promenades and gardens, the Prado is the most remarkable.

Although M. is one of the handsomest modern cities, it contains, properly speaking, only one striking building—viz. the royal palace. It has no cathedral. It forms only a suffragan bishopric of Toledo. Many of its chs., of which it numbers between 60 and 70, are beautifully decorated with paintings of the old masters, but none of them has any architectural merit. The same is the case with the convents and monasteries, which formerly were so numerous in M., but which now mostly are used for other purposes; 44 monasteries were suppressed in 1836. The royal palace was built between 1737 and 1750, of granite and white marble, forming a square 470 ft. long, 100 ft. high, inclosing a court 240 ft. square, occupying an area of 230,900 sq. ft. and surrounded with magnificent gardens. It contains a library of 100,000 vols., an interesting collection of arms, a numismatic collection of 150,000 pieces, and a great number of magnificent pictures. The industry of the city is not considerable. Beside the manufacture of certain necessary articles, such as chocolate, beer, shoes, and hats, only those of plated ware, coaches, gloves, and fans have acquired prominence. But the commerce is important. The retail business is mainly in the hands of foreigners, especially Frenchmen. But wholesale transactions are mostly made by native houses, and are very large, the city forming the entrepot for all the interior provs. Pop. 397,816.

**Madu'ra**, an island of the Malay Archipelago, N. E. of Java, belonging to the Netherlands. The inhabs. are Mohammedans, and live in 3 kingdoms governed by native princes under Dut. superintendence.

**Madura**, city of Brit. India, in the presidency of Madras. It is fortified, and contains some of the most remarkable Hindoo buildings, among which are the magnificent Pandiyam palace, the great temple of Mahadeva, and an inn for pilgrims, 312 ft. long and 125 ft. broad, resting on 6 rows of columns of gray granite and 25 ft. high. A R. Cath. mission was started here in 1606, which after a long interruption was resumed in 1837, and in 1834 a Prot. mission was established by the Amer. Board of Foreign Missions. Pop. 51,987.

**Mad'vig** (JOHANN NICOLAI), b. Aug. 7, 1804, at Svanike, Bornholm, Den., ed. at Frederiksborg, studied at the Univ. of Copenhagen, where he became prof. of the Lat. lang. and lit. in 1829. His *Latin Grammar* (1841) made quite an epoch in grammatical studies.

**Maan'der** (now *Meander*), a river of Asia Minor, flows into the Egean Sea after a course of 200 m. It is noted for its winding and tortuous course. It is narrow and deep, and carries with it a large quantity of mud, which has extended the coast many stadia farther into the sea, and connected it with some adjacent islands.

**Mæce'nas** (CAIUS CLAUDIUS), b. before the middle of the first century B. C., d. 8 B. C. He is celebrated as the friend of Augustus and the patron of poets and artists.

**Maelstrom**, or **Malström**, mäl'strum, meaning in Nor. "grinding stream," is, according to a widespread legend, the name of a whirlpool at the W. coast of Nor., near Lofoten Islands, which is said to seize men-of-war, whales, etc., and grind them to powder. In reality the only foundation for the legend is a strong, often difficult, and sometimes dangerous current formed between two of the islands. It should be added that the legend is of much more frequent occurrence in the Eng. than in the Nor. literature.

**Maestricht** (mah'strikt) **Beds**, certain strata which, near Maestricht, in the Netherlands, in parts of Fr. and Den., cap. the Upper White Chalk, and thus terminate the Cretaceous series of rocks, and record the conclusion of the Mesozoic age.

**Mat'titt** (JOHN NEWLAND), D. D., b. at Dublin, Ire., Dec. 28, 1794; became a Wesleyan preacher; came to the U. S. in 1819; was pastor of several chs. in N. Eng., and in 1831 began a career as "revivalist" in the S. States; established the *Western Methodist* at Nashville, Tenn., in 1833; became prof. of elocution and belles-lettres at Lagrange Coll., Ala., in 1837; was elected chaplain of the U. S. Cong. in 1841; settled at Auburn, N. Y., where he edited (1845-46) the *Calvary Token*, a monthly paper. D. May 28, 1850.

**Maga'da**, a kingdom of India in the 4th century A. C., at the time of the invasion of Alexander the Great. It occupied the valleys of the Ganges and Jumna, the cap. being Palibothra. The greatest monarchs of M. were Chandragupta (312-280), and his grandson Asoka (250 B. C.).

**Magalla'nes**, or **Magellan** (FERNANDO), b. at Oporto, Port., in the latter part of the 15th century; entered the navy at an early age, and distinguished himself in the E. I., but left in 1517 the Port. service and went to Sp., proposing to Cardinal Ximenes to discover a W. route to the Molucca or Spice Islands. He sailed from Seville Aug. 10, 1519, reached the mouth of the river La Plata Jan. 12, 1520, and on Oct. 21, 1520, entered the strait between the island of Terra del Fuego and the Amer. continent, which afterward came to bear his name. On Nov. 28 he had launched into the Pacific, and after many hardships the fleet reached the Ladrones on Mar. 6, 1521, and the Philippine Islands on the 18th of the same month. M. took possession of these islands in the name of the Sp. king, but on Apr. 27, 1521, he was killed in an encounter with the natives. Only one of the ships returned to Sp. (Sept. 1522), and thus the first circumnavigation of the earth was achieved.

**Magallanes**, or **Magellan Strait** of, separates the



continent of S. Amer. from the island of Terra del Fuego. It is 300 m. long, from 5 to 30 m. broad, but difficult to navigate; discovered in 1520 by Magallanes (Magellan).

**Magazine' Guns**, breech-loading small-arms, having a magazine-tube in the stock to carry several cartridges. After firing a cartridge the empty shell is thrown out, and a full cartridge brought into position and loaded by mechanical means.

**Mag'dala** [Ar. *Mejdel*], in Galilee, on the W. shore of the lake, at the S. E. corner of the plain of Gennesaret, about 3 m. N. of Tiberias. It contains some 20 miserable huts, and is the only inhabited spot in the plain.

**Magdala**, a mt.-fortress of Abyssinia, situated on one of the 3 peaks of the spur which King Theodore defended against the Eng. The 3 peaks rise about 9000 ft., and are separated from each other by saddle-like depressions. On Apr. 13, 1868, the Eng. took the fortress and Theodore committed suicide.

**Magdalena**, a river of S. Amer., rises in Ecuador, flows through Colombia, and enters the Caribbean Sea in lat. 11° N. and lon. 75° W., after a course of 900 m. Its upper part is full of cataracts, but below Honda, 540 m. from its mouth, it becomes navigable.

**Mag'dalene**, or **Mary Magdalene**, a woman who stood by Jesus at the cross; was present when Joseph of Arimathea laid him in the sepulchre; came early on the first day of the week to the tomb and found it open; went to Peter and John, and saw the two angels sitting in the sepulchre when she returned with the apostles. Jesus himself appeared to her shortly after.

**Mag'dalen Islands**, a group of islands in the Gulf of St. Lawrence, belonging to Gaspé co., Quebec, comprising some 80,000 acres. They contain numerous harbors. Amherst, on Amherst Island, is a port of entry, and has a custom-house and jail. Fish, oil, and gypsum are exported. Pop. 3172.

**Magdeburg'**, chief town of Prus. Sax., on the Elbe, is a fortress of the first rank. Most of the streets are crooked and narrow, but the houses are generally neat and substantial, and there are several fine buildings, among which is a Gothic cathedral of the 13th century. There are many beautiful promenades. The manufactures comprise woollens, cotton, ribbons, leather, soap, and glass; the breweries and distilleries are extensive. M. is one of the commercial centres of N. Ger. It has many benevolent insts., and good military, scientific, industrial, and commercial schools. Pop. 137,135.

**Maggee'** (WILLIAM CONNOR), D. D., b. at Cork, Ire., in 1821, studied at Trinity Coll., Dublin; became curate in a Dublin parish; obtained the curacy of St. Saviour's, Bath, 1848; became incumbent of the Octagon chapel, Bath, 1850; took a leading part in organizing the Ch. Defence Society in opposition to the Liberation Society; became minister of Quebec chapel, Lond., 1860, rector of Inniskillen 1861, dean of Cork 1864, and shortly afterward dean of the chapel royal, Dublin; was Donellan lecturer at Dublin 1865-66, and appointed bp. of Peterborough 1868. He has taken an active part in the debates of the House of Lords, especially in opposition to the disestablishment of the Irish Ch.

**Magellan**. See MAGALLANES.

**Magen'ta**, town of N. It., in the prov. of Milan, was the theatre of many battles, the last being that known as the battle of Magenta, fought on the 4th of June, 1859, in which the Aus. were defeated by the Its. and Fr. Pop. 6195.

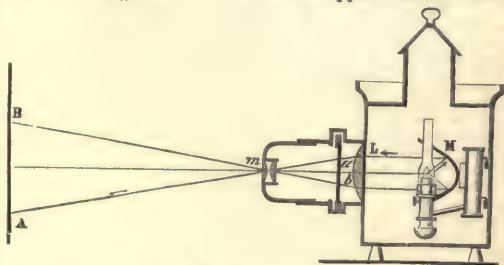
**Magi**, mā'ji, the priestly class among the anc. Medians. The amalgamation between the Magian religion and the Zoroastrian, derived by the Pers. from their Bactrian ancestors, began when the 2 nations were subjected to a common rule under Cyrus the Great. The M. attempted to reassert their power during the reign of Cambyses by placing Gomates, one of their race or class, upon the throne; but upon his overthrow by Darius Hystaspes the M. and their religion were proscribed and the faith of Zoroaster officially established.

**Mag'ic** [Lat. *magus*; Gr. *μάγος*; Pehlvi, *mag* or *mog*, a "priest". Though popularly derived from the arts of the Magi, the belief in M., or the art of working wonders by supernatural power, is inherent in man. It is evident that before exact science was founded it was impossible not to believe that there existed some primal clew by which all knowledge could be gained. As all that was positive could be expressed geometrically, it was natural enough to assume that the spiritual was subject to the same laws. The heavenly bodies had certain influences, as of the moon on the tides, the sun in giving light, heat, and health, and the planets in their conjunctions had peculiar effects on individuals. The study of astron. became more and more magical. Such methods applied to natural philos. naturally made chemical investigation reduce matter to a few elements and to a *prima materia*, which could enable man to develop or make any later forms, such as gold or diamonds, an elixir of immortality, and a universal panacea, just as the first principle in astron., also divine, was believed to give the illimitable godlike knowledge of all that the stars governed. The next step was to bring chemical principles into harmony with astrology and the lore of God and spirits. "There are four elements, without the perfect knowledge whereof we can effect nothing in magic." At the base of all was the fifth element, "that spirit which God himself breathed into man, and by which man is united again to God." The powers of this spirit "are full of wonders and mysteries, and are operative as in Magic Naturali, so the spirit or very being of stars, mountains, etc., establishing between them wonderful affinities, bestowing on them occult properties, and impressing on them by divine art in their curves, lines, colors, or spots a secret alphabet and written lang. As certain gems, metals, etc. were virtually the same with certain planets, all of them consisting of matter impressed by the same astral element, it followed

that these gems especially, when marked at fit times with signs of the proper planets, etc., became amulets which protected the bearer from disease, etc. From learning to know, and from conferring with the spirits of nature by means of prayer, will, and communion with God, there was but a step to commune with the dead and call up their spirits by the art of necromancy. When the infinite Spirit of God was supposed to be in all things, with a reciprocal appreciative spirit in man, it was soon believed that inspired books concealed deep mysteries. This was the secret of the Cabbala. This kind of M. was known to Pythagoras. The rabbis by means of it deduced universal categories of the spirit-world, the art of governing them by spells, that of making talismans, and all manner of M., great and small. The names of God properly pronounced were the highest spells; among these *Agla* was greatly revered.

As M. embraced a mutual harmony of all that exists, it included good and evil. Hence, white or holy M., and also black M. or sorcery, which works by the aid of demons. This latter was connected with witchcraft. Celestial M. was founded on prayer and communion with God. Natural M. is the art of working wonders simply by science. Ceremonial M. is chiefly cabalistical. Works on this subject are innumerable. Sorcery involved many horrible iniquities; some of the old Heb. works of M. are enough to cause their writers to be execrated by all the world. M. was a passion in Egypt and Assyria. In Alexandria, from the 2d to the 4th century, M. revived. The Renaissance, as well as the Ref., had its school of devotees to occult philos.; and the movement of Luther, which made religious discussion common to all, also popularized the study of M., and books hitherto kept in Lat. for the learned were now translated, so that everybody could raise the devil in his native tongue. The last grand revival of such studies took place with that of Masonry, Illumination, and the extraordinary fancies of the 18th century. As astrology and the Cabbala lost ground in popular faith, and witches and devils grew dim, M. took refuge in mesmerism, and more recently in its nearly related Spiritualism. (See *Curiosités des Sciences occultes* by the Bibliophile Jacob.) [From orig. art. in *J.'s Univ. Cyc.*, by C. G. LELAND.]

**Mag'ic Lan'tern**, an optical contrivance, the device of Father Athanasius Kircher, a Ger. Jesuit of the 17th century, for producing enlarged images of transparent or translucent objects, usually paintings, drawings, or photographs on glass. Optically considered, it consists of 2 distinct parts, an illuminating apparatus and a magnifying apparatus. The illuminating apparatus embraces a source of light (in the original construction a lamp), inclosed in a tightly-shutting box or chamber opening on the side, a condensing lens some inches in diameter adapted to an opening in the front of the box, and a concave mirror behind the light within, and opposite to the lens. This is properly the lantern; the magnifying apparatus is external to it, and consists of one or more converging lenses fixed in a sliding tube. The figure shows the entire apparatus in section.



The Magic Lantern.

M is the mirror, here shown as attached to the oil-chamber of the lamp, which is secured to the back of the lantern by means of bracket-hooks; L is the condensing lens; *a b* is a figure upon a glass plate, supported by a frame which slides in the grooves or ways shown in the diagram; *m* is the magnifying system of lenses; and A B is the magnified image as received upon a plane white surface, or screen. In order to give distinctness to this image the tube carrying the lenses *m* is drawn out or pushed in till the true focus is found. The mirror, M, in this design, is parabolic, and is supposed to be perforated, or notched, at top to accommodate the lamp-chimney; but in the simpler forms it is of spherical curvature, and is entirely behind the lamp. In order to exhibit the optical effects of this apparatus, the room must be darkened; and inasmuch as there must be provision for the admission of air to the lantern, and for the escape of the gaseous products of combustion, care must be taken that the apertures so provided are screened against the escape of light into the apartment.

The foregoing is a description of the M. L. in its essentials. A great variety of forms have been given to the instrument, for the purpose of producing particular effects, such as phantasmagoria, dissolving views, projections vertically upward, etc., all which will be found described in *J.'s Univ. Cyc.*, in an article on this title.

F. A. P. BARNARD.

**Mag'ic Squares**, arrangements of the terms of an arithmetical series in parallel and equal rows and columns, so that the sum of every continuous row, whether vertical, horizontal, or diagonal, may be the same. For convenience the terms are commonly arranged in regularly called geometrical squares. In some of these arrangements the rows parallel to the diagonals give also the same sum as the diagonals themselves, if, after running out at top or bottom, they are resumed from the point immediately op-



posite, and continued to completion. Such rows may be called broken diagonals, and the squares which have this property possess the magical character in the highest degree, and may be distinguished as *perfect* M. S., others being called *ordinary*. It is obvious that in any M. S., the transfer of columns from side to side or of rows from top to bottom, and *vice versa*, cannot affect the vertical or horizontal sums. By such transfers any broken diagonal may be made a true diagonal. In perfect squares these changes do not affect the magical character, but in ordinary squares they do so.

The subject of M. S. possesses a curious interest to the student of the properties of numbers, which has made it singularly fascinating to many minds. It has occupied the attention of numerous investigators, some of them men of high eminence. But the methods of construction invented by these writers, though manifesting in many instances great ingenuity, are none of them founded upon principles largely general, being apparently in most cases the results of tentative or empirical processes of inquiry, and special methods of construction may be multiplied almost to infinity. (For an elaborate treatment, see *Magic Squares*, in *J's Univ. Cyc.*) F. A. P. BARNARD.

**Magna Charta**, mag'na kar'ta [Lat. "The Great Charter"], a charter of liberties originally granted by King John (A. D. 1215) to the clergy, barons, and freemen of Eng., and repeatedly confirmed by subsequent monarchs, and justly regarded as forming the most important part of the Brit. const. The tyrannical character and oppressive acts of King John aroused an opposition among the clergy and barons at an early period in his reign. On Aug. 25, 1215, a council of the prelates and barons was held in Lond. for the purpose of concerting measures by which the royal authority might be confined within legal bounds, and the rights and liberties of all estates in the kingdom might be secured and guaranteed. The contest, which was thus openly commenced, lasted through the 2 succeeding yrs. All the manœuvres of the king, by which he attempted to weaken and divide his opponents, were unsuccessful: the clergy, as well as the nobility and the commons, remained firm in their demands for such fundamental guaranties as should secure their rights and liberties. On May 24, 1215, the barons with a large force entered Lond., the king having fled from the Tower to Odham in Hampshire. From this place he sent word that he would comply with the petitions, and asked that a time and place should be appointed for a conference. The barons named Runnymede as the place and the 9th of June as the day. The conference actually commenced on the 15th and lasted until the 19th. The Great Charter itself was finally consummated and the royal seal affixed at Runnymede on Friday, the 19th, although it bears date the 15th of June, 1215, the day on which the negotiations were commenced.

The Great Charter was most solemnly re-established and confirmed by the king and Parl. A. D. 1300, being the 25th yr. of the reign of Edward I., and in the form as thus finally adopted, although differing in several particulars from the original, it appears in the Eng. statute-book, and has been again confirmed by kings and Parl. more than 30 times. The Great Charter remains in full force and effect as the very foundation and security of civil liberty in G. Brit., and the most important and comprehensive of the clauses has been incorporated into all the Amer. consts., national and State. The most important articles by far of the Great Charter are the 39th and 40th. The corresponding article of the charter of 9 Hen. III. and 25 Edw. I. is the 29th. The following is the authoritative translation of this capital provision as found in the Eng. book of statutes: "No freeman shall be taken, or imprisoned, or be disseised of his freehold, or liberties, or free customs, or be outlawed, or exiled, or any otherwise destroyed; nor will we pass upon him nor condemn him, but by lawful judgment of his peers, or by the law of the land. We will sell to no man, we will not deny or defer to any man, either right or justice." To this text I shall only add a sentence from the eloquent eulogium of Lord Chatham: "These three words, '*nullus liber homo*,' have a meaning which interests us all; they deserve to be remembered, they deserve to be inculcated in our minds, they are worth all the classics." JOHN NORTON POMEROY.

**Magna Græcia**, the name by which the anc. denoted collectively the Gr. cities and settlements in S. It. These colonies were planted in the 8th century B. C. by different Gr. peoples—Croton in 710 by the Achæans, Tarentum in 708 by the Spartans, Locri in 708 by the Locrians, Sybaris and Rhegium by the Chalcidians—and they very soon attained a high degree of prosperity. When conquered by the Romans, in the 3d century A. C. they lost their splendor, and at the time of Cicero most of them lay in ruins.

**Magnesia**, mag-nē'zhe-a, the oxide of the elemental metal magnesium.

**Native Magnesia**.—It occurs as the beautiful crystallized mineral species *periclase* or *periclasite*, which is too rare even to be a gem.

**Properties**.—Artificial M. is a snow-white powder. In the mass it is usually very light, because so finely divided, but its true density is high, at least 3.2, and on strong ignition it becomes as heavy as periclasite—3.61. Before Hare's blow-pipe it melts to an enamel hard enough to scratch glass. It requires for solution 55,368 times its weight of water, or very nearly one U. S. gal. to dissolve 1 grain. M. is an exceedingly bad conductor of heat, and may be used for confining heat in boilers, for refrigerators, and fire-proof safes. Its refractory character has also led to its proposal as a material for crucibles made by hydraulic compression.

**Occurrence in Nature**.—M. is of almost universal occurrence—in rocks, soils, mineral waters, the ocean, and as an essential constituent of almost all plants and animals. It occurs as *dolomite*, forming mt.-masses and containing 21.73 per cent.; as *serpentine*, a silicate of M., containing some 43 per cent.; as *magnesite*, the carbonate, containing 47.6 per

cent.; in the crystalline schists, from which most other rocks and all soils are mainly formed, it is in the forms of *magnesian amphiboles* and *pyroxenes*, containing often 20 or 25 per cent.; *M.-micas*, or *phlogopite* and *biotite*, *hypersthene*, etc., etc. The trap-rocks of the Hudson River Palisades contain sometimes as much as 10 per cent. of M. There are very few limestones which are not more or less magnesian. Sea-water contains nearly  $\frac{1}{4}$  of 1 per cent. of M., and the *bitterish* taste of the ocean-brine is attributed chiefly thereto. The chief source of commercial M. and its salts at present is probably the native chloride, *carналite*, and other magnesian minerals of the celebrated Stassfurt deposits, the residua from the evaporation of some anc. sea. Many medicinal mineral waters owe their virtues wholly or in part to M. The ashes of grains of wheat contain 11.75 per cent. of M., and a soil deficient in this constituent, which is not at all uncommon, could not, of course, grow wheat, no matter how rich otherwise. The amount of M. in the grain is nearly 4 times the lime, while this proportion is about reversed in the straw; so that a good calcareous soil, if lacking M., might produce straw without any wheat.

**Preparation**.—Usually by gently igniting the carbonate.

**Uses**.—Under *Properties*, above, some of the uses have been referred to. Its medicinal uses are elsewhere treated of. A mixture of M., water, and the chloride of magnesium forms a cement, known as *Sorel's cement*, which hardens to an oxychloride as hard as marble.

**Salts and Compounds**.—Of these, the carbonate, sulphate, and chloride are the only ones of much practical note. The commercial carbonate is not a simple carbonate of M., but a compound of the carbonate and a hydrate, and its composition varies considerably with the mode of preparation. The simple carbonate occurs native, as the mineral *magnesite*. The hydrate is also found native as *brucite* and *neumilite*. The sulphate of M. is known commercially as *Epsom salt* (Ger. *Bittersalz*). It was first discovered in the springs at Epsom in Eng. by Dr. Grew in 1675. Much is contained in the mother-liquor left after crystallizing out the salt from sea-water. It occurs as a mineral, *epsomite*, particularly in dry caves. The chloride of magnesium is important only as being the compound employed in the manufacture of the metal magnesium. [From orig. art. in *J's Univ. Cyc.*, by Prof. HENRY WURTZ, Ph. D.]

**Magnesia**, a town in Lydia, now *Manissa*, celebrated for the battle in 190 A. C. between the 2 Scipios and Antiochus the Great of Syria.

**Magnesium**, the metal of which magnesia is the oxide, and of which magnesian minerals and magnesian rocks are the ores. The ocean is an inexhaustible reservoir of M. Each cubic foot of the ocean contains 1.34 ounces of metallic M., or over  $\frac{1}{10}$  of a cubic inch. A cube of 30 ft. of sea-water contains 1 ton of 2240 lbs. of the metal M.

**Properties, Chemical and Physical**.—M. is silver-white and very brilliant, malleable, and ductile. It melts at a red heat, and is readily cast into ingots. At a higher heat it volatilizes and distills, like zinc, which will facilitate greatly its manufacture and purification on a large scale. The density of M. is 1.743. One of the most remarkable characters of M. is its combustibility in the form of filings, wire, or ribbon, with a light of dazzling brilliancy. In this also it is like zinc, which will burn in the same way if in sufficiently thin foil. A chemist named Woods has shown very recently that in this combustion more heat is developed per chemical equivalent of combustible—that is, for equal amounts of oxygen taken up—than in the case of any other metal, so far as known. Being by far the lightest substance of equal strength that is known, and obtainable in unlimited quantities, it is unquestionably, next to *aluminium*, the most important of the metals of the future.

**Manufacture of Magnesium**.—The method of Sonstadt consists in heating in a closed crucible 6 parts of chloride of M., 1 of dry common salt, 1 of powdered fluor-spar, and 1 of metallic sodium to a bright red heat. The granules of M. thus formed are separated from the mass and purified by distillation in a current of dry hydrogen gas, at a white heat, in an apparatus composed of carbon. It is incorporated into a body for casting into ingots by fusing, under a flux composed of the same ingredients as above—mixed chlorides of M. and sodium and fluoride of calcium. [From orig. art. in *J's Univ. Cyc.*, by Prof. HENRY WURTZ, Ph. D.]

**Magnesium, Medicinal Uses of**. The compounds of M. used in med. are magnesia and magnesium carbonate, citrate, and sulphate. Magnesia and the carbonate are valuable as alkalis to neutralize acidity in the alimentary canal. Hence, in poisoning by the mineral acids and in acid dyspepsia they are very useful, but cannot be employed to alkalinize the blood. All soluble magnesian salts are purgative, producing watery discharges. M. citrate is employed as an agreeable laxative and mild purge. M. sulphate, or "Epsom salt," is a more powerful though safe neutral saline purge, and is used where a free watery evacuation is desired.

**Magnet; Magnetism; Terrestrial Magnetism**.

The word *magnet* is from the Gr. *μάγνης*, the name given to the loadstone or native M., an ore of iron extensively distributed over the globe.

The loadstone has the power of giving all of its own properties to hard iron or steel when these bodies are touched by it. If we take 2 bars of steel, magnetized as just described, and suspend them at some distance from each other, we shall observe that they will oscillate through arcs of gradually decreasing amplitude until they come to rest with their lengths in a northerly and southerly direction. If we mark those ends of the bars which point northerly, and bring the marked end of one M. near the marked end of the other, the marked end of the latter will swing away from the marked end of the former. But if the marked end be brought near the unmarked end of the suspended M., the latter will move toward the former. The ends of the M. are called their *poles*, and the laws are: *Unlike magnetic poles attract, and like poles repel.*



**Method of Detecting a Magnet and a Magnetic Substance.**—Let  $NS$  be a  $M$ . free to move in a horizontal plane, and let  $N'S'$  be the bar whose magnetic condition we would determine. We bring  $N'S'$  near the  $M$ .  $NS$ , so that it points toward the centre of  $NS$ , and at right angles to its length. If  $NS$  remain at rest, we know that  $N'S'$  is not a  $M$ .; but it may be a magnetic substance, for the bar  $N'S'$  acts like a bar of soft iron, attracting equally  $N$  and  $S$ , and hence the  $M$ . remains at rest. But if  $N'S'$  should rotate around its centre, then  $N'S'$  is a  $M$ .; and if it should rotate in the same direction as the hands of a watch, then the end  $N'$  nearest the  $M$ .  $NS$  is a  $N$  magnetic pole, and vice versa.

**Phenomena presented by a Broken Magnet.**—When a  $M$ . is broken in two, each of the parts is a perfect  $M$ ., containing  $N$  and  $S$ . polarity. Thus, each molecule of the  $M$ . is itself a perfect  $M$ .

**Magnetic Induction.**—The most remarkable phenomenon of magnetic action is that called *induction*. If  $NS$  be a  $M$ ., and

FIG. 1.

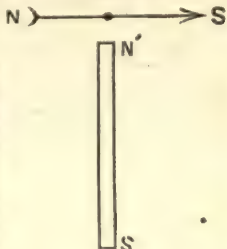
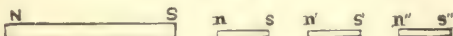


FIG. 2.



$n$ ,  $s$ ,  $n'$ ,  $s'$ ,  $n''$ ,  $s''$  be bars of iron, it will be found that as long as  $NS$  is near the iron bars the latter will be  $M$ ., with their poles  $n$ ,  $s$ ,  $n'$ ,  $s'$ , etc. all placed in the same direction as those of  $NS$ , as shown in the figure. The interposition of any substance, not magnetic, between  $NS$  and  $n$ , or between  $S$  and  $n'$ ,

or  $s'$  and  $n''$ , has no effect in decreasing or augmenting the magnetic intensity of the bars. If  $NS$  be gradually removed from  $n$ ,  $s$ , then the magnetism of the bars will gradually diminish until it becomes imperceptible when  $NS$  has been removed to a considerable distance. If  $NS$  be brought in contact with  $n$ ,  $s$ , and the bars be pushed together, they will adhere as long as  $NS$  touches the bar  $n$ ,  $s$ .

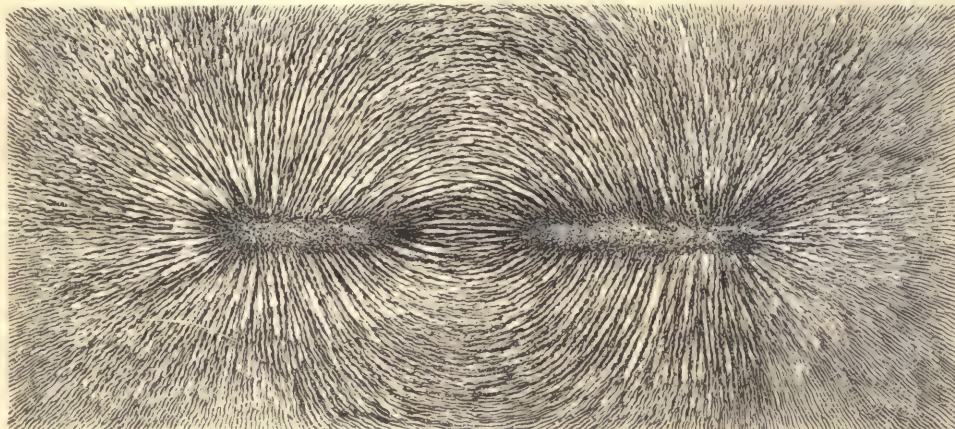
**Explanation of the Magnetization of Hard Steel.**—*Coercive Force.*—In soft iron the molecules are readily placed with their magnetic axes in line, but the axes of the molecules of steel are with difficulty brought into one direction, but retain more or less of their alignment after the inducing  $M$ . has been withdrawn. This resistance which a body offers to its magnetization is called its *coercive force*.

**Apparent Concentration of Force at the Ends of a Magnet.**—If a bar  $M$ . be rolled in iron filings, this substance will only adhere near the ends of the  $M$ ., the middle portion of the  $M$ . appearing entirely devoid of magnetic properties.

**Definition of the Pole of a Magnet.**—Consider a point in which positive magnetism is concentrated, and situate at so great a distance from a  $M$ . that all straight lines drawn from this centre to different points of the  $M$ . can be regarded as parallel. Each point of the negative half of the  $M$ . is attracted, and so much the more strongly as it is nearer the extremity of the  $M$ . All of these parallel attractions have a resultant whose point of application is situate within the  $M$ . at a certain distance from the extremity. This point of application is called the *pole* of the  $M$ . There exists a similar pole in the other half of the  $M$ ., which is the point of application of the resultant of the repulsive forces exerted on the magnetic centre.

**Lines of Magnetic Force.**—If fine filings of soft iron be uniformly sifted over a glass plate, and this plate be then placed gently on a  $M$ ., we shall observe merely a slight bristling of the filings, caused by the action of the  $M$ .; but if the plate be carefully vibrated, we shall observe a system of lines gradually develop (Fig. 3). The contemplation of these

FIG. 3.

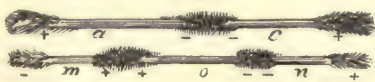


Magnetic Curves.

curves, in connection with the action of  $M$ . on magnetic bodies led Faraday to the adoption of the terms "magnetic field" and "lines of magnetic force."

**Methods of Making Artificial Magnets.**—*Consequent Points.*—In hypothetical lang. magnetization is a method of permanently separating the magnetisms of steel bars, and thus giving to the bars the properties of the  $M$ . which magnetized them. The various processes of magnetization are termed *touches*, and are divided into the methods of *simple touch*, *double touch*, and *separated touch*. The earliest known method of magnetization is to place the bar of steel against a loadstone, and in the direction of the line joining its 2 poles. After some time the latter is found to be magnetized. When the bar touches the  $N$ . pole of the  $M$ . there is found near the point of contact a  $S$ . pole in the bar, and a little farther in the axis of the bar there exists a  $N$ . pole, and next to this a second very feeble  $S$ . pole. These poles proceed slowly toward the opposite extremity of the bar, and at the end of a certain time the first  $N$ . pole will reach its extremity, and the magnetized bar will be found with 2 poles only. If the bar is very long, this pole will never reach its extremity, and there will be produced *consequent points* in the bar; that is, there will exist more than 2 poles in the bar, and 2 of these interior contiguous poles form what is called a *consequent*

FIG. 4.



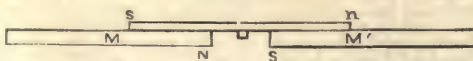
point. See Fig. 4, where the consequent points have been detected by rolling the bar in iron filings.

**Simple Touch and Friction.**—We can magnetize to saturation any little bar of steel by sliding over it the pole of a  $M$ . several times, always being careful that the pole of the  $M$ . glides in the same direction during each pass.

**Method of Double Touch.**—Two powerful magnetic bars,  $M$  and  $M'$  (Fig. 5), are placed in the same straight line with their opposite poles,  $N$  and  $S$ , very near each other; the needle or bar  $n$  to be magnetized is laid flat on the surface of the bars, with its centre over the space between the  $M$ . The magnets

$M$  and  $M'$  are now separated by moving them in opposite directions, while the bar  $n$  remains stationary, until the bar rests with its extremities in contact with the 2  $M$ .; it is then slid off sideways, removed to some distance, but still kept

FIG. 5.



parallel to the  $M$ ., which are to be restored to their former position, and the bar or needle replaced for a new operation. The poles  $N$  and  $S$  of the  $M$ . conspire in their action on the bar  $n$ ; the pole  $N$  of the magnet  $M$  attracts all of the  $S$ . polarity and repels the  $N$ ., while the pole  $S$  of the bar  $M'$  attracts all of the  $N$ . polarity and repels the  $S$ .; hence, in the final and permanent magnetic condition of the bar, the position of the poles  $n$  is the reverse of the poles  $NS$  of the bars. In *Epinius's* method the ends of the bar to be magnetized rest upon the ends of the opposite poles of 2 powerful  $M$ .,  $a$  and  $b$ , as shown in Fig. 6. Two movable  $M$ .,  $c$  and  $d$ , are

FIG. 6.



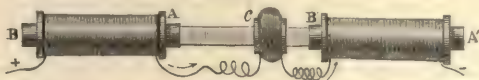
placed on the middle of the bar, with the poles of each of the same name as that of the pole of the fixed  $M$ . nearest it. These 2  $M$ ., separated by a block of wood, are placed at an inclination of  $15^\circ$  to  $30^\circ$  to the bar. In this position the 2  $M$ . are slid together from one extremity to the other of the bar, so that each half of the bar has had the same number of strokes.

**Magnetization by Means of a Current of Voltaic Electricity.**—The bar to be magnetized is placed between the opposite poles of 2 powerful electro- $M$ .  $A$  and  $B$ ,  $A'$  and  $B'$  (Fig. 7). The vol-



taic current which passes through these electro-M. also passes through a helix C, which is moved backward and forward.

FIG. 7.



ward the same number of times over each half of the M., and is finally brought to rest in the centre of the bar.

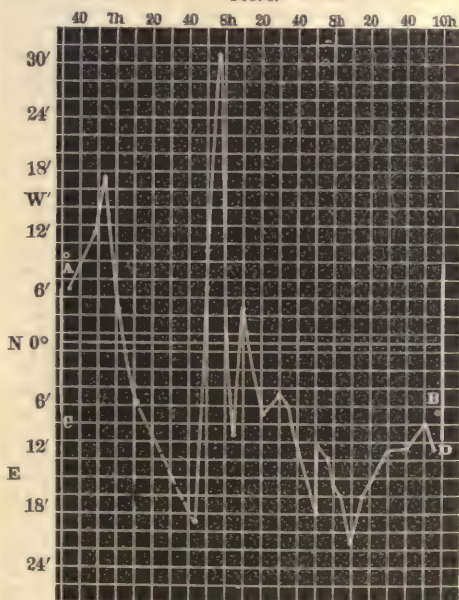
**Supersaturated Magnets.**—M. made by the processes of double touch and of the voltaic current are often *supersaturated*; that is, they contain more separated magnetisms than the bar can maintain separated when it is left to itself; for after these M. have been made their magnetic powers gradually diminish until they reach saturation.

**Terrestrial Magnetism.**—*Mariner's Compass.*—*The Magnetic Declination.*—A natural or artificial M. suspended by a thread or floated on water places itself in a northerly and southerly line. Always pointing to the pole-star, it guides the mariner on his course. The fact that the needle does not point to the N. at all places was early known (variation or declination). Columbus discovered a line of no variation  $24^\circ$  E. of the Isle of Corvo in the Azores. But the needle does not keep one line of direction even in the same place, but slowly changes its angle with the meridian yr. by yr. The N. end of the needle has at Lond. moved about  $3\frac{1}{2}^\circ$  to the eastward during the last 30 yrs. It occupies 158 yrs. for the needle to swing from the geographic meridian into its extreme W. declination, and after reaching this extreme position it at once begins its approach to the meridian.

**Daily Variations of the Magnetic Needle.**—In the N. hemisphere the N. end of the needle has its extreme easterly position 4 or 5 hours before midday; hence it begins to swing with an increasing velocity, which attains its maximum nearly at the moment when the sun crosses the magnetic meridian of the station. One or two hours afterward the needle comes to rest, and soon after begins its eastward swing, and comes, with a slight secondary vibration, to its first position about sunrise.

**Magnetic Perturbations and the Aurora Polar.**—The M. is often subject to sudden and extensive motions in variation, coming at unexpected times, and affecting simultaneously M. suspended at great distances from each other. These disturbances are often accompanied by displays of the aurora polaris, and it has been observed that the flashes and lateral movements of the auroral columns are always accompanied by simultaneous movements of the M. in declination. Also, an examination of extended series of observations on auroras has led to the discovery that they obey periods of maximum and minimum frequency, coinciding with the cycles of the solar spots and of the mean daily range in declination. The vertical divisions of Fig. 8, as shown on the

FIG. 8.



Magnetic Motions during an Aurora.

left, equal  $3'$  of arc each. The r. m. times of observation are given on the upper horizontal line. The distances of the broken line above  $0^\circ$  show W., and those below E. positions of the N. end of the M. referred to the line  $0^\circ$ , which is the mean declination of Oct. 14, 1870. The line D represents the range ( $18.43$ ) of Oct. 14. A is the position the M. had ( $+9.33$ ) at 1h. 17m. p. m. on Oct. 14, while B is the declination ( $-7.25$ ) at 8h. a. m. (the time of greatest E. declination) on the morning of Oct. 15. Observations made on the aurora simultaneously with those on the M. showed that the motion of the M. coincided in its maxima and minima with the greatest activity of the aurora.

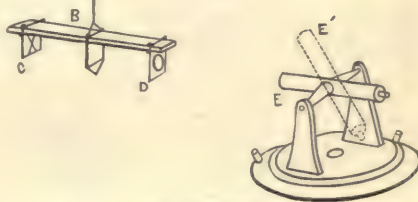
**The Dip of the Magnetic Needle.**—*Magnetic Poles and Equator.*—If a bar of steel is supported on its centre of gravity, so that it will necessarily remain in any position in which it is placed, it will, after having been magnetized, swing into

the magnetic meridian and place its length at an angle with the horizon. In the N. magnetic hemisphere the N. end of the needle points downward; in the S. magnetic hemisphere the S. pole of the M. points downward. This phenomenon is called the *dip* of the needle. The point where the needle takes an exactly perpendicular position is called the N. magnetic pole of the earth. No explorer has reached the S. magnetic pole.

**Magnetic Equator.**—Between these 2 poles, along an irregular line in the tropics, the needle does not dip, but holds a truly horizontal position. This line, passing round the globe near its equator, in every part of which the dip is nothing, is called the *magnetic equator*, which is a very irregular line, crossing the equator at four points, as shown in Fig. 9.

**Determination of the Declination.**—The declination is determined with the instrument represented in Fig. 10. E. is

FIG. 10.



The Declinometer.

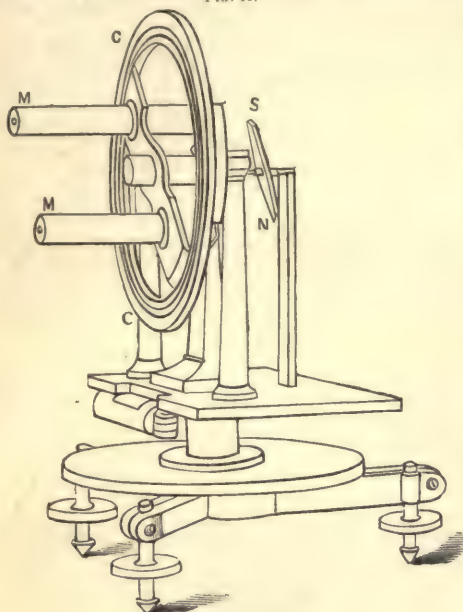
a theodolite whose telescope rotates on a horizontal axis. This telescope has also a motion around a vertical axis, and this motion in azimuth is measured by a horizontal divided circle. B is a M. suspended by untwisted silk fibres. Attached to the M. is a small frame C carrying 2 crossed spider threads. At the other end of the M. is a frame D, in which is a lens whose principal focus is exactly in the plane of the cross-threads. The rays issuing from the illuminated threads will therefore emerge from the lens as parallel rays, and when the axis of the telescope is coincident with the axis of the lens, we shall see distinctly the image of the cross-threads, when the telescope gives the distinct image of a star. After the telescope has been adjusted so that the point of crossing of the threads at its focus coincides with the image of the point of crossing of the threads of the M., the reading is made on the horizontal divided circle. After this the theodolite is turned on its horizontal and vertical axes until the pole-star or some other circumpolar star is seen bisected by the cross-threads in the telescope. Knowing the time at which this bisection is made, the geographic meridian is readily computed, and the reading of the circle when the telescope points due N. is known. The difference between this angular reading and the one previously made when the cross-threads of the M. were observed gives the *magnetic declination*.

**Determination of the Dip.**—Fig. 11 shows the best form of dipping-needle. S N is a magnetic needle with a delicate steel axis resting on 2 parallel edges of agate. C C is a vertical divided circle. Attached to an arm with verniers are 2 microscopes with cross-threads at their foci. This arm glides around the vertical circle. To determine the dip, the vertical axis of the instrument is first adjusted to preserve a vertical position when the instrument is rotated around this axis. We then substitute for the magnetic needle a similar one made of brass, but loaded at one of its ends, so that this end always points downward. A sight is taken with one of the reading microscopes on a cross-thread stretched over an opening in this end of the needle. The axis of the needle is reversed and another sight taken, this time on the other side of the cross-threads. The mean of the readings of the vertical circle corresponding to the above 2 sights will give the reading of the circle for the vertical position of the axis of the needle. The magnetic needle is now placed on the agate edges, and the instrument is rotated around the vertical axis until the pointed end, or medial mark, of the needle points to the vertical reading of the circle. In this position the plane of motion of the needle is at right angles to the magnetic meridian, so that on rotating the instrument through  $90^\circ$  the plane of motion of the needle is brought into the magnetic meridian. The pointed ends of the needle



are now bisected by the 2 reading microscopes, and the corresponding readings on the vertical circle taken. After having obtained the reading on the needle above described, the vertical axis of the instrument is rotated through  $180^\circ$ , and another reading of the dip obtained. The magnetism of the

FIG. 11.

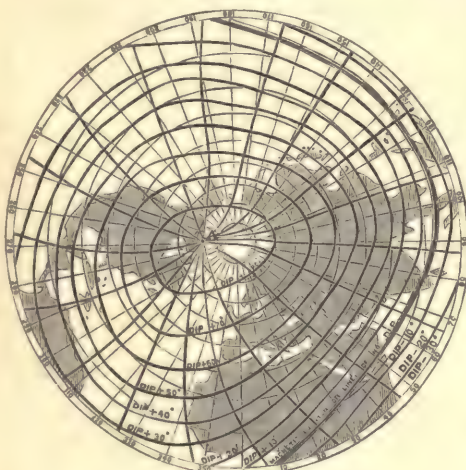


The Kew Dipping-needle.

needle is then reversed by the method of double touch or by the voltaic current, and the 2 series of observations just described are repeated. The mean of the 4 series will give the true dip.

**Magnetic Charts.**—Observations on the magnetic declination and dip have been made over a large portion of the earth, and maps have been constructed on which are drawn the magnetic equator and its poles, the lines of equal declination, the lines of no declination, and the lines of equal dip with the magnetic meridians. In Figs. 12 and 13 are laid down the position of the N. and S. magnetic poles, the magnetic equator, the lines of equal dip, and the magnetic meridians. The magnetic meridians are lines which would be described by transporting a declination M, so that it constantly moved in the direction in which it pointed.

FIG. 12.



A, North Magnetic Pole.

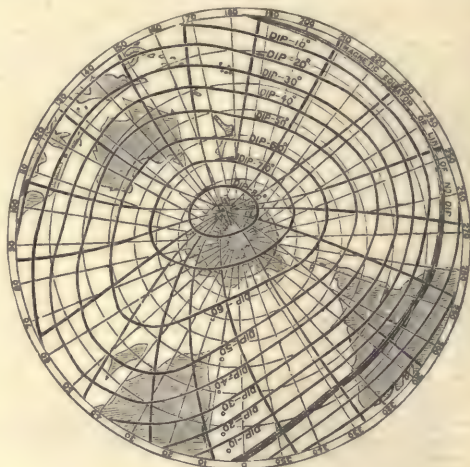
These lines evidently cross the lines of equal dip, and converge to the 2 magnetic poles. To convey a vivid idea of the phenomena of the dip, Fig. 14 is given.

**The Earth a Great Magnet.**—The phenomena of terrestrial magnetism are explained by regarding the earth as a great M. of an irregular structure, so that its magnetism is very unequally distributed in and over its mass. Indeed, spheres have been formed of large masses of loadstone which so act on small dipping-needles carried over their surfaces as to give results which approach in character to the irregular lines which express the magnetic elements of the earth. That the earth is a great M. is proved by its producing the same actions as does a M. on suspended M. when these bodies are placed in the same conditions in reference to the earth and to the M. Thus, a bar of soft iron is temporarily

magnetized when pointed toward the pole of a M. or toward the magnetic pole of the earth.

**Correction of the Compass in Iron Ships.**—In 1803 Capt. Flinders first made the important observation that the disturbances in his compasses could be accounted for by assuming the existence of iron placed in the direction of the ship's head and charged with S. magnetism for the N. hemisphere, and with N. magnetism for the S. hemisphere. To correct these disturbances he suggested placing aft of the compass a vertical bar of soft iron whose upper end, having like magnetism as the imaginary mass in the ship's head, would, in acting on the opposite pole of the compass-needle, correct its disturbances. The first real explanation of the peculiar disturbances observed in iron ships was

FIG. 13.



A, South Magnetic Pole.

given by Airy in 1839. He was the first clearly to distinguish between the effects of the magnetism induced in the ship by the earth's inductive action, and what he terms the *sub-permanent* magnetism of an iron ship. By the latter is designated such a character of magnetization as is given to a bar of iron when it is placed in the line of the dip and struck. In single iron bars the sub-permanent magnetism diminishes sensibly in a few hours, and is lost in a few days. In some large iron ships a portion of it has remained unaltered for many yrs. Hence, both induced and sub-permanent magnetism exists in iron ships. Airy "conceives the ship's magnetism to be resolved into 2 parts—one transversal to the ship, one longitudinal. When the ship's head is placed N. or S., the transversal force alone disturbs the compass, and the quadrantal (inductive) disturbance van-

FIG. 14.



Magnetic Dip and Intensity.

ishes; and the transversal magnetic part can be corrected by an opposite transversal M. broadside on to the compass, whose distance is determined without any calculation, simply by trying its effect at different distances till the needle points correctly. Then, in like manner, if the ship's head be placed E. or W., the longitudinal magnetism only disturbs the compass, as the quadrantal deviation vanishes there, and it is to be corrected by a longitudinal M. broadside on to the compass, tentatively applied. The effects of permanent or sub-permanent magnetism are now entirely corrected. In order to correct for the induction effect which produces quadrantal deviation, the ship's head must be placed in azimuth  $45^\circ$  (nearly), or  $135^\circ$ , or  $225^\circ$ , or  $315^\circ$ ; there will be no difficulty in ascertaining whether the quadrantal disturbance is such as corresponds to the effect of



iron in the direction of the ship's head; and if so, it must be corrected by iron on one or both sides, shifted by trial till the correction is complete." [From orig. art. in *J.'s Univ. Cyc.*, by PROF. A. M. MAYER, PH. D.]

**Magnetic Iron Ores.** See IRON ORES.

**Magnetic Pyrites, or Pyrrhotine,** a natural sulphide of iron, differing from common iron pyrites in crystallizing in the hexagonal system and in chemical composition, containing a larger proportion of iron. It is slightly attracted by the magnet.

**Magnetism.** See MAGNET.

**Magneto-Electricity** is electricity which is produced by means of magnets. M.-E. is the correlate of electromagnetism; and precisely as magnetism is developed in an iron bar when an electric current flows through a coil surrounding it, on the one hand, so does the disappearance of the magnetism in the bar give rise to an electrical current in the coil, on the other. This is a magneto-electric current.

The conditions under which magneto-electric currents are produced are simple. A magnetic field is a space where a freely suspended magnet will take up a definite direction. This directive tendency of the field is clearly due to the magnetic force pervading it; and since a force is known when its direction and magnitude are known, the properties of the field are due to the direction and intensity of the magnetic force which it contains. To facilitate reference, the direction is generally replaced by a number of parallel or non-parallel lines called lines of force. A magnet free to move will, when placed in a magnetic field, place itself parallel to a line of force. Now, the only condition necessary for the generation of a magneto-electric current is that a conductor should move through a magnetic field in such a way as to cut the lines of force. The strength of the current generated is evident, depends in the first place on the number of lines of force which are cut by the conductor in a unit of time. In the second place, the strength of the current generated is proportional to the sine of the angle which the line of force cut makes with the axis of the conductor, and hence has its maximum value when the one is perpendicular to the other. From this relation it also follows that no current at all is produced when a conductor moves parallel to a line of force. The direction of the current is a joint function of the direction of the motion and the direction of the lines of force.

The discovery of electro-magnetism by Oersted in 1819 prepared the way very naturally for the converse discovery of magneto-electric induction by Faraday in 1831.

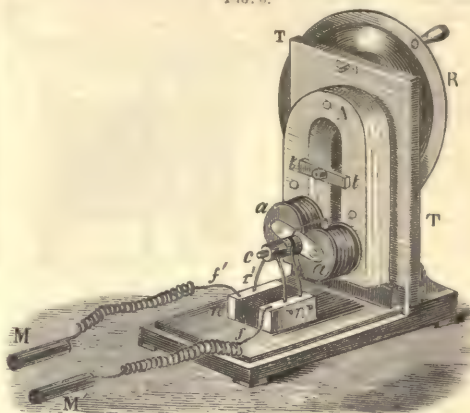
In Sept. 1832 Pixii, an instrument-maker of Paris, mounted a steel horseshoe magnet upon the end of the arbor of a lathe, and caused it to revolve with its ends opposite to those of a piece of soft iron bent into the form of a U and wound with 400 metres of silk-covered copper wire. When the ends of this wire were placed in a vessel of water, oxygen and hydrogen gases were evolved from them during the rotation of the magnet, and the more rapidly the quicker this rotation. Subsequently, a larger machine was constructed by Pixii for Ampère's lectures at the Sorbonne (Fig. 1). In this machine the magnet—which was powerful enough to lift 100 kilograms—was supported on a vertical axis and revolved by bevel gear. Above it a fixed electro-magnet was placed, wound with 1000 metres of covered wire. The machine when in action gave vivid sparks and strong shocks, diverged gold-leaves, and decomposed water rapidly.

In June 1833 Joseph Saxton of Phila., then residing in Lond., constructed a magneto-electric machine having marked improvements (Fig. 2). In place of a rotating magnet and a fixed armature, he used a fixed magnet and a rotating armature, since the armature was lighter than the magnet. The plane of the magnet was horizontal, and contained the axis of rotation of the armature.

In 1836 Clarke, an instrument-maker of Lond., described a machine essentially similar to that of Saxton, but with some variations of detail (Fig. 3). The magnet in this machine was placed vertically, with its poles downward. The armature with its coils was placed in front of these poles, and revolved about a horizontal axis passing between them, being driven by a multiplying-wheel. One end of the wire constituting the armature coil was connected with one of two brass rings or ferules upon the prolongation of the axis in front, the other end with the other ferule. Both ferules were insulated from the axis, and they were arranged to give at will the various modifications of

the current desired. Two armatures were provided, one wound with coarse, the other with fine wire.

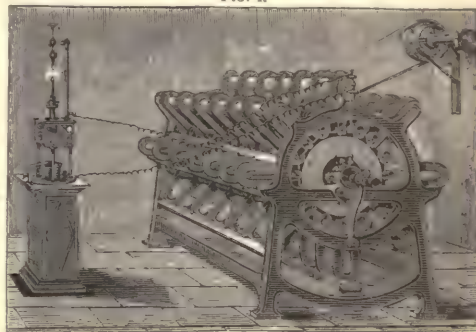
FIG. 3.



Clarke's Machine.

The "Alliance machine" is the only one in use on the large scale for the production of the electric light, in which the field of force is generated by permanent magnets (Fig. 4). It consists of 48 compound U-magnets of steel, arranged in 6 rows of 8 each. The 8 magnets are arranged radially in a

FIG. 4.



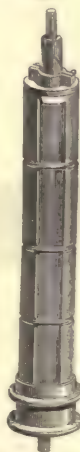
Alliance Machine.

circle, their poles facing inward and alternating, thus forming a circle of 16 alternate poles, and in all a cylinder of 96 alternate poles. On a horizontal axis passing through this cylinder 6 bronze disks are placed, upon the periphery of each of which are 16 coils of copper wire, each having a tubular core of iron slit lengthwise, the axes of the coils being horizontal and parallel to the axis of rotation. The length of a coil is such that it will just pass between the poles of two successive circles of magnets. The coils upon a single disk are united alternately right and left, the first end of one coil being joined to the last end of the preceding one. When the disks are rotated the coils are brought alternately between opposite magnetic poles at both ends, the current generated being reversed by each successive pair of poles.

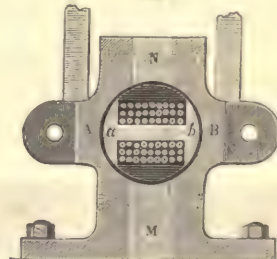
Up to this time the magneto-electric machines had all been constructed on one gen. plan, this being that of the original Saxton machine. In 1857 Werner Siemens of Berlin

FIG. 5.

FIG. 6.



Siemens Armature (longitudinal).



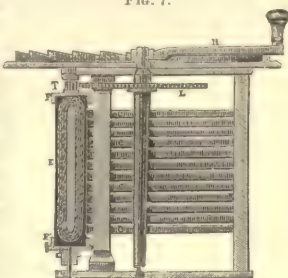
Siemens Armature (transverse).

made an important advance by devising a new form of armature, since known as the "Siemens armature." To construct it, a cylinder of soft iron whose length is 5 or 6 times its diameter is deeply grooved on opposite sides longitudinally, so as to make its cross-section nearly the shape of an I. Covered copper wire is then wound lengthwise in the grooves, and the 2 ends of the cylinder are furnished with bearings on which the armature can rotate. The ends of the wire coil communicate with a commutator placed on the axis at one end. The advantages of this form of armature,

(Figs. 5 and 6).



which are decided, consist chiefly in its compactness, the magnetic surface being large, and at the same time capable of complete action within a very intense and uniform magnetic field. Moreover, from its construction the coils cut the lines of magnetic force nearly at right angles. In Siemens's machine a series of from 12 to 30 steel U-magnets were fastened together in a row, but not in contact, their planes being parallel. A cylindrical space was made between the poles of these magnets, and in this space the armature revolved, being driven by a belt running to a pulley on one end of the axis. One of the forms of the Siemens machine is shown in Fig. 7.

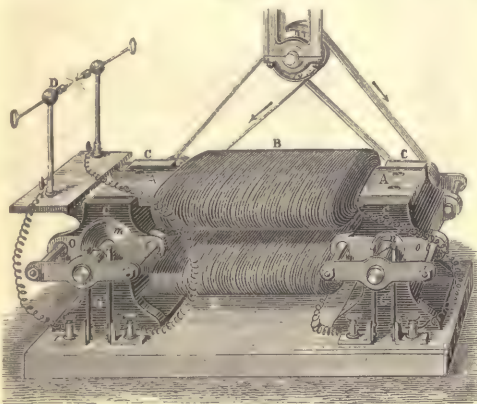


Siemens Machine.

In 1866 Wilde of Manchester produced the first magneto-electric machine in which permanent steel magnets were replaced by the vastly more powerful electro-magnets. To charge these magnets the current from a small Siemens permanent-magnet machine was used. The Wilde machine is used in Scotch light-houses.

In Mar. 1867 Ladd, an instrument-maker of London, described a new form of machine, in which the difficulty arising from having the field of force in the main circuit was very ingeniously obviated. In this machine only one electro-magnet was used, but its peculiarity consisted in its having 2 Siemens armatures upon it, one at each end, both being simultaneously driven (Fig. 8). This machine, the first

FIG. 8.



Ladd's Machine.

large machine in which residual magnetism was used as the starting-point, was called a dynamo-electric machine, the name magneto-electric machine being restricted to machines with permanent magnets. In the Ladd machine the current made in the smaller of the 2 armatures charged, through its commutator, the electro-magnets of the field of force. The current from the larger armature was used externally.

In July 1871 Z. T. Gramme, an artisan of Paris, presented to the Fr. Acad. of Sciences a description of a new form of magneto-electric machine, in which an entirely novel principle appeared. Like all other similar machines, an iron armature surrounded with coils was caused to revolve in the vicinity of a magnet; but, unlike all others, this armature was shaped like a ring, its plane coinciding with that of the U-magnet to which it was attached, and its rotation in that plane being continuous in one direction. The principle involved in the Gramme machine may be illustrated by means of the annexed cut (Fig. 9). Let N S represent a bar magnet, and X a coil of copper wire; if the coil be made to approach the end of the magnet marked N, a current of electricity will be developed in it which will continue in the same di-

FIG. 9.

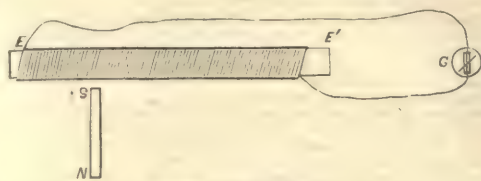


Coil and Bar Magnet.

rection until the coil reaches M, the neutral point; then it will change, continuing inverse until the coil passes off the bar at S. If the current produced when the coil moves from N to M be called positive, it will become negative as the coil moves from M to S. If the coil move from right to left, the current will be positive from S to M, and negative from M to N. To this magnet let a second one be now added, S' N', the two similar poles S and S' being placed together. If now the coil move over this double bar as before, the current developed from N to M will be positive, from M to S negative, from S' to M' negative, and from M' to N' positive; all these currents being reversed when the coil moves back again. Substitute now in place of the magnet and iron bar surrounded with a permanent coil (Fig. 10), and

place at a little distance from it a steel magnet with its axis perpendicular to that of the bar. Whenever the magnet is moved to or fro along the bar, being kept parallel to itself,

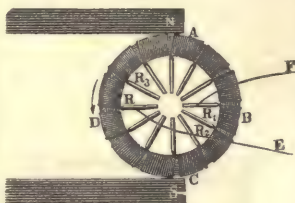
FIG. 10.



Magnet, Coil, and Iron Bar.

a current of electricity will flow through the coil, which under the circumstances given is due to 3 separate causes acting together—first, to the magnetization and demagnetization of the bar due to the approach and the recession of the magnet; second, to the constant change in polarity in the bar as the magnet moves along, while preserving constantly the same distance from it; and third, to the current which is generated in the coil itself when it cuts the lines of force of the moving magnet. The first of these currents may be demonstrated by moving the magnet to and from the bar in the direction of its own axis; the second, by keeping the magnet and the coil at rest, and moving the bar through the coil only; the third, by removing the bar entirely, and then moving the coil alone before the magnet, or the magnet before the coil. If the bar be annular, however—if it be in the form of a ring instead of a straight rod—the currents first named will, as Gauguin has shown, disappear entirely. Suppose now such a ring of iron be caused to rotate in its own plane between the poles of a U-magnet, the plane containing these poles coinciding with that of the ring, and the axis of rotation being of course perpendicular to this plane (Fig. 11). It is evident that

FIG. 11.

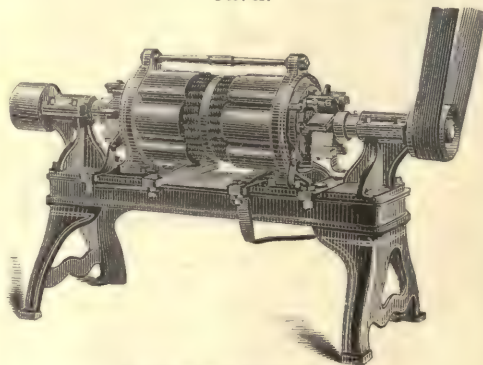


Gramme Ring.

are together and the 2 S. poles together, the neutral points being half way between the poles, or on a line perpendicular to that joining the 2 poles. If now we suppose this ring to be covered with a series of coils of copper wire all wound in the same direction, it is obvious that as the coils move from B to A, in the quadrant BA, a current will be generated in them, at first feeble, but gradually increasing in strength as the pole is approached. As above stated, this current will be due to 2 causes—first, to the fact that the spires of wire cut the lines of force of the magnet as they rotate; and second, to the fact that the iron nucleus is changing the distribution of its polarity constantly. Since these 2 currents flow in the same direction, they will of course reinforce each other. In the second quadrant AD the former of the 2 currents will remain unchanged in direction, since the lines of force are cut in the same way; the latter will, because the direction of motion of the ring with reference to the polarity of the magnet remains unchanged. The 4 currents thus developed in the 2 quadrants will therefore unite to produce a single current, the direction of which will depend on the polarity of the magnet, the direction in which the coils are wound, and the direction of rotation.

In April 1875 a patent was taken out in the U. S. by Farmer, then of Newport. The form of the plating-machine is shown in Fig. 12. It had 2 sets of electro-magnets of 6

FIG. 12.



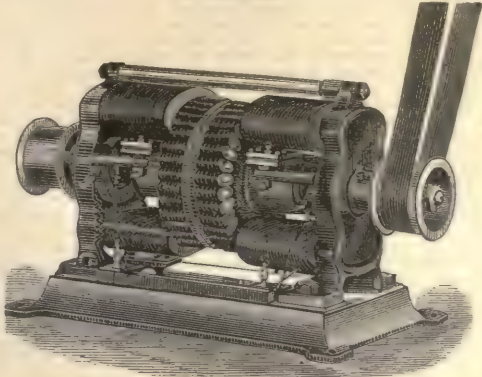
Farmer-Wallace Plating-Machine.

each, facing inward for the field of force, and 17 coils on each face of the disk for the bobbin. The machine was 61 inches long, 12 wide, and 16 high, and stood on a table 2



ft. from the ground. These machines have undergone considerable modifications and improvements, and have come into general use, especially for electro-deposition of metals.

FIG. 13.



Farmer-Wallace Machine for Light.

The machines for lighting have also been modified. In place of 12 magnets in the field of force, only 4 are used, though these are somewhat larger than formerly. Fig. 13 represents one of the 4 machines employed in lighting the grounds of the Phila. Exhibition of 1876. It had 25 armature coils on each side, wound with wire .045 inch in diameter, the wire on the field-of-force coils being .0189 inch in diameter, and the total resistance of the machine being 4.63 ohms. [From orig. art. in *J's Univ. Cyc.*, by Prof. Geo. F. Barker, M. D.]

**Magnolia** [named by Linnæus in honor of Pierre Magnol (1638-1715)], a genus of exogenous trees and shrubs, of the order Magnoliaceæ, mostly natives of the warm parts of N. Amer. and the temperate and warm parts of Asia. The U. S. have 7 species, all handsome trees or shrubs, mostly with conspicuous fragrant flowers. Among them are the cucumber tree and the umbrella tree. The smallest and the hardest is the white bay or beaver-wood (*M. glauca*), found from Cape Ann in Mass. south-westward to Tex.; the largest is the *M. grandiflora*, a superb evergreen of the S. States.

**Magnoo'** (ELIAS L.), D. D., b. at Lebanon, N. H., Oct. 20, 1810; was a bricklayer in youth, but obtained by his own exertions an education at Waterville Coll.; was ordained in 1840 to the ministry as pastor of the Second Bap. ch. at Richmond, Va.; made a tour in Europe 1846, and was successively pastor of chs. in Cin. 1847, New York 1849, Albany 1857, and Phila. 1860. He wrote *Orators of the Amer. Revolution*, *Republican Christianity*, etc.

**Magpie**, a name applied to various birds, mostly of the genus *Pica*, belonging to the crow family. The common M. of Europe (*Pica caudata*) is a bird well known for its cunning and mischievousness, and its disagreeable screaming voice. There are two sub-species in the U. S.

**Magruder**, mag-roo'der (ALLAN B.), b. in Ky. about 1780; became a lawyer; removed to La.; was U. S. Senator from that State 1812-13. D. Apr. 1822.

**Magruder** (JOHN BANKHEAD), b. in Va. about 1810, grad. at W. P. 1830; was distinguished in the Mex. war, earning the brevet of major for gallantry at Cerro Gordo, and lieut.-col. for Chapultepec, where he was wounded; resigned from the U. S. A. Apr. 30, 1861; entered the Confed. army; commanded at Yorktown until its evacuation; took part in the campaign on the Chickahominy; was appointed brig. and maj.-gen. He recovered Galveston from U. forces, and was active in military affairs in Tex. throughout the war. D. Feb. 19, 1871.

**Mahābhārata** [from Sans. *mahat*, "great," and *Bhārata*, the name of an anc. king], a great epic of anc. Indian lit. *Bhārata* is said to have been the first universal monarch, and to have brought all nations "under one umbrella." His descendants were called *Bhāratas*, and the M. was the great war between the *Bhārata* heroes, i. e. between the *Kauravas* and the *Pāndaras*. The 2 great dynasties of anc. India were the Solar and the Lunar. To the latter belongs the M. narrative. Though the wars between the *Kaurava* and the *Pāndava* families form the prin. subject of the M., many other topics are treated in the poem. The M. contains old poetical versions of nearly all legends current among anc. Hindus, treats of their customs, sciences, and laws, of their religious observances, and contains almost all known by anc. Hindus except that in the Vedas. There are over 100,000 verses in the epic. The anc. legends current respecting the *Bhārata* heroes were versified by royal bards. These versified accounts were repeatedly sung at the courts of Hindu kings; new songs and poems were from time to time added to the old; finally, some learned Hindu pandit collected all these compositions, arranged, and pub. them as one entire production—the M.

**Mahan'** (ASA), D. D., b. in Vernon, N. Y., in 1799, grad. at Hamilton Coll. in 1824, at Andover Theological Sem. 1827; became pastor of a Presb. ch. in Pittsford, N. Y., in 1829, of the Sixth st. ch. in Cin. 1831, and in 1835 pres. and prof. of philos. at Oberlin Coll., O.; was pres. of Cleveland Univ. 1850-56; pastor of a Congl. ch. in Jackson, Mich., 1856-58, of another at Adrian 1858-61, and pres. of Adrian Coll. 1861-71. He wrote *The Science of Moral Philos.*

**Mahan** (DENNIS HART), LL.D., b. in New York Apr. 2, 1802, but taken to Norfolk, Va., in infancy; intended for the profession of med., he relinquished his med. studies in 1820

to enter the U. S. Military Acad., from which he grad. at the head of his class in 1824; was retained at the acad. as assistant prof. of math. and of engineering until 1826, when he was sent to Europe on professional duty, where he passed 4 yrs. in visiting and studying the fortifications and insts. connected with his profession. Returning to the U. S. in 1830, he was in 1832 appointed prof. of the dept. of civil and military engineering, of which he had been in charge since 1830, and at the head of which he continued until 1871. Among his works are *Course of Civil Engineering*, *Treatise on Field Fortifications*. D. Sept. 16, 1871.

**Mahdi**, KL. See APPENDIX.

**Mahanoy' City**, R. R. centre, Schuylkill co., Pa., 80 m. N. W. of Phila. and 56 m. N. E. of Harrisburg, in the Mahanoy valley and coal-fields; was first settled in 1859. Pop. 1870, 5533; 1880, 7181.

**Mahmood** (or **Mahmūd I.**, sultan of Tur. (1730-1754), b. at Constantinople Aug. 6, 1696, a son of Mustapha II.; succeeded his uncle, Ahmed III., but his long reign was comparatively insignificant.—**MAHMOOD II.**, sultan of Tur. (1808-1839), b. at Constantinople July 20, 1785, became sultan July 28, 1808. M., with Bairaktar for his grand vizier, took up the work of reform, but on Nov. 14, 1808, an insurrection of the janizaries broke forth. The house of the grand vizier was razed to the ground, the city was pillaged and set on fire at different points, and even the seraglio was stormed. But being the only surviving descendant of Osman, and, in consequence of a Tur. superstition which makes the destiny of the race dependent on the continuation of the dynasty of Osman, his person became inviolable. The attempts at reform had roused the religious and national fanaticism of the Turks to the highest pitch, and in this situation entered a young prince with his head full of reforms, but without experience. In some respects, however, M. succeeded. In 1826 he dissolved the corps of the janizaries after a horrible struggle in the streets of Constantinople; 15,000 were executed, 15,000 exiled, and the reorganization of the Tur. army after European models followed rapidly. Roads were made, an effective police established, postal communications introduced, and diplomatic connections with other European courts maintained. Of immense importance was the beginning emancipation of the Tur. women, who appeared now in public outside the harem. But in other respects M. failed signally. Gr. became independent, and Egypt was almost independent. It was only the interference of Rus., which prevented the Ottoman empire from falling to pieces. D. July 1, 1839.

**Mahmood** (or **Mahmūd of Ghizni** (ABUL-KASIM-YEMIN-ED-DAULAR), sultan of Per., first Mohammedan emp. of India and founder of the Ghizvide dynasty, b. at Ghizni (Ghazna or Ghuzny) in Candahar Dec. 12, 967. His father, Subuktigin, owned a nominal allegiance to Per., but was really independent. In 997 M. overthrew his younger brother, Ismael, who had succeeded to the govt. by his father's appointment; took Ghizni 998, formed an alliance with the rulers of Toorkistan and Kashgaria, and overthrew the Per. kingdom, which was divided among the confederates; turned his arms against India, plundered and devastated the country, carried off enormous treasures, and massacred vast numbers of the Hindoos. M. was the first ruler who assumed the title of sultan. D. Apr. 3, 1030.

**Mahogany** [a word of aboriginal Amer. origin], the *Swietenia Mahogani*, a noble forest tree of the W. I. and Central and S. Amer. Its wood is of very beautiful reddish color, extremely hard, strong, and heavy, and so costly that for a long time it has been used almost entirely as a veneering. It has for nearly 300 yrs. been a staple article of commerce, from Honduras, Cuba, Hayti, Jamaica, and S. Amer. The "mountain mahogany" of Ut. is the *Cercocarpus ledifolius*, of order Rosaceæ, one of the hardest woods.

**Mahomet**. See MOHAMMED.

**Mahon**, LORD. See STANHOPE, EARL OF.

**Mahone** (WILLIAM), b. in Southampton, Va., about 1827, grad. at the Va. Military Inst. 1847; devoted himself to civil engineering; was the constructor of the Norfolk and Petersburg R. R.; took part in the capture of the Norfolk navy-yard Apr. 21, 1861; raised and commanded the 6th Va. regiment; was engaged in most of the battles of the Peninsular campaign; was appointed brig.-gen. Mar. 1864, and maj.-gen. Aug. 12, 1864; at Lee's surrender was in command at Bermuda Hundred. After the war devoted himself to the development of Va. R. Rs. as pres. of several lines. In 1881 was elected to the U. S. Senate.

**Mahrattas**, ma-rat'taz, a people of Central and W. India, who in the last century overran the greater part of the peninsula, placed the Mohammedan empire of Delhi under tribute, and were for half a century the most formidable obstacle to Brit. supremacy in India.

**Maimonides**, mi-mo-ni-dez, or **Rabbi Moses ben Maimon**, abridged into **Ra M Ba M**, b. Mar. 30, 1135, of a Jewish family in Cordova, received an excellent education. For many yrs. he was compelled to renounce the public profession of Judaism and embrace Mohammedanism, but in 1165 he settled in Egypt, at Old Cairo, and was for some time engaged in the jewelry trade, but his learning soon gained for him a prominent place among his coreligionists, who rank him next to Moses, and at the Egyptian court, where he became phys. to the sultan Saladin, while his numerous writings spread his fame all over the world. He brought into a consistent system the whole mass of Jewish tradition, which lay scattered in Midrash, Mishnah, and Talmud. When he d. at Cairo, Dec. 13, 1204, his body was brought to Tiberias in Pal., and his tomb became a place of pilgrimage. His prin. work, written in Heb., is *Mishneh Torah* ("The Second Law") or *Yad Chazakah* ("The Strong Hand"), which gives a systematic representation of all Jewish laws scattered in the Bible, Talmud, and elsewhere. The most remarkable of his Arabic works is the *Delalat Al-Ha'irin*; Heb. *Moreh Nebuchim*; Lat. *Doctor Perplexorum* ("The Guide of the Erring"), the philos. of the Jewish religion.



**Maine**, the largest of the E. or N. Eng. States, and the extreme N. E. portion of the U. S., between 48° 04' and 47° 31' N. lat., and between 66° 45' and 71° 06' W. lon. It is bounded on the N. W. by Que., Dominion of Canada, on the N. by Que., on the N. B., on the S. E., and S. by the Atlantic Ocean, and on the W. by N. H.; area, 33,040 sq. m. or 21,145,600 acres; great-length, 330 m.; greatest width, from the ocean to the Canada line, 160 m. Part of the Isles of Shoals, near N. H., belong to M.



Seal of Maine.

**Face of the Country.**—The sea-coast for 10 or 20 m. inland is flat, low, and at some points marshy; exceptions are Mt. Agamentiscus in the S. W., 670 ft. high; the Camden Hills on the Penobscot, 1500 ft., and the 13 peaks of Mt. Desert Island and its vicinity, ranging from 1000 to 2800 ft. The Appalachian chain has its origin in the prov. of N. B., enters M. at Mars Hill, and crosses it in a S. W. direction, joining the White Mt. range at the N. H. line. It consists of isolated peaks, all trending S. W., though often separated by broad river-valleys and large streams. Mars Hill is about 2000 ft. above the sea; Mt. Katahdin, in the centre of the State, is 5385 ft. in height. Mt. Abraham, in Franklin co., 3400 ft., Mt. Blue, in the same co., 3800. Sugar Loaf, Chase's Mt., Mt. Mattabocus or Speckled Mt., Mt. Puzzle, and Mts. Saddleback and Bigelow also belong to this chain. Two prin. spurs or outflows from this range deserve notice—viz. the Ebene and Spencer Mts., trending S. in Piscataquis co., and the range of highlands along the Canada boundary, which rise to the height of 2000 ft. at the Monument, and attain a higher altitude in Bald Mt. Between these isolated summits the Penobscot and its prin. tributary the Piscataquis, the Kennebec, and the Androscoggin flow toward the ocean, and the valleys thus formed also contain large and deep lakes. The N. portion of the State slopes gradually down to the valley of the St. John, which is less than 300 ft. above the sea at the N. extremity of the State.

**Coast, Bays, Rivers, Lakes, Etc.**—Following the line of the shores, M. has 2186 m. of sea-coast, being the most irregular and deeply indented coast-line in the U. S. There are 17 large bays on the coast—viz. Passamaquoddy, Machias, Little Machias, Englishman's, Narraguagus, Frenchman's (protected by Mt. Desert Island), Isle au Haute, Penobscot and Belfast bays (forming together the fine estuary of the Penobscot River), Muscongus, Damariscotta, Sheepscot, Quohog, Casco, Saco, and Piscataqua Bay or estuary. The lakes and rivers must be considered together. The Saco River drains a dozen or more small lakes, and itself falls into Saco Bay. The Umbagog chain of lakes is drained by the Androscoggin, which by a circuitous course finds its way into Quohog Bay. Sebago Lake and the smaller lakes which surround it have for an outlet a small stream called Presumpscot River. The Moosehead chain, which comprises many small lakes, finds an outlet in the Kennebec River, whose course is nearly due S., and which discharges its waters into the ocean by many channels through a wide delta. The Penobscot River drains nearly  $\frac{1}{2}$  of the area of the State, and through its E. and W. branches and their tributaries furnishes an outlet for the surplus waters of more than 50 lakes and ponds. Every stream which discharges its waters into the Atlantic forms the outlet of from half a score to a score of these lakes and ponds, and the St. John River, which drains the N. part of the State, has not far from a hundred lakes and ponds attached to it and its tributaries. The area covered by the rivers and lakes is estimated at 3200 sq. m., or a little more than  $\frac{1}{11}$  of the total area of the State.

**Mineralogy.**—The prin. minerals of economic value are iron, galena, granite, lime, slate, and a fine white marble. Fine colored tourmalines are found at Paris, Oxford co., garnets, etc. at Phippsburg and Parsonsfield, feldspar, etc. at Brunswick and Topsham, and beryl of fine quality at Bowdoinham.

**Vegetation, Soil, Etc.**—The soil in the river-valleys and between the Penobscot and Kennebec is of good quality and yields large crops. In the mountainous dists. and along the sea-coast it is sterile, and does not repay cultivation. In other parts of the State it is moderately productive. A large portion of the State is still covered with forests, and its timber and lumber trade directly and indirectly gives employment to a large number of its inhabs. The forests of the N. part of the State are principally composed of pine, hemlock, and spruce. Farther S. there is an admixture of white and red oak, maple, beech, birch, and ash. There are cedar swamps in the N. portion. Butternut and hickory are found, but are not abundant. Poplar, elm, basswood, dogwood, sassafras, juniper, pine, hornbeam, buttonwood, wild-plum, alder, willow, etc. are found in the forests of the S. part of the State. Among fruit trees, the cherry, plum, pear, and apple flourish.

**Zoology.**—M. is the only State in the U. where the moose and caribou or Amer. elk are yet found. The black bear,

deer, catamount, wild-cat, wolverene, badger, marten, sable, weasel, mink, wolf, raccoon, woodchuck, porcupine, rabbit, several species of squirrels, etc. are found. Wild geese, ducks, brant, and teal inhabit the lakes, ponds, and, at certain seasons, the bays along the coast. Eagles, hawks, owls, and crows are found in all parts of the State, and gulls, fish-hawks, etc. on the coast, while partridges, pigeons, quails, robins, and generally the birds of passage common to N. Eng. are abundant in their season. Salmon, salmon-trout, shad, trout, pickerel, maselonge, sturgeon, etc. abound in the rivers and lakes, and cod, herring, mackerel, and halibut are found along the coast in great numbers. The rattlesnake, milk-adder, and a smaller adder are not uncommon; the black snake or racer, a considerable number of harmless snakes, and several of the batrachians are found.

**Climate.**—The climate, though severe and subject to great extremes, is moderately uniform during each season, and is considered generally favorable to health. The fogs and easterly winds on the coast, as well as the intense cold of the winters, are supposed to increase the mortality from pulmonary diseases, but in the interior there is little or no danger from these causes. Snow lies on the ground on the coast from  $\frac{3}{4}$  to 5 months, and in the interior from  $\frac{4}{5}$  to 6 months. The summers are short and hot. At Brunswick, in 52 yrs. of observation, July was the only month in which no frost occurred. Rainfall, between 36.46 and 45.25 inches.

**Agriculture.**—The census of 1880 showed—hay, 1,107,788 tons; potatoes, 7,999,625 bushels; oats, 2,265,575 bushels; corn, 960,633 bushels; wheat, 665,714 bushels, and buckwheat, 382,701 bushels. Potatoes are exported largely.

**Farm Animals.**—The census of 1880 showed horses, 87,848; cattle, 324,421; sheep, 565,918; swine, 74,359.

**Manufactures.**—The great production of M. being timber, the manufacture of lumber and wood-work in various forms is a large industry. The iron and steel manufacture employed, in 1880, 700 hands, with a cap. of \$450,000 and product of \$583,328. Of pig iron, 3578 tons were manufactured.

**Fisheries.**—M. has extensive cod and mackerel fisheries, and her numerous inland lakes abound in fresh-water fish. This is the only State wherein lobster-packing is pursued as an industry. The total value of the fisheries in 1880 was \$3,614,178.

**Commerce.**—Foreign commerce in 1881 from Portland alone amounted to \$4,186,153 exports and \$1,809,212 imports. The coastwise trade is also large.

**Finances of the State.**—The valuation of property in 1881 was \$235,978,716, real and personal; State tax, 50 cents on \$100, producing \$900,000. Total taxation, local and State, \$5,182,135; State debt, \$7,405,557.

**Banks, Etc.**—In 1881 there were in M. 69 national banks, with cap. of \$10,385,000; circulation, \$8,211,247, secured by \$9,244,300 U. S. bonds; deposits, \$9,458,736. There were 2 State banks and trust cos., 54 savings banks with deposits of \$24,116,117, and 7 private bankers with deposits of \$169,764. The insurance cos. in 1880 insured \$63,991,559 risks, receiving \$744,227 premiums, and paying \$468,874 losses.

**Railroads, Etc.**—M. had, in 1881, 1013 m. of railway in operation, of which the prin. were the Maine Central, Portland and Ogdensburg, Atlantic and St. Lawrence, and European and N. Amer. Cost of railways, \$39,434,181; net earnings, \$1,589,896. Large numbers of vessels are employed in the coastwise trade, numbering, in 1881, 2471 sailing and 88 steam vessels, with a tonnage of 504,100.

**Education.**—Number of children of school age (4-21 yrs.) in 1880, 214,656, of whom 149,827 were enrolled in public schools, with average attendance of 106,763. Total expenditure for public schools in 1880, \$991,297, of which \$777,692 was for teachers' salaries. There are 3 colls. with 44 instructors and 501 students, paying tuition in 1880, \$19,251.

**Churches.**—The Meths. had 232 chs. and 25,883 members; Congregationalists, 243 chs. and 21,645 members; Baps, 263 chs. and 21,165 members; Free Will Baps, 281 chs. and 15,688 members; Univts., 89 chs. and 1679 members; Prot. Epils., 35 chs. and 2103 members; R. Caths., 47 chs. and 39 priests. Other denominations have from 6000 to 30 members.

**Population.**—In 1860, 628,279; 1870, 636,915; 1880, 648,936 (white 646,852, colored 2084, including 8 Chi. and 625 Indians).

**Principal Cities and Towns.** Pop. 1880.—Portland, 33,810; Lewiston, 19,083; Bangor, 16,856; Biddeford, 12,651; Auburn, 9555; Augusta (cap.), 8865; Bath, 7874; Rockland, 7599; Saco, 6389; Calais, 6173; Belfast, 5908; Ellsworth, 5052; Gardiner, 4439; Eastport tp., 4006; Hallowell, 3154; Skowhegan, 2609; Brunswick, 2410; Waterville, 1917.

COUNTIES.	*Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
Androscoggin.....	9-B	35,866	45,042	Auburn.....	9,555
Aroostook.....	3-E	29,609	41,700	Houlton.....	1,030
Cumberland.....	10-B	82,091	86,359	Portland.....	33,810
Franklin.....	7-B	18,407	18,180	Farmington.....	1,462
Hancock.....	8-E	36,483	38,129	Ellsworth.....	5,032
Kennebec.....	9-C	53,203	53,058	Augusta.....	8,665
Knox.....	9-D	30,823	32,863	Rockland.....	7,599
Lincoln.....	10-D	25,597	24,821	Wiscasset.....	tp. 1,847
Lake.....	8-A	33,488	32,627	Paris.....	tp. 2,831
Penobscot.....	6-E	75,150	70,476	Bangor.....	16,856
Piscataquis.....	5-D	14,403	14,872	Dover.....	602
Sagadahoc.....	10-C	18,903	19,272	Bath.....	7,874
Somerset.....	6-C	34,611	32,333	Skowhegan.....	2,609
Waldo.....	9-D	34,522	32,463	Belfast.....	5,908
Washington.....	7-G	43,343	44,484	Calais.....	6,173
York.....	11-A	60,174	62,257	Machias.....	tp. 2,903
				Alfred.....	306
				Saco.....	6,389
Total.....		626,915	648,936		

\* Reference for location of counties. See map of Maine.

**History.**—The first discovery of the coast of M. was made by the Northmen as early as the yr. 990. They made occasional visits to it until the middle of the 14th century, but from that time to the second voyage of Cabot, in 1498, we have no evidence that the coast was seen by any European.













MAP OF  
**MAINE**  
Drawn and Engraved on Copper Plate  
EXPRESSLY  
FOR  
**JOHNSON'S CYCLOPEDIA**

Scale of Miles 10

Longitude East 8 from E Washington







until the Fr. expedition under Verazzano in 1524, of Gomez, the Spaniard, in 1525, and of Rut, under the Eng., in 1527. In 1556 André Thetvet, a R. Cath. priest, sailed in a Fr. ship along the entire coast. The first attempt to settle upon the terr. was made by the Fr. under Du Mont in 1604. In 1605 the coast in the neighborhood of the river St. George was visited by Capt. Weymouth, which led to the expedition to the mouth of the Kennebec River in 1607, under command of Capt. George Popham as pres. and Capt. Raleigh Gilbert as admiral, sent forth by Sir John Popham and Sir Ferdinando Gorges with a view to colonize this portion of the coast, for which, and the whole country from N. lat. 34 to 44, a charter had been obtained from King James in 1606. But the colony became discouraged. In 1616 Sir F. Gorges sent his agent, Richard Vines, with a small company to Saco. Capt. John Smith took possession of Monhegan Island in 1614, and thence ranged the whole coast to Cape Cod. In 1620 James I. granted to the Plymouth Co. in Eng. the whole country lying between the 40th and 48th degrees of N. lat., and to the Va. Co. the S. portion of the original patent. In 1622 Gorges and Capt. John Mason obtained of the Plymouth Co. a grant of the terr. lying between the Merrimack and Kennebec rivers, and the next yr. planted a colony at the mouth of the Piscataqua, which was the first permanent occupation of the mainland in M. But the settlements commenced at different places were all overthrown in the Indian war of 1675. E. of the Penobscot River the Fr. laid claim to the country, and very little improvement was made there until after the revolution of 1775. On the division of the Plymouth Co. of their patent among the proprietors, the portion lying between Piscataqua and Kennebec rivers was awarded to Gorges in 1635, confirmed by the king in 1639, and he forthwith established a regular govt. over it under his deputy, assisted by an assembly of delegates chosen by the people, and by the king's patent of confirmation it received the name which is now extended over the whole terr. His govt. continued until 1677, when the heirs sold their interest to Mass. for £1250. Two yrs. before this (in 1675) King Philip's Indian war commenced with terrible massacres in M. For the next 85 yrs. the country was kept in terror by the frequent raids of the savages. Gorges died in 1647. The province between the Kennebec and Penobscot rivers was granted by Charles II. in 1664 to his brother James, duke of York (afterward James II.). This country was surrendered to Mass. in 1686. Between 1687 and 1689, Andros, the royal gov. of the N. Eng. colonies, visited M., and there as elsewhere practised great extortion. After the organization of Mass. as a State, and its incorporation into the Union, M. became a part of Mass., which exercised jurisdiction over it as "the District of Maine." There were, however, frequent bickerings between Mass. and its "district," and conventions were held at Portland between 1784 and 1791 to devise plans for a separation. These difficulties increased, but it was not until after the war of 1812 that they led to decisive measures. After repeated conferences an act of Cong. was approved Mar. 3, 1820, declaring that on and after the 15th of Mar. of the same yr. M. should be admitted into the Union on the same terms as the original States. A dispute had existed between the U. S. and the Brit. govt. in regard to the boundaries between the N. portion of M. and the provs. of Que. (or Canada East) and N. B. In 1842 the boundaries were definitively settled by the Ashburton treaty, by which the St. John and the St. Francis were agreed upon as the N. and N. E. boundaries, with free navigation of the former, and the highlands between the prov. of Que. and M. recognized as the N. W. boundary. In 1851 the M. legislature passed the "Maine Liquor law," prohibiting the sale of intoxicating liquors as a beverage. Since the war she encouraged immigration, and established a large Swe. colony within her terr.

#### Governors.

Wm. King (resigned).....	1820-21	Samuel Wells .....	1856-57
D. Williamson (act.).....	1821-22	H. Hamlin (resigned).....	1857
Albion K. Parris.....	1822-27	J. H. Williams (act'g).....	1857-58
Enoch Lincoln (died).....	1827-29	Lot M. Morrill.....	1858-61
Nathan Cutler (act'g).....	1829-30	Israel Washburn, Jr.....	1861-63
Jonathan D. Hunton.....	1830-31	Abner Coburn.....	1863-64
Samuel E. Smith.....	1831-34	Samuel Corry.....	1864-67
Robert P. Dunlap.....	1834-38	J. L. Chamberlain.....	1867-71
Edward Kent.....	1838-39	Sidney Perham.....	1871-74
John Fairfield.....	1839-40	Nelson Dingley, Jr.....	1874-76
Edward Kent.....	1840-41	Selden Connor.....	1876-79
John Fairfield.....	1841-43	Alonzo Garcelon.....	1879-80
E. Kavanagh (act'g).....	1843-44	Daniel F. Davis.....	1880-81
Hugh J. Anderson.....	1844-47	Harris M. Plaisted.....	1881-83
John W. Dana.....	1847-50	Frederick Robie.....	1883-87
John Hubbard.....	1850-53		
W. G. Crosby.....	1853-55		
Anson P. Morrill.....	1855-56		

REVISED BY A. R. SPOFFORD.

**Mal'notes**, the people of Malina, a mt.-dist. of Laconia, in the Peloponnesus, between the Messenian and Laconian gulfs. They boast of their descent from the anc. Spartans, although some consider them Slavic. They were virtually independent for many yrs. before the rest of modern Gr. They are handsome, warlike, and superstitious. Their number is about 60,000.

**Maintenon**, mant-nôn', de (FRANÇOISE D'AUBIGNÉ), MARQUISE, b. Nov. 27, 1695; was (1651-60) the wife of the poet Scarron, and in 1669 became governess to Louis XIV.'s children by Madame de Montespan, whom she supplanted in the king's affections; acquired and long maintained a powerful influence over the king, and in 1685 the king married her in private. She procured the Revocation of the Edict of Nantes, displayed great zeal for the R. Cath. Ch., and had considerable literary talent. D. Apr. 15, 1719.

#### Malina.

**Malonneuve**, mal-zo-nuv', de (PAUL DE CHOMEDÉY), SIEUR, b. in Champagne, Fr., early in the 17th century; en-

tered the army at an early age; was sent in 1641, at the head of a band of colonists, to Canada; founded Montreal in May 1642; was gov. for 22 yrs.; brought over a second body of settlers in 1652; displayed vigor and ability in his administration; was removed from office 1664, sent to Fr. 1665, resigned his post 1669. D. Sept. 9, 1676.

**Maistre**, metr. de (JOSEPH), COUNT, b. at Chambéry, Fr., Apr. 1, 1733, was the son of the pres. of the senate of Savoy, and himself became a senator in 1787; entered the service of the king of Piedmont; was grand chancellor of Sard. 1799, minister to Rus. 1803-17, regent of the grand chancery 1818; became a member of the Turin Acad. 1819. He was the most powerful defender of Ultramontanism, the divine right of kings, and the papal infallibility, and advocated a return to the mediæval system. Among his writings are *Considérations sur la France*, *Du Pape*, *De l'Eglise judiciaire*, and *Étamen de la Philosophie de Bacon*. D. Feb. 26, 1821.

**Mait'land** (Sir RICHARD) of LETHINGTON, b. in Scot. in 1496, was ed. at St. Andrew's and in Paris; became a lawyer; was successively employed in public affairs by James V., the regent Arran, and Mary of Lorraine; became a knight and lord of session about 1551; lost his sight 1560; was speaker of the Prot. convention Aug. 1560; became lord privy seal 1562; resigned that post 1567; made a MS. collection of early Scot. poetry, and wrote original verse of considerable merit. D. Mar. 20, 1586.

**Maitland** (WILLIAM) of LETHINGTON, known as "Secretary Lethington," eldest son of the preceding, b. in Scot. about 1525, was ed. at St. Andrew's and on the Continent; became a convert to the doctrines of the Ref. about 1555; was appointed sec. of state 1556; joined the "Lords of the Congregation" 1557; was made an extraordinary lord of session 1561; opposed the ratification of the *Book of Discipline*, and conducted the prosecution of Knox for treason 1563; took part in the conspiracy against Rizzio; was proscribed and escaped to Ger. 1566; fought against Mary at Langside 1568; was arrested, but soon liberated, and joined Kirkaldy of Grange in support of the queen 1569; assisted in the defence of Edinburgh Castle 1573-73; surrendered May 30, and d. in prison at Leith June 1573.

**Maize**, or **Indian Corn** [Zea mays; Sp. *maiz*, from Haytian *mahiz*], a well known Amer. grain and forage plant. (See GRASSES and INDIAN CORN.)

**Majesty**, as a title of royalty, is a reminiscence of the *majestas* claimed by the Rom. emps.—a peculiar dignity, or literally greatness, which was held to have directly descended to the emps. of Ger. Henry VIII. was the first Eng. king to assume the style of "His Majesty."

**Majolica** [from *Majorca*, where it was once made] was originally the name of those kinds of pottery since called faience, but it is now applied to a cheap earthenware of colored clay covered with a white glaze. It is much used in S. Europe.

**Major** (GEORG), D. D., b. at Nuremberg, Ger., Apr. 25, 1502; became rector at Magdeburg 1529, supt. at Eisleben 1536, prof. of theol. and court-preacher at Wittenberg 1539. By the support he gave to the Leipzig Interim, he separated from the strict Lutherans, and became involved in a controversy with Amsdorf (1552). In his later yrs. he was involved in the Crypto Calvinistic controversy, and was forced to sign the Torgau Articles. His prin. works are homilies and commentaries on the N. T. The "Majoristic controversy" gave rise to the formation of a theological circle called Majorists. D. Nov. 28, 1574.

**Major** (RICHARD HENRY), F. S. A., b. in Lond., Eng., 1818; appointed keeper of the maps and charts of the Brit. Museum 1844; was honorary sec. of the Hakluyt Society 1849-58, editing for it several rare works. In 1861 he found in the Museum, and laid before the Society of Antiquaries, documents showing the discovery of Australia by a Port. navigator in 1601, which procured him from the king of Port. the honor of knighthood. In 1868 he wrote a *Life of Prince Henry of Port.*, surnamed the Navigator. He was honorary sec. to the Royal Geographical Society and a frequent contributor to its *Journal*.

**Makart** (HANS), b. at Salzburg, Aus., May 28, 1840, studied painting in Vienna and Munich, and began to exhibit in 1866; visited Italy in 1869, and lived for some time in Rome; afterward settled in Buda-Pesth; became insane in Aug. and d. in Oct. 1884. His principal pictures are *Leda and the Swan*, *The Plague in Florence*, *The Seven Deadly Sins*, *Tannhäuser*, *The Entrance of Charles V. into Antwerp*, etc. The last picture became, through photographs and engravings, exceedingly popular.

**Malabathrum** (Gr. *μαλαβαθρον*), a drug composed of leaves brought from India, and much esteemed as a perfume and as a med. by the anc. The name is considered a corruption of *tamala-putra* ("tamala leaves"), a drug composed of the leaves of several species of cinnamon tree.

**Malachi**, mal'a-ki, the last prophet in the O. T. He lived in the time of Nehemiah (440-420 B. C.). He rebukes the people for despairing of God's mercy, for neglecting the tithes, for offering imperfect animals, and for intermarrying with Gentiles.

**Mal'achite** [Gr. *μαλακός*, "soft"], a natural green carbonate of copper, occurring in certain localities (as Siberia and Australia) in such beauty as to be highly valued for ornamental purposes.

**Mal'achy**, SAINT (O'MORGAIR), b. at Armagh, Ire., in 1094; became a rigid ascetic, and when 25 a priest; restored the monastery of Bangor; became in 1124 bp. of Connor, in 1134 abp. of Armagh, primate of all Ire., and labored to bring the Irish Ch. under the papal sway. In 1137 he resigned the primacy and became bp. of Down; in 1139 was named legate for Ire. by the pope, and in 1142 established a Cistercian monastery in Ire. In 1148 he induced the synod of Inis Padrig to request the pope to bestow the pallium upon the Irish bps. D. Nov. 2, 1148.

**Malacology**. See CONCHOLOGY.

**Mal'aga**, city of Sp., the cap. of the prov. of Malaga, on



the Mediterranean. It is beautifully situated at the foot of a lofty mt.-range, whose highest peak is crowned with the old Moorish castle Gibralfaro, and whose sides are covered with vines, producing the malaga wine. It is an old city, founded by the Carthaginians, having lived through long periods of Rom. and Moorish dominion. Many of its streets are narrow and crooked, but the newer part is elegant. It is chiefly a place of commerce, increasing every yr. Its harbor is spacious and safe. Its trade in wine, oil, figs, almonds, raisins, and grapes, and its manufactures of cloth, silk, ropes, and leather are prosperous; beside, it has iron-foundries, breweries, and distilleries. Its educational insts. are good. Pop. 115,882.

**Malan** (SOLOMON CESAR), D. D. b. in Geneva in 1812, grad. at St. Edmund's Hall, Ox., in 1837; received in 1838 a professorship in the Bishop's Coll. Calcutta; returned to Eng., and in 1871 became a prebendary of Sarum. He has translated a great number of works from Chi., Japanese, Ethiopic, Arabic, Armenian, Coptic, Per., Rus., and other lts. He understands nearly 150 langs.

**Mälaren, or Mälär**, the most beautiful and one of the largest of the lakes of Swe. With a breadth of from 2 to 30 m., it stretches 70 m. inland from the Baltic Sea, with which it is connected by a channel. It contains over 1300 islands, fertile and beautiful. Stockholm is situated on both sides of the channel and on a number of the islands.

**Malaria**. See INTERMITTENT FEVER, MIASMA, and REMITTENT FEVER.

**Malay Archipelago**. See EASTERN ARCHIPELAGO.

**Malay Peninsula**, the S. extremity of Farther India, projects from Indo-China between the Chi. Sea and the Gulf of Siam to the E., and the Bay of Bengal and the Strait of Malacca to the W., for a distance of about 900 m.; greatest breadth, 180 m. It is traversed by a mt.-range from 3000 to 6000 ft. high, bordered with alluvial plains along the coast. Large parts of the country are now dependencies of Siam. The Brit. have several important settlements—Penang, Malacca, and Singapore. But there are also independent Malayan states in the southern-most part of the Peninsula.

**Malay Race** [called by themselves *Malayu*], the dominant race of Malacca and the E. I. Islands. In a larger sense, the inhabs. of the greater part of the islands of Polynesia are said to be of Malay race. Some ethnologists have made the Malays the type of a fifth race of mankind, but others regard them as Mongolian. They are of a brown color, have black and often curled hair, and prominent facial bones, are short of stature, and courageous, but unstable. They are treacherous enemies and inconstant friends, but are active and useful sailors. Gambling, cock-fighting, and intoxication are the national vices. The Malays are inveterate liars. In religion they are Mohammedans. Fondness for music and disregard of death are almost universal. Their civilization is small. There are manufactures of weapons, of ornamental gold and filigree work, and of fast sailing but small vessels of curious construction. The lang. is soft in its sounds, and is easily learned. It is the commercial lang. of the E. The lit. is small. The Arabic alphabet is used.

**Mal'colm** (Sir John), b. at Burnfoot, Scot., May 2, 1769; entered the army at the age of 12; became a cadet in the military service of the E. I. Co., and having familiarized himself with several Oriental langs. performed a political mission to Per. in 1799, became pres. of Mysore in 1803, and in the same yr. accompanied Gen. Arthur Wellesley in the Mahratta campaign, and signed the treaty of peace with Scindia after the latter's defeat at Assaye. During the ensuing yrs. M. was employed in high civil functions under the successive Indian administrations; was again sent as envoy to Per. in 1807 and 1809; returned to Eng. in 1812, and was knighted. He returned to the East in 1817; engaged in the Mahratta and Pindaree wars in the Deccan as second in command, with the rank of brig.-gen.; distinguished himself at the battle of Mehudpoor (Sept. 21, 1817), in which he broke the power of the Mahrattas; was gov. of Malwa 1818-22; was gov. of Bombay 1827-30. M. P. for Lancaster 1831. Wrote *Hist. of Per. Memoirs of Central India, and Political Hist. of India*. D. May 31, 1838.

**Mal'com** (HOWARD), D. D., LL.D., b. in Phila. Jan. 19, 1799, grad. at Dickinson Coll. in 1817; studied at Princeton Theological Sem.; was pastor of Bap. chs. at Hudson, N. Y., Boston, and Phila.; was pres. of the coll. at Georgetown, Ky., 1839-49, and of Lewisburg Univ. in Pa. 1851-59, after which he retired from the ministry and settled in Phila. He wrote a *Dict. of the Bible* and *The Chr. Rule of Marriage*; visited the Bap. missions in India, Burmah, Siam, Chi., and Afr. 1835-36; wrote *Travels in S. E. Asia* and an *Index to Religious Lit.* D. Mar. 25, 1879.

**Malden**, maw'l'den, city and R. R. centre, Middlesex co., Mass., on the Malden River, 4 m. N. of Boston; has good water-power. Pop. 1870, 7367; 1880, 12,017.

**Malebranche**, mahl-bronsh' (NICOLAS), b. in Paris Aug. 6, 1638; d. there Oct. 13, 1715; studied theol. at the Sorbonne, and entered in 1660 the congregation of the Oratory; devoted himself exclusively to philos., and after 10 yrs. preparation produced his prin. work, *De la Recherche de la Vérité* (1674). In the hist. of philos. he represents the so called Occasionalism.

**Malesherbes**, mahl-zärb', de (CHRÉTIEN GUILLAUME DE LAMOIGNON), b. at Paris Dec. 6, 1721, ed. by the Jesuits; studied law, and entered early the civil service; from 1750 to 1771 was censor of the press and pres. of the court of aids. In 1771, when Louis XV. dissolved the Parl. because they would not register his tax-edicts, M. presented a memoir advising the convocation of the States-General, for which he was banished from Paris. On the accession of Louis XVI. he was recalled to the court in 1774, and was made minister of the interior in the cabinet of Turgot. He could do nothing, however, against the follies and intrigues of the court, and left the ministry in 1776; when in 1792 Louis XVI. was arraigned before the National Convention,

he undertook his defence, and spoke with admirable courage. The result was his own arraignment in Dec. 1793, and on Apr. 22, 1794, he was guillotined.

**Mal'ic Acid** [Lat. *malum*, "an apple"]. First discovered by Scheele in apples. It occurs in many fruits and berries, among them cherries, gooseberries, strawberries, raspberries, and the berries of the sumach and of the mountain-ash, from which latter it is usually procured. It exists also in pineapples and in the leaves, stems, seeds, and roots of a great many plants. The acid of tomatoes is chiefly citric.

**Mal'ice** [Lat. *malitia*, "bad"], in law. Primarily, M. imports a wicked purpose toward the person injured, but as a legal term it is used to describe the intentional doing of any wrongful act without just cause or excuse. M. is often separated into 2 classes, express and implied. This classification, however, has reference solely to the manner of proving the M. in a given case. It is express when its existence is established by direct evidence showing the intention; implied, when the wrongful intention is presumed from certain acts or omissions of the wrong-doer. The effects of M. are the same when established by either method.

JOHN NORTON POMEROY.

**Malignous** (ma-lish'us) **Mischief**, in law. At common law, M. M. seems to have been confined to the wilful destruction of personal property from actual ill-will or malice toward the owner or possessor. In the U. S. any intentional or wanton injury to property, done through malice and committed secretly, or exhibiting cruelty to animals, or accompanied by a breach of the peace, so that the offence would be more than a mere civil trespass on the one hand, and would not amount to arson or any other well-defined crime on the other, is embraced within the gen. term "malignous mischief."

JOHN NORTON POMEROY.

**Malignant Pus'tule**, a disease communicable from the lower animals to man, though sometimes apparently originating in man without contagion. It sometimes attacks those who handle the hides, and especially the hair, of the lower animals, and is believed to be sometimes propagated by insects. In its inception it resembles a boil, or sometimes a carbuncle, seldom very painful; the pustule soon becomes the seat of gangrene, sometimes emitting a remarkable fetor; there is an intense fever, with profound septic symptoms, and unless active treatment be employed death is certain to follow.

**Malignant Sore Throat**. See DIPHTHERIA.

**Malines**. See MECHLIN.

**Mal'ard, or Greenhead**, the most common wild-duck in N. Amer. and Europe (*Anas boschas*). It is the original from whence have sprung almost all the varieties of the domestic duck, excepting some which are bred in Chi. and Japan.

**Mal'ory** (STEPHEN R.), b. in Nassau, N. P., in 1810, was the son of a shipmaster of Conn.; settled with his mother at Key West, Fla., in 1821; was ed. at the N.; admitted to the bar at Key West in 1833; was inspector of customs under Jackson, and became co. judge and judge of probate for Taylor co., Fla.; became in 1845 collector of the port of Key West; was U. S. Senator from Fla. 1851-61; became sec. of the Confed. navy. After the war he was imprisoned, released on parole in 1866, and pardoned in 1867 by Pres. Johnson. He afterward practised law in Pensacola, where he d. Nov. 9, 1873.

**Malmesbury, William of**, b. in Eng. about 1095; became a monk and librarian of the monastery at Malmesbury, and wrote in Lat. a historical work which, next to the *Saxon Chronicle*, is considered the most valuable authority for A.-S. times. D. about 1143.

**Malms'ey**, malm'ze [Fr. *vin de Malvoisie*], originally a sweet wine from Napoli di Malvasia. The name afterward came to be applied to other sweet Levantine wines. It is at present applied especially to "malms'ey maderia."

**Malone**, cap. of Franklin co., N. Y., on R. R. and Salmon River, 60 m. from Ogdensburg and same from Rouse's Point. Pop. 1880, 4193.

**Malone** (EDMOND), b. at Dublin Oct. 4, 1741, studied at Trinity Coll. 1756; was called to the bar 1767; inherited a considerable fortune, and devoted himself to literary pursuits in Lond. Wrote *Hist. of the Eng. Stage*, but is chiefly known by his exposure of Ireland's Shakspearean forgeries, and by his critical ed. of Shakspeare. D. May 25, 1812.

**Malpighi**, mahl-pee'ge (MARCELLO), b. near Bologna in 1628; held the chair of med. successively at Bologna, Pisa, and Messina; was called to Rome in 1691 by Innocent XII. as his chief phys. He was the first to apply the microscope in the study of anat. His prin. discovery was that of the translocation of the blood from the arteries to the veins, described in his *De Pulmonibus*. Various parts of the epidermis, spleen, and kidneys still bear his name. D. Nov. 29, 1694.

**Malplaquet**, mahl-plah-ket', a v. of Fr., dept. of Nord, famous for a battle (Sept. 11, 1709) between the Fr. under Villars and the allied Eng., Dut., and Aus., under Marlborough and Eugene, resulting in favor of the allies.

**Mal'ta**, maw'l'ta, an island in the Mediterranean, the largest of the Maltese group, belonging to G. Brit., 58 m. from Sic. and 180 m. from Afr. Area of whole group, 115 sq. m.: of Malta, 95; pop. 184,892. The surface is rocky, and has only a shallow layer of soil, but it is well cultivated, and produces corn, cotton, figs, oranges, and grapes in abundance. Climate is hot, but healthy. Excellent marble is quarried. Its chief importance M. derives as a station on the route from Eng. *via* Egypt to India, and its most remarkable features are the fortifications which the Eng. have built around the cap. Valetta. M. was known to the Gs. under the name of Ogygia. In the 4th century the Carthaginians colonized it, but at the close of the second Punic war it became a Rom. possession. After the fall of the E. Rom. empire M. was conquered by the Vandals in 454, the Goths in 494, the Byzantines in 533, the Arabs in 870, and the Normans in 1090, who united it to Sic. In 1539 Charles V. gave it to the knights of the order of St. John of Jerusalem, who were besieged by the Turks



in 1537 and in 1565, but at the latter siege Sultan Solym was compelled to re-embark. In 1796 Bonaparte took the island by treachery; in 1800 it was taken by the Eng.

**Malte-Brun**, b. at Thisted, Jutland, Aug. 12, 1775, was banished from Den. in 1800 on account of his radicalism, and settled in Paris, where (1803-05) he pub., in connection with Montelle, *Géographie, Mathématique, Physique et Politique*, in 16 vols., and from 1810 to 1825 his *Précis de Géographie Universelle*. D. Dec. 14, 1826.

**Mal'tha** (Gr. μάλαθα), a name originally given to a mineral talow from Kirwan, which resembles wax, and probably consists of paraffine. It has been more recently applied to certain varieties of mineral oil.

**Mal'thus** (THOMAS ROBERT), b. in Surrey co., Eng., 1766, grad. at Cambridge in 1788, prof. of hist. and political economy at Haileybury Coll. in 1805. He gained his chief distinction by an *Essay on the Principles of Population, with a View of its Past and Present Effects on Human Happiness*, which created quite a sensation and went through several editions. Its leading idea is, that pop. unchecked increases in a geometrical ratio, while food can be made to increase at most only in an arithmetical ratio. Hence the inference, that in order to avoid the evils of a pop. in excess of support, some checks must be applied to the increase of pop. He wrote several other essays on kindred topics. D. Dec. 29, 1834.

**Malus** (ETIENNE-LOUIS), b. at Paris July 23, 1773; studied math. and engineering at Mézières, and afterward at the École Polytechnique; became examiner at the École Polytechnique in 1811. He was the discoverer of the polarization of light by reflection. D. Feb. 23, 1812.

**Malvern, Ia.** See APPENDIX.

**Malvern Hill**, Va., an elevated plateau near the James River, the position occupied (June 30-July 1, 1862) by the U. army on its retreat from the Chickahominy toward the James. The left and centre of the U. lines rested on M. H., the right curved backward through a wooded country toward the James. The left wing of the U. army was strengthened by massing the troops here, and disposing the art. so that a fire of 60 pieces could bear upon its front and left. Toward 3 p. m. (July 1) the battle was commenced by the Confeds., who opened a heavy fire of art. along the right of their lines, followed by an assault of inf. which was repulsed. The attack was renewed by the Confeds. about 6, with the whole strength of their art., upon the left of the U. lines, followed at once by columns of inf. to carry the hill. These were met with an overwhelming fire, and repelled with great loss, until darkness put an end to the battle. During this battle the navy maintained a constant fire of shells. Although the result of the battle was a decided victory, Gen. McClellan continued his retreat to the James, the army arriving at Harrison's Landing on the day and evening of July 3. The loss on U. side exceeded 900 killed and 1800 wounded, Confed. loss more than double.

**Mamaroneck**, Westchester co., N. Y., on R. R. and L. I. Sound, 22 m. N. E. of New York. Pop. tp. 1870, 1493; 1880, 1863.

**Maneluc'o** [Sp.], in parts of S. Amer., the offspring of a negro father and an Indian mother; called also *Cariboco* and *Zambo*.

**Man'elukes** [Ar. *mamlūk*, a "slave"], a former class of slaves in Egypt, who became the dominant people of that country. The M. are mentioned before 950 A. D. In 1250 they became masters of Egypt. The battle of the Pyramids (1798) almost annihilated them, and in 1811 the greater part of their number were massacred by Mehemet Ali.

**Mam'ia'ni** (TERENZIO) COUNT, b. at Pesaro, It., in 1800; became in 1831 a member of the revolutionary provisional govt. of Bologna. Being afterward proscribed, he was captured and conducted to Venice, where he was kept a prisoner 4 months, and then allowed to retire to Fr. In 1848 Pius IX. named him minister of the interior, and after the death of Rossi he assumed, temporarily, the duties of minister of foreign affairs. Having been elected deputy to the Rom. constituent assembly, M. voted against the republic. On the arrival of the Fr. he retired to Genoa. In 1859 he was elected deputy to Parl., and afterward appointed senator. In 1860 he became minister of public instruction, occupying at the same time the chair of philos. and of hist. in the Univ. of Turin. Afterward he was sent as minister from It. to Athens. His prin. writings, beside a vol. of poems, are *Dialoghi di Scienza*, *Le Confessioni di un Metafisico*, and *Un nuovo Divitto Europeo*.

**Mammalia**. See MAMMALS.

**Mam'mals** [Lat. *mamma*, "teat"] are the first and highest class of the vertebrate branch of the animal kingdom, and include all the vertebrates with a quadrilocular heart, warm blood, the lower jaw composed of simple rami and articulated directly with the skull, and the body covered wholly or partially with hair. The chief characteristics are as follows:

**Tegumentary System**.—Hair is a distinctive feature of the M., and is developed as such in no other class. It is found in more or less abundance in all M.; only in the embryos of whales, and in them only in the upper lip; over the greater portion of the skin in all others. Sometimes the hairs assume the strength of spines.

**Osseous System**.—The skeleton is always completely developed, and is quite constant in the number and relations of the constituent parts. The vertebral column is divided into 5 distinct regions—viz. (1) the cervical, with normally 7 vertebrae; (2) the dorsal vertebrae, variable in number, to which the ribs are attached; (3) the lumbar vertebrae; (4) the sacral vertebrae, connected with the sacral bones of the pelvis; and (5) the caudal vertebrae, which vary greatly in number. The skull is very characteristic, and may be divided into 4 parts: (1) the cranium, (2) the lower jaw, (3) the auditory ossicles, and (4) the hyoidean apparatus.

(1) The cranium is most uniform in all the types at the posterior part, and deviates most at the distal and peripheral parts. The hindmost segment has an axial element

(the *basioccipital*), with which are connected 2 lateral ones (the *exoccipital*), chiefly bearing the condyles for the articulation of the "backbone;" and these are connected above by a keystone element (the *supraoccipital*); in the higher forms these 4 elements early coalesce into a single bone, the *occipital*; they all bound the aperture through which the nervous system enters the skull. On the axial line is the *basisphenoid*; with the upper sides of this are connected dilated wing-like elements, one on each side (the *alisphenoids*); with the anterior surfaces another axial element (the *presphenoid*) articulates; and with the upper margins of this and the anterior of the *alisphenoid* 2 lateral elements (the *orbisphenoids*) are connected; finally, with the inferior surface of the previous axial bones, as well as with processes of the *alisphenoids*, is connected a median vertical element (the *pterygoid*); these several elements are united in the higher animals in a single bone—the *SPHENOID*. The roof of the skull is formed first, by 2 bones (the *parietal*), which are chiefly connected by their lateral margins with the *alisphenoid* elements, and these are followed forward by 2 other bones (the *frontal*), connected below with the *orbisphenoid* elements; in front are the *nasal*. The foremost axial bone is the *mesencephalon*, which together with 2 lateral ones (the *chondrotubinal* and *maxillotubinal*) form the compound *ETHMOID*. All the bones thus far enumerated form the cerebral chamber or true cranium. The olfactory chamber is in advance; its floor is constituted in front by the *intermaxillary* and *supramaxillary* bones, and behind by the *palatine*; its roof by the *nasal* and in part the *frontal* bones. Lodged between the frontal, supramaxillary, and palatine bones is the *lacrimal* bone. The periotic bones are interposed between the occipital, parietal, and sphenoid ones; a single bone (the *periotic*) includes the labyrinth of the inner ear; the antero-internal portion of this forms the so-called "petrous" portion, and the postero-internal the "mastoid" portion. With this bone is connected a scale-like bone called the "*squamosal*," which emits from its anterior borders the zygomatic process to meet the *malar* or *jugal* bone; from the inferior portion is developed the *tymppanic* bone. These several elements frequently coalesce and form a compound *TEMPORAL* bone.

(2) The lower jaw is composed of 2 simple rami (*mandibles*), connected together at the symphysis, and each has a more or less convex condyle by which it articulates with a "glenoid cavity" at the base of the zygomatic process of the *squamosal* bone.

(3) In a chambered space formed by the periotic bones—the *tymppanic cavity*—are 3 ossicles or small bones devoted entirely to the organ of hearing; these are the (1) *malleus*, (2) *incus*, and (3) *stapes*; the names recall their shapes.

(4) The hyoidean apparatus must also be regarded as an appendage to the skull, although chiefly subservient to the respiratory apparatus; it is composed of 2 pairs (anterior and posterior) of "cornua." The anterior is connected with the periotic bones, and each cornu has generally 3 long bones—a proximal ("stylohyal"), middle ("epihyal"), and distal one ("ceratohyal"); the last are connected with a cross-piece (the "*basihyal*"), and from the sides of this diverge backward the posterior cornua ("thyrohyal"), which are directly united with the thyroid cartilage of the larynx.

With the anterior ribs at least, at their distal ends, are connected a chain of median bones or cartilages designated by the common name of *sternum*. In all normal types the sternum is represented by (1) an anterior piece (*presternum*); (2) a series of succeeding bones (the *mesosternum*); and (3) a posterior piece (the *xiphisternum*). The members are specialized upon a common principle, although they may be externally very much modified. The anterior members have each successively (1) a single long proximal bone (*humerus*); (2) 2 following long and parallel ones (*radius* and *ulna*); (3) a group of 2 rows of small wrist (*carpal*) bones; (4) a row of longish *metacarpal*; and generally (5) 3 rows of *phalanges* or digital bones in variable numbers, the normal number of carpal and phalangeal bones or series (5) being often much abridged by the suppression of the lateral elements. With the *humerus* is connected a single flattened bone (the *scapula*) at the sides or back of the thoracic cavity. Apposed to the sacral bones are 2 compound bones (the *innominate*), which, together with the sacrum, form the pelvis. Each innominate bone is composed of 3 elements—(1) a proximal bone (the *ilium*), obliquely inserted on the processes of the sacral vertebrae, and (2-3) 2 distal bones parallel with each other, and connected together at their extremities, but leaving between them a space (the *thyroid* or *oburator foramen*) occupied only by membrane; (2) the dorsal or posterior of these pieces is the *ischium*, and (3) the lower or anterior one is the *pubis*. The hind legs are composed of bones similar to those of the fore limb—viz. (1) a proximal long bone or *femur*; (2) 2 succeeding long bones, the *tibia* and *fibula*; (3) 2 rows of small bones, the *tarso*; (4) several parallel moderately long ones (the *metatarsal*); and (5) several parallel rows of small-longish ones, the *phalanges*, 3 or 2 in each row. A large sesamoid bone, the *patella* or kneecap, caps the knee-joint.

The *Muscular System* is so variable that there are few generalizations that can be specified as applicable at once to all the M. and to no other vertebrates.

**Nervous System**.—The brain is highly developed; the cerebrum always larger than the cerebellum. The hemispheres of the cerebrum are connected together (1) by an *anterior commissure*, and (2) by a great superior commissure, the *corpus callosum*. The most characteristic feature in the brain of M. is the development of the corpus callosum.

**Dental System**.—Although when the teeth are developed they are quite characteristic of M. in their mode of insertion, etc., they are not infrequently entirely wanting. They vary in others in number from 1 to nearly 300. They may be all nearly uniform in appearance or differentiated into several kinds. They are indeed generally distinguished as incisors, canines, and molars, which last are further separated into premolars



and true or postmolars. They are almost always implanted by roots in the jaws. They do not grow in size *pari passu* with the jaws, but the series are accommodated to the size of the animal in a peculiar way. In the typical diphyodont M. (i. e. those forms which have 2 sets of teeth), shortly before or after birth a set of teeth becomes gradually evolved, but after the animal has well advanced in growth these are shed, and are succeeded by a second and final set of larger ones, and somewhat differing in other respects; and still later, in the back of the jaws, teeth come up where none had appeared before. (See TEETH.)

**Alimentary System.**—The alimentary canal and its appendages have furnished no material to the systematist for the diagnosis of the class.

**Circulatory System.**—The blood has its red blood-corpuscles non-nucleated. The circulation is complete and closed, the stream being received and transmitted by the right half of the quadrilocular heart to the lungs for aëration, therein oxygenated and warmed, thence sent to the left side of the heart, and finally transmitted through the system. The aorta is single and reflected over the left bronchus.

**Respiratory System.**—Respiration is effected by means of the lungs. These are, in common with the heart, in a special thoracic cavity, separated, as already indicated, from the abdominal cavity by the diaphragm. This diaphragm, by its alternate contraction and expansion, assists the lungs in their inhalation and expulsion of air. The windpipe or trachea bifurcates in its distal portion, and sends special branches to the respective lungs.

**Reproductive System.**—In the female the chief organs are the ovaries, which by oviducts communicate directly with the uterus, and thereby with the vagina. The so called clitoris is the homologue of the penis of the male, but is rarely perforated by a urethral canal. In the male the testes, although in the lower types abdominal, in the higher descend into external "scrotal" pouches, and the penis is almost always external, and often pendulous and free. The eggs are in the lowest type of considerable size, but in the others extremely small. Impregnation is always effected internally. For the nourishment of the new-born young a peculiar provision is made in the development of certain glands (*mammary*), which in the female are highly specialized and secrete the milk. The position and number of these mammae vary greatly.

The chief modifications of the class of M. are expressed in 3 types, which have been differentiated as sub-classes—viz. Monodelphia, Didelphia, and Ornithodelphia; these are themselves opposable under 2 categories, Eutheria and Prototheria.

**Evolution and Genetic Relations.**—The class of M. is so decidedly differentiated from all others, and its early hist. is so fragmentary, that its exact phylogeny is not apparent. It is, however, most probable that the original progenitors of the class were modified from very generalized reptiles, or perhaps Amphibians merging into reptiles, and that they culminated into the present types at a comparatively early epoch, the earliest known forms—those found in the Liassic formation—being quite specialized.

**Geographical Distribution.**—M. exist in almost every region of the globe. Monotremes are peculiar to Australasia. Marsupials are now confined to Australasia and outlying islands and Amer. Insectivores are well represented in the entire N. hemisphere, as well as in Asia and Afr. Primates are represented especially in the tropical regions of Afr., Asia, and Amer. The Edentates are represented still more exclusively than the Primates in warm countries, and have most members in Amer. The carnivorous M., on the other hand, are quite widely distributed, extending almost between the extremes of the N. and S. hemispheres, Australia alone having no land representatives except of a species of dog.

The Felidæ (cat) and Canidæ (dog) families are especially thus distributed. The others are more limited, or have a greater number of genera restricted to limited countries. The ungulates are at present generally more restricted, the Equidæ (horses) and Rhinocerotidæ (rhinoceroses) being peculiar to the warmer regions of the Old World. The Tapridæ (tapirs) and Camelidæ are distributed in an anomalous manner. Of the former about 4 species are found in S. and Central Amer., and 1 in Sumatra; of the Camelidæ, 1 generic type (camel) is represented in Afr. and Asia, while 1 (llama) inhabits Chili and Peru. The Proboscidiæ (elephants) are now restricted to the Old World, 1 generic form being represented in Afr. and another in Asia. Bats are found nearly everywhere. The cetaceans are abundantly represented in the polar regions, but are also rich in tropicopolitan genera, and have also several peculiar fresh-water types in the tropics. The Sirenia are cosmopolitan in their range.

**Geological Range.**—For a long time it was believed that no representatives of the class existed previous to the Tertiary epoch. The evidence, however, is now conclusive of their existence in the Mesozoic, both in the Triassic and Oolitic periods, although only fragments, chiefly of lower jaws, have been found. These remains have been mostly attributed to the order of Marsupials. In the Tertiary epoch numerous remarkable extinct types, representing even orders without living members, existed, and have furnished clues for the appreciation of the genetic relations of the several groups of the class.

**Mammee'** [Haytian, *mamey*] **Apple**, the fruit of *Mamea Americana*, a tree, order Guttifera, growing in S. Amer. and W. I., one of the most delicious of tropical fruits.

**Mam'moth** [of Samoid origin, applied to burrowing animals] (*Elephas primigenius*), an extinct species of elephant, about twice the weight of the living species, formerly abundant in the higher lats. of both the Old and New Worlds. Their remains are abundant in Siberia and Alaska, where their tusks are gathered as an article of export. The M. was closely related to the existing Indian elephant. It differs, however, in many respects. The tusks are long and

much curved, in some cases forming a complete circle. Tusks have been found over 12 ft. in length. This animal is better known than any other species extinct before the historic period, as its remains have been perfectly preserved in the ice and frozen soil of the Arctic regions. The hairy covering enabled the M. to endure a much colder climate than that to which the existing elephants are confined. Its food consisted of the leaves and branches of N. pines, willows, birches, and other hardy trees, such as may now be found along the isothermal of 40°, which in that age may have run as high as N. Siberia, where these animals then lived in large herds. They roamed also over Europe, where they were contemporary with two-horned rhinoceroses, a hippopotamus, gigantic deer, 3 kinds of wild oxen, a tiger as large as that of Bengal, and another fierce carnivore of equal size, the *Machærodus*, together with troops of hyænas and a savage bear. During the Palæolithic and Reindeer eras they were contemporary with men, who have left rude delineations of the M. engraved on ivory of its own tusks. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. O. C. MARSH.]

**Mammoth Cave.** This celebrated cavern is situated in Edmondson co., Ky., about 80 m. S.S.W. of Louisville, and about 10 m. from the railway which connects that city with Nashville, Tenn. It is but one of a great series of caverns which occupy nearly every part of the sub-carboniferous limestone, and are thus found over an area of at least 6000 sq. m. in Ky., beside a part of the neighboring States of Tenn. and Ind. This particular cavern is situated on the left bank of the Green River; the entrance is about 200 ft. above the stream and  $\frac{1}{4}$  m. from its borders. From this point the cavern is excavated in a series of chambers and passages descending in successive stages to the level of Green River, 200 ft. below the entrance; the river communicates freely with the cave. A voyage of some hundreds of yards on the winding branches of Echo River brings the visitor to an extensive system of passages beyond its borders far more beautiful from the incrustations than anything on the entrance side of the stream. It requires a walk of about 7 m. to attain the farthest point, but as the survey of the cave has not been permitted, it is not possible to say how far in a direct line from the entrance this point really is. Though the cave furnishes some scenes of great beauty, its most imposing effects arise from the great size of some of the halls and the majestic dignity of its domes. In detail of ornament it is much exceeded by many other caves, but for grandeur none can excel some of the scenes of this cave. Perhaps the finest of its effects will be found in the Star Chamber, where pendent stalactites catch the gleam of a concealed light, and imitate with their faint twinkling glow the stars of the firmament.

As a whole, the M. C. is now shrinking in size. The accumulation of dust upon the floor has already gone far to diminish its size in the larger chambers. This dust is composed of the waste from the roof and walls, together with the waste of living and the remains of the dead animals, chiefly rats and bats, which inhabit the cavern. There are at least 3 species of fish and a number of insects peculiar to this and the neighboring caves, which with a blind crayfish make up the list of cavern-animals to about 20 species. Nearly all these insect forms are more or less closely allied to those of the neighboring outer world, yet the differences are quite enough to entitle them to rank as distinct species. It is impossible to exaggerate the value of this evidence in the questions connected with the origin of species. There can be no doubt that we have here organic forms in the very process of becoming fitted for changed conditions of life. There are several forms where the eyes, the most highly organized of all the organs, are disappearing or have quite vanished.

Upon the question of the antiquity of these caverns the geological evidence leads to the conclusion that less than 1,000,000 yrs. has sufficed for their production. As this period is less than the hundredth of the time which has doubtless elapsed since the introduction of life on the earth, the rapidity of the process is relatively great. The temperature of the cave is uniformly at 59° F. The air is very clear, being free from dust and from the odors of vegetation. Coming from it out into the forest, we perceive, in summer-time, a wonderful transition from the pure to the impure air. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. N. S. SHALER.]

**Mammoon'**, or **Māmūn**, **Al** (ABUL ABBAS ABDALLAH), the 7th caliph of the Abbasside dynasty, b. at Bagdad in 786, a son of Haroun-al-Raschid; was invested with the govt. of Khorassan in 800, and ascended the throne Oct. 4, 813. He was a great patron of science and lit., but in other respects his govt. was weak; the outlying provs. declared themselves independent, and even over Egypt and Syria his authority was merely nominal. In 837 he joined the heterodox sect, Motasalis, which considered the Koran a created work and not eternal. D. Aug. 9, 834.

**Man** [Teutonic, from Aryan *man*, "to think;" Sans. *manu*, "thinker?"]. The origin of *Man* cannot have been a matter for observation. No man can be supposed present for the purposes of testimony at his own birth, nor can he have been a witness of the mode or process of his own creation. We state in outline the principal hypotheses which have been suggested to account for the origin of man: (1) The hypothesis of Darwin is that man has grown by a series of modifications in geological time from some extinct form of the anthropoid apes. Darwin also states that man, "since he attained to the rank of manhood, has diverged into different races or sub-species." . . . Nevertheless, all the races agree in so many unimportant details of structure, and in so many mental peculiarities, that they can be accounted for only through inheritance from a common progenitor." (2) Mr. A. R. Wallace, who, independently of Darwin, formulated and defended the hypothesis of natural selection, denies that it will account for the origin of man. Like Darwin, Wallace affirms the original unity of man. His



general conclusion is that an external intelligent force, acting independently of those laws which control the differentiation of the animal kingdom, must be postulated to account for the special phys., mental, and moral endowments which make up the specific and unique nature of man; that "a superior intelligence has guided the development of man in a definite direction and for a special purpose, just as man guides the development of many animal and vegetable forms." (3) Another hypothesis is that of Carl Vogt. He adopts Darwin's idea, that the law of natural selection accounts fully for the origin and endowments of man; but he positively rejects the idea put forth by Wallace, that a higher and controlling intelligence is necessary to account for the capacities of man, and assumes that man has descended not from one form of anthropoid apes, but from 3 forms, and possibly from several. We thus find Carl Vogt, while adopting the methods of Darwin, arriving at the conclusion that the different types of men constitute different species, from the fact that they have been developed from different types of monkeys. Trenchant and irreconcilable differences also may be pointed out in the applications and modifications of these hypotheses in the works of naturalists who have in some of its forms adopted them. These differences tend to confirm the impression that, however imposing the authority under which these methods of accounting for our origin have been put forth, they still await scientific verification. As working hypotheses they may all be useful. They may aid investigators to bring out new or neglected truths; but so long as no transition fossils bridging over the gulf between man and the apes can be produced, so long as these systems depend upon what *may possibly have been*, and not upon what is proved as fact, we may reasonably place the various suppositions regarding the origin of man by generation from lower animals among the immense mass of unverified hypotheses which active minds are continually bringing to the surface in the progress of inquiry. All that Darwin really claims for his hypothesis in its application to man is that it *may* be true. He concedes that it is an inference from premises which are not seldom speculative.

When we take into account the laws of man's mind, his use of articulate lang., his social, moral, and religious const., we are met by problems which are extremely difficult of explanation on any hypothesis of evolution. This founds the development of mind and its laws upon habit and association, acting upon mere capacity for sensitive impressions. But habit and association are unintelligible terms except on the assumption of the fundamental laws of intelligence as already existing. For 2 objects of knowledge to be associated with each other there must be the intelligence to apprehend them as objects of knowledge—the power to discriminate them from the self and from each other, to note their distinguishing marks and attributes in time and space. If, as may justly be claimed, a mental habit is formed by frequently going through a mental process or mental processes, manifestly habit, like association, postulates those very laws of mental activity to account for which it is brought forward. Both the system of Mill and that of Spencer are vitiated by this fatal defect, while in vitally important particulars they contradict each other. The difficulties which attach to all systems that seek to account for the powers and laws of the mind by habit and association alone are illustrated by the laws of human speech. Lang. is the instrument of human thought more emphatically than it is a means for its transmission. The rudest forms of human speech involve the presence of all the germs of a complete human mind. We hear, it is true, of langs. which have no abstract terms, and which indicate no powers beyond the rudimentary instincts and intelligence of animals. But when we attempt to analyze a sentence in any lang., however uncultivated, we recognize abstract terms, and some of a high degree of generality. We find always subject, object, and predicate; we can detect the agency of all the laws and limitations which make up what we call the constitution of the mind. The beginning of articulate speech, as well as the beginning of thought, necessarily postulates the essential characteristics of mind and its laws, however imperfectly developed that mind may be.

*The Unity of Man* was generally conceded by the early naturalists. Virey (1801) seems to have been the first among modern naturalists to call in question the specific unity of man. The terms *monogenist* and *polygenist* characterize those who affirm or deny the unity of the human race. A few yrs. since polygenism was popularly supposed to have become the settled creed of men of "advanced" views in science. It was claimed, indeed, as one of the points which science had settled. The change within 20 yrs. is noteworthy. Mr. E. B. Tylor says: "On the whole, it may be asserted that the doctrine of the unity of mankind now stands on a firmer basis than in any previous ages." To the same effect are the quotations from Darwin and Wallace already given.

*Antiquity of Man*.—Many attempts have been made to determine the antiquity of man by reference to the Heb. Scripts., the monumental inscriptions of Egypt, and the lit. of E. nations. Jewish and Chr. writers have endeavored to settle this question from the Pentateuch, but the continuity of the chronological record embodied in the Pentateuch is by no means certain; and the Masoretic Heb. text, the LXX. version, and the Samaritan Pentateuch greatly differ in respect to their chronology. Abp. Usher (*Chronologia Sacra*, 1660), following the Heb. text, fixed upon 4004 B. C. as the date of the creation of Adam. William Hales (*New Analysis of Chronology*, 1809-14), taking the LXX. as his guide, assigned the creation of Adam to 5411 B. C. The drift of Chr. opinion with reference to this subject is further illustrated in the preface to the *Oxford Chronological Tables* (1835), which says: "The Scriptures were written for nobler and more exalted purposes than the mere transmission of dates or the gratification of antiquarian curiosity; and hence we must not be surprised if, on topics connected with chronology, we fail to meet with the information we desire, and find ourselves at

a loss to ascertain the precise time at which some of the most important transactions took place. This increased uncertainty, however, seems to have aroused the diligence and ingenuity of chronologers, who have compiled system upon system, without adding much to our stock of knowledge respecting the remote ages of antiquity. Thus, for example, there are not less than *three hundred* different dates assigned as the era of the Creation, varying in the extremes no less than 3000 yrs." A note on the chronology of Genesis in the *Speaker's Commentary* (vol. 1, p. 61) affords conclusive evidence that the best scholars of the Ch. of Eng. fully recognize the difficulty of determining the age of man from the Heb. Scripts., and the tendency of opinion in this direction was marked and clear before recent discoveries of fossil remains and stone implements in the Drift formation had specially called the attention of naturalists to the gen. subject. Fossil human bones and stone implements had been found during the 18th century in such situations as led to the supposition that they were deposited in the localities where found previous to the historical period; but only so late as 1838 did the discoveries of Boucher de Perthes give to the question such importance as to command the attention of the scientific world. Subsequent to this time discoveries similar to those of De Perthes at Abbeville and St. Acheul have rapidly multiplied. The discovery by Dr. Keller, in 1854, of the remains of lake-dwellings in the Swiss lakes, and the exploration in 1847 of the shell-heaps in Den., excited the public mind to great activity on this subject. These investigations have led a large majority of scientific men to conclude that this geological evidence points to a much higher antiquity for man than had been commonly assumed; but all attempts from this evidence to settle a definite chronology for the human race have ended in conclusions as conflicting and unsatisfactory as those reached by chronological writers using other methods.

*The Nature of Primitive Man* has been much discussed within a few yrs. past under the form of inquiries into the origin of "civilization" and "culture." The remains of pre-historic man seem to point to a gradual development of civilization by slow degrees, and from a state of intelligence low indeed, but sufficient to generate successful efforts in the direction of higher conditions of life. These pre-historic remains have led some writers to assume a primitive state utterly savage, even below that of the most barbarous tribes at present known. But various considerations give weight to the hypothesis that primeval men started in the race of improvement from the condition of grown-up children rather than from that of brutal savages. It has been too readily assumed that the remains of pre-historic men, and the implements found with them, are proof that they led a life scarcely above that of beasts. The well known Engis and Neanderthal skulls, though at first pressed into the service of this notion, do not on careful examination favor it. Prof. Huxley says of the Neanderthal skull that it "is by no means so isolated as it appears to be at first, but forms in reality the extreme of a series leading gradually from it to the highest and best developed human crania." Of the Engis skull he says, "It is, in fact, a fair average human skull." He adds that the fossil remains of man hitherto found do not indicate a lower condition than the lowest savages of the present day. Nor is the inference to be drawn from the earliest implements used by man at variance with that drawn from the form and capacity of these primitive skulls. The manufacture of the earliest and rudest stone implements that have yet been discovered, with only such tools as the Drift period could afford, indicates a continuity of thought and persistence of will which will compare favorably with that possessed by a considerable segment of the inhab. of civilized countries. It is significant, with reference to the primitive condition of mankind, that no tribe, however degraded, has ever been found without a spoken lang. which involved all the essential principles of gen. grammar, however limited its vocabulary or imperfect its development. Thought and lang. are so connected that neither can exist without the other; and the rudest lang. ever spoken implies the possession, by those speaking it, of a mental constitution which is essentially the same as that of civilized man. This view is not affected by the evidence that lang. may have passed through successive stages of development and growth from monosyllable through agglutinative forms to the inflectional system of the Aryan nations. For those langs. which, like the Chi., have been arrested in their course of development in the monosyllabic state, have shown themselves equal to all the requirements of lit. and civilization. The assumption that the lowest forms of savage life at present illustrate everywhere an advance upon man's primitive condition, seems irreconcilable with the facts of hist. or of our present life. In the absence of positive knowledge concerning the origin of the arts of life and the condition of primitive man, we see no speculative reason for assuming either a golden age or a state of bestial degradation. Nor do we see reason for giving a chronological significance of universal application to implements of stone, bronze, or iron. We may reasonably suppose that in primitive ages, as now, there were oscillations of progress and decadence. We know that the age of stone succeeded the age of copper in Amer., and that the use of stone, bronze, and iron has been contemporaneous in different countries. The use of these implements indicates rather states of development than periods of time. Implements of stone are in certain localities in use even at the present day.

*The Varieties of Men* can only be determined upon some proximate system of classification. But while every basis of classification that has been adopted has a certain value, when we rigidly apply them they clash with each other, and bring us to confused and contradictory results. The failure of lang. to constitute a basis for the classification of man which shall be trustworthy and *universal* is obvious to the least instructed observer. The instances in which whole



nations have, within the historic period, laid aside the lang. of their forefathers are numerous. Notwithstanding this fact, however, lang. furnishes the solution of a greater number of ethnological problems than any other mark of race-affinity. The following classification of the prin. human races—which proceeds upon a linguistic basis, and is mainly that of Latham—is, like all other classifications that have been proposed, measurably provisional and defective. It is, however, adequate to our present purpose.

#### A. ASIATICS AND NORTHERN EUROPEANS—POLY-NESIANS—AMERICANS.

**CLASS I. MONGOLIANS.**—*Division 1* (langs. monosyllabic).—The Chi., the Siamese, the Burmese, Tibetans, the peoples of the Indian Archipelago, and various smaller tribes.

*Division 2. Turanians* (langs. other than monosyllabic).—Groups: (1) The Mongolians proper, occupying the great central steppes of Asia. (2) The Turks. (3) The Ugrians, occupying an area which is pretty equally divided by the Ural Mts. The most prominent representatives of the W. Ugrians are the Lapps and Finns and the Magyars of Hungary. (4) The Tungús, occupying an area to the N. and E. of the Mongolians proper. (5) The Peninsular group, including the Koreans, Japanese, Kurile Islanders, Kamskadales, and Koriaks, whose affinity for each other is acknowledged to be doubtful.

**CLASS II. IRANIANS**, who may be grouped as follows: (1) *Persians*—divided into Pers. proper, Kurds, Blüch, Afghans. (2) *Paropamisians*—occupants of the Kohistan of Cabul. (3) *Armenians*—who are scattered beyond the limits of the country bearing their name. (4) *Dioscurians* (or Caucasians), in the limited and more recent sense of the term—including Circassians, Georgians, and other cognate tribes.

**CLASS III. INDIANS** (Asiatic).—These may be divided into 2 families—the N. or Sanskritic, and the S. or Tamul. To the Sanskritic family belong, on the basis of lang. at least, the peoples speaking the Hindi, the Bengali, the Mahratta, and other less important tribes.

**CLASS IV. THE OCEANIC STOCK**, which may be divided into—1. *The Amphinesian*—of the Mongol rather than the Afr. type, and with lang. akin to the Malay. This division may be subdivided into—(1) *Protonesian*, or occupants of the Indian Archipelago and Chi. Sea, and, in gen., those islands (*νῆσοι*) which were first (*πρώτοι*) occupied from the E. continent; (2) *Micronesian* of the Caroline and Marianne Isles; (3) *Polynesian* of the S. Sea Islands in gen., from the S. I. to New Zealand, from the Fijis to Easter Island; (4) *Malagasi* of Madagascar. 2. *The Melanesians*—of the Afr. (*αἰθιοπικός*) rather than the Mongol type, and with slight affinities in lang. to the Malay. This division may be subdivided into—(1) *Papuan*; (2) *Tasmanian*; (3) *Australians*.

**CLASS V. THE AMERICAN STOCK.**—1. *Eskimo and Algonkin Stocks*.—Beginning with the coast of Greenland, we find the Eskimo extending along the Arctic shores to Asia. On the N. E. coast of the Atlantic we meet the Algonkin stock, which extends S. from the Eskimo line to N. C. on the seacoast, and in the Miss. Valley to the mouth of the O. River, with outlying tribes as far S. as the Tenn. It also has a N. W. extension, reaching through Canada to the valley of the Red River of the N., the Saskatchewan, and the N. portion of the Rocky Mts.

2. *The Iroquois Stock* was found mainly in N. Y., its range extending from the Hudson to the Genesee Valley, the Susquehanna extending into Pa., and the Tuscaroras so far S. as N. C., whence they migrated northward about 1711.

3. *The Dakota and Sioux Stock* seems to have originally occupied the terr. between the head-waters of the Miss. and Mo. rivers. It extended, at a later time, to the Rocky Mts., and S. till it included the Black Hills. It reached S. from the Niobrara River to the mouth of the Mo., and down the Miss. to the Ark.

4. *The Gulf Tribes* occupied the terr. S. of the Tenn. to the Gulf of Mex., and from the Miss. to the Atlantic.

5. *The Athapascan Stock* extended from Hudson's Bay westward, in the extreme N. W. to the Pacific.

6. *The Shoshone and Snake Tribes* spread S. from the Lewis branch of the Columbia to Ut., including the Utes, the Comanches of Tex., and some scattered tribes in Lower Cal.

The langs. of the tribes extending over the immense area from the Arctic to Cape Horn, though dissimilar in their vocabularies, are so uniform in their structure and grammatical forms that they are considered to belong to one great stock. (Gallatin, *Amer. Eth. Soc. Trans.*, vol. i. p. 10.) The partial civilization of the Peruvians and Mex. is thought by some to segregate them in origin from the other Amer. tribes; but there is reason to believe that the exceptional character of this civilization has been very much overrated.

#### B. CENTRAL AND SOUTHERN EUROPEANS.

The prin. races of this region are to be referred, on both linguistic and historic grounds, to one family, the *Indo-European*, so called because it had its possible origin, certainly its early abode, on the banks of the Indus, whence it has overspread the prin. portion of Europe. To this family belong the Sanskritic division of the Indie group and the Iranian group, which have already been mentioned in their appropriate locality. The European division of the Indo-European family includes—

I. **THE CELTIC**, which may be divided into (1) the Cymric and (2) the Gaelic.

II. **THE ITALIC**, including—(1) the anc. races of the It. peninsula; (2) the Lat. race and its lineal descendants.

III. **THE HELLENIC**, including the various tribes of anc. Gr. and S. It., with their descendants, and possibly the Albanian or Skiptar, though in regard to this last point there is considerable doubt.

IV. **THE LITHUANIC**, occupying a narrow belt extending from the Gulf of Finland to the Vistula, and represented by the peoples of Livonia, Courland, and old Prus. (See Quatrefages, *The Prus. Race*.)

V. **THE TEUTONIC**, which may be subdivided into—(1) the Low German peoples, including the Frisic, Dut., and Eng.; (2) the High Ger., or Ger. in the modern sense of the term; (3) the Scandinavian, including the Icelandic, Dan., Nor., and Swe.

VI. **THE SLAVONIC**, of which the Rus. and the Poles are the prominent representatives.

We have already recognized the fact that the Lapps and Finns and the Magyars of Hungary are of "Ugrian," the Turks of "Mongolian" stock, and that the connection of the Skiptar or Albanians with the Indo-European family is doubtful. The Basques—whose habitat is in the S. of Fr. and N. of Sp., in the vicinity of the W. Pyrenees—must also, on the ground of lang. and other considerations, be regarded as standing apart from the Indo-European family.

#### C. AFRICANS AND SOUTH-WESTERN ASIATICS.

1. *The Semitic*, including, in Asia, the Syrians, Assyrians, Babylonians, Phœnicians, Ammonites, Moabites, Ishmaelites, Edomites, Samaritans, and Jews, with their colonies; in Afr., the Abyssinians of Tigre, the Abyssinians speaking the Amharic lang., and the Gafat Abyssinians, and (as sub-Semitic) the Berber and the Coptic tribes.

2. *The Nilotic* tribes, which may be grouped as (1 and 2) the Nubians and Bishari, approximating to the Copts; (3) the Agows, resembling the Abyssinians; (4) the Gallas, having both Semitic and Kafre characteristics.

3. *The Kafres*, extending from the parts N. of the equator, on both sides of the continent, to the Hottentot frontier, and, in the hottest and moistest portions of their habitat, nearly akin to the negro type.

4. *The Negro*, subdivided into numerous petty tribes (which vary in color and physiognomy from the typical black according to locality), occupying the centre of the continent S. of the equator.

5. *The Hottentot*, who, according to Latham, "has a better claim to be regarded as a separate species of the genus *Homo* than any other section of our kind," occupies the S. portion of the Afr. continent.

Popular treatises upon the subject under discussion are PESCHEL'S *Races of Man*; DE QUATREFAGES'S *Human Species*; KEARY'S *Dawn of Hist.*; TYLOR'S *Anthropology*. For further references, see *J.'s Univ. Cyc.* M. B. ANDERSON.

**Man, Isle of**, an island of G. Brit., in the Irish Sea; area, 145,325 acres. It is traversed from N. to S. by mt.-ranges. Black marble, copper, zinc, and iron occur; lead is abundant. Agriculture and cattle-breeding are pursued. The fisheries are rich. The inhabs. are of Celtic race, and still speak a lang. of their own, the Manx, but the Eng. lang. is generally understood. The island has an independent legislature, called the Tynwald, consisting of two branches—the Gov. and Council, and the House of Keys. Cap. Castletown. Pop. 53,738.

**Managua**, the cap. of Nicaragua, stands on the S. shore of the lake of the same name, in lat. 12° 7' N., lon. 86° 12' W., surrounded with coffee plantations. Pop. 8000.

**Managua, Lake of**, a body of water in Nicaragua, 40 m. long, 16 m. wide, and from 2 to 40 fathoms deep, which has played a part in the projects of interoceanic communication. Its N. shore is separated from the ocean only by the plain of Leon, 15 m. broad. At its S. extremity it is connected with Lake Nicaragua by the river Tipitapa.

**Man'akin**, a name given to the rather numerous species of birds of the family Ampelidæ, sub-family Piprinæ, and genera *Phainopepla*, *Pipra*, *Rupicola*, *Melospiza*, and *Calyptura*, (S. Amer.), and the Old-World species *Calyptomena viridis* (green M.), from Java and Sumatra. The male M. are beautifully colored.

**Manassas Junction, Battle of**. See BULL RUN, BATTLE OF.

**Manas'seh**, the eldest son of Joseph; was adopted by Jacob on his death-bed, and became the head of a tribe of Israel, which numbered 32,200 warriors on the exodus from Egypt and 52,700 on the entrance into Canaan. It received lands on both sides of the Jordan.

**Manasseh**, the 14th king of Judah, a son of Hezekiah; reigned from 696 to 641 b. c.; became an idolater; was taken prisoner by the king of Assyria, and detained at Babylon, but was restored to his kingdom.

**Manatee** (Haytian), a genus of herbivorous marine animals, called "sea-cows." The adult M. is a clumsy oval form, over 9 ft. in length. It has a tough hide, resembling that of the pachyderms, sparsely beset with short, stiff hairs. The flippers are furnished with flat nails. The posterior extremity is flattened and expanded horizontally in a fan-like form, and constitutes a very large proportion of the whole body. It has 32 molar teeth, 8 on either side, above and below. The canines and incisors are absent, except in extremely young individuals. All members of the family are vegetable eaters.

**Manchester** (Sax. *Mamchestre*; Lat. *Mancunium*), a city of Eng. Lancashire on the Irwell, consists of M. proper, on the W. bank of the river, and Salford on the E., connected by 8 bridges, and virtually constituting one town, though having separate municipal govts. It is the greatest cotton-manufacturing centre in the world, its cloth and clothing manufactures employing over 43,000 hands. Beside its manufactures of textile fabrics and clothing, its metal and other manufactures employ about 30,000 hands. The spirit of this busy hive is shown by the many industrial inventions and improvements, which either originated or were first adopted here. One of the finest canal works in the world, the Bridgewater Canal, and the first railway ever in active operation, were built between M. and Liverpool. The ideas of free trade originated here, and here was established the first free lending library in Eng. The city has over 200 places of worship and a great number of charitable and educational insts. But in spite of many recent improvements the city is still one of the unhealthiest in Eng. In architectural respects the city is not very remarkable. The



cathedral, 216 ft. long and 120 ft. wide, in Gothic style, was built in 1422, but has undergone many changes. Pop. of M. proper, 341,414; of Salford, 176,235.

**Manchester**, R. R. Junc., Hartford co., Conn., 8 m. E. of Hartford. Has extensive manufactures, especially of silk and paper. Pop. 1870, 4223; 1880, 6462.

**Manchester**, on R. R., Delaware co., Pa., 47 m. W. of Dubuque, on W. branch of Magnoketa River. Pop. 1870, 1492; 1880, 2275.

**Manchester**, Mich. See APPENDIX.

**Manchester**, city and important R. R. centre, one of the caps. of Hillsborough co., N. H., on both sides of Merrimack River, 16 m. S. from Concord, was the first city incorporated in the State. It was settled in 1722, and was incorporated in 1751 as the town of Derryfield. Its name was changed in 1810 to that of Manchester, and it was made a city in 1846. It owes its extraordinary growth since 1838 to the Amoskeag Manufacturing Co., which controls the water-power of the Merrimack. The Amoskeag Falls, with a descent of 54 ft. 10 in., supply water-power, by 2 canals, for 4 large manufacturing corporations. M. contains the State reform school, co. jail, co. c-h., orphan asylum, a R. Cath. convent, a free library of 18,000 vols., 5 public parks, and 2 cemeteries. Pop. 1870, 23,536; 1880, 32,630.

**Manchineel** [Sp. *mancinella*, a "little apple," so called from the appearance of the fruit], the *Hippomane mancinella*, a very poisonous evergreen tree of the W. I., belonging to the order Euphorbiaceæ. Its white juice burns the skin upon which it falls. To taste its fragrant fruit would be dangerous were it not that the mouth is at once blistered by it. Men are said to have died from sleeping in its shade.

**Manchooria**. See MANTHOORIA.

**Mançini**, mah-n-chee-ne (FASQUALE STANISLAS), b. at Naples about 1820; at an early age became prominent as a publicist; took a lively part in the Neapolitan movements of 1848, after which he retired to Turin with his wife (the poetess, Laura Beatrice Oliva Mancini, who d. in 1869), and there practised as an advocate. In 1851 he was elected prof. of international law in the Univ. of Turin. In 1855 Cavour invited M. to take part in the Consiglio del Contenzioso Diplomatico. As an opposition M. P. the speeches of M. were listened to with interest. In 1862 he was for a short time minister of public instruction while Rattazzi was pres. of the council. In the peace conference at Ghent in 1873, M., as rep. from It., was chosen pres. of the cong.; was minister of foreign affairs 1881-83.

**Man'co Capac**, the founder of the Inca dynasty of Peru, appeared, with his sister and wife, Mama Oello, on an island in the Lake of Titicaca several centuries before the Sp. conquest, professing to be children of the sun, becoming the instructors of the Peruvians in civilization. A descendant, Manco Capac II., brother of Atahualpa, was made nominal sovereign of Peru by Pizarro in 1534.

**Mandan**, Dak. See APPENDIX.

**Manda'ra**, or **Wandala**, kingdom of Central Afr., S. of Bornoo, of which it is a dependency, consists of a large, fertile, and well-cultivated valley, encircled by the Mendepy Mts. The inhabs. are Mohammedan negroes, industrious in the manufacture of cotton fabrics and articles of iron, and have a noted breed of horses. The cap. is Doloo.

**Mandarin** (man-da-reen') **Duck** (*Aix galericulata*), a duck of Chi., of singularly brilliant plumage, closely related to the wood duck of the U. S. It has a fine green crest and a fan-shaped tuft of feathers on the back.

**Mandate**. See BAILMENT.

**Man'davee**, city of Cutch, Hindostan, on Gulf of Cutch, has important trade with Ar. and W. Afr. Pop. 50,000.

**Mandelay**, or **Pattawapura**, the present cap. of the kingdom of Burmah, is situated 3 m. from the Irrawaddi River, a little N. of Amarapura, the former cap. It was founded in 1856, and is laid out in 3 parallelograms, separated from each other by fortifications. The innermost parallelogram is occupied by the king's palace, the second by the officials, the third by the merchants and mechanics. The whole city is built of wood, but glittering with colors and gilding, and it stands in a fertile plain. Pop. 90,000.

**Manderson** (C. F.). See APPENDIX.

**Mandingo**, terr. of W. Afr., extending between lat. 10° and 14° N., and between lon. 6° and 10° W., consists of a high table-land, and contains the sources of the Senegal and the Niger. Its inhabs. form one of the finest negro tribes. They possess a rich lang., written with Arabic characters. They are Mohammedans, and very zealous propagandists of Islam. Their number is between 6,000,000 and 8,000,000.

**Man'drake** [Gr. *μανδραγόρα*], the *Atropa mandragora* (*Mandragora officinarum*), a solanaceous perennial herb of the warm parts of the E. continent. It is a narcotic poison, and was used by the anc. for its soporific and anæsthetic effects; was anciently believed to have many magical virtues; its forked root was likened to a man, and believed to possess a soul; it was believed to shriek so loudly when dug up that the person digging it died. Consequently, the earth was carefully removed from it by one whose ears were stopped with wax, and a dog was attached by cords to the root to drag it out. The name has been applied in the U. S. to *Podophyllum peltatum*, the May-apple.

**Man'drill** [said to be a combination of *man* and *drill*, a species of baboon—*i. e.* the "manlike drill": *drill* is an Old Eng. word, not yet quite obsolete], the *Cynocephalus mormon*, the largest of the baboons, a native of N. Afr.

**Mane'sa**, or **Manis'sa** [anc. *Magnesia*], a town of Asiatic Tur., in Asia Minor, on the Hermos. It is a large city, containing more and finer public buildings than Smyrna, and carrying on an important trade in cotton, grain, and tobacco. Pop. 40,000.

**Man'es** [Lat. pl., probably at first signifying the "good ones"], among the anc. Roms., the name for the spirits of deceased persons. The household Lares came to be regarded as identical with the ancestral M.

**Man'etho of Heliopolis**, Egyptian high priest and

keeper of the sacred archives in the 3d century a. c., b. at Sebennytus in Lower Egypt. He wrote in Gr. his Egyptian hist., of which nothing remains but fragments. These fragments, in addition to an account of the Hyksos, furnish the complete lists of 30 dynasties, running over more than 3500 yrs. By means of this, in conjunction with recent discoveries which attest their correctness, the Egyptian chronology has been restored. C. P. KRAUTH.

**Man'fred**, b. in Sic. about 1183, a son of Frederick II. of the house of Hohenstaufen, received, on the death of his father in 1250, the principality of Tarent, and acted as regent in It. during the absence of his half-brother, Conrad IV. He subdued the insurrections in Capua, Naples, and other cities, but his services were ill-rewarded by Conrad. In 1254 Conrad died, and M. was for the second time appointed regent in It. during the minority of Conradin, and, on a rumor of the death of Conradin in Ger., he was proclaimed king of the Two Sicilies, and crowned at Palermo Aug. 11, 1258. The rumor proved false, but he now refused to abdicate; and when the pope, Urban IV., put him under ban, he invaded the Papal States and conquered all Tuscany after the victory at Montapertoso, Sept. 4, 1260. His govt. was beneficial to the country. Meanwhile popes Urban IV. and Clement IV. put up for sale the crown of Naples and Sic., and Charles of Anjou, a brother of Louis IX. of Fr., was the highest bidder. With a Fr. army he landed in It., was crowned in Rome Jan. 6, 1266, and defeated M. in the battle of Benevento, Feb. 26, 1266. M. himself fell in the battle.

**Manganese**, a metal at first confounded with iron. It occurs in nature in the form of various oxides, sulphide, carbonate, silicate, etc.; is very generally distributed in rocks and soils. M. compounds have valuable uses in dyeing, also in med. M. has been found to be a normal constituent of the ashes of plants, and in very minute quantity is believed to be always present in human blood and in animal tissues generally. With the exceedingly delicate test known as "Grum's test" it is found to be almost, if not quite, as universally diffused throughout nature as iron, to which latter it is closely linked by a great many chemical analogies and affiliations.

**Metallic Manganese**.—Though known for nearly a century, this metal has not yet come into use, either in a pure form or in alloys, though it was long since found to form some alloys having promising properties. Deville obtained M. in a form in which it had a reddish color like bismuth, and decomposed water readily in the cold. An impure M., containing more or less iron, is now manufactured in considerable quantities, and used, under the name of *spiegeleisen*, in the manufacture of Bessemer steel.

**Oxides of Manganese**.—There are 6 oxides of this metal known. Manganous oxide is the base of the ordinary salts of M., the sulphate, carbonate, acetate, etc. Manganoso-manganic oxide, corresponding in composition to the magnetic oxide of iron, is the mineral species *hausmannite*. Manganic oxide, the sesquioxide, occurs as the mineral *braunite*. The deutoxide is the mineral *pyrolusite*, occurring in powdered form in commerce as *black oxide of M.* This is the most valuable M. mineral; used in making chlorine. Manganic acid has not yet been isolated, being known only in its salts, which are themselves decomposed by contact with water, yielding solutions of permanganates. The manganates are green in color. By fusing together any oxide of M. in the air with an alkali, a green manganate is formed, which was formerly known as *chameleon mineral*, from the alterations of color from green to purple which its solution in water undergoes through the change from a manganate to a permanganate. Permanganic acid is known, isolated, in liquid, and even in solid crystalline forms. It is described as a thick, greenish-black, metallic-looking liquid, evaporating when warmed as violet vapors, but exploding when heated quickly. It sets fire to paper, and explodes with alcohol on contact. Its most important compound is the *permanganate of potash*, familiar now in commerce in beautiful crystals, which are largely used as a disinfecting agent. It is also one of the most valuable tests used by the chemists in the laboratory. M. has been stated by Percy and others to form alloys with copper similar to and capable of being substituted for *German silver*, which, if correct, would enable it to take the place, to some extent, of the expensive metal *nickel*, and make the latter cheaper. [From *orig. art. in J. S. Univ. Cyc.*, by Prof. HENRY WURTZ, Ph. D.]

**Mange** [Fr. *démanger*, to "eat"], a disease of dogs, horses, cattle, swine, and sheep, distinguished by the presence of *acari* or mites upon the skin, and also marked by scurfiness, itching, heat, and pimples upon the skin. Sulphur ointments, carbolic-acid washes, corrosive sublimate in weak solution, and decoction of tobacco or of the green leaves of *Veratrum viride*, are all useful applications.

**Man'go** [Malayn, *mangga*], the fruit of *Mangifera indica*, an E. I. tree, order Anacardiaceæ, naturalized in other tropical climates. There are many varieties of the fruit, with an agreeable blending of sweetness and acidity.

**Mangold-Wurzel** [Ger. for "beet-root"], a name adopted by farmers and others into Eng. to designate the larger and coarser varieties of the beet (*Beta vulgaris*), now extensively grown as food for domestic animals. M. are too coarse and rank for human food, and even for cattle they are harsh and irritant to the bowels in the early part of the winter; but toward spring they may be fed to all kinds of stock with advantage, though too liberal feeding is believed to have a diuretic effect. They need a generous soil, clean culture, and liberal manuring. Eighty tons to the acre have been grown in favorable circumstances.

**Mangosteen** [Malayn, *mangusta*], the fruit of *Garcinia mangostana*, a small tree of the order Guttifera, a native of the Spice Islands, and cultivated in the E. Archipelago. The fruit externally resembles an orange. The edible portion is a white pulp around the seeds, large and 5 in number, in the centre. This juicy pulp is described as "having the whiteness and solubility of snow, and a refresh-



ing, delicate, delicious flavor, . . . partaking of the compound taste of the pineapple and peach, with many other equally good but utterly inexpressible flavors."

**Mangrove** [probably corrupted from Malay *mangle*, and *grove*], a popular name for the shrubs and trees of the order Rhizophoraceæ, natives of the muddy coasts of hot countries, where they form dense thickets. *Rhizophora mangle* and *candelaria* are the typical M. The former abounds on the coasts and keys of Fla. Their stems put forth long aerial roots which extend down into the water; the seeds germinate in the fruit, and send down a long and heavy root, which on falling sinks into the mud; and thus the M-swamp slowly gains upon the shallow seas.

**Man'gum** (WILLIE PERSON), b. in Orange co., N. C., in 1792, grad. at the Univ. of N. C. in 1815; became a lawyer and politician, and was in 1819 and 1826 chosen a judge of the superior court; was in Cong. 1825-26; U. S. Senator 1831-37, and again in 1841-53. In 1837 11 electoral votes were cast for him for Pres. of the U. S. He was pres. of the Senate during the Tyler administration. D. Sept. 14, 1861.

**Manhattan Island**. See New York, City of.

**Manhat'tan**, R. R. centre, cap. of Riley co., Kan., at the junction of Big Blue and Kansas rivers; is the seat of the Kan. State Agricultural Coll. Pop. 1870, 1173; 1880, 2105.

**Mania**. See INSANITY.

**Manichæism**, man-e-ke'e'izm, a religious system which arose toward the end of the 3d century in the Per. empire, compounded mainly of Per. Dualism, Buddhism, and Syrian Gnosticism, and using certain Chr. ideas as a gloss for a heathen theosophy. Spreading in the Rom. empire, the sect was persecuted by Diocletian because of its Per. origin, and afterward by the Chr. emps. as heretical. In this system good and evil were opposed from eternity, and were represented by light and darkness. The good god, Ormuzd, and his 12 sons, constituting the kingdom of light, were in eternal warfare with Satan and his demons, the kingdom of darkness. Inroads had been made by the latter upon the former, and in order to guard the border-land Ormuzd places over it an *Æon* (the mother of life), who gives birth to the ideal man; who, assisted by the 5 pure elements, enters on the contest, but is taken captive. Another *Æon* (the living Spirit) is now sent to his aid—not, however, in time to prevent the kingdom of darkness from swallowing up part of his luminous essence (the soul of the world). The remaining part of the ideal man—the Jesus *Impatibilis*—is now transported to the sun. Out of the mixture of the luminous essence, thus absorbed, with the kingdom of darkness, the living Spirit now creates this present visible world, in order that from a process of purification now entered on the particles of light may now regain strength and freedom. From this mixture every man has, beside a soul of light, an evil soul; the former of which is to gain the victory by drawing to itself the particles of light scattered through nature, and especially in the vegetable world. While this purification is being accomplished under the superintendency of the ideal man residing in the sun, and of the living Spirit, the evil demons, on the other hand, are attempting by false religions, as Judaism and heathenism, to bind souls to the kingdom of night. At last the ideal man in the sun—the Christ—descends in a seeming bodily form, and aims by his doctrine to liberate the imprisoned souls of light. He is seemingly killed by demons, but it is only the phantom of his body that is crucified. But his doctrine is misapprehended and misrepresented by his apostles, to restore which to its purity Mani, the promised Paraclete, is sent.

In various combinations, and under various names, its main elements were soon diffused through the Rom. empire. Afr. was its chief seat in the W., and its chief apostle there was Faustus of Mileve. Through his influence Augustine was for a time its adherent, but afterward wrote largely against it. From Valentinian I. (364-375) the Rom. emps. issued edicts against it. In Afr. it was also persecuted by the Vandals. At the time of Leo the Great (A. D. 440-461) numbers of its adherents were found at Rome. The elements of the M. system were diffused through Sp. by the Priscillianists, a sect which, appearing 380, was suppressed 583. The elements of their system appear during the Middle Ages in various mystic and Gnostic schools, such as the Paulicians and the Catharini. The mystery of the origin of evil and the seeming dualism of human nature have ever tended to drive minds in the direction of their speculations. [From orig. art. in *J. v. Univ. Cyc.*, by Prof. T. M. Post, D. D.]

**Manila**, mah-nee'la, or **Manilla'**, city of Luzon, cap. of the Philippines, and the residence of the Sp. viceroy or gov., is situated at the mouth of the Pasig. It consists of the city proper with about 15,000 inhabs., and a number of suburbs; total pop. 160,000. The city proper is situated between the river and the sea, and is surrounded by walls and defended by a citadel. It is laid out with straight and broad streets, and with many public squares. It contains a cathedral, the palaces of the gov. and the abb., the colls., barracks, and other public buildings. Of the suburbs, Binondo, situated on the N. bank of the river, is the largest and most important. It is the seat of traffic and commerce. M. has been one of the principal centres of commerce in the E. I. almost since its foundation in 1571 by Legaspi. It has an excellent harbor, and all the products of the Philippines are brought hither—rice, sugar, coffee, cotton, hemp, and tobacco. The last 2 articles are the prin. ones. The city has a dangerous enemy in the earthquake; in 1863 all its chs. fell, and thousands of people were killed.

**Manila Hemp**, or **Abaca**, the fibre of *Musa textilis* of the Philippine Islands, is obtained from the leaf-stalk of the plant; is largely imported for the manufacture of cordage and canvas, which is of the very best quality, exceeding hemp in durability, but not in flexibility. Old M. is used for paper-stock, and makes a wrapping-paper of excellent quality and great strength.

**Manili'us** (MARCUS), a Lat. poet, author of a didactic

poem in 5 books, *Astronomica*, which has been preserved; but of his life and age nothing is known, though it is probable he flourished under Augustus.

**Manin'** (DANIELE), b. in Venice in 1804, ed. at Padua, and at an early age became one of the most distinguished advocates in Venice. His influence was important in preparing the revolution in Venetian Lombardy. Being imprisoned, he was subjected to a political trial, but on Mar. 17, 1848, the people liberated him, and placed him at the head of the provisory gov't. M. moderated the violence of the revolution, and defended the independence of Venice to the utmost. On his banishment he withdrew to Fr., where he was a most active apostle for the freedom of It. D. in Paris Sept. 22, 1857.

**Ma'nioce**, Cassa'va, Ju'ca, or **Mandio'ca**, names of the *Jatropha Manihot* and other species, euphorbiaceous plants of S. Amer., extensively cultivated as sources of food. From the farinaceous root is prepared tapioca, Brazilian arrow-root, the Brazilian *farinha*, etc.

**Manis**. See PANGLIN.

**Manistee'**, city, on R. R. cap. of Manistee co., Mich., on both sides of the Manistee River, and between Lake Manistee and Lake Michigan; located in the great peach and fruit belt of Mich. The river between the lakes is 1½ m. long, and navigable for small vessels drawing 10 to 12 ft. water. Pop. 1870, 3343; 1880, 6090; 1884, 10,373.

**Manito'ba**, prov. of the Dominion of Canada, Brit. N. Amer., bounded on the N. by the parallel of 53° N. lat., on the E. by the meridian 90° W. lon., on the S. by Minn. and Dak., U. S. A.—the line being the 49th degree of N. lat.—and on the W. by the meridian of 101° W. lon. Area, 120,000 sq. m. Pop. 1881, 49,509.

**Surface and Climate**.—The whole former area of the prov. is included in the valley of the Red River of the N., and is a fertile plain, the part near the river being a remarkably dead level. W. of the river the streams flow in deep troughs or *coulees*. Tall grass covers a great part of the country. The soil is very productive of wheat and most other crops. There is at least sufficient timber in the prov. for all immediate wants. Buffalo and other game abound. The waters teem with valuable fish. The pub. climatological statistics appear to show that it is one of the coldest inhabited parts of Brit. Amer. in winter, though the rather short summer is very warm. The rain and snow fall is very light in winter, hence the Canadian Pacific Railway, which passes through the prov., will here meet with but small obstruction to its trains from snow. The E. portion of the terr. has more wood and water than the W., and is not such a dead level. It has some marshy land.

**Man'itou** (Indian). Among the N. Amer. Indians of Algonkin stock, any object of religious reverence or dread is called *manitou*. *Gûche Manitou* means the Supreme Being.

**Manitowoc'**, city and R. R. centre, cap. of Manitowoc co., Wis., on Lake Michigan, at the confluence of Manitowoc River, 75 m. N. of Milwaukee. Pop. 1870, 5168; 1880, 6367.

**Manka'tou**, city and R. R. centre, cap. of Blue Earth co., Minn., on the Minnesota River, at the mouth of the Blue Earth, 86 m. from St. Paul, 184 m. from Sioux City, and 140 m. from Winona. Pop. 1870, 3482; 1880, 5550.

**Mankind**. See MAN, by PRES. M. B. ANDERSON, LL.D.

**Man'ly** (BASIL), D. D., b. near Pittsburgh, N. C., Jan. 28, 1798; became a member of a Bap. ch. when 16, and soon began to preach, though not regularly licensed until 1818; entered the junior class in S. C. Coll. the following yr., grad. 1821; was for 3 yrs. pastor of a ch. in Edgefield dist., then for 11 yrs. (1836-37) pastor of the only Bap. ch. in Charleston; was influential in the establishment of Furman Univ. at Greenville, S. C.; became in 1837 pres. of the Univ. of Ala., which post he filled until 1855, when he resumed his pastoral labors at Charleston, S. C.; acted subsequently as a traveling missionary in Ala.; was for a time pastor of a ch. at Montgomery, Ala. He was the chief organizer of the S. Bap. convention 1845, and of the theological sem. at Greenville 1858, and wrote a *Treatise on Moral Science*. D. Dec. 21, 1868.

**Mann** (A. DUPLEY), b. in Va. in 1805; was com. to negotiate commercial treaties with Hanover, Oldenburg, and Mecklenburg 1845, to all the minor Ger. states 1847; special com. to the insurgent gov't of Hungary 1849; minister to Switz. 1850; private sec. to Pres. Pierce 1853, but resigned the same yr.; devoted himself thenceforth to the development of the material resources of the S. States, and was appointed 1861 upon a special mission to procure the recognition of the Confed. States by European govts., being afterward associated for the same purpose with Messrs. Mason and Slidell.

**Mann** (ALFRED TURNER), D. D., b. in Augusta, Ga., Nov. 1, 1815; studied at the State Univ. at Athens, and at Randolph-Macon Coll. in Va., where he grad. in 1836, and in the same yr. entered the ministry of the M. E. Ch. S., and is an eloquent pulpit orator.

**Mann** (HORACE), LL.D., b. at Franklin, Mass., May 4, 1796, grad. at Brown Univ. in 1819; studied law at Litchfield, Conn.; was admitted to the bar in 1823, and settled at Dedham, Mass., but in 1833 removed to Boston. He was often in the State legislature, where he was an effective laborer for educational and other reforms. He was (1837-48) sec. of the Mass. Board of Education; M. C. 1848-53, Free-Soil candidate for gov. of Mass. 1852, and pres. of Antioch Coll., Yellow Springs, O., 1852-59. His 12 annual reports to the Mass. legislature are of high value. He wrote also *Lectures on Education*, *Letters and Speeches on Slavery*, *Lectures on Intemperance*, and supervised publication of *Revised Statutes of Mass.* (See LIFE, by MRS. MANN.) D. Aug. 2, 1880.

**Man'na** [Heb. *mân*], the concrete juice of the *Fraxinus ornus*, a small tree native in the countries on the Mediterranean. At present the M. of commerce is obtained exclusively from Sic. It is in the form of cream-colored, brittle, spongy flakes of an agreeable sweet taste. It contains a large percentage of a peculiar sugar called *mannite*. M. is a gentle laxative, and is occasionally used as such in med.,



especially in case of children, from its pleasant taste. It is an ingredient of the old "black draught."

The *M. [Ar. mon]* of the Sinaitic peninsula is found, during the month of June only, on the twigs and branches of the shrub *turfia*, whose botanical name is said by Porter to be *Tamarix gallica*. Small pots of it are kept for sale at the convent of Mt. Sinai. The present annual yield of the peninsula is 500 or 600 lbs. only; and there could never have been enough to feed two or three millions of people, so that the *M. of Ex. vii. 14* and *Josh. v. 12* must have been miraculous.

**Manna Grass, or Floating Rescue**, the *Glyceria julifans*, a grass growing in wet places in the temperate regions of nearly every quarter of the world; affords abundant hay of fair quality, and in Poland and parts of Ger. the seed is used as a grain. It is called Polish manna.

**Manning** (DANIEL). See APPENDIX.

**Manning** (HENRY EDWARD), CARDINAL, b. at Totteridge, Hertfordshire, Eng., July 15, 1806; studied theol. at the Univ. of Ox., and was appointed rector of Lavington and Graffham in Sussex in 1834, and archdeacon of Chichester in 1840; but the Gorham case occasioned him to give up in 1851 his preferments in the Anglican Ch. and join the R. Caths. After residing for several yrs. in Rome he was ordained a priest in 1857, and appointed rector of St. Helen and St. Mary's, Bayswater, and in 1865 he was nominated abp. of Westminster. He was created a cardinal Mar. 15, 1875. He founded the R. Cath. univ. of Kensington Oct. 15, 1874. Wrote *The Temporal Power of the Pope*, etc.

**Manning** (JACOB MEERILL), D. D., b. at Greenwood, N. Y., Dec. 31, 1824, grad. at Amherst Coll. in 1850, and at Andover Sem. in 1853; was settled over the Mystic Ch. (Congl.) in Medford, Mass., 1854-57, when he became associate pastor with Dr. Blagden of the Old South ch. in Boston, and in 1866 also lecturer at Andover on the relations of Christianity to popular infidelity. Wrote *Half Truths and the Truth, Helps to a Life of Prayer*, etc. D. Nov. 29, 1882.

**Manning** (JAMES), D. D., b. at Elizabethtown, N. J., Oct. 22, 1738, grad. at Princeton in 1762; was the first pres. of R. I. Coll. (now Brown Univ.) 1765-90, and was 1770-91 pastor of the First Bap. ch., Providence, R. I. He was sent to Cong. in 1786, and was a zealous Federalist. D. July 29, 1791.

**Mannite**. See MANNA and SUGAR.

**Mannometer** (Gr. *μάνος*, "rare," and *μέτρον*, "measure"), an instrument for determining the degree of density of the air. One simple form is a bent tube, of which the shorter leg is sealed at the end. The bend is filled with mercury. The pressure of the mercury on the inclosed air equals the sum of the atmospheric pressure, and the weight of that part of the mercurial column which rises in the longer leg above the level in the shorter leg.

**Mans, Le**, leh mong, town of Fr., the cap. of the dept. of Sarthe, with 55,347 inhabs., on the Sarthe, forms a centre of the railways between Paris, Tours, Angers, Rennes, and Cherbourg, and is one of the most important commercial and manufacturing places of W. Fr. The city is old-fashioned, Norman in its character, but has a very beautiful Gothic cathedral, commenced in 1216 and finished in 1484; several other interesting buildings, and numerous scientific and benevolent insts. It is the seat of a bp. and of the govt. of the dept. Its trade is chiefly in cattle, poultry, and other agricultural produce; among its manufactures are those of carpets, linen, and lace, the extensive; also its bleaching-fields and tanneries are extensive. In anc. times its name was *Vindinnum*, and it was the cap. of the Cenomani; in the 4th century it became the seat of a bp. and at the time of Charlemagne it was one of the most important cities of Fr. But the invasion of the Normans in the 9th century, and later on the long contest between the count of Anjou and the duke of Normandy, destroyed its prosperity. A battle took place here Dec. 12, 1793, between the royalists and the republicans, and another on Jan. 12, 1871, between the Gers. under Prince Friedrich Carl and the Fr. under Gen. Chanzy, in which the former were victorious.

**Mansfield**, city and R. R. centre, cap. of Richland co., O., has a fine c.h., a public library, opera-house, and public hall. Pop. 1870, 8029; 1880, 9859.

**Mansfield**, Penn. See APPENDIX.

**Mansfield** (EDWARD D.), LL.D., b. at New Haven, Conn., Aug. 17, 1801, grad. at W. Pt. in 1819, but declined appointment in the army, and grad. from the Coll. of N. J. 1822; studied law at the Litchfield Law School, and was admitted to the bar in Conn., but immediately removed to O., where in 1836 he was elected prof. of constitutional law in Cin. Coll. Leaving the profession of the law, he was ed. of the *Cin. Chronicle* 1836-49, of the *Atlas* 1849-52, of the *Gazette* 1857, and of the *Railroad Record* 1854-72; for several yrs. contributed to the *New York Times* over the signature of "Veteran Observer;" com. of statistics for the State of O. 1857-67. Author of *Utility of Mathematics*, *Treatise on Constitutional Law*, *Legal Rights of Women*, etc. D. Oct. 27, 1880.

**Mansfield** (JARED), b. at New Haven, Conn., in 1759, grad. at Yale Coll. in 1777. His *Essays, Mathematical and Physical*, attracted the notice of the govt., which led to his appointment in 1802 to a captaincy in the engineer corps of the army, and assignment to duty at the Military Acad. as acting prof. of math.; in 1808 he was appointed surveyor-gen. of the N. W. Terr. and removed to O., where he was the first to run the meridian lines on which is based the admirable system of the public surveys, and to do which he imported astronomical instruments, and practically established the first observatory in the U. S., in his own house near Cin. Returning to New Haven in 1812, having meanwhile been promoted to be lieut.-col. in his corps, he was in Oct. of that yr. appointed prof. of natural and experimental philos. at W. Pt.—the first to fill this chair. After 16 yrs. of service in this capacity, he resigned in 1828. D. Feb. 1, 1830.

**Mansfield** (JOSEPH K. F.), b. at New Haven, Conn., Dec. 22, 1803, grad. at W. Pt. 1822. Prior to 1846 he was engaged on engineering duty; in the war with Mex., as chief engineer of Gen. Taylor's army, he was distinguished in the

defence of Ft. Brown; at the battle of Monterey, where he was severely wounded, and at Buena Vista (brevet col.). Returning to duty with his corps at the close of the war, he was for 5 yrs. a member of the board of engineers for fortifications on the Atlantic and Pacific coasts, when he was appointed (1853) inspector-gen. of the army, with the rank of col. In Apr. 1861 he was placed in command of the dept. of Wash., receiving the appointment of brig.-gen. of volunteers the following month. Retained on this duty until Oct., he was transferred to Camp Hamilton, Va., and in Nov. to the command of Newport News; transferred in command of Suffolk June-Sept. 1862; promoted to be maj.-gen. of volunteers in July; assigned to the command of a division in the Army of the Potomac Sept. 10, at the head of which, at the battle of Antietam, he received wounds from which he d. the next day, Sept. 18, 1862.

**Mansfield** (WILLIAM MURRAY), EARL OF, b. at Scone, Perthshire, Scot., Mar. 2, 1705, ed. at Westminster School, at Christchurch, Ox., and at Lincoln's Inn; was called to the bar 1730, and soon acquired almost a monopoly of appeals from the Scot. court of sessions to the House of Lords. At the same time he cultivated the society of men of letters, and rose rapidly in his profession; married in 1738 a daughter of the earl of Nottingham; was elected to Parl. in Nov. 1742, and received the appointment of solicitor-gen. The Jacobite rebellion of 1745 exposed Murray to an accusation of disloyalty, his only reply being the energy with which he conducted the prosecutions against noblemen convicted of treason. In 1747, and again in 1754, Murray was re-elected to Parl., was appointed atty.-gen. and chief-justice of the king's bench, with the title of Baron Mansfield and a seat in the cabinet. In 1757 he effected the coalition between Pitt, Fox, and Newcastle, which resulted in the formation of the ministry of the former. In the Amer. troubles consequent upon the repeal of the Stamp Act he gave his opinion that the colonists must submit to the authority of Parl. before their grievances could be considered. In the trial of Woodfall, the publisher of Junius's letters, he held that the jury was competent only to pronounce upon the fact of publication and the "sense of the paper," not upon any question of law. He was created earl of Mansfield in 1776; retired from the bench June 4, 1788, and d. at Highgate Mar. 20, 1793. (See his *Life*, by Roscoe.)

**Mansfield, Mount**, in Cambridge, Lamoille co., Vt., is 4389 ft. high. The view from the summit is one of the finest in N. Eng., the mts. about Montreal, 70 m. away, being easily seen in clear weather. It is the highest of the Green Mts.

**Manslaughter**, man'slaw-ter, in law. By the common law, M. was the unlawful and felonious killing of another without any malice express or implied. It was separated by the text-writers into 2 classes, the involuntary and the voluntary. In most of the States of this country the crime is entirely defined and regulated by statute. These statutes, however, in gen. closely conform to the common-law principle, although differing in their details. The punishment is imprisonment in the State prison for different periods.

**Mansoo**. In See APPENDIX.

**Manchooria**, man-choo're-a, a region of N. E. Asia, forming the northernmost part of the Chi. empire, extends between lat. 40° and 53° 30' N. and lon. 118° and 135° E., bounded S. by Corea and the Yellow Sea, W. by Mongolia, and N. and E. by Asiatic Rus., from which it is separated by the rivers Amoor and Ussuri. Its present area is estimated at 362,313 sq. m., its pop. at about 12,000,000. It consists of large plateaus, bordered S. by the Shan-Alin Mts., and W. by parts of the Khingai Mts., which rise to a height of 15,000 ft., and traversed by several broad valleys, of which that of the Soongari River, an affluent of the Amoor, is the most remarkable. The plateaus are mostly covered with dense forests, the habitation of many wild animals which yield excellent furs. The rivers teem with fish, salmon and sturgeon. The valleys are well cultivated; barley, wheat, millet, ginseng, tobacco, and rhubarb are raised, and large herds of cattle, horses, and sheep are reared. The country is divided into 3 provs.—Liaotung or Shinking, cap. Mukden; Girin, and Saghalin-ulu. The inhabs. the Mantchoos, belong to the Tungusian family of the Mongolian race. In the beginning of the 17th century they invaded Chi., and in 1643 conquered Peking and placed their chief on the Chi. throne. At the present day the Mantchoos are rapidly dying out before the quickly advancing Chi. settlers. By far the greater number of the present inhabs. of Manchooria are Chinamen. The Chi. system of education is adopted everywhere throughout the country; the Chi. lang. is taught in all the schools, and Manchooria will, no doubt, before long become as Chi. as Chi. proper. See Alexander Williamson, *Journeys in North China*.

**Manteuffel**, mahn-toiff-el, von (EDWIN HANS CARL), BARON, b. at Magdeburg Feb. 24, 1809; entered the regiment of guard-dragoons in 1826, became aide-de-camp to the king in 1848; he often held important positions of a diplomatic character, and was the most important man in the reorganization of the army. In 1861 he was made a lieut.-gen.; in 1864 he was sent to Schleswig as govt. In the war gen. of 1866 against Aus. he first commanded under Gen. Vogel von Falkenstein, but in July he became commander-in-chief of the army of the Main. During the armistice he received the important mission of securing the sympathy of the Rus. court for the intended reorganization of Ger., but soon after he took his leave. In 1868 he was recalled to military service, and received the command of the first army corps. This he led in the Fr. war. After the capitulation of Metz he was made commander-in-chief of the first army, and was sent to N. Fr., where Faidherbe was organizing the army of the N. At Amiens the command of the S. army. The army of Boursbaki, which, defeated by Gen. Werder, retreated from Belfort, he attacked in the flank, cut off its retreat, and compelled it to cross the Swiss frontier. After the war he became commander-in-chief of the army of occupation. On



Sept. 14, 1873, the emp. created him a field-marshal. [From *orig. art. in J.'s Univ. Cyc.*, by AUGUST NIEMANN.]

**Mantis** [Gr. *μαντις*, a "diviner"], a remarkable genus of large orthopterous insects, raptorial in their habits, and kindred to the Phasmidae, or walking sticks. They are popularly called walking leaves, race-horses, soothsayers, or prophets. When watching for their prey these creatures assume a sort of kneeling posture, doubling the great spiny fore legs under the thorax. Hence they were once believed to be engaged in prayer. The Hottentots worship them.

**Mantua** (*Mantova*), city of N. It., in the prov. of Milan, the strongest fortress of the "Quadrilateral" and of It. It is in lat.  $45^{\circ} 07' 45''$  N., lon.  $28^{\circ} 27' 33''$  E., 8 m. N. of the Po, and 90 ft. above the level of the Adriatic. It is built on 2 islands formed by the Mincio, which here creates a lake that encircles the city. The channel between the 2 islands dividing the city is called the *Rio*. The streets and squares are broad and regular, and the public and private buildings have a grand mediæval aspect, and are very rich in works of art. The town has 5 gates and a dockyard, called Porta Catena, from whence there is a navigable communication with the Po. The cathedral of M. was designed by Giulio Romano, and contains fine frescoes. The chs. of St. Andrea and Santa Barbara are adorned with pictures by first-rate artists. St. Martino and St. Egidio are chs. of the 6th century. The old ducal palace is very sumptuous, with frescoes by Mantegna, Giulio Romano, etc. Pop. 28,048.

**Manuel I., Comnenus**, Byzantine emp., b. about 1120; succeeded his father, John II., or Calo-Joannes, in 1143, and d. Sept. 24, 1180. His reign was a succession of campaigns, but his successes were barely sufficient to keep his tottering throne standing.

**Manuel II., Palæologus**, Byzantine emp., b. in 1348; succeeded his father, John V., in 1391, and d. July 21, 1425. The Byzantine empire consisted at that time of Constantinople and the adjacent dists.; and so miserable had this throne become that on a tour to the W. countries John V. was detained in Venice for debt. Many Turks had settled in Constantinople, where they had 3 mosques, etc. Bajazet pushed his demands further, and John V. sent M. to his court as security for the fulfilment of the demands. On the death of his father, M. fled to Constantinople in order to secure the throne for himself, and Bajazet followed him with a great army. Aided by Sigismund, king of Hungary, M. met him at Nicopolis, but was defeated in 1396, and Bajazet laid siege to Constantinople. The last hour of the Byzantine empire seemed now to have come, when the progress of Timur still left it standing for some time.

**Manure**. See FERTILIZERS and AGRICULTURAL CHEM.

**Manutius** (ALDUS). See AULDINE EDITIONS.

**Manzoni**, mahn-zo'ne (ALESSANDRO), COUNT, b. at Milan May 8, 1785. His early studies were prosecuted at Merate and at Lugano, and he grad. at Pavia. At the age of 20 he went to Paris, where his mother was residing with Carlo Imbonati. Imbonati dying in 1806, M. wrote his famous verses on the death of his mother's friend. At this time M. made the acquaintance of Faurlin, to whom he became warmly attached. In 1807 he pub. his little poem *Urania*. Hitherto atheistic, he became converted between 1807 and 1808 to the Catholic faith, of which he was afterward an eloquent defender. Returning to Milan M. commenced his tragedy, *Il Conte di Carmagnola*, which he completed at Paris in 1819. On the death of Nap. in 1821, M. composed his immortal ode, *Il Cinque Maggio*. The following yr. M. pub. his tragedy, *Adelchi*. The distinguishing characteristic of the tragedies of M. is a return to the most simple and truthful dialogue. In 1825 he pub. *I Promessi Sposi*. This was followed by *Storia della Colonna Infame*. After this M. devoted himself entirely to the study of Italian. He was named senator by the It. govt., and an annual pension of 12,000 francs was settled upon him. D. May 22, 1873.

**Maoris**, the name give by themselves to the inhabs. of New Zealand. The natives of this archipelago are derived from the Malay stock. They have a tradition that their ancestors came about 500 yrs. ago in 7 canoes from a distant island called Hawaiki. There seems to be some reason to believe that the real aborigines of New Zealand were a small dark race akin to the Papuans. Owing to favorable phys. influences, the natives of New Zealand have developed into the first family of the Polynesians, being as remarkable for their bodily vigor as for intellect. The 2 great national customs which have not yet disappeared are *maru* and *tapu* or taboo. By the former any man who had by accident or otherwise transgressed certain customs rendered himself liable to a heavy fine or in some cases to be plundered by everybody. Owing to this no property was secure; an object of value, such as a coat, would pass in a few days through many hands; and it became disgraceful not to be plundered, because the being subject to *maru* gave a man a right to rob others. *Tapu*, or "prohibition," was infinite in its refinements. Under it nothing belonging to chiefs or *rangatira* (gentlemen) could be touched. Superstition aided this; a powerful man who had eaten unknowingly the remains of a chief's dinner died in a few hours of terror. *Rangatira* were *tapu* from carrying anything on their backs, but they evaded it by bearing it in their arms and nursing it like a child. No man could take light from a chief's fire. *Mana*, luck, virtue, force, or inherent power, was an element of vast influence among the M. A weapon which had slain many men, a virgin fortress, the prestige of a great chief, a pig which foretold changes in the weather by squealing, were all *mana*. Suicide was practised for many causes. When husbands or wives died the survivors in many cases hanged themselves; widows did so almost invariably; and debtors often settled their accounts in this manner. They excel in carving, of which their war-canoes, carrying 100 men, are specimens. They entertained formerly a superstitious dread of an *Atua* or supreme being, and cultivate many superstitions akin to worship relative to the stars, sun, moon, and minor divinities. They believe that the stars are the left eyes

of deceased chiefs; that the higher class among themselves are immortal, but when the *Cookes* or vulgar perish they die forever. The number of M. decreased very rapidly up to about 1858, since which there has apparently been a slight increase. In the census of 1881 their number is given at 44,099. (See GREY, *Maori Mementoes*.)

**Map** [Lat. *mappa*, "cloth"]. The word *map* is applied to a representation of the whole or of some portion of the earth's surface, properly termed a *terrestrial map*; it is also used to designate charts of the positions of the constellations of the celestial vault, considered as a surrounding sphere. The first man who attempted to draw a map of the world is Anaximander of Miletus, who lived from a. c. 611 to 547. Eratosthenes, b. at Cyrene in a. c. 276, is the first of whom it is recorded that he tried to measure the magnitude of the earth. The astron. Hipparchus of Bithynia, b. in the beginning of the 2d century a. c., also treated of geog. But it was not till the 2d century of the Chr. era that Claudius Ptolemy of Alexandria in Egypt, who must be considered the great father of mapping, constructed his series of 26 maps, together with a gen. map of the then known world, basing these upon a catalogue of the astronomical lats. and lons. of places. Rom. geog. of the 3d century was represented by the Peutingerian table, executed about 230 A. D., which exhibits the itineraries of the whole world known to the Roms., from Brit. to Farther India. In mediæval times the scientific mapping of Ptolemy seems to have given place in Europe to sentimental representations of the earth, in which the holy city of Jerusalem is taken as the central point of the world, all the lands of the globe being made to circle round it, and the ocean to encompass the whole on the outer margins. During the Middle Ages the Ars. rendered most important services to this science, and the old Arab treatises on geog. and travels are still valuable. It. maps of the 14th and 15th centuries betoken a return to scientific mapping.

An epoch was marked in the hist. of maps when the geog. Gerard Mercator introduced in 1556 the cylindrical projection of the sphere which bears his name. Between this time and the conclusion of the following century vast strides were made in geog., and the vols. of maps which were then pub. by private individuals far excel in costly elaboration any such works of the present day. Among the most important geographical works of the beginning of the 18th century is the survey of Chi. given out in the name of Père du Halde, the work of a number of Jesuit missionaries, who gained admittance first into Chi. about the end of the 15th century. It should be mentioned, however, that native Chi. maps of high value existed previously to this Jesuit survey. Coming down to more modern times, we find in the latter part of the 18th century the beginnings of those mathematically accurate surveys and delineations of the surfaces of civilized countries which are now making steady progress. In considering briefly the different kinds of maps and their construction, we shall divide these into the two chief classes of *topographical* or *special*, and *geographical* or *gen. maps*.

The greater part of the existing *topographical* maps are the result of surveys undertaken by the govts. of the more advanced countries of the globe. The preliminary step in the survey is the exact measurement of a base-line in some level plain, from the extremities of which base-angles are observed to surrounding objects chosen as trigonometrical stations. The distances of these stations from the ends of the base-line are then calculated and laid down on paper, forming so many new base-lines from whence other trigonometrical stations are determined, until the entire area of the country to be surveyed is covered with a network of triangles. Within the prin. triangulation minor triangles, termed *secondary* and *tertiary*, are observed, and afterward the interior of each is filled up by measurements with theodolite and chain. By this process the length and breadth of each part of the land are determined, and its features in respect of these 2 co-ordinates are accurately known; but a third element, that of elevation or depth, is also requisite to complete the true representation. In ascertaining this third element of height, the level of the sea is assumed as a datum line. In order to determine the true position on the globe of the tract surveyed, the astronomical position of some of the chief stations of the prin. triangulation must be obtained with the most rigid accuracy, their lats. being observed independently, their lons. by differences of time between each other and between a certain known or assumed meridian.

The class of *general maps*, embracing the whole of the geographical representations of the world, or of portions of its surface which are smaller in scale than the limit of topographical maps, is a wide one. The only representation of the whole world in which the relative proportions of its various parts can be accurately preserved is that of an artificial globe, on the surface of which the features of land and sea are mapped; and without the aid of such a globe no true ideas of the planet on which we live can be impressed on the mind. Since, however, the use of such an instrument is limited, it becomes imperative to have recourse to the more convenient representations on a flat surface. Just as it is impossible to lay a sheet of paper on the surface of a globe without folding in some parts, so no map on a plane surface can represent any considerable portion of the globe without distortion. In the case of gen. maps, some plan by which these errors of representation shall be reduced to a minimum must be employed. Various methods, termed *projections*, have from time to time been devised for this end, each having its application to some special purpose, some being designed for the truer representation of smaller areas, others for larger or for the whole globe. When a country has been topographically surveyed, the production of a gen. geographical map of that region is a simple matter of reduction of the larger to the smaller scale, and should be a perfect delineation of the main features of the land. [From *orig. art. in J.'s Univ. Cyc.*, by KEITH JOHNSTON.]



**Mapes** (JAMES J.), LL.D., b. in New York May 29, 1806: became a merchant and sugar-refiner, and was for a time prof. of chem. and natural philos. in the National Acad. of Design. He invented useful processes in industrial chem., and became a successful agriculturist in Newark, N. J. He became a manufacturer of fertilizers, ed. of the *Working Farmer*, and put forth many addresses and papers on chem. and agriculture, also *The American Repository of Arts, The Practical Farmer*, and other works. D. Jan. 10, 1866.

**Mapes**, or **Map** (WALTER), b. in Eng. about the middle of the 12th century; studied at Paris: became a noted theologian and a favorite of Henry II.: was canon of St. Paul and of Salisbury, precentor of Lincoln, incumbent of Westbury, Gloucestershire, and archdeacon of Ox. (1196). D. about 1210. The *Lat. Poems* commonly attributed to *Walter Mapes* were pub. in 1841, and the prose work, *De Nugis Curialium*, in 1850.

**Ma'ple** [A.-S. *mapeltréo*], a name given to trees of the genus *Acer* and order Sapindaceæ, natives of N. Amer., Asia, and Europe. Many of them are noble shade and timber trees. The Amer. species are the following: (1) The sugar M. (*A. saccharinum*), and its variety, *nigrum*, the black M. In Canada and the N. States great quantities of sugar of good quality are made by boiling the sap of this tree. It is used extensively in making furniture, especially the peculiar forms of the wood called birdseye and curled M. (2) The white M. or silver M. (*A. dasycarpum*), a fine shade tree; its soft and white wood is used for making shoemakers' lasts. (3) The red or swamp M., which shares with the preceding the name of soft M.; it is not unlike that of the silver M. (4) The striped M. (*A. pennsylvanicum*), sometimes called moosewood, and (5) the mountain M. (*A. spicatum*) are small trees or tall shrubs of little importance. These are the Atlantic U. S. species. In the Rocky Mts. occurs (6) *A. glabrum*, a handsome small tree. Or. and Cal. have 2 species: (7) the vine M. (*A. circinnatum*), a small tree or large shrub with leaves which may be likened to those of the grape-vine; (8) the large-leaved M. (*A. macrophyllum*), a very handsome tree, but never very large; its timber hard and close-grained, and greatly valued in Or., this and an ash being prin. hard-wood trees of region. Of European species, the species commonly planted in U. S. for shade and ornament, are Nor. M. (*A. platanoides*) and sycamore M. (*A. pseudo-platanus*), in Eng. called simply sycamore, both hardy trees of rapid growth and good timber. The wood of latter is much used in Europe for carving. ASA GRAY.

**Mapleton**, Ia. See APPENDIX.

**Maquoketa**, ma-k'ke-ta, city and R. R. junc., cap. of Jackson co., Ia. Pop. 1870, 1756; 1880, 2467.

**Marabou** (mar-a-bo'o') **Stork**, the *Leptoptilus marabou* of W. Afr., one of the ugliest of the stork family, held sacred from its usefulness in devouring large quantities of filth. From this bird, and from the almost equally repulsive adjutant-bird of India, the very beautiful and costly marabout feathers are obtained.

**Marabouts**, mar-a-boots' [Ar.], a sort of half-priestly caste in the N. and W. of Afr., among Mohammedan peoples. They are descendants of the Almoravide sovereigns of Sp. and Morocco.

**Maracaybo**, **Lake of**, is 100 m. long and 70 m. broad, and communicates through a channel 20 m. long and 5 m. broad with the Gulf of Maracaybo, an inlet of the Caribbean Sea, on N. shore of Venezuela. Its entrance is fortified.

**Maranhão**, or **Maranham**, town of Brazil, the cap. of the prov. of Maranhão, is situated on the N. W. coast of the island of the same name, and at the mouth of the Maranhão River, in lat. 2° 31' S. lon. 44° 18' W. It is a handsome city, with many fine buildings. The streets are steep, and carriages cannot be used. It has a good harbor and a large and important trade. Pop. 31,604.

**Maranta'ceæ** [from *Maranta*, one of the genera], a natural order of endogenous herbs, mostly tropical. The starch of *M. arundinacea* is true arrow-root.

**Maraschino**. See LIQUEUR.

**Marasmus**, consumption of the bowels, abdominal phthisis, is a wasting disease of the entire body, dependent upon scrofulous or tubercular degeneration of the mesenteric glands. It is chiefly a disease of children, especially the bottle-fed, those in asylums, or ill cared for. It often co-exists with the presence of tubercles in the lungs or tubercular meningitis, and frequently developed by the exhaustive influence of a difficult dentition or persistent summer diarrhæa. The prognosis is always bad. The treatment is entirely nutritive.

**Marat**, mah-rah' (JEAN PAUL), b. May 24, 1744, at Boudry, Neuchâtel, Switz., of Prot. parents; studied phys. science and med., read many books, and acquired a great multitude of miscellaneous notions, but learned nothing; wandered restlessly around from place to place; pub. at Edinburgh in 1774 *The Chains of Slavery*; settled at Paris in 1775; began to practice as a phys., and wrote book after book on optics, electricity, etc., but found no patients and no readers. With the Revolution this man suddenly became prominent. His paper, *L'Ami du Peuple*, became a power in Fr. Danton, the minister of justice, a man of great talents, wished to use M. and his paper. He introduced him in the club of the Cordeliers. Thence he crept into the Convention, and one day he stood beside Danton as member of the committee of public weal, and made Danton himself tremble. The Sept. massacres, and the law against suspicious persons, which brought 400,000 Fr. citizens to jail, were his greatest deeds. He was killed by Charlotte Corday July 13, 1793.

**Marathon**, a plain on the coast of Attica, about 6 m. long, 1½ m. wide, and 22 m. E. N. E. of Athens. The river Charadrus runs through it, and 2 little hamlets (Vrana and Marathona) are on its W. edge, under the hills. The battle fought there in Sept. 490 a. c. is one of the most important.

**Marble**. In common lang. any limestone which will take a good polish is called M., but the name is only properly applied to limestones which have been exposed to

metamorphic action, and have thereby been rendered more crystalline in texture, and have had their colors more or less modified or totally removed. White M. belongs to the latter category. This is formed from limestones in which the coloring-matter was organic, and was expelled by heat. In chemical composition, M. are either carbonates of lime or compounds of the carbonates of lime and magnesia. Many of the best M. contain much magnesia, and some of them are true dolomites. The use of M. in arch. apparently dates from the dawn of civilization. Among the Egyptians it was extensively used at a very early period, and nearly all the great masterpieces of arch. left by the Grs. and Roms. are composed of this material. M. has also been employed in all civilized nations for the internal and external decoration of buildings made of this or other material, and it has been the favorite and almost the only stone in which the sculptor has given form to his ideal.

M. are found to exhibit great diversity of color and texture, running into varieties which have served different purposes among both the anc. and moderns. They are commercially classified as *white* and *colored*, but each of these divisions constitutes a group in which there are many varieties, known by distinct names. The white M. are divided into the pure white, or statuary, and the mottled or clouded white, in which the mass is white with more or less clouds or stains. The colored M. are gray, blue, black, red, and yellow, or mottled with various mixtures of these colors with each other or with white. Of all these, the rarest and most highly esteemed is the pure white or statuary M. Comparatively few localities are known where good statuary M. is found, and the quarries which have supplied the material employed by anc. and modern sculptors have world-wide fame. The white M. chiefly used by the Grs. were the Pentellic and Parian. Of these, the first was obtained from Mt. Pentelcus, in Attica; the second from the island of Paros. By the anc. the Parian was regarded as the most beautiful of all M., and the finest works of Phidias, Scarpas, and Praxiteles, were wrought in it. The Pentelic M. is very fine-grained, translucent, and somewhat waxy in appearance. The Parian is more granular, resembling in color and texture *fine* loaf-sugar. The studios of the Rom. sculptors were mainly supplied from the quarries at Carrara, on the shore of the Gulf of Spezia, and the greater part of the white M. now used for statuary in Europe and Amer. is derived from the same source. The Carrara M. is of somewhat coarser grain than the Gr., but is very pure in color and sufficiently compact to receive a high polish. In the U. S. statuary M. has yet been quarried only at Rutland, Vt. Here a layer from 3 to 4 ft. in thickness of pure white is interstratified with 40 to 50 ft. of clouded M. This is as perfect in color as the Italian, but is somewhat less strong and durable. The clouded white M. are much more abundant than the pure white, and usually constitute ¾ of the deposit where that occurs. Most of the temples and palaces of antiquity are constructed from this variety, often taken from the same quarries which yielded the pure white in smaller quantities. In N. Amer. what are called white M. occur in a great number of localities, as in the Laurentian rocks of Canada, throughout the Alleghany belt, in the Rocky Mts. and Sierra Nevada. White or light M. of desirable quality are, however, yet known to exist in but few places, and almost all the fine M., such as come in competition with the It., are obtained from Rutland co., Vt. The M. of this region is of the age of the Trenton limestone of N. Y., and forms part of a calcareous mass about 2000 ft. in thickness, called the *Edonian limestone* by Prof. Hitchcock. The M. belt of Rutland co. extends to a great distance N. and S. through the States of Vt. and Mass., but the quality of the stone deteriorates in either direction. A belt of white M., probably distinct from that described above, runs southward along the flanks of the Alleghanies from Mass. to and beyond the Potomac. The M. of this belt is a typical dolomite, and is very coarsely crystalline. It is quarried at Sing Sing, Tuckahoe, and various points in Westchester co., N. Y., and near Baltimore, Md.

"Colored" M. are either of one simple color or variegated. Among the first are the black, red, blue, gray, and yellow M. Jet-black M. was somewhat largely used by the anc., and that found in the ruins of It. is known as the *Nero antico*. It is now highly prized, and is chiefly used as a groundwork for mosaics. Black M. are found in Belg., Eng., Ire., and in the U. S. The red and yellow M. of the Roms. are called by the modern Its. the *Rosso antico* and *Giallo antico*. Like the *Nero antico*, they were largely used by the Roms. and Etruscans for the decoration of the interiors of their houses, but the localities from which they were derived are not now known. Gray M. have always been more or less employed in arch. The most common gray M. of the Roms. is the *Cipolino*. The columns of the temple of Jupiter Serapis at Balæ (bored by mollusks, and thus recording the former partial submergence of the temple) are of *Cipolino*. The variegated M. are often spotted or veined with different colors, and are sometimes of great beauty. They are used for the decorations of the interiors of buildings, for counters, soda-fountains, mantels, etc. *Brocatello* is the name given to a peculiar mottled M. found in Sp. *Lumachella* (It.) is a highly fossiliferous M. or limestone, to which the inclosed fragments of shells, retaining their nacre and iridescence, give great brilliancy and beauty. *Bardiglio* is a bluish-gray M. with strongly marked veins and spots of black. In the U. S. the colored and variegated M. are known to exist in various localities, and some of them are in gen. use for the purposes such M. serve. Of these, the best known is the "Tennessee," a very handsome stone, mottled chocolate or lilac and white in color, and a favorite material for the interior decoration of public buildings. A scarcely less beautiful variety is the "Winooski" M., quarried near Burlington, Vt. This is mottled with red, brown, and white, and is much esteemed, but, like many



other veined and mottled M., it contains much silica and is difficult to work.

In quarrying M., the surface-rock, except when protected by clay or earth, is found cracked and decomposed by frost, sun, etc. to a depth of 10 to 30 ft., and is worthless. When the surface or "cap rock" is removed, a "floor," or level space, is formed, where the "channelling-machines" are set to work. By these machines narrow parallel channels are cut across all the floor to the depth of perhaps 6 ft. The machines are then turned, and channels are cut at right angles with the first. The floor is thus cut into blocks of any required size. One of these, called the "key-block," is then broken out, and the others, thus rendered accessible, are drilled through at their bases—a process called "gadding"—and are lifted out by cranes. When removed from the quarry the blocks of M. are taken to a mill constructed for that purpose, and *quarried* into slabs of different thickness or into pyramids for monuments, blocks for building, etc. This is done with gangs of horizontal saws, which are strips of soft iron, fed with sand and dripping water. The polishing of M. is also done by machinery, the slabs or blocks being placed in a "rubbing-bed" and ground and polished with sand, emery, "putty," etc. by a rubber with either a rotary or a to-and-fro motion.

J. S. NEWBERRY.

**Marblehead**, R. R. centre, Essex co., Mass., 20 m. N. E. from Boston, has a deep and spacious harbor, nearly landlocked. The fisheries, once prominent, are declining. It is a summer resort. Pop. tp. 1870, 7703; 1880, 7487.

**Marcellinus**, SAINT, and bp. of Rome, succeeded Caius June 30, 296, and d. Oct. 24, 304. The old story of his apostasy under Diocletian is now regarded as fabulous.

**Marcellinus**. See AMMIANUS.

**Marcellus**, the name of an illustrious plebeian family of anc. Rome, belonging to the gens Claudia. The most famous member of this family was Marcus Claudius Marcellus, b. about 268 B. C., and killed at Venusia, in Apulia, in 208 B. C. He was 5 times consul—viz. in 222, 215, 214, 210, and 208 B. C. He slew with his own hand Viridomarus, king of the Gauls, in the battle of Clastidium, during his first consulship. Of still greater importance was his success at Nola in 215 B. C., where he repelled the attack of Hannibal. But his greatest exploit was the conquest of Sic. in 212 B. C. His great services to the republic were disfigured by the cruelty of his character. Syracuse he gave up to be plundered by his soldiers, and he carried away its works of art. In Rome itself his proceedings occasioned much censure.

**Marcellus I.**, SAINT, a Rom. bp. of Rome in 308, was forced by the emp. Maxentius to become a slave in his stables. D. 310.—**MARCELLUS II.**, POPE (*Marcello Cervini*), was cardinal-legate of Julius III. at Trent; became pope, retaining his own name, and d. of poison May 1, 1555.

**March** [*Lat. Martius*, the month of Mars], the 3d month of the Gregorian style, the 1st of the Julian calendar.

**March** (ALDEN), M. D., LL.D., b. at Sutton, Mass., in 1795, grad. at Brown Univ. in 1820, and in the same yr. settled as a surgeon at Albany, N. Y. He was the prin. founder of the Albany Med. Coll. and the City Hospital, and was long a prof. of surgery and dean of the faculty in the former inst. He was a successful surgical operator, and was at one time pres. of the Amer. Med. Association. He wrote some excellent professional papers, and introduced important changes in operative surgery. D. June 17, 1869.

**March** (AUSIAS), a Valencian poet, the yr. of whose birth is unknown, but who appears to have d. in 1462. His poems in subject and gen. character resemble those of Petrarch, but his treatment of his themes is original, and he is entitled to rank not only first among the bards of his native lang., but among the first of the century in which he flourished. His compositions are generally in stanzas of 7, 8, or 10 verses, in most cases rhymed, but sometimes simply *assonant*.

**March** (CHARLES W.), b. at Portsmouth, N. H., Dec. 15, 1815, grad. at Harvard Coll. in 1837; studied law; engaged in journalism in New York; pub. *Daniel Webster and his Contemporaries*; travelled in Europe; wrote *Sketches and Adventures in Madeira, Port., and the Antebanks of Sp.*; was for some time vice-consul at Cairo. D. Jan. 24, 1864.

**March** (FRANCIS ANDREW), LL.D., b. at Millbury, Mass., Oct. 25, 1825, grad. at Amherst Coll. in 1845; was tutor there 1847-49; admitted to the bar in New York 1850; was a teacher at Fredericksburg, Va., 1852-55, and became in 1858 prof. of the Eng. lang. and of comparative philology at Lafayette Coll., Easton, Pa. He has written *A Method of Philological Study of the Eng. Lang.*, an *A. S. Gram.*, and an *Introduction to A. S.*, beside editing *Lat. Hymns* and a portion of the *Ecclesiastical Hist.* of Eusebius. In 1873 he was elected pres. of the Amer. Philological Association.

**Marcelon**, mar'she-on, the son of a bp. of Sinope in Pontus; was excommunicated by his father on account of his heretical views; went to Rome about 140; associated with the Syrian Gnostic Cerdon. He established the first known canon of sacred books.

**Marcoman'ni** ("men of the borders"), a Ger. tribe, first settled in the regions between the Neckar and the Main; accompanied Ariovistus when in the time of Cæsar he invaded Gaul, but were later on led by their own chief, Maroboduus, into the land of the Boii (Bohemia), which they conquered. Maroboduus's rule was of short duration; he was compelled to flee from his country, sought refuge with the Rom. emp. Tiberius, and d. at Ravenna. The M. continued to be the ruling people in Bohemia. In the latter part of the 2d century Marcus Aurelius was occupied in war with them from 161 to 180, and when he d. his son Commodus bought peace of them. In the 3d century they invaded It. with various success. In the 4th century they became lost.

**Marco Polo**. See POLO.

**Marcon**, mar'-koo' (JULIUS), b. Apr. 20, 1834, at Salinis, in the dept. of Jura, Fr.; studied geol.; received in 1847 employment at the palæontological collection of the museum of the Sorbonne; travelled much in the U. S. 1848-50, 1853-54,

and 1860, and was appointed prof. in geol. at Zurich in 1855. Pub. in Eng., *Geological Map of the U. S.*, *Geol. of N. Amer.*; in Fr., *Drius et Trias*, *Carte géologique de la Terre*, and *Derniers Triasans sur le Drius et le Trias en Russie*.

**Mar'cus**, bp. of Rome, came to that dignity in 836, and d. Oct. 7 of that yr.

**Marcus Aurelius Antoninus**. See ANTONINUS (MARCUS AURELIUS).

**Mar'cy** (ERASTUS E.), M. D., b. at Greenwich, Mass., Dec. 9, 1815, grad. at Amherst Coll. 1837, and in med. at Jefferson Med. Coll., Phila., 1840; was for some yrs. an allopathic phys., but adopted the homœopathic doctrines, after which he "verified his theories by extended observation in the first hospitals of Europe;" settled in New York; wrote numerous essays on med. and chemical subjects; edited from 1852 *N. Amer. Homœopathic Journal*; pub. *The Theory and Practice of Med. and Homœopathy vs. Allopathy*, and edited Hahnemann's *Lesser Writings*.

**Mar'cy** (WILLIAM LEARNED), b. at Southbridge, Mass., Dec. 12, 1786, grad. in 1808 at Brown Univ.; was for a time a teacher, but became a lawyer of Troy, N. Y.; served as an officer of volunteers in the war of 1812-14, capturing at St. Regis, Canada, the first prisoners and the first flag taken on land in the war; became in 1816 recorder of Troy, and for a time conducted the *Troy Budget*, then a leading anti-Federalist organ; became in 1821 adjutant-gen. of N. Y., in 1823 comptroller; a judge of the State supreme court in 1829; was chosen U. S. Senator in 1831, but resigned the following yr. upon being elected gov. of N. Y., to which position he was twice re-elected, but defeated in 1838 by W. H. Seward. In 1839 Pres. Van Buren appointed him com. to adjust the Mex. claims, and in 1845 Pres. Polk made him sec. of war. In 1853 Pres. Pierce appointed him sec. of state. D. July 4, 1857.

**Mar'cy**, Mount, called by the Indians *Tahawus*, or the "cloud-splitter," the highest land in N. Y. State, is in the town of Keene, Essex co. Height, 5467 ft.

**Mardi-Gras**, mar-de-grah, is the name applied to the festival preceding the first day of Lent, or Ash Wednesday. It is one of special interest in New Orleans, which city is distinguished for the splendor she gives to her favorite holiday, the M. G. or "Fat Tuesday." The ceremonies, annually performed, were introduced by the Fr. pop. 1827.

**Mare Island**, in Solano co., Cal., in the N. E. part of San Pablo Bay, near Vallejo. It has a U. S. navy-yard.

**Mar'en'ne** (*Ora Maritima*), a name applied to a vast marshy, unhealthy terr. bordering on the Tyrrhene Sea, from the mouth of the Magra to that of the Volturno. It covers about 1000 sq. m., and is divided into the Tuscan M. and the Rom. M., these being again subdivided. This great tract is covered with stagnant water or immense deposits of seaweed, interspersed with thorny thickets, wild forests, and verdant meadows. There are few villages, or even roads, in the M., and the pestiferous exhalations extend even to the more elevated portions.

**Mar'en'go**, a v. of It., in the prov. of Alessandria, famous for the battle fought here June 14, 1800, in which Nap. routed the Aus.

**Mar'engo**, on R. R., McHenry co., Ill., 66 m. N. W. of Chicago, centre of a rich and fertile section of country. Pop. 1870, 1327; 1880, 1264.

**Mar'engo**, on R. R., cap. of Iowa co., Ia., 84 m. W. of the Miss., on Iowa River, surrounded by a good farming and grazing country. Pop. 1870, 1693; 1880, 1738.

**Mar'enholtz-Bülow** (BERTHA VON BULOW), BARONESS, the prin. apostle of Froebel's Kindergarten idea, and the foremost authority on it. Through her intercession the injunction laid against Froebel's inst. by the Prus. govt. was removed. In 1855 she held séances in her own parlors at Paris. She assisted personally in the establishment of kindergartens in Ger., Switz., Hol., Belg., Eng., and It.; in Berlin she lectured gratuitously during 3 yrs. in a normal school for the education of kindergartners. Wrote *The Kindergarten, The Educational Mission of Woman, The Child and its Being*. She is at present chief lecturer in the new coll. for kindergartners in Dresden.

**Marco'us**, Lake, or Birket-el-Marloot, a salt lake in Lower Egypt, 30 m. long, 15 m. broad, and separated from the Mediterranean by a narrow isthmus of sand. It had been dry for 3 centuries, when in 1801 the Eng., having some military purpose in view, dug through the isthmus and let in the waters. This passage was closed by Mehemet Ali.

**Mar'co'ri** (CARLOS), b. in 1819, the son of an It. cook; obtained an office in the Sp. civil service through the influence of Gen. Narvaez, of whom he had married a relative. He became a deputy and counsellor, and Queen Isabella honored him very much. Always in association with Narvaez, he obtained political influence, and in 1866, when Narvaez became minister, M. was appointed gov. of Madrid and chief of the royal household. Hated by the people, he was overladen with honors by the queen. In 1868, when the revolution broke out, she was told from all sides that the dismissal of M. was the only means of preserving the throne, but she remained faithful to M. In exile M. continued to be *maître de la maison* of the queen.

**Marg'aret** (THE SAINT), queen of Scot., b. in Hungary in 1046, was grand-niece of King Edward the Confessor and daughter of Edward, son of Edmund Ironside, who was driven into exile by Canute. She resided at the Eng. court at the time of the Norman Conquest, when she accompanied her brother, Edgar Atheling, in his flight to Scot. She there attracted the admiration of King Malcolm Canmore, whom she married in 1070, and earned canonization by her efforts in diffusing Christianity, and especially by connecting the Scot. with the Romish Ch. D. Nov. 16, 1093.

**Marg'aret of Angoulême**, generally known as **Marguerite de Valois**, queen of Navarre, b. at Angoulême Apr. 11, 1492, a sister of Francis I., and married in 1509 to the duke of Alençon. Still more gifted by nature than



her brother, she received an excellent education. After the battle of Pavia in 1525, in which the king was taken prisoner and brought to Madrid, she repaired to this capital, an undertaking which was connected with the greatest dangers. Her negotiations at the court of Charles V. exercised great influence on the destiny of her brother and on the relations between Fr. and the Ger.-Sp. empire. In 1527 she married Henry d'Albret, count of Béarn and titular king of Navarre, and from this time, and up to her death (Dec. 21, 1549), she resided in Béarn, to whose prosperity she contributed much. The Prots. found shelter in Béarn and Alençon against R. Cath. persecutions, and her book, *Le Miroir de l'Âme Pécheresse*, shows a leaning toward Protestantism. She wrote *L'Heptameron des Nouvelles*, an imitation of Boccaccio's *Decamerone*.

**Margaret of Anjou**, queen of Henry VI. of Eng. and daughter of René, count of Provence, b. at Pont-à-Mousson, Lorraine, Mar. 23, 1423; married Apr. 22, 1445; became unpopular in Eng. on account of the cession of the provs. of Maine and Anjou, then in the hands of the Eng., to her father. She founded Queen's Coll., Cambridge, in 1449, and the king being subject to periods of imbecility, she soon became the real ruler. This power being contested by the duke of York, gave rise to the "Wars of the Roses." M. was at first victorious; afterward forced to flee to Scot., she invaded Eng. and killed the duke of York at Wakefield (1460); released her husband by the battle of St. Alban's, Feb. 17, 1461; was herself defeated at Towton Mar. 29, and forced to escape to Scot. and Fr.; made another invasion 1464; succeeded by the aid of Warwick in momentarily reinstating Henry upon the throne 1470, but Warwick being killed at Barnet, M. was defeated and captured at Tewkesbury May 4, 1471. M. was kept in prison until 1475, when she was ransomed by Louis XI. of Fr. She lived in strict seclusion thenceforth at Recluse, near Angers, and d. at Dreux Aug. 25, 1481.

**Margaret of Denmark**, queen-regnant of the 3 Scandinavian kingdoms, b. in 1353, a daughter of Valdemar IV. Atterdag, king of Den., and married in her 10th yr. (Apr. 9, 1368) to Haco VI., king of Nor., to whom she bore in 1371 a son, Olaf. In 1375 Olaf succeeded his grandfather as king of Den., and in 1380 his father as king of Nor. During his minority M. conducted the govt. of both countries, and this task she fulfilled with so much discretion that on the death of Olaf in 1387 the estates of both kingdoms chose her queen-regnant. In Swe. a large party was opposed to the king, Albert of Mecklenburg, and opened negotiations with M.; and as Albert always had shown himself very hostile to her, she sent her gen., Ivar Lykku, into Swe. with an army. On Feb. 24, 1389, the combined Dan.-Swe. army defeated Albert's Ger. mercenaries at Falköping. The king himself was captured, and M. was acknowledged queen-regnant also of Swe. On July 20, 1397, she promulgated an act of union between the 3 Scandinavian kingdoms, the so called Calmar Union, agreed upon by emissaries from all 3 countries. D. Oct. 28, 1412.

**Margaret of Parma**, b. in 1522 at Brussels, a daughter of Charles V. by Margaret van der Gunt; was ed. at the court of Mary, queen-dowager of Hungary. She was first married in 1536 to Alessandro di Medici, duke of Florence, who was assassinated in the following yr., and then in 1542 to Ottavio Farnese, duke of Parma and Piacenza, to whom she bore a son, the celebrated gen., Alexander Farnese. In 1559 Philip II. made her regent of the Netherlands, which position she filled for 8 yrs., but it was impossible for her to reconcile the principles of Philip II. and the instincts of the Dut. In 1567 she retired to It. D. at Ortona in 1586.

**Margaric Acid** and **Margarine**. Chevreul announced in 1820 the discovery of a simple fat which he called margarine, and supposed to be a glyceride of margaric acid, as occurring in all the common animal fats. Heintz in 1852 showed this margarine to be a mixture of stearic and palmitic, and this margaric acid to be a mixture of the corresponding acids. There is, however, a margarine and a margaric acid, produced artificially. (See **FATS** and **OILS**.)

**Oleomargarine** is a name given to a certain fat extracted from beef suet and used for making artificial butter.

**Margarite** [Gr. μαργαριτης, "pearl"], or **Pearl Mica**, a beautiful mineral crystallizing in the trimetric system, with micaceous cleavage and a pearly lustre, consisting essentially of a silicate of alumina and lime. It is generally found associated with deposits of corundum and emery, as at Chester, Mass.

**Margay**, the *Felis tigrinus*, a handsome little tiger-cat of tropical Amer. When taken young it may be domesticated, and is highly prized as a destroyer of rats.

**Mari'a Christi**, b. at Naples Apr. 27, 1806, a daughter of Francis I., king of the Two Sicilies, was married, Dec. 11, 1829, to Ferdinand VII., king of Sp., his fourth wife. On Mar. 29, 1830, when the queen declared herself pregnant, the king abolished the Salic law of inheritance, and reintroduced the old Castilian law, according to which the crown could be inherited also by females. On Oct. 10, 1830, the queen bore a daughter, Isabella, and immediately the court and the country became divided into 2 parties, the Carlists and the Christinos, the former headed by Don Carlos, brother to the king, the latter headed by M. C. On the death of the king (Sept. 29, 1833) a civil war commenced, which lasted till 1840. Meanwhile M. C., who was appointed regent during the minority of Isabella II., soon lost the popularity she had gained by her alliance with the liberals. Her subservience to the policy of Louis Philippe placed her in opposition to the progressists or radicals, who found much sympathy in Eng., and her personal relations gave general scandal; she bore 10 children to one Fernando Muñoz, a member of her body-guard, created duke of Rianzares, to whom she was not publicly married until Oct. 13, 1844. On Oct. 12, 1840, she was compelled to abdicate the regency to Espartero and leave the country. She returned after the fall of Espartero in 1844, and although Isabella II. had

been declared of age in 1843, Maria continued to meddle with the govt. until she was once more expelled in 1854. For 10 yrs. she lived in Fr., It., and Eng., returned in 1864 to Sp., whence, by the revolution which dethroned Queen Isabella, she was again expelled in 1868. D. Aug. 22, 1878.

**Maria Louisa**, ma-rí-a loo-ee'za, b. Mar. 12, 1791, a daughter of the emp. Francis I. of Aus.; was married Apr. 2, 1810, at Paris, to Nap. I., who had obtained a divorce from his wife, the empress Josephine, for the sake of this connection with Aus., and bore him a son Mar. 20, 1811. During the campaigns of 1812 and 1813 she was appointed regent. When Nap. abdicated she took up her residence in Schönbrunn, near Vienna. By the Peace of Paris, Parma, Piacenza, and Guastalla were given to her, and she governed them for more than 30 yrs. After the death of Nap. she contracted a marriage with Count Nieperg, to whom she bore several children. D. at Vienna Dec. 18, 1847.

**Marianne Islands**. See **LADRONES**.

**Maria Theresa**, ma-rí-a te-ree'sah, b. at Vienna May 13, 1717, a daughter of the emp. Charles VI.; was declared sole heir of all the possessions of the house of Hapsburg by the Pragmatic Sanction, and married (Feb. 12, 1736) to Francis Stephen, grand duke of Tuscany. On the death of her father (Oct. 20, 1740) she ascended the throne, and on Nov. 21 in the same yr. appointed her husband co-regent, but claims to various parts of her inheritance were raised from different sides, a formidable alliance was formed against her between Sp., Fr., Bavaria, Sax., and Prus., and the Aus. War of Succession was opened by the invasion of Silesia by Frederick II. By the Peace of Aix-la-Chapelle (Oct. 18, 1748) she lost only Parma and Piacenza to Sp. and Silesia to Prus., while her husband was recognized as emp. of Ger. But the loss of Silesia she could never forget. In 1753 Prince Kaunitz became Aus. chancellor, and he succeeded in forming an alliance between Aus., Fr., Sax., and Rus. for the humiliation of Prus. But the Seven Years' war brought no result; the Peace of Hubertsburg (Feb. 15, 1763) left Silesia a Prus. possession. On Aug. 18, 1765, the emp. Francis I. d., and M. T. took her eldest son Joseph as co-regent. His policy was one of aggrandizement, and it was due to his influence that she participated in the first partition of Poland (Aug. 5, 1772), which brought Galicia and Lodomeria under the Aus. dominion. Tur. was compelled to cede Bukovina (Feb. 25, 1777). In the interior her govt. was successful, and marked with great energy and wisdom. D. at Vienna Nov. 29, 1780, leaving 4 sons, of whom the eldest, Joseph II., succeeded her, and 6 daughters, of whom the next to the youngest was Marie Antoinette.

**Marie Antoinette**, mah-re' on-twah-net', the fifth daughter of Maria Theresa and Francis I., b. at Vienna Nov. 2, 1755, and married at Versailles May 16, 1770, to the dauphin (afterward Louis XVI.), to whom she bore 4 children, of whom 2 died in infancy; the other 2 were Louis XVII. and the duchess of Angoulême. Her position at the Fr. court was difficult, and soon became dangerous. There was a difference of character between her and the people which proved fatal in the end. At the outbreak of the Revolution she was hated by the Fr. people, and after the unfortunate attempt at flight (June 21, 1791) her doom was certain. She was beheaded Oct. 16, 1793.

**Marie de Médicis**, mah-re' deh mā-de-sēs's, b. at Florence Apr. 26, 1573, a daughter of Francis I., grand duke of Tuscany; was married Dec. 16, 1600, to Henry IV., king of Fr., to whom she bore in the next yr. a son, afterward Louis XIII. She was beautiful, but low and mean; Henry always avoided her, and she was not crowned until the day before his assassination (May 13, 1610). From this time she conducted the govt. together with the Concinis till the conspiracy of De Luynes (Apr. 14, 1617), after which she was confined in the castle of Blois. On the death of De Luynes (Dec. 14, 1621) she returned to the court and took her place in the king's council, having been reconciled to him by Richelieu; but, jealous of the growing power of the new minister, she began intriguing against him and was sent once more from the court in 1630, and confined in the castle of Compiègne. Thence she escaped, wandered several yrs. in Eng. and the Netherlands, dying at Cologne July 3, 1642, in miserable circumstances.

**Marietta**, R. R. centre, cap. of Cobb co., Ga., 2 m. from Kennesaw Mt., 20 m. N. of Atlanta, has a female coll. and a male acad. Pop. 1870, 1888; 1880, 2227.

**Marietta**, city and R. R. centre, cap. of Washington co., O., on the O. River at the mouth of the Muskingum, 180 m. from Pittsburg, 300 m. from Cin. by water, 115 m. from Columbus, and 175 m. from Cleveland by rail; has art-galleries, a fine city-hall, a children's home, and one of the leading colls. of the W. It is in the great oil-region of O. and W. Va., and within a few m. of rich iron and coal deposits. Pop. 1870, 5218; 1880, 5444.

**Marietta**, Lancaster co., Pa., on R. R., the Susquehanna River, and the Pa. Canal, 25 m. E. of Harrisburg and 81 m. W. of Phila. It is the E. market for all the timber and lumber brought down the river. Pop. 1870, 2397; 1880, 2503.

**Marietta College**, Marietta, O., was chartered in 1835, and its first class was grad. 1838. The first faculty were all graduates of N. Eng. colls., and in its course of study and gen. arrangements the coll. has adhered to the N. Eng. type. No aid has been received from the State, but the inst. has been wholly sustained by private liberality. The apparatus connected with the dept. of physics and chem. has been recently largely increased. The coll. cabinet contains over 16,000 specimens of minerals, shells, etc., beside which there is the valuable cabinet of the late Dr. S. P. Hildreth. The number of vols. in the coll. and society libraries is about 32,000.

**Mari'gold**, a popular name for various yellow-flowered plants, but especially for those of the genera *Tagetes* and *Calendula* of the order Compositæ.

**Marine Glue**. See **GLUE**, **MARINE**.

**Marine Insurance**. See **INSURANCE**.



**Mariner's Compass.** See COMPASS.

**Marinette'**, cap. Marinette co., Wis., on R. R., 50 m. N. of Green Bay, at the mouth of Menominee River. Prin. business, lumbering. Pop. 1870, 1834; 1880, 5412.

**Marionetry.** See MARY, THE BLESSED VIRGIN.

**Marion**, on R. R., cap. of Perry co., Ala., has 2 colls. and 2 female sams. Prin. business, planting. Pop. 1870, 2846; 1880, 2074.

**Marion**, R. R. centre, cap. of Grant co., Ind. Pop. 1870, 1638; 1880, 3182.

**Marion**, R. R. centre, cap. of Linn co., Ia. Pop. 1870, 1822; 1880, 1099.

**Marion**, Kan. See APPENDIX.

**Marion**, R. R. centre, cap. of Marion co., O., 40 m. N. of Columbus. Pop. 1870, 2531; 1880, 3899.

**Marion (FRANCIS)**, b. at Winyaw, S. C., in 1732, of Huguenot ancestry; went to sea at 16, and barely escaped with his life from a vessel that foundered on a voyage to W. L.; volunteered in an expedition against the Cherokees (1759), serving as lieutenant in a cavalry troop; was engaged in Montgomery's campaign the following yr. In 1761 he was a capt. in Middleton's regiment; participated in Col. Grant's expedition, and led the forlorn hope at the battle of Etchoee. In 1775 he was elected a member of the provincial Cong. of S. C., and in June was commissioned capt. in Moultrie's regiment; was engaged in the early operations against the forts and Brit. shipping in Charleston harbor; was promoted to major, placed in command of a fortification at Dorchester, and aided in the defence of Ft. Moultrie against a formidable Brit. fleet, which was repelled June 28, 1776. He served during the next yr. in the defence of Ga. at the head of a body of 600 men; was in 1779 left in command at Ft. Moultrie during Gen. Prevost's operations against Charleston; was engaged in the siege of Savannah by the combined Fr. and Amer. forces in the same yr., and in the defence of Charleston when again besieged in 1780. Having broken his leg, he was sent into the country, and thus escaped falling into the hands of the enemy when Charleston was surrendered to Clinton in May. In the summer, M., now a col., recruited a few companies from among his neighbors, and joined Gen. Gates in N. C., but this reinforcement met only with ridicule and an account of its ragged condition. He was returning from a bootless errand against the Brit. boats at the time Gates was defeated at Camden (Aug.), and falling suddenly upon the Brit. guards he succeeded in rescuing the Continental prisoners. A few days later he surprised and dispersed 2 bodies of Tories, baffled pursuit by Tarleton, and from that time was for more than 2 yrs. engaged in a constant series of forays, surprises, and manoeuvres, which procured him the name of the "Swamp Fox." He occasionally undertook more formal warfare in the capture of Brit. outposts, and took part in several battles in connection with the army of Greene. During this time his forces gradually increased, and they were dignified with the title of brigade, though never regularly organized. After the evacuation of Charleston (Dec. 1782) M. disbanded his forces, resumed the life of a farmer, and married a lady of wealth. He served in the State senate and the constitutional convention of 1790, and was until 1794 a gen. of the State militia. (See his *Life*, by HARRY and WEEBES, and that by W. G. SIMMS.) D. Feb. 29, 1795.

**Marion C. H.**, S. C. See APPENDIX.

**Marionettes', or Puppets** [Fr.], a spectacle in which the action of a pantomime is represented on a miniature stage by means of small figures set in motion by a concealed mechanism of springs and wires or cords. This amusement was known both to the Grs. and Roms., has been popular in It. from the Middle Ages to the present time under the name of *fantoccini*, and was introduced into Fr. in the time of Charles IX. (1560-74) by an It. named Marion, whence the name by which it is known. In Eng. puppet-shows were common in the time of Elizabeth, and were still popular in the days of Swift and the *Spectator*, but for a century and a half thereafter were rarely seen except at country-fairs or as strolling "Punch-and-Judy shows," until in 1872 they reappeared in Lond., under the name of "marionettes."

**Mariscal** (Genacio), b. in Oaxaca, Mex., July 5, 1829; was admitted to the bar in 1849; became solicitor-gen. of Oaxaca 1850; removed to the city of Mex. 1853; was elected in 1856 a deputy to the cong. which framed the const. of 1857; appointed judge of the supreme court of Oaxaca 1850, and a federal circuit judge 1860; was again M. C. 1861-62, a supernumerary justice of the supreme federal court 1862, assistant sec. of state 1863, sec. of legation in the U. S. 1863-66, and was *chargé d'affaires* 1867-68. In July 1868 he was appointed minister of justice by Pres. Juarez; returned to the U. S. as envoy extraordinary, being received in that capacity Aug. 11, 1869, and was Mex. sec. of state from May 25, 1871, to June 1872; subsequently again resided as minister in the U. S. 1872-77, was a judge in Mexico 1877-79, minister of justice 1879-80, and premier and sec. of state under Pres. Gonzalez from Dec. 1880.

**Maritime Law.** See INTERNATIONAL LAW, SUMMARY, by T. D. WOOLSEY, S. T. D., LL.D.

**Marius (CAIUS)**, b. at Cereate, near Arpinum, in 157 B. C.; grew up in humble circumstances, but distinguished himself greatly in the Numantian war (133). In 119 he was elected *tribunus plebis*, became the leader of the popular party, and married Julia, the aunt of Cæsar. Having been consul in 107, Numidia was assigned to him as his prov., and his victories over Jugurtha made him the most conspicuous man in the Rom. republic. At this time the Teutones and Cimbrs appeared on the frontiers of the republic, and when the Teutones broke into Gallia Transalpina, and the Cimbrs showed themselves in Gallia Cisalpina, Rome was struck with terror. M. was chosen consul 5 times in succession from 104 to 99; he destroyed the Teutones at Aquæ Sextia (Aix), in 102, and the Cimbrs at Campus Raudius in 101, and when he returned to Rome he was hailed as the third founder of the city, after Romulus and Camillus.

But having no talent as a politician, his popularity soon decreased. In the war against Mithridates, Sulla, the leader of the aristocratic party, was appointed commander-in-chief, and this infuriated the old man to such a degree that he undertook, by the aid of the popular party, to overthrow the decision of the senate by force. But Sulla marched to Rome, and M. was compelled to flee for his life through S. It. to Afr. Hiding in the swamps of Minturnæ, wandering about among the ruins of Carthage, he thought of nothing but revenge. By the aid of Cinna he returned to Rome in 86. At the head of a guard composed of liberated slaves and the rabble of the Rom. pop. he entered the city, declared himself and Cinna consuls, let loose his soldiers to murder and plunder, and d. in Rome in 86 B. C.

**Marjoram** [Ger. *Marjoran*], a popular name for several aromatic labiate herbs of the genus *Origanum*. The common M. (*O. vulgare*) has been naturalized in the U. S. from Europe. The sweet M. of the gardens is *O. Majorana* of the S. of Europe, is much pleasanter in odor and taste than the preceding, and is employed in cookery.

**Mark**, a term employed since the middle of the 11th century, throughout the states of Ger. and also in Sp. and Port., to signify a half-pound weight of gold or silver. The same term has also been used in many of these states to designate the unit of account in their monetary systems. These monetary units were originally identical with the unit of weight, but by the continual degradation and debasement of the coinage came in the lapse of time to represent very inferior and, in different states, very unequal values. Thus, the silver M. current of Hamburg became worth no more than 1s. 2½ d. sterling = \$0.29; the M. banco = 1s. 5½ d. = \$0.36½. A M. also was used in Eng. equal to 13s. 4d. = \$3.24½, and another in Scot. equal to 13½ d. = \$0.27. In most of the Ger. states it has been the usage during the past century or two to fix the standard of the silver coins in actual use by declaring what number of such coins shall be struck from 1 M. by weight of pure silver, the standard M. being the M. of Cologne, containing 3608 Eng. grains, exceeding half an avoirdupois lb. by 168 grains. Thus, 11½ thalers of Lubeck were coined from 1 Cologne M. of fine silver, and 14 thalers of Prus. from 1 such Cologne M.

Since the formation of the Ger. empire the term "mark" has been applied to the standard unit of the imperial monetary system, the value being fixed by the enactment that 139½ 10-M. pieces, or 69¾ 20-M. pieces, shall be made from 1 Ger. lb. (500 grams) of fine gold. A M. of the empire has therefore the value of \$0.23.8212 of the money of the U. S. As the standard of gold coinage is but 9/10 fine, a 10-M. piece weighs 3.9825 grams = 61.4593 grains, and a 20-M. piece 7.965 grams = 122.918 grains Troy. F. A. P. BARNARD.

**Mark, SAINT. I. Life.**—There was in the primitive Ch. an office which occupied an intermediate position between the apostolate and the ministry—namely, that of *evangelist* or missionary of the second order, subordinate to the apostles. M. belonged to this class of ecclesiastical functionaries. He was of Jerusalem ancestry, where his mother, called Mary, owned a house. His Israelite name was John, but to this was added, according to a Jewish custom of that time, the Rom. surname of Mark. M. appears for the first time in the evangelical hist. when, about the yr. 44, Paul and Barnabas set out on their first missionary journey among the pagans to the island of Cyprus and the adjacent parts of Asia Minor. On their arrival in the wild regions of the Taurus Mts. M. left the 2 missionaries and returned to Jerusalem; and this circumstance was the reason why on his second journey St. Paul absolutely refused to have him for a companion. Barnabas, together with M., went to the island of Cyprus, and thence to other countries which are not specially mentioned in the hist. Later on M. became reconciled to St. Paul. We find them together at Rome about the yr. 62, when Paul remembers him to the Colossians and Philemon, and toward the close of his life Paul called him a second time to stay with him as a coadjutor "profitable for the ministry." Nevertheless, M. appears to have been most closely connected with Peter. A tradition, almost unanimous, designates him as the companion of Peter, either his sec. or his interpreter. Several ancient writers attribute to M. the foundation of the ch. of Alexandria. According to them, he was the first bp. of that ch., d. there, and left the episcopal see to Anianus. Hither he went when in 64 he left Peter at Rome during the persecutions of Nero. Chrysostom asserts that it was at Alexandria he composed his Gospel.

**II. Gospel.**—The testimonies of the Fathers relative to our second canonical Gospel are nearly unanimous with respect to the following 3 points: (1) That it was composed by the evangelist M.; (2) that M. wrote it from the statements which he heard from the lips of Peter in the chs. which he visited together with him; (3) that it was written at Rome, and on the demand of the Chrs. of that cap. The contents of the Gospel itself confirm these 3 points. To begin with the last: (1) Is it not evident that the second Gospel was written for Chrs. of pagan origin, since it omits throughout the evidence of the Messiahship of Jesus drawn from the prophecies of the O. T., and gives explanations of Jewish customs unnecessary to Chrs. of Heb. origin? Is it not evident that these Chrs. were of Lat. origin? since M. always prefers Lat. terms, Hellenized, to the Gr. terms, and in the account of the poor widow even transfers the Gr. money into Rom.? And does it not follow from the notice relating to Simon of Cyrene, "the father of Alexander and Rufus," that these Lat. Chrs. were those of Rome, since Rufus was a member of the ch. of Rome, and this small detail could interest none who were not personally acquainted with the members of this family? (2) It is as incontestable that the statements of Peter must have served as a basis for the work. A multitude of small details betray the remembrance of an eye-witness, while of a grave hist. they would have formed no very dignified element. But this witness so intimate cannot be he who among the disciples loved Jesus



most; it must be he who admired him most. Throughout the whole narrative he strives at one aim only—to impress the reader with that admiration which penetrated all who came in contact with Jesus. It is also in this Gospel alone that we find mentioned the crowing of the cock twice, a little trait which makes the denial of Peter still more inexcusable. In the Acts we find a specimen of Peter's manner of teaching while founding or travelling in order to build up the chrs. This speech of the apostle to Cornelius is the Gospel of M. in a nutshell. (3) The authorship of M. might be inferred from the 2 following facts, even if we had no tradition: first, the style of our Gospel is so absolutely different from that of the First Epistle generally attributed to Peter that even though the statements belong to Peter the narrative must have proceeded from another; next, in his Epistle Peter calls M. his son, thus designating him as his spiritual heir, with whom he had deposited his most precious treasure, his personal acquaintance with Jesus. The end of the second Gospel is lacking in the oldest MSS. But how is it to be explained, and whence is derived the traditional termination of the Gospel? Is it not possible that it was the persecution of Nero during the sojourn of Peter at Rome in 64 which caused the interruption of the work of M.? With respect to the plan of the work, which Papias found inconsistent with the historical order, it seems very natural from our point of view. The author having placed Jesus in the centre of his activity at Capernaum, shows us how this activity expands in every direction through excursions more and more prolonged, though at the end of each excursion the Lord always returns to Capernaum. And his final departure for Jerusalem thus appears as his last missionary voyage. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. FRÉDÉRIC GODET, D. D.]

**Markham** (CLEMENTS ROBERT), C. B., F. R. S., b. at Stillington, near York, Eng., July 20, 1830, ed. at Westminster School; entered the navy as cadet in 1844; served in the Pacific squadron under Admiral Seymour; attained the rank of lieutenant in 1850; participated in an Arctic expedition in search of Sir John Franklin 1850-51, and pub. *Franklin's Footsteps*; left the navy in order to undertake a journey of exploration in Peru 1853-54, narrated in *Cuzco and Lima*; became clerk in the board of control 1855, sec. of the Hakluyt Society 1858; visited Peru and India 1860-61 as com. to introduce into the latter country the quinine tree; pub. *Travels in Peru and India* and a *Quichua Gram. and Dict.*; became sec. of the Royal Geographical Society 1863; visited India and Ceylon 1865-66; became assistant sec. in the India office 1867, in which yr. he pub. a work on *Sp. Irrigation*; accompanied the Abyssinian expedition as geog. 1867-68; pub. a *Hist. of the Abyssinian Expedition*; wrote a *Life of the Great Lord Fairfax*, *Ollanta*, a *Quichua Drama*, a *Memor. on the Indian Surveys*, etc. Since 1868 M. has had charge of the geographical dept. of the India office; has written annual reports on the *Moral and Material Progress of India*, and edited *Ocean Highways*.

**Marl** (Lat. *marga*), a name vaguely applied to those soils and earths which contain a mixture of clay and sand, with a considerable proportion of carbonate of lime. They are frequently useful fertilizers, but not always. The green-sand M. of N. J. is valuable from the presence of phosphate of lime and potash. The white M. of Canada West (Ontario) are often very useful when applied to land.

**Marlboro'**, on R. R., Middlesex co., Mass., 25 m. W. of Boston, 15 m. E. of Worcester. It contains a beautiful lake (Williams), covering 160 acres, and an elegant soldiers' monument. Pop. tp. 1870, 8474; 1880, 10,127.

**Marlborough** (JOHN CHURCHILL), DUKE OF, b. at Ashe, Devonshire, Eng., June 24, 1650, son of Sir Winston Churchill, who obtained for him an appointment as page to the duke of York, afterward James II. About the same time his sister Arabella was appointed maid-of-honor to Anne Hyde, duchess of York, and soon became mistress to the prince. Young Churchill entered the army in 1666 as ensign in the guards. In 1672-77 he served with the rank of capt. of grenadiers in the corps sent to co-operate with Fr. against Hol., and was promoted to col. At the Peace of Nymwegen (1678) he returned to Eng., received a position in the household of the duke of York, and married Sarah Jennings, maid-of-honor to the duchess, and the most intimate friend of the princess Anne from childhood. He now became the constant companion of the duke of York, his confidant in his intercourse with Charles II. and with the king of Fr. He was soon created Baron Churchill of Aymouth in the peerage of Scot. (1682), and on the death of Charles II. Churchill was sent as ambassador to Louis XIV. to announce the accession of James (Feb. 1685). On his return he was created brig.-gen. and Baron Churchill of Sandridge in the Eng. peerage, rendered good service in the suppression of Monmouth's rebellion, and was advanced to maj.-gen. He did not scruple, when the follies of James rendered his downfall imminent, to enter into treasonable correspondence with the prince of Orange, nor to desert with many of his officers to the invading army (1688) at the critical moment. He received the reward in the earldom of Marlborough (Apr. 9, 1689) and a commission as lieutenant-gen. was in command of the Eng. forces in Flanders (1689) and in Ire. (1690), but in Jan. 1692 was thrown into the Tower in consequence of treasonable intrigues with the exiled king. He was soon released from prison, but spent the ensuing yrs. of the reign of William in false protestations of loyalty, while carrying on secret correspondence with James, and employing every artifice to strengthen his favor with Anne as the probable successor to the throne. In 1698 William appointed him gov. to Anne's infant son, the duke of Gloucester. On the accession of Anne (1702) M., who had recently been employed in service in Hol., became the most influential subject of the new queen, since to his own favor at court was added that of Lady Marlborough and of his son-in-law Godolphin, who became prime minister. He was intrusted with the chief command of the armies of the alliance combined

against Fr. The capture of Liege (Oct. 23, 1702) brought him the dukedom of Marlborough; in 1703 other successes were recognized by the grant of the manor of Woodstock. With the aid of Prince Eugene he terminated the campaign of 1704 by the victory of Blenheim (Aug. 18). In the following yrs. he gained the battles of Triermon (1705), Ramillies (1706), Oudenarde (1708), Tournay (1709), Malplaquet (1709), and Bouchain (1711); was made a prince of the Ger. empire. M. returned to Eng. in Oct. 1711, but was charged with peculation shortly after. M. was dismissed from all his offices Jan. 1, 1712, and retired to Ger., where he became a partisan of the Hanoverian succession; returned to Eng. at the accession of George I. (1714), by whom he was restored to his offices and honors. He rendered prompt service in the direction of the campaign of 1715 against the Pretender, passed the remainder of his life in quiet enjoyment of his wealth, d. at Windsor Lodge June 16, 1722, and was buried in Westminster Abbey. (See ALISON'S *Life*.)

PORTER C. BLISS.

**Marlin**, cap. of Falls co., Tex., on R. R., near the Brazos River. Pop. 1870, 602; 1880 not given.

**Marlowe** (CHRISTOPHER), b. at Canterbury, Eng., in 1564; studied at Corpus Christi Coll., Cambridge, where he grad. 1583, and produced in 1586 the first part of his tragedy of *Tamburlaine*. In 1588 he brought out his *Tragical Hist. of the Life and Death of Dr. Faustus*. He also wrote *The Jew of Malta* and *Edward II.* D. June 16, 1593.

**Marlstone** [from *marl* and *stone*], a stratum of rock belonging to the Middle Lias. (See LIAS.)

**Marmier** (XAVIER). See APPENDIX.

**Marmora**, Sea of, separates European from Asiatic Tur., and communicates with the Black Sea by the Strait of Constantinople and with the Aegean Sea by the Strait of the Dardanelles. It is 135 m. long and 45 m. broad. Among its islands, Marmora is famous for marble and alabastrer.

**Marmoset** [Fr. *marmoset*], a name applied to various small S. Amer. monkeys of the aberrant family Midae, and of the genera *Saguinus*, *Midax*, etc. They are very delicate, and in cool climates the M. soon dies if exposed. The *Saguinus jacchus* is one of the best known species.

**Marmot** [Fr.], a name given to rodent mammals belonging to the squirrel family. The typical species of M. is *Arctomys marmota*, the European M., which is abundant in the Alps. The best known Amer. species is *Arctomys monax*, the woodchuck or ground-hog, which is very abundant E. of the Miss.

**Maronites**, a Chr. people of Syria, who take their name from their first monothelitic bp., John Maro, who d. 701 A. D. Their number is estimated at from 200,000 to 250,000. They live chiefly in the N. part of the Lebanon, but are found also all over the Lebanon and the Anti-Lebanon. They are R. Caths. of the Syrian rite. Since 1840 they have been deadly enemies of their neighbors, the Druses.

**Maroons** [Fr. *négres marrons*, from the Sp. *caravon*, a "mountaineer"], a name used formerly in Jamaica, and now in Guiana, to designate the runaway slaves and their descendants. The M. of Jamaica fought the Brit. gov't. from 1655 to 1795, and were finally conquered by the aid of Cuban bloodhounds. Some were sent to Afr. and some to N. S. The M. of Guiana are from the Dut. colony, and virtually independent. Their number is about 7500.

**Marque** [Fr.], **Letters of**. In international law these words denote the consent of a gov't., expressed in a formal permission, that a certain vessel may act as a privateer when the requisite bonds and formalities have been given or complied with. The words are explained best by the Fr. *lettres de marque*—*l. e.* of stamp, or stamped letters, like *lettres de cachet*, letters of seal, or sealed with the king's signet, but specially giving authority to arrest. They are, then, stamped letters allowing reprisals or private warfare.

**Marquesas**, mar-ké'sahs (or *Mendaña*) **Islands** consist of 2 groups of islands, situated in the S. Pacific between lat. 7° 30' and 10° 30' S., and lon. 138° and 140° 20' W. The N. group is generally called Washington Islands, but the name of Marquesas Islands extends to both of the groups. The S. group consists of 5 islands of volcanic origin, mountainous, with steep coasts, comprising an area of 500 sq. m., and belonging to Fr. The interior of the islands is fertile; the climate is hot, but healthy; the sugar-cane, cocoa-nut tree, and cotton-plant abound. The inhabs., numbering 5754, form one of the most savage tribes of the Polynesian race.

**Marquetry**, mar-ket-ree [Fr. *marqueterie*], the art of inlaying wood with shells, metal, ivory, or pieces of wood of another color. It is carried to great perfection by the cabinet-makers of Fr., Ger., and Belg., that of Sorrento, It., being perhaps the most elaborate.

**Marquette**, mar-kett', city and R. R. centre, cap. of Marquette co., Mich., 425 m. N. of Chicago, is the prin. shipping-port of the great iron-region, and has regular communication by steamers with all the lake cities. It is situated upon a low bluff 25 ft. above the bay, and has a fine natural park, a public library, a Catholic cathedral and convent. Pop. 1870, 4000; 1880, 4690; 1884, 5612.

**Marquette** (JACQUES), b. at Laon, Fr., in 1637; sailed in 1666 as a Jesuit missionary to Canada; founded the mission of Sault Ste. Marie in 1668; went in 1669 from La Pointe to Mackinaw, where in 1671 he built a chapel; accompanied Joliet in his expedition of 1673 down the Wis. and Miss., and returned *via* the Ill. River and Green Bay, Wis.; missed in 1675 the mission at Kaskaskia, but his strength failing, set out to return to Mackinaw; d. on the journey, May 18, 1675.

**Marquez** (LEONARDO), b. in the city of Mex. about 1818; took part in the defence of the valley of Mex. against the Amer. army in 1847; headed a revolutionary movement in favor of Santa Anna 1849; was advanced to important military commands by Santa Anna during his last presidency (1853-55); maintained a guerilla warfare against Alvarez and Comonfort 1856-57; was one of the most trusted gens. of Presidents Zuloaga and Miramon in their struggle against



Juarez 1858-60, and continued to wage an irregular warfare against Juarez until the Fr. intervention, which he supported 1861-64. He was sent by the archduke Maximilian as minister to Constantinople, but returned without permission Oct. 1866; accepted the command of a division, and during the siege of Querétaro defended the city of Mex. against the republican forces. On the fall of the city he escaped to Havana. He was one of 3 persons expressly excluded from the Mex. amnesty of 1870.

**Marryat** (Capt. Frederick), b. in Lond., Eng., July 10, 1792; entered the Brit. navy in 1812 as mdpn.; took part in many naval engagements with the Fr.; served on the Amer. squadron 1812-15; was engaged in action on Lake Pontchartrain in 1814. Was author of a remarkable series of nautical novels, of a record of travel in the U. S., *A Diary in Amer.*, with *Remarks on its Insts.*, etc. D. Aug. 2, 1848.

**Mars** [Lat. *Marors* or *Mamers*], one of the prin. gods among the anc. Its., was worshipped at Rome under 3 aspects: as *Mars Gradivus* he was the god of battle; as *Silvanus* he was the god of husbandry and rural life; as *Quirinus* he was the tutelary divinity of the Rom. state.

**Mars**. The planet Mars is the 4th in order of distance from the sun, and the nearest of the superior planets. M. travels at a mean distance of 139,311,000 m. from the sun. But the eccentricity of his orbit is considerable, amounting to 0.093262, so that the greatest and least distances of the planet differ from his mean distance by nearly a tenth part, or by about 13,000,000 m. His greatest distance amounts to 152,304,000 m., his least to 126,318,000. His orbit is inclined  $1^{\circ} 51'$  to the ecliptic, its rising node being in lon.  $48^{\circ} 45'$ . He completes his sidereal revolutions in a mean period of 686.9797 days, and returns to opposition at intervals separated by a mean period of 779.936 days, which is therefore his mean synodical period. The diameter of M. has been variously estimated. The value at present regarded as most probable is about 4400 m. The planet's equator is inclined about  $28^{\circ}$  to his orbit. Although M. does not appear so large an object in the telescope as Jupiter, yet he is in reality seen on a much larger scale; not only because of his much greater proximity to us, but because, being also much nearer to the sun, his surface is much more brightly illuminated, so that a higher telescopic power can be advantageously employed. Among the markings of M., a whiteness around the S. pole of the planet had been already noticed for 60 yrs., when Maraldi first paid special attention to the peculiarity. He found that the outskirts of this white region were subject to notable variations, and even while his observations were in progress the fainter portion of the spot disappeared. Sir W. Herschel detected a similar whiteness around the N. pole of the planet. He was soon led to ascribe the peculiarity to the probable existence of ice and snow around the polar regions of M. From this it was inferred that M. had an atmosphere, and that it was often saturated with aqueous vapor, a conclusion that has been confirmed by spectroscopic observations. [From orig. art. in *J's Univ. Cyc.*, by R. A. Proctor, F. R. A. S.]

**Marsala** [Ar. *Marsa Alla*, "the port of God"], a maritime town of Sic. in the prov. of Trapani, about 19 m. S.S.W. of the port of Trapani, in lat.  $37^{\circ} 47' N.$ , lon.  $30^{\circ} 05' E.$  The back country is fertile, the town itself well built and well fortified, and the public edifices contain many objects of historic and artistic interest. M. occupies nearly the site of the old Carthaginian *Lilybæum*. Its trade consists in grain, oil, salt, etc., but chiefly in M. wine. The number of vessels which enter this port yearly exceeds 1200. M. has recently acquired historic interest as the point where Garibaldi began the romantic campaign which terminated the kingdom of the Two Sicilies. Pop. 38,015.

**Marselles**, mar-sälz' [anc. *Masilia*], the prin. seaport of Fr. and the cap. of the dept. of Bouches-du-Rhône, is on the N. E. shore of the Gulf of Lyons. The old part of the city consists mostly of narrow and dirty streets, and is separated from the new part, with its broad, straight streets and magnificent quays along the harbors. The most elegant part of the new city is the Cannebière, a street running to the old harbor, and containing the most prominent hotels and the most brilliant shops. But the liveliest and most characteristic part of M. is the quays, thronged with people from Algeria, Egypt, Syria, and all parts of Europe. Of the public buildings the most remarkable are the cathedral, the town-house, the bourse, and the mint. The educational and benevolent insts. are numerous and good. The manufacturing industry is very flourishing, especially of soap, leather, glass, porcelain, liqueurs, etc. But its prin. importance the city derives from its commerce, extending to all ports of the Mediterranean. M. was founded in the 6th century B.C. by Phœceans from Asia Minor. In the 4th century B.C. it sent its traders into the Baltic, and had founded a number of ports on the Mediterranean. In 49 B.C. it was united to the Rom. republic. In the 9th century of our era it belonged to Burgundy, in the 13th to Provence; in 1481 it was united to Fr. During the Revolution it suffered frightfully, but it rose rapidly after the Restoration. Pop. 360,099.

**Marselles**, on R. R., La Salle co., Ill., 77 m. S. W. of Chicago, on the N. bank of Ill. River, has a fine water-power. Pop. 1870, 758; 1890, 1882.

**Marsellaise**, mar-säl-yäz', the grand anthem of the Fr. Revolution, composed, both words and music, in 1792, in a single night, by Rouget de Lisle.

**Marsh** (Charles), LL.D., b. at Lebanon, Conn., July 10, 1765, grad. at Dartmouth 1786; commenced the practice of law at Woodstock, Vt., 1788; was U. S. dist. atty. for Vt. during Washington's presidency; M. C. 1815-17; one of the founders of Amer. Colonization Society, and a liberal benefactor of missionary and Bible societies. D. Jan. 11, 1849.

**Marsh** (George Perkins), LL.D., b. at Woodstock, Vt., Mar. 15, 1801, grad. at Dartmouth in 1820; studied law at Burlington, Vt., and practised at the bar; was elected in 1835 a member of the supreme executive council of the

State; studied comparative philology, and printed privately a translation of Rask's *Icelandic Gram.* (1838); was M. C. from 1842 to 1849, when he was appointed minister resident at Constantinople; went on a special mission to Gr. in 1852; travelled extensively in Europe, returned to the U. S. in 1854; pub. in 1856 *The Camel, his Organization, Habits, and Uses, considered with Reference to his Introduction into the U. S.*; served as R. R. com. in Vt. 1857-59; delivered in 1859 a course of 30 *Lectures on the Eng. Lang.* at Columbia Coll., N. Y., and in the winter of 1860-61 a second course on the same subject before the Lowell Inst. at Boston, *The Origin and Hist. of the Eng. Lang.*; pub. in 1861 a largely annotated edition of the first vol. of Wedgwood's *Etymology*. He has also written *Man and Nature*, which was reissued with important additions, with the title *The Earth as Modified by Human Action*. He was appointed in 1861 minister to It., a post he retained till his death, July 24, 1882. He was one of the associate eds. of *J's Univ. Cyc.*—His second wife, CAROLINE CRANE, b. at Berkeley, Mass., Dec. 1, 1816, pub. in 1857 *The Hattie, or the Sheepfold in the Waters*, translated from the Ger. of Biernatzki, with a biographical sketch of the author, and in 1860 a vol. entitled *Wolfe of the Knoll, and Other Poems*.

**Marsh** (JAMES), D. D., b. at Hartford, Vt., July 19, 1794, grad. at Dartmouth in 1817; was a tutor there 1818-20; grad. at Andover Sem. 1822; was ordained to the Congl. ministry in 1824; prof. of langs. in Hampden-Sidney Coll., Va., 1824-26; was pres. of the Univ. of Vt. 1826-33; prof. of moral and intellectual philos. 1833-42. He was author of many able contributions to periodical lit., chiefly philosophical and theological; also made some translations from the Ger. D. July 3, 1842.

**Marsh** (OTHNIEL CHARLES), F. G. S., b. at Lockport, N. Y., Oct. 29, 1831; prepared for coll. at Phillips Acad., Andover, Mass.; grad. at Yale Coll. 1860, and at Yale Scientific School 1862; prosecuted scientific studies at the univs. of Berlin, Heidelberg, and Breslau 1862-65, and was appointed prof. of paleontology in Yale Coll. 1866. He has written largely upon that science in the *Amer. Journal of Science* and elsewhere. For several yrs. he has been investigating the extinct animals of the Rocky Mt. region in N. Amer., discovering more than 200 fossil animals before unknown. Became pres. National Acad. of Sciences 1883.

**Marshall**, R. R. junc., cap. of Clark co., Ill., has manufactures of woollen and flour. Pop. 1880, 1885.

**Marshall**, a city, on R. R., cap. of Calhoun co., Mich. Pop. 1870, 4925; 1880, 3795; 1894, 4081.

**Marshall**, on R. R. and Redwood River, cap. of Lyon co., Minn. Pop. 1880, 961.

**Marshall**, on R. R., cap. of Saline co., Mo., 85 m. N. W. of Jefferson City and 16 m. W. of the Mo. River, has abundance of stone-coal, and is surrounded by a fine agricultural region. Pop. 1880, 2701.

**Marshall**, R. R. centre, cap. of Harrison co., Tex. Pop. 1870, 1920; 1880, 5624.

**Marshall** (HUMPHREY), a relative of Chief-Justice Marshall, emigrated to Ky. in 1780; was a prominent man in State affairs; U. S. Senator 1795-1801, and wrote a *Hist. of Ky.* D. July 1, 1841.

**Marshall** (HUMPHREY), b. in Frankfort co., Ky., Jan. 13, 1812, grandson of the preceding, and son of Judge John J. Marshall; grad. at W. Va. Pt. in 1832; entered the army as brevet 3d lieut. of mntd. rangers; transferred to the 1st Dragoons as brevet 2d lieut. in the following yr., and resigned from the army Apr. 30, 1833; studied law, and was admitted to the bar, practising first at Frankfort till 1834, then at Louisville till the outbreak of the war with Mex., when he led the 1st Ky. Cav., and was engaged at the battle of Buena Vista. On the disbandment of his regiment he returned to his native State and settled on a farm. In 1849 he was chosen to Cong., and re-elected in 1851; in 1852 Pres. Fillmore appointed him com. of the U. S. to Chl., which was at once raised to a first-class mission; recalled in 1853, and practised law in Wash.; elected to Cong. from Ky. in 1855, and re-elected in 1857. He espoused the Confed. cause in Sept. 1861, and was appointed brig.-gen.; resigned his commission shortly after, and was elected to the Confed. Cong.; practised law in Richmond, Va., for a time, subsequently at Louisville, Ky. D. Mar. 28, 1872. G. C. SIMMONS.

**Marshall** (JOHN), LL.D., b. at Germantown, Va., Sept. 24, 1755, the eldest of the 15 children of Col. Thomas Marshall, a small planter, who served with honor as an officer of the Revolution. The son was himself an officer in active service from 1775 to 1779, distinguishing himself alike in the field and in courts-martial. In 1779, while on detached service in Va., he attended law-lectures at William and Mary Coll. and was licensed to practise. In 1781 he resigned his commission and entered upon the practice of law. In 1783 he married and returned to Richmond; distinguished himself in the Va. convention for ratifying the U. S. const. and in the State legislature; declined the U. S. atty.-generalship, a seat on the bench of the supreme court, and other important positions; went in 1798 as envoy to Fr.; entered Cong. in 1799, where he was one of the ablest Federalists in the House; was appointed in 1800 sec. of war, and soon after sec. of state; and in 1801, having been nominated chief-justice of the U. S. by Pres. Adams, was confirmed by the Senate without a dissenting vote, holding this office for many yrs. with the greatest honor. The influence of his legal decisions was great and permanent, and his fame as a solid reasoner, a just judge, and a profound jurist is world-wide. In constitutional, commercial, and prize law his decisions are of paramount importance. His *Life of Washington* and his *Hist. of the Colonies* are more valuable to the historian than to the gen. reader. D. July 6, 1835.

**Marshall** (JOHN JAMES), b. in Woodford co., Ky., Aug. 4, 1785, grad. at Princeton in 1806; was for many yrs. an able lawyer and active politician of Ky.; was 1896-46 a judge of the State circuit court, and prepared 7 vols. of law reports. D. June 1846.



**Marshall** (THOMAS ALEXANDER), LL.D., son of Humphrey Marshall the historian, b. in Woodford co., Ky., Jan. 15, 1794, grad. at Yale in 1815; began law-practice in Frankfort in 1817; removed to Paris, Ky., in 1819; was M. C. 1831-35, a judge in the court of appeals 1835-56, prof. of law in Transylvania Univ. 1836-49, and chief-justice of the court of appeals 1866. D. Apr. 17, 1871.

**Marshall** (THOMAS FRANCIS), b. in Frankfort, Ky., June 7, 1801, was a nephew of Chief-justice Marshall. He began law-practice when young; removed in 1831 to Louisville; became a prominent political orator and a judge of the State circuit court; was M. C. 1841-43. D. Sept. 22, 1864.

**Marshall** (WILLIAM CALDER), R. A., b. at Edinburgh, Scot., in 1813; studied sculpture in Lond. under Chantrey and Bailey; visited Rome in 1836; took up his permanent residence in Lond. in 1839, and devoted himself chiefly to the poetic element in sculpture. Among his best works are *The Broken Pitcher*, *Rebecca*, and *The First Whisper of Love*.

**Marshall** (WILLIAM R.), b. in Boone co., Mo., Oct. 17, 1825, ed. at Quincy, Ill.; went to Minn. (then Wis. Terr.) in 1847; was a member of the first legislature of Minn. in 1849; founded the St. Paul *Daily Press* in 1861, together with J. A. Wheelock; entered the army in 1862 as lieut.-col. of 7th Minn. Volunteers; commanded a brigade in the battles of Nashville (Dec. 15 and 16, 1864); was elected gov. of Minn. in 1865, and re-elected in 1867.

**Marshalltown**, city and R. R. centre, cap. of Marshall co., Ia., in the centre of a fine agricultural region. Pop. 1870, 3218; 1880, 6240.

**Marshallfield**, Wis. See APPENDIX.

**Marsh-Gas**, *Methane*, *Light Carburetted Hydrogen*, *Pire-Damp*, a gas composed of 12 parts of carbon and 4 parts of hydrogen. It is produced by the decomposition of organic matter at ordinary as well as at high temperatures.

**Occurrence**.—It is found in coal-beds (*fire-damp*), and mingling with the air of coal-mines causes the explosions which are so common. It occurs in vast quantities in some rocky strata, and is evolved from *gas-wells*. (See GAS-LIGHTING.) It is a product of putrefaction (see FERMENTATION), is evolved from the mud of ponds, and is a constituent of sewer-gas. It is produced by the destructive distillation of bituminous coal, and is the chief constituent of coal-gas.

**Preparation**.—It is most readily prepared by heating a mixture of sodium acetate with sodium hydroxide and lime.

**Properties**.—Next to hydrogen it is the lightest substance known; it is 8 times heavier than hydrogen, while compared with air its specific gravity is 0.557. It burns with a pale, non-luminous flame, and in certain proportions forms an explosive mixture with air. It is the first member of the paraffine or marsh-gas series. (See PARAFFINES.)

**Marsh-Hawk**, or **Harrier**, of the U. S., the *Circus Hudsonius*, a large and rapacious bird found in all parts of N. Amer. The M.-H. of Europe and Afr. is *Circus rufus*.

**Marsh-Hen**, a name applied to the *Rallus crepitans* and *Rallus elegans*, game-birds of the U. S., rarely seen except by sportsmen and naturalists. (See R. L.)

**Marsh-mallow**, the *Althaea officinalis*, an herb of the mallow family, a native of the Old World, but naturalized in the U. S., principally in salt-marshes. The plant is remarkably mucilaginous, and is used chiefly in domestic practice as a demulcent in coughs and diseases of the bowels and kidneys. M. paste and candy are popular confections, used to allay irritation in the throat.

**Marsh-Margold**. See CATHA.

**Marsh-Rosemary**, or **Sea-Lavender**, the *Statice Limonium*, a salt-marsh plant, common along the Atlantic shores of the U. S., Canada, and Europe. Its root abounds in tannic acid, is used in med., especially as a remedy for sore mouth and sore throat.

**Marsh's Test**. A test for arsenic, by means of zinc and dilute sulphuric acid, etc.

**Mar'si**, an anc. and warlike It. people, early allies of the Romans, but fought against them in the Social war. They dwelt in an inland and mountainous dist. around the Fucine Lake, and were famous as magicians and diviners. Their chief city was Marruvium.

**Marsipobranchia** (Gr. μάσπιον, "purse," and βράγχια, "gill"), a class of vertebrates generally confounded with the fishes, but distinguished by many remarkable peculiarities. The skeleton is of a very inferior type, the notochord or embryonal vertebral column being persistent. The skull is in a most rudimentary condition, and represented by a small brain-case and capsules for the organs of sense (auditory and olfactory), as well as by an ethmovermerine plate; the upper as well as lower jaws are wanting. The olfactory apparatus consists of a median sac, which is provided with but a single external aperture. The heart is divided into an auricle and ventricle. The class is represented by few species, but these exhibit two radically distinct types of structure, and have been differentiated into two orders:—(1) Hyperoartili, comprising the lampreys, in which the tube terminates in a blind sac at its posterior end; and (2) Hyperotreti, represented by the hag or myxine, in which the narial canal perforates the pharyngeal roof and connects with the pharynx. THEO. GILL.

**Mars la Tour**, a v. on the road from Metz to Verdun, 10 m. to the W. of Metz, is noted for the battle which took place here Aug. 16, 1870, which is generally called after Vionville, farther to E. and nearer to centre of the battle.

**Marston** (GILMAN), b. in Orford, N. H., in 1811, grad. at Dartmouth Coll. in 1837 and at the Law School, Cambridge, Mass., in 1840; settled in 1841 at Exeter, N. H.; was M. C. 1850-63 and 1865-67; served through the war of 1861-65, at first as col. of the 2d N. H., and afterward as a brig.-gen. of volunteers.

**Marston Moor**, an open plain, 8 m. from York, Eng., memorable as the scene of the victory gained (July 2, 1644) by the allied Parliamentary and Scotch armies, commanded respectively by Lord Fairfax and the Earl of Leven, over

the royal forces under Prince Rupert. The result was the surrender of York to Lord Fairfax.

**Marsupials** (Lat. *marsupium*, a "pouch"), the only generally recognized order of the mammalian sub-class Didelphia, and comprising the opossums, kangaroos, wombats, and related types. The young, instead of being nourished in the womb until it has attained a considerable size and a certain maturity of development, as in ordinary mammals, has no organic connection with the mother, but is born or expelled from the uterus in a very immature condition. The newly-born animal is transferred to a "marsupium," or inguinal pouch, and the young instinctively clings to the teat to which it is presented, and the corners of the mouth growing around it, the animal remains clinging to the teat for several weeks, and until it has attained a considerable size and the adult characters have been in a large degree assumed. The M. are now confined to Australasia and S. Amer. (exclusive of a few emigrants beyond those borders), but they were formerly the predominant mammal types of every part of the globe paleontologically known.

THEODORE GILL.

**Marsyas**, in Greek mythology, a satyr who picked up the flute which Athene had thrown away and cursed when she saw how distorted her features became by playing it; challenged Apollo, who played the lyre, to a musical contest, with the Muses for judges. M. was defeated, bound to a tree, and flayed alive by the god.

**Martel** (CHARLES). See CHARLES MARTEL.

**Marten** (*Mustela*), the common name of several carnivorous fur-bearing animals of the family Mustelidae. In N. Amer. we have the Hudson's Bay sable or pine M. (*Mustela Americana*), which produces a very valuable fur, inferior in value to that of the Rus. sable only. The latter animal (*M. zibellina*) is caught in Siberia. The pine M. of Europe (*M. martes*) and the stone M. or common European M. (*M. foina*) produce great quantities of cheap and useful fur. They have long bodies and very short legs.

**Marten, Spotted, or Long-tailed Dasyurus** (*Dasyurus viverrinus* or *macrurus*), a small but fierce carnivorous marsupial mammal of Australia, having a chestnut-colored fur spotted with white. It is some 18 inches long, inhabits marshy places, and is nocturnal in its habits.

**Martina's Vineyard**, the prin. island of Dukes co., Mass., in the Atlantic, is 19 m. long, and averages 5 m. in breadth. It is rather level, and in part has a very productive soil. It contains the towns of Edgartown, Chilmark, Tisbury, Cottage City, and Gay Head, and is noted for annual camp-meetings. Pop. 4148.

**Martialis**, mar-shé-á-lis (MARCUS VALERIUS), b. at Billis, in Sp., Mar. 1, 43 A. D.; went during the reign of Nero (in 66) to Rome, where he resided for 35 yrs., and achieved a great literary fame, and returned in 100 to his native city, where he seems to have d. a few yrs. afterward. Of his works, 14 books, containing about 1500 *epigrammata*, are still extant, all distinguished by cutting wit, great felicity of expression, and very interesting for the moral study of the time to which they belong.

**Martial Law**. As defined by a recent Eng. writer, "Martial law is the suspension of all law but the will of the military commanders intrusted with its execution, to be exercised according to their judgment, the exigencies of the moment, and the usages of the service, with no fixed or settled rules or laws, no definite practice, and not bound even by the rules of the military law." It differs widely from "military law" and from "military government," with each of which it is often confounded. M. L. may be applied to civilians as well as to the military, and its operation is not necessarily confined to the enemy's territory, nor to dists. technically hostile. In the celebrated case of Milligan, the supreme court denied the lawfulness of M. L. within the U. S. except in dists. actually occupied by the opposing forces, and the same doctrine has been laid down in Eng.

**Martin** (Fr. *martinet*), a name given to several birds of the swallow family (Hirundinidae). The purple M. of the U. S. (*Progne purpurea*) is one of the finest of our native swallows. It often inhabits boxes put up near houses, and is a popular favorite, being regarded as a bird of good omen. The house-M. of Europe (*Heddon urtica*) frequently attaches its nest to the walls of houses even in towns. The name is extended to other swallows.

**Martin**, bp. of Tours and a saint of the R. Cath. Ch., b. in 316 at Sabaria, in Pannonia, of pagan parents; visited the school of Pavia, but entered the army in his 16th yr. and served under Constantine and Julian the Apostate. Having left the army, he became a disciple of Hilary, bp. of Poitiers; returned to Pannonia; converted his mother to Christianity, but suffered much from the persecutions of the Arian party, which finally expelled him from the country. Once more he went to Gaul; was made bp. of Tours in 375, and founded the monastery of Marmontiers, where he d. about 400.

**Martin I.**, POPE and SAINT, received the tiara in 640, succeeding Theodore I.; called in 649 the first Lateran Council, and was banished by the emp. Constans II. to Naxos 653, to Constantinople 654, and to the Thracian Chersonese 655. D. Sept. 16, 655.—MARTIN II. (or MARINUS I.), b. at Montefiascone; became pope in 881, and d. Feb. 14, 884.—MARTIN III. (or MARINUS II.) succeeded Stephen VII. in 942, d. 946.—MARTIN IV. (*Simon de la Brie*), b. in Touraine of humble parentage; became a Franciscan at Tours; was patronized by St. Louis; became a cardinal in 1262; The long papal legate at Paris; became pope in 1281. The Sicilian Vespers soon followed (1282), and he excommunicated the enemies of the Fr., weakening his own cause in It. D. Mar. 28, 1285.—MARTIN V. (*Otto Colonna*), b. of noble stock at Rome; became auditor of the rota 1394, cardinal-deacon 1405; was chosen pope by the Council of Constance 1417; he fulminated a bull against the Hussites 1418. He healed the divisions of the Ch., restored the splendors of Rome, pacified Europe, and advanced the cause of learning. D. at Rome Feb. 20, 1431.



**Martin** (ALEXANDER), LL.D., b. in N. J. of Irish parentage about 1740, grad. at Princeton in 1756; removed to Guilford co., N. C., 1772; was a col. of Continental troops in the Revolution; served often in the N. C. senate, of which he was for a time pres.; acting gov. of N. C. 1781, gov. 1782-85 and 1789-92, member of the U. S. constitutional convention 1787, and U. S. Senator 1793-99. D. Nov. 1807.

**Martin** (BOY LOUIS HENRI), b. at St. Quentin, Fr., Feb. 20, 1810; commenced his literary career by writing historical novels and dramas, but turned soon to a more serious and thoroughgoing treatment of hist. His *Histoire de France* made a great sensation and was crowned by the Acad. The most prominent of his other writings are *De la France, de son Génie et de ses Destinées*, which gives the ideal view on which his narrative of the hist. of Fr. is based; *L'Unité Italienne*, and *La Russie d'Europe*; is senator of Fr.

**Martin** (FÉLIX), S. J., b. in Normandy, Fr., Oct. 4, 1804; entered the order of Jesuits in 1823; was sent to Canada in 1842, founded St. Mary's Coll. at Montreal, and spent much time at Que. in the collection and arrangement of materials for the early hist. of Canada. Owing to impaired eyesight he was compelled to return to Fr., but has since written *Mission du Canada, Relations inédites, De Montcalm en Canada*, and *Le R. R. Isaac Jogues*, beside aiding in Carayon's work on the Jesuit missions.

**Martin** (FRANÇOIS XAVIER), LL.D., b. at Marseilles, Fr., Mar. 17, 1702; came in 1782 to the U. S., and became a Fr. teacher, printer, and journalist at Newberne, N. C. In 1789 he was admitted to the bar, and soon won distinction. Jefferson made him a judge in Miss., where in 1813 he was chosen atty.-gen. In 1815 he was appointed a judge of the supreme court of La., and was its chief-justice 1837-45. He wrote valuable hist. of La. and N. C. D. Dec. 10, 1846.

**Martin** (GEORGE), b. at Middlebury, Vt., in 1815; settled in 1836 at Grand Rapids, Mich., and became a co. judge. In 1851 he was appointed a judge of the State supreme court, and was its chief-justice 1857-67. D. Dec. 15, 1867.

**Martin** (JOHN A.). See APPENDIX.

**Martin** (JOSHUA L.), removed in early life to the N. of Ala.; was a judge of a State circuit court 1831-35, a Dem. M. C. 1835-39, gov. of Ala. 1845-47, chosen as an independent Dem., but supported by the Whigs. He had previously been chancellor of Ala. D. Nov. 2, 1856.

**Martin** (LUTHER), LL.D., b. in New Brunswick, N. J., in 1744, grad. at Princeton in 1766; became a prominent lawyer of the E. Shore of Va. and Md.; was in Cong. 1784-85; atty.-gen. of Md. 1778 and 1818; was a member of the convention which drew up the const. of the U. S., which he bitterly opposed. In 1814 he became judge of oyer and terminer for Baltimore. He was a zealous friend of Aaron Burr, whom he defended on his trial for treason. Author of a *Defence of Capt. Cresap*. D. July 10, 1826.

**Martin** (ROBERT M.), b. in Worcester co., Md., in 1798, grad. at Princeton; was M. C. 1825-27, chief judge of the W. circuit of Md. 1845-51, judge of the superior court of Baltimore 1856-67, a prof. in the law school 1867-70. D. July 20, 1870.

**Martin** (WILLIAM D.), b. at Martintown, S. C., Oct. 20, 1789; studied in the law school at Litchfield, Conn.; became one of the ablest jurists and most prominent legislators of S. C.; became judge of State circuit court in 1830; belonged to extreme State Rights school. D. Nov. 10, 1833.

**Martindale** (JOHN H.), b. at Sandy Hill, N. Y., Mar. 20, 1815, grad. at W. Pt., and was appointed in the dragoons, but resigned 1836 and became an engineer. In 1838 he located at Batavia, N. Y., and practised law until 1851, when he removed to Rochester. In Aug. 1861 he was appointed a brig.-gen. of volunteers, and commanded a brigade in the Va. Peninsular campaign of 1862; was military gov. of D. C. from Nov. 1862 until the opening of the final campaign, when he joined (May 1864) the 18th corps (Army of the James), which, united with the Army of the Potomac, fought the battles of Cold Harbor June 1-3, 1864, and was engaged in the siege of Petersburg. He succeeded to the temporary command of the 18th corps July 7-22, and resigned, owing to impaired health, Sept. 13, 1864. Elected atty.-gen. of N. Y. in 1866. D. Dec. 13, 1881.

**Martin de Moussy** (JEAN ANTOINE VICTOR), M. D., b. at Moussy-le-Vieux, Fr., June 26, 1810; studied med. at Paris; practised in the military hospitals, and in 1841 went to Montevideo, S. Amer., where he resided for 12 yrs. as a phys., keeping a constant meteorological register. On the downfall of the Argentine dictator, Rosas, in 1852, he was engaged by the govt. of Pres. Urquiza to prepare a geographical description of the republic. The result was his *Description, géographique et statistique, de la Confédération Argentine*. He was one of the writers of the *Encyclopédie des Connaissances utiles* and of the *Dictionnaire Politique*. D. about 1870.

**Martineau**, mar'te-nō (HARRIET), sister of James, b. at Norwich, Eng., June 12, 1802, of a family descended from Huguenot exiles; was ed. under the auspices of her uncle, a distinguished surgeon; entered upon literary life in 1823; visited the U. S. in 1834, and travelled in Pal. and the E. in 1846. Wrote *Society in Amer., A Retrospect of W. Travel, Z. Life, Past and Present; Brit. India, etc.*, and an excellent condensation of Comte's *Philosophie Positive*. D. June 27, 1876.

**Martineau** (JAMES), LL.D., b. in Norwich, Eng., Apr. 21, 1805, of Fr. extraction. His father was a manufacturer of bombazines, in humble circumstances. Mr. M. studied in the Unit. coll. at York, and was minister of societies first in Dublin, and afterward at Liverpool in Hope chapel. While in Liverpool in 1839 he took part, in connection with J. H. Thom and Henry Giles, in a controversy with 13 clergymen of the Ch. of Eng. on questions of Chr. theol. In 1853 he was called to the chair of moral and metaphysical philos. in Manchester New Coll., Lond., whither he went to live. Of late yrs. he has been distinguished as the defender of spiritual faith against the different schools of atheism, materialism, and scepticism.

**Martinsburg**, R. R. centre, cap. of Berkeley co., W. Va., 80 m. W. of Wash. Pop. 1870, 4863; 1880, 6335.

**Martin's Ferry**, O. See APPENDIX.

**Martinsville**, R. R. junc., cap. of Morgan co., Ind., on White River, 31 m. S. W. of Indianapolis. Prin. business is in pork, grain, and lumber. Pop. 1870, 1131; 1880, 1943.

**Marvell** (ANDREW), b. at Winestead, Yorkshire, Eng., Mar. 2, 1621, was ed. at Cambridge and on the Continent; was the constant friend of liberty both under the Commonwealth and after the Restoration; was called the "British Aristides;" refused to be moved by the bribes of Charles II. or the persecutions of royalists, who frequently threatened his life. D. Aug. 17, 1678.

**Marvin** (ENOCH M.), D. D., bp. of the M. E. Ch. S., b. in Warren co., Mo., June 12, 1823. In 1841 he entered the itinerant ministry in the Mo. conference. He filled important stations in the Mo. and St. Louis conferences, and during the war, in Marshall, Tex. He was elected bp. 1866. He wrote *The Work of Christ*, etc. D. Nov. 26, 1877.

**Marx** (KARL), b. at Treves in 1818; studied at Berlin and Bonn, and became in 1842 ed. of the *Rheinische Zeitung*, pub. in Cologne, which formed an opposition to the Prus. govt., but which was suppressed in 1843. Having settled in Paris, he continued his attacks on Prus.; was expelled from Fr. in 1846; returned in 1848 to Cologne; founded the *Neue Rheinische Zeitung*, but was expelled in 1849. In 1850 he settled in Lond. and devoted his services to the International. Wrote *Kritik der politischen Öconomie* and *Das Kapital*. D. Mar. 15, 1883.

**Mary, The Blessed Virgin, and Mariolatry.** Of Mary Holy Script. tells us all that we know with certainty. And in Script. her life is hid with Christ. Yet there are vols. called *Histories of the Blessed Virgin*, in which we may read fullest details from her immaculate conception to her bodily assumption. All of which is founded on writings wholly apocryphal and full of fables. The devotion to the Blessed Virgin is of gradual growth. Modern devotion to the Blessed Virgin is called by opponents Mariolatry—a term of which her votaries may rightly complain. Worship is a relative term; its force depends upon the object to which it is addressed. Reverence is due to the saints; the worship rendered them is called in theological lang. *dulia*. To the highest of saints, "the mother of God," a higher reverence, or *hyperdulia*, is offered. That reverence or worship which is shown only to God is *latría*. Mariolatry, then, is the giving to Mary the honor due to God only. By this modern hyperdulia, to all who receive it, the character of Christ's religion is changed. The loving-kindness of the Lord is blotted out. There are pointedly 2 religions—the religion of loving confidence, that of Mary; and the religion of stern law, causing fear, that of Jesus.

**Mary I.**, queen of Eng. from 1553 to 1558, b. at Greenwich Castle Feb. 18, 1516, a daughter of Henry VIII. by Catharine of Aragon; ed. in Sp. fashion, a fanatic R. Cath. On the death of Edward VI. (July 6, 1553) she succeeded to the throne. The first period of her reign was rather mild, and it was not until after her marriage with Philip II. of Sp., July 25, 1554, that persecutions against the Prots. commenced. On Nov. 30, 1554, Cardinal Pole declared Eng. and Rome reconciled, and on Feb. 4, 1555, John Rogers was burned at the stake. Cranmer, Latimer, and Ridley shared the same fate, and were followed by 200 or 300 more, and the ruin of Eng. seemed impending, when she d. Nov. 17, 1558.

**Mary II.**, queen of G. Brit., b. Apr. 30, 1662, daughter of James II. by Anne Hyde, and in 1677 was married to her cousin, the prince of Orange (King William III.), with whom she was declared joint sovereign in 1689. D. Dec. 28, 1694.

**Mary, Brothers of**, a R. Cath. community whose work is instruction, founded at Bordeaux in 1817, confirmed in 1839 by the pope; introduced in 1849 into the U. S.

**Mary, Society of**, a congregation of R. Cath. priests, established in 1815 at Lyons, Fr.; received papal approbation in 1831, 1836, and 1873; introduced in 1862 into the U. S. Instruction and missions are their prin. objects.

**Mary Stuart**, queen of Scots, daughter of James V. by Mary of Guise, and great-granddaughter of King Henry VII. of Eng. through his daughter, Margaret of Tudor, b. at Linlithgow Dec. 8, 1542. Her father d. a few days after her birth, and on Sept. 9, 1543, she was crowned queen of Scot., the earl of Arran, and afterward her mother, conducting the govt. In 1548 she was affianced to Francis, dauphin of Fr., and brought to Fr. to be ed. at the Fr. court. Her marriage with the dauphin was celebrated Apr. 24, 1558, in the ch. of Notre Dame, and when Mary I. of Eng. d. in the same yr. (Nov. 17) she had her arms quartered with those of Eng. On July 10, 1559, Henry II. d., and was succeeded by Francis II. M. thus became queen of Fr., but Francis d. Dec. 5, 1560. In the same yr. her mother d., and she then returned to Scot., landing at Leith Aug. 14, 1561. James, her half-brother, whom she created earl of Murray, was her councillor. On July 29, 1565, she married Henry Darnley, a grandson of the earl of Angus and of Margaret Tudor, the widow of James IV., and thus related both to Elizabeth and to herself. Murray and his party among the nobility were opposed to this marriage, and revolted; but although she succeeded in suppressing the revolution, a sore disappointment overtook her. Darnley was profligate and jealous, weak and treacherous. On Feb. 9, 1567, the house in which Darnley lay sick was blown up by gunpowder, and his mangled corpse was found at a distance. Bothwell's connection with this murder was apparent; his trial was a mere mockery; and when M. married him a rising took place. In the battle of Carberry Hill (June 15) Bothwell was defeated and fled. M. escaped, and rallied a new force, but was defeated at Langside May 13, and fled to Eng. Here she was immediately imprisoned. After several yrs. imprisonment she was tried on a charge of complicity in conspiracies against the life of Elizabeth, and on Oct. 25, 1586, a sentence of death was pronounced against her. On Feb. 2, 1587, Mary Queen of Scots was beheaded.



**Maryland**, one of the central Atlantic States, one of the original 13, lying between 37° 53' and 39° 44' N. lat., and 75° 2' and 79° 30' W. lon. It is bounded on the N. by Pa., on the E. by Del. and the Atlantic Ocean, on the S. by Va., and W. by Va. and on the N. W. by W. Va.; extreme length from E. to W., 198 m., and its width varies from 3 or 4 m. at the narrowest portion to 120 at the widest; area, 12,210 sq. m. or 7,814,400 acres.



**Face of the Country.**—The E. Shore, lying between Chesapeake and Del. bays and the Atlantic, is mostly level, and in portions low and swampy. Toward the neck of the peninsula at the N. it is more rocky and broken. The W. Shore, lying between the Potomac River and the Chesapeake Bay with its prin. affluent, the Susquehanna, is, as far N. as the Great Falls of the Potomac, level and sandy, and in some places marshy; above that point it rises in terraces, and soon in broken and rugged hills; and in the region above Rockville it is decidedly mountainous; the Blue Ridge, Laurel Ridge, and the other main ranges of the Alleghanies, 5 or 6 in number, pass through the narrow N. W. portion of the State. Washington co., lying between S. Mt. and Tuscarora Mt., is a part of the Cumberland Valley, and abounds in beautiful scenery, while its soil is very rich and productive. The mts. in the extreme W. of the State, in Garrett co., are the highest, but none of them exceed 2500 ft. in height.

**Coast, Bays, Rivers, Lakes, Etc.**—The Atlantic coast proper is only 39 m. in extent, and has no good harbors, but Chesapeake Bay furnishes a coast-line of more than 500 m. Chesapeake Bay is navigable throughout its whole extent, and has numerous excellent harbors. The prin. river of the State is the Potomac, which rises in the mts. of W. Va. and flows N. E., E., and S. E. for a distance of about 450 m., of which nearly 200 are navigable. The other rivers of the State are—on the W. Shore, the Wicomico, Patuxent, South, Severn, Patapsco, Bush, and Susquehanna; on the E. Shore, the Pocomoke, Manokin, Nanticoke, Choptank, St. Michael's, Wye, Chester, Sassafras, Elk. To these also belong the so called Fishing, Honga, and Hudson rivers. Chincoteague Bay, Sinepuxent Bay, and St. Martin's Bay are sounds lying between the E. Shore and the island reefs and barriers which receive the Atlantic surf. Pocomoke Sound, Tangier Sound, and E. Bay are portions of Chesapeake Bay. There are numerous islands in the bay, the largest of which are Kent, Bloodworth's, Holland's, Smith's, Tangier, Halfmoon, and Assateague.

**Mineralogy.**—Copper, hematitic iron, chrome iron, and other ores, including galena, manganese, and barites, are found in the centre of the State; bituminous coal in great quantities in the N. W.; bog-iron ores in the E.; breccia and other marbles and building limestones and sandstones in the central portion of the State. There are also marls, magnesite, hornstone, and traces of gold, nickel, and cobalt have been discovered.

**Zoology.**—The fox, raccoon, and opossum are not uncommon, and bears are found in W. cos.; a few deer are left in the mts., and smaller game is abundant, but the most characteristic of the fauna of M. are its birds, fishes, and mollusks. The Baltimore oriole is one of the most brilliant-bred of song-birds; the rice-bird (the N. bobolink) and many other of the finches and tanagers have their homes for at least a part of the yr. in M. The number of species of wild-ducks, brant, and teal found in its bays and estuaries is very large, and pigeons, partridges, snipe, quail, etc. are found in the E. part of the State in immense numbers. Fish are abundant and of excellent quality; the oysters of Chesapeake Bay have the highest reputation both for size and flavor.

**Soil and Vegetation.**—Among the forest trees, the gum, cypress, cedar, juniper, dogwood, magnolia, holly, elm, cherry, locust, persimmon, beech, sycamore, poplar, sassafras, red maple, etc. are most abundant in the lowlands, while several species of oak, maple, walnut, hickory, ash, birch, chestnut, pine, and spruce are found in large forests in the mountainous dists. The soil in the E. part of the State is a light sandy loam, easily tilled, and with a good supply of fertilizers yielding good crops. It is well adapted to peach-culture and to market-garden products. The soil of the valleys of the middle and N. cos. is very rich and fertile, and yields immense crops of tobacco, wheat, and Indian corn. The mt.-slopes are clothed with forest trees, and some of them hardly repay cultivation.

**Climate.**—The climate of M. is equable, removed alike from the intense cold of the N. and the protracted heat of the S. It is generally healthy, except along the low and marshy lands which border the bay and the lower Potomac, where miasmatic influences are prevalent, and congestive, bilious, intermittent, and remittent fevers occur. Average mean temperature of yr., 54.64°. Rainfall, total for yr., 48.11 inches (Baltimore).

**Agricultural Productions.**—The prin. crop in M. is Indian corn—15,908,533 bushels by census of 1880. Of wheat, 8,004,

864 bushels were raised; oats, 1,794,872 bushels; tobacco, 26,082,147 lbs.; wool raised, 850,084 lbs.

**Farm Animals.**—The census of 1880 showed 117,796 horses, 262,540 cattle, 171,184 sheep, and 335,408 swine.

**Manufactures.**—Extensive manufactures of wood, metals, leather, etc. are established in M. In 1880 the iron and steel manufactures employed 2763 hands, with capital of \$4,962,125; wages paid, \$95,090; value of product, \$4,470,050. Baltimore has heavy packing establishments for canned fruits and vegetables. The coal mined in 1881 was 2,300,000 tons; pig iron produced in 1880, 61,437 tons. M. in 1880 had in all manufacturing industries 6787 establishments, employing 74,945 hands; wages paid, \$18,904,965; capital invested, \$58,742,384; aggregate products, \$106,780,563.

**Railroads, Etc.**—M. had in operation, in 1881, 1012 m. of railway, the prin. of which is the great trunk line of the Baltimore and O. The cost of all R. Rs. was \$78,627,467; net earnings, \$6,008,921, of which \$4,548,508 was paid in interest and dividends. The commerce by water is quite large, Baltimore importing, in 1881, commodities to the value of \$16,197,404, and exporting \$72,444,413, this port ranking third in the country in point of exports. Baltimore receives and ships about 35,000,000 bushels of wheat and 22,000,000 bushels of corn annually. The Chesapeake and O. Canal, 184 m., runs from Cumberland to Georgetown, D. C.

**Finances.**—The assessed value of property in 1880 was \$459,187,408, real and personal; State tax, 1874 cents on \$100, producing \$988,463 for State purposes; total taxation, local and State, \$5,497,462; State debt, exclusive of sinking fund, \$7,243,410; total indebtedness, State and local, \$10,896,006.

**Banks, Etc.**—In Oct. 1881 there were 38 national banks in M., with capital of \$13,603,000; circulation, \$8,606,433; bonds to secure circulation, \$9,606,650; deposits, \$36,341,500. Of State banks and trust cos. there were 14, with \$22,904,628 capital and \$28,905,215 deposits; savings banks, 15, with deposits of \$23,419,173; private bankers, 21, with deposits of \$2,432,774. The fire and marine insurance cos. paid losses in 1880 of \$865,233, and received in premiums \$1,395,057.

**Churches.**—M. has about 1800 chs., of which 775 are M. E., with 75,995 members; 168 Prot. Epis., with 22,023 members; 131 R. Cath., with about 1800 parishioners; 222 Prot. Meth., with 13,200 members; 119 Lutheran, with 14,500 members; 51 Bap., with 9970 members; 43 Presbs., with 7375 members, and 24 other sects, having from 50 chs. down to 1 each.

**Education, Etc.**—Number of children of school age (5-20 yrs.) was 276,120 in 1870; children enrolled in public schools, 1880, 162,431, with average daily attendance of 85,449. Amount expended for public schools, 1880, \$1,395,284, of which teachers' salaries absorbed \$1,117,145. Of colls. and univs. M. has 9 (6 of which are R. Cath.), with 126 instructors, and 1436 students, paying tuition fees in 1880 of \$13,572. M. had, in 1882, 139 newspapers and periodicals.

**Population.**—In 1860, 687,049; 1870, 780,894; 1880, 934,943 (white 724,693, colored 210,250, including 5 Chi. and 15 Indians).

**Principal Cities and Towns, Pop. 1880.**—Baltimore, 332,313; Cumberland, 10,693; Frederick, 8650; Annapolis (cap.), 6642; Hagerstown, 6627; Easton, 3005; Havre de Grace, 2816; Salisbury, 2581; Westminster, 2507; Chestertown, 2359; Port Deposit, 1950; Elliott City, 1784; Elkton, 1752.

COUNTIES.	*Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
Allegany	1-B	38,536	38,012	Cumberland	10,693
Anne Arundel	1-F	34,457	29,576	Annapolis	6,642
Baltimore City	2-F	267,354	332,313	Baltimore	332,313
Baltimore County	1-F	68,287	83,336	Towson	1,316
Calvert	4-F	9,885	10,538	Pr. Frederick T.	.....
Caroline	3-G	12,101	13,766	Denton	469
Carroll	1-E	28,619	30,992	Westminster	2,507
Cecil	1-G	26,874	27,108	Elkton	1,752
Charles	4-E	15,738	18,548	Port Tobacco	202
Dorchester	4-F	19,458	23,110	Cambridge	2,969
Frederick	1-D	47,572	50,482	Frederick	8,659
Garrett	1-A	.....	19,175	Oakland	910
Hagerstown	1-E	32,805	28,042	Bel Air	tp. 6,586
Howard	3-E	14,150	16,140	Elliott City	1,784
Kent	2-G	17,102	17,605	Chestertown	2,359
Montgomery	2-D	20,563	24,759	Rockville	688
Prince George's	3-E	21,138	26,451	St. Maryborough	541
Queen Anne's	2-G	16,171	19,257	Centreville	1,196
Saint Mary's	4-E	14,944	16,934	Leonardtown	465
Somerset	5-G	18,190	21,668	Princess Anne	751
Talbot	3-G	16,137	19,065	Easton	3,005
Washington	1-C	34,712	38,561	Hagerstown	6,627
Wicomico	4-G	15,802	18,016	Salisbury	2,581
Worcester	5-H	16,419	19,539	Snow Hill	1,276
Total	.....	780,894	934,943		

**History.**—The first white settlement was that of William Clayborne, an adventurer from Va., who with a party of his followers landed upon Kent Island in Chesapeake Bay in 1631. In 1632 a charter was granted to Cecilus Calvert, second Lord Baltimore; in 1634 he sent out his brother, Leonard Calvert, as gov. of the colony, with 300 emigrants. The colonists landed at St. Mary's, and named the colony Maryland, in honor of the queen. Lord Baltimore in organizing his colony had proclaimed religious toleration. In consequence many who had suffered from religious persecution flocked thither. In 1642 an Indian war commenced. In 1645 there was a rebellion which had its origin in Kent Island; this extended to St. Mary's, and Gov. Calvert was obliged to escape to Va. For the next 12 or 13 yrs. there was constant trouble. A large colony of Puritans, driven out of Va., had settled in M., and sought to wrest the colony from its rightful proprietor. In 1649 the assembly passed a law defining religious toleration, which prohibited atheism and all bitter reviling of one sect by another. The Puritans still proved turbulent, but the gov. sought to conciliate them by granting them additional land. They increased rapidly in numbers, and when the power in Eng. had passed into the hands of the Commonwealth and the Protector, they insisted on the immediate proclamation of

\* Reference for location of counties. See map of Maryland, in DELAWARE.



the new order of things. The Calverts objected. But the Puritans were found to be a majority, and in 1652 some from Eng. fully established the authority of the Commonwealth. A civil contest ensued, and the proprietary party led a force against Providence (Annapolis), but were defeated, and their whole force killed or captured. This was in Mar. 1655. In 1658 Lord Baltimore regained his proprietary rights, and his brother, Philip Calvert, was appointed gov. The colony began again to thrive. In 1689 King William avowed his intention of assuming the gov't. of the prov., and sent over in 1691-92 Sir Lionel Ogle as gov. The cap. was removed in 1693 or 1694 from St. Mary's to Providence, which then received the name of Annapolis. In 1714 Benedict Charles Calvert, fourth Lord Baltimore, succeeded to his father's proprietary rights. The colony thenceforward grew rapidly; Baltimore was founded in 1729, Frederick in 1745, and the first newspaper issued in the colony the same yr.; Georgetown was laid out in 1751. In 1750 the boundary-line between Pa. and M. was run by the coms. Mason and Dixon. In the 2d Fr. wars M. bore a prominent part; Gen. Braddock's unfortunate expedition was organized in the colony, and from 1754 to 1758 W. M. was kept in constant terror by Indian raids. M. entered heart and soul into the Revolution of 1776. The const. adopted by the State Aug. 14, 1776, was retained until 1861. M. ratified the const. of the U. S. Apr. 28, 1776, by a vote of 63 to 11. In the war of 1812 the State suffered severely. The State has been largely engaged in works of internal improvement. The slackwater navigation of the Potomac, the Chesapeake and O. Canal, the Baltimore and O. Railway, have all been measures in which she has taken a large pecuniary interest. In the late c. war M. was peculiarly situated; a slaveholding State, and with large interests in the S., she had also warm and strong attachments to the U., and was, moreover, the highway to the national capital. At first, like Ky., she proposed to take a neutral position, but the attack upon the Mass. regiment at Baltimore (Apr. 19, 1861) and the destruction of the R. R. from Annapolis to Wash. led to the occupation of Baltimore by Federal troops, and to the suppression of manifestations of sympathy with the S. Very many citizens of M. left their homes and joined the Confederate armies, but of those who remained at home a majority were loyal to the U. One of the greatest battles of the war (that of Antietam, Sept. 17, 1862) was fought on her terr., and several other minor, but important, engagements, as S. Mountain, Monocacy etc., were also on her soil. Since the war the State has been laboring zealously to recover its commercial prestige, and to become more firmly bound to the great West. In 1851 its const. was revised and largely remodelled, and in 1864, and again in 1867, constitutional conventions were held and changes made in its organic law.

#### Lords Proprietary and Governors.

Lords Proprietary.	State Government (1777-1838), Annual Elections.
Cecilus Calvert, second Lord Baltimore.....	1632-75 Thomas Johnson.....
Charles Calvert, third Lord Baltimore.....	1675-1715 Thomas Sim Lee.....
Benedict Leon Calvert, fourth Lord Baltimore.....	1715-51 William Smallwood.....
Charles Calvert, fifth Lord Baltimore.....	1715-51 John Eager Howard.....
Frederick Calvert, sixth Lord Baltimore.....	1751-76 George Plater.....
Sir H. Harford, last proprietary.....	1715-76 Thomas Sim Lee.....
Governors Appointed by the Lords Proprietary.	1715-76 John H. Stone.....
Leonard Calvert.....	1633-47 John Henry.....
Thomas Greene.....	1647-49 Robert Bowie.....
William Stone.....	1649-54 Edward Lloyd.....
Commissioners under Parl.	1654-55 Robert Bowie.....
Joshua Fendall, pres.	1661-62 Robert Wright.....
Philip Calvert.....	1661-62 Edward Lloyd.....
Charles Calvert.....	1662-67 Robert Bowie.....
Charles, third Lord Balt.....	1667-78 Lewis Winder.....
Thomas Notley.....	1678-80 C. Ridgely of Hants.....
Charles, third Lord Balt.....	1681-85 Charles Goldsborough.....
Wm. Joseph, president of Deputies.....	1685-89 Samuel Sprigg.....
Conven. of Prot. Asso.....	1689-92 Samuel Stevens, Jr.....
Royal Governors.	1692-93 Joseph Kent.....
Sir Lionel Ogle.....	1693-94 Daniel Martin.....
Sir Edmund Andros.....	1694-99 Thomas M. Carroll.....
Francis Nicholson.....	1699-1703 Daniel May.....
Nath. Blackstone.....	1699-1703 George Howard (acting).....
Thomas Trench, pres.....	1703-04 George Howard.....
John Seymour.....	1704-05 James Thomas.....
Edward Lloyd, pres.....	1705-15 Thomas W. Veazey.....
John Hart.....	1714-15 Const. of 1838, Three-year Terms.
Proprietary Government.	1715-20 William Grason.....
John Hart.....	1720-27 Francis Thomas.....
Charles Calvert.....	1727-32 Thomas Swann.....
Benedict Leon Calvert.....	1732-33 Oden Bowie.....
Samuel Ogle.....	1733-35 Wm. Pinckney Whyte.....
Charles, fifth Lord Balt.....	1735-39 J. B. Groome.....
Samuel Ogle.....	1739-42 Philip P. Thomas.....
Thomas Bladen.....	1742-47 Robert M. McLane.....
Samuel Ogle.....	1747-52 Henry Floyd (acting).....
Benjamin Tasker, pres.....	1752-53
Horatio Sharpe.....	1753-59
Robert Eden.....	1759-74
The Revolution.	
The Convention and Council of Safety.....	1774-76

REVISED BY A. R. SPOFFORD.

**Marysville**, city and R. R. centre, cap. of Yuba co., Cal., at the junction of the Feather and Yuba rivers, 52 m. N. of Sacramento, incorporated in 1851; is centre of trade for the surrounding country. Pop. 1870, 4738; 1880, 4321.

**Marysville**, city and R. R. junc., cap. of Marshall co., Kan., on the E. bank of the Big Blue River, here crossed by a fine bridge. A stone dam has been built, utilizing for mills the fine water-power. Pop. 1870, 300; 1880, 1249.

**Marysville**, city and R. R. junc., cap. of Union co., O., 28 m. N. W. of Columbus. Pop. 1870, 1441; 1880, 2061.

**Maryville**, city and R. R. junc., cap. of Nodaway co., Mo., 45 m. N. of St. Joseph. Prin. business, farming and stock-raising. Pop. 1870, 1682; 1880, 3485.

**Masaccio**, mah-sah't'cho, b. at Castel S. Giovanni in 1402; said to have d. in Rome in 1429. In regard to the pieces that may be safely attributed to him there has been much dispute. The frescoes in the Brancacci chapel at Florence are with most confidence traced to his hands. The paintings in the Uffizi at Florence and in other European galleries are of doubtful genuineness. In the development of art M. holds a distinguished place.

**Masaniello**, mah-sah-ne-el'lo (O. **MASANO ANIELLO**), a fisherman of Sorrento, who in 1647 excited a popular insurrection in Naples against the duke of Arcos, the Sp. viceroy. But the populace itself rose against him soon after his triumph, and he was assassinated July 17, 1647.

**Mascalonge**, or **Muskinunge**, the largest and finest fish of the pike family, the *Esox nobilior*, inhabiting the Great Lakes, etc. It has been known to weigh 60 lbs. It is an extremely bold and vigorous biter. (See also PIKE.)

**Mascarene Isles**. See APPENDIX.

**Masin'sa**, or **Massinissa**, king of the Massylians, one of the most powerful Numidian tribes, b. about 240 B. C., a son of Gala. Hasdrubal having promised to give him his daughter Sophonisba in marriage, he attacked the Massesylians, who in the struggle between Rome and Carthage sided with Rome; defeated their king, Syphax, in 213; crossed over to Sp. and fought with success against Cneius and Publius Scipio. But when Hasdrubal gave his daughter to Syphax, M. attacked Carthage. In the beginning he was unsuccessful, but when (in 204) Scipio landed in Afr., M. entered into an alliance with him, routed the Massesylians, and received the terms of Syphax. Sophonisba he now married, but Scipio demanded her as a Rom. captive, and M. sent her a cup of poison, which she drank. He occasioned the third Punic war, but d. before its close, 148 B. C.

**Mason**, city, on R. R., cap. of Ingham co., Mich., 12 m. S. of Lansing. Pop. 1870, 1212; 1880, 1809; 1884, 1882.

**Mason** (ARMISTEAD THOMSON), son of S. T. Mason, b. in Loudoun co., Va., in 1787, grad. at William and Mary Coll. 1807; served as col. of a cav. regiment in the second war with Eng.; distinguished himself in the defence of Norfolk; was subsequently brig.-gen. of Va. militia; served some yrs. in the Va. legislature; was chosen U. S. Senator in 1815 as a Dem.; served until 1818, when he resigned to become a candidate for the House of Reps. against the eminent Federalist, Charles Fenton Mercer; was defeated by a few votes in a contest of great personal bitterness, which led to several duels, in one of which, fought with muskets at Bladensburg, Md., with his cousin, Col. John Mason McCarty, he was killed, Feb. 6, 1819.

**Mason** (CHARLES), F. R. S., b. in Eng. about 1730; was assistant for several yrs. at Greenwich Observatory, and with Mr. Jeremiah Dixon was sent to the Cape of Good Hope to observe the transit of Venus of June 6, 1761, while Dr. Maskelyne proceeded with them to St. Helena for the same purpose. In 1763 Messrs. M. and Dixon were commissioned by the proprietors of Pa. and Md. to survey the boundary-line between their Amer. possessions; arrived at Phila. Nov. 13, and were engaged upon this task until Dec. 26, 1767. Messrs. M. and Dixon embarked at New York for Falmouth Sept. 9, 1768. Dixon d. at Durham, Eng., in 1777. M. observed the transit of Venus of June 3, 1769, at Cavan, Ire.; was employed by the bureau of longitudes to verify the celebrated *Lunar Tables* of Tobias Mayer, pub. after his death under the title *Mayer's Lunar Tables, improved by Charles Mason*. M. d. at Phila. in Feb. 1787.

**Mason** (CHARLES), b. in N. Y. about 1808, grad. at W. Pt. in 1829, but retained as assistant prof. of engineering until 1831, when he resigned from the army and commenced the practice of law at Newburg, N. Y., removing to New York in 1834, where for a time he had the editorial management of the *Post*. In 1837 he removed to Wis. Terr., and in 1838 was appointed chief-justice of the supreme court of Ia., which he held until the admission of Ia. into the U., where for several yrs. he was State atty. to settle the question of boundary-lines, and one of the coms. which drew up the code of laws adopted by the State in 1851; was com. of patents during the administration of Pres. Pierce, and since 1860 has practised his profession at Wash.

**Mason** (EBENEZER PORTER), b. at Washington, Conn., Dec. 7, 1819, grad. at Yale 1839, distinguishing himself as a math. and astron.; was engaged in the summer of 1840 as a member of the com. for determining the boundary between Me. and Canada, and wrote soon afterward a paper entitled *Observations on Nebula*, which was highly commended by Sir John Herschel. D. Dec. 24, 1840.

**Mason** (ESKINE), D. D., youngest child of Dr. John M. Mason, b. in New York Apr. 16, 1805, grad. at Dickinson Coll. in 1823; joined Princeton Sem. in 1824; was pastor of the 1st reb. ch. in Schenectady from 1827 to 1830, and of the Bleecker st. ch., New York, from 1830 till his death, May 14, 1851. From 1836 to 1842 he discharged the duties of prof. of ecclesiastical hist. in Union Theological Sem. He was an argumentative preacher of great power. A posthumous vol. of his sermons, with a brief memoir of the author by Dr. William Adams, was pub. in 1853.

**Mason** (FRANCIS), D. D., b. in York, Eng., Apr. 2, 1796, came to the U. S. in 1818; worked as a shoemaker in several towns of Mass.; became connected with the Bap. ch. at Canton, Mass., about 1825; studied anc. langs. under the guidance of his minister; entered Newton Theological Sem. in 1827, and was sent in 1830 as a missionary to Burmah. He devoted himself chiefly to the Karens, among which tribe he had wonderful success. He translated the Bible into 2 Karen dialects, ed. many native preachers, prepared a gram., chrestomathy, and vocabulary of the Pali lang., wrote a *Life of Ko-Thah-Bu*, the Karen Apostle, and an autobiography, *The Story of a Workingman's Life, with Sketches of Travel*. D. Mar. 3, 1874.



**Mason** (GEORGE), b. in Stafford (now Fairfax) co., Va., in 1726, was descended from Col. George Mason, a M. P. in the reign of Charles I. and officer in the army of Charles II. at the battle of Worcester, after which he escaped to Va. in disguise, losing all his estate in Eng. His great-grandson, also called George, married a niece of Sir William Temple, by whom he had 2 sons who attained distinction, George and Thomson. The former settled after his marriage in Truro parish (which includes Mt. Vernon), built Gunston Hall on the banks of the Potomac, and became the intimate friend of Washington, to whom he was a valuable adviser, and for whom he drafted the "non-importation resolutions," which the latter presented to the Va. assembly, and procured their adoption 1760. One of these resolutions pledged the Va. planters to purchase no slaves imported after Nov. 1 of that yr. At a meeting of the people of Fairfax, July 18, 1774, he presented a series of 24 resolutions on the questions at issue between G. Brit. and the colonies, which were sanctioned by the Va. convention in Aug., and substantially reaffirmed by the Continental Cong. in Oct. of the same yr. In 1775 he was a member of the Va. convention, declined an election to the Continental Cong., which was pressed upon him, and nominated Francis Lightfoot Lee in his place. In May 1776 he drafted the "Declaration of Rights" and the "Plan of Government," which were adopted June 12 and 20. In the revision of the statutes of Va. his liberal sentiments were conspicuous. He was a member of the Continental Cong. 1777, and of the convention for framing the Federal const. 1787. In the latter body he took a conspicuous part, proposing that the election for Pres. should be direct, and for a single term of 7 yrs., opposing the postponement of the repeal of the slave-trade, the counting of slaves as a basis for representation, and the establishment of a property basis for suffrage. Several features which he considered dangerous were incorporated in the const., which he consequently refused to sign; and having been elected to the Va. convention to consider that instrument, he united with Patrick Henry in demanding its rejection unless some 20 amendments should be made. Several of these were subsequently adopted by the States and incorporated into the const. He was chosen one of the first Senators from Va., but declined the post, and spent the remainder of his life in retirement. His statue is one of the group which surrounds that of Washington in front of the State capitol at Richmond. D. Oct. 7, 1792.

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**Mason** (JAMES MURRAY), grandson of George, b. at Annapolis Island, Va., Nov. 3, 1798, grad. at the Univ. of Pa. in 1818; studied law at William and Mary Coll.; began practice in 1820; was prominent in the State legislature; M. C. 1837-39, U. S. Senator 1846-61, and was the author of the Fugitive Slave Law; entered in 1861 the Confed. Cong., and was sent with John S. Dix as a com. to Eng. and Fr.; was taken off the Brit. steamer Trent by Capt. Wilkes Nov. 8, 1861, and confined in Ft. Warren, near Boston; released on the demand of the Brit. govt. Jan. 2, 1862, and proceeded upon his mission to Europe. D. Apr. 28, 1871.

**Mason** (JEREMIAH), LL.D., b. at Lebanon, Conn., Apr. 27, 1768, grad. in 1788 at Yale; was admitted in 1791 to the Vt. bar; practised law at Westmoreland, N. H., until 1794; at Walpole, N. H., 1794-97; at Portsmouth, N. H., 1797-1832; after which he resided in Boston. In 1802 he became attorney of N. H.; several times elected to the legislature, and U. S. Senator 1813-17. D. Oct. 14, 1848.

**Mason** (JOHN), b. at Lynn Regis, Eng.; served in 1610 in the navy against an insurrection in the Hebrides; went in 1616 as gov. to Newfoundland, of which he pub. a description and a map; explored in 1617 the N. Eng. coasts; obtained in 1622 a grant of a region called Mariana, now the N. E. part of Mass.; procured in 1622, with Sir Ferdinando Gorges, a patent for the prov. of Me.; sent in 1623 a colony to the Piscataqua River. M. was 1624-29 treas. and paymaster of the royal armies in the Sp. war. In 1629 he took a patent for the N. H. colony, and with Gorges took another patent for Laconia, a tract including Lake Champlain. He held various important positions in Eng. In 1635 he was a judge in Hampshire, and was appointed vice-admiral of N. Eng. His rights in N. H. were sold to Gov. Samuel Allen in 1691, and proved a fruitful source of litigation to that gentleman and his heirs. D. Dec. 1635.—**JOHN TUFON MASON**, one of John Mason's heirs, in 1746 sold his own rights to a Portsmouth co. called the Masonian proprietors.

**Mason** (JOHN), b. in Eng. about 1600, was one of the first settlers of Dorchester, Mass., 1630, and one of the founders of Windsor, Conn., 1635; was commissioned in 1637 to command an expedition against the Pequod Indians, who had massacred several settlers at Wethersfield, and with a party of 90 Eng., 70 friendly Mohegans, and several hundred Narragansett warriors he surprised one of the Pequod forts on Mystic River before daybreak, May 26, 1637, and destroyed more than 500 Indians, his own loss being 2 killed and 20 wounded. Soon afterward he killed or captured most of the remaining members of the tribe in another expedition in W. Conn. M. was appointed major of the Conn. forces, retaining that office through life; settled first at Saybrook, and in 1659 at Norwich; was for many yrs. a magistrate, and was deputy gov. 1660-70. At request of the gen. court he prepared an account of the Pequod war. D. 1672.

**Mason** (JOHN MITCHELL), D. D., son of John (1734-92), b. in New York Mar. 19, 1770, grad. at Columbia Coll. in 1789, and studied at the Univ. of Edinburgh; succeeded his father in an Associate Reformed pastorate in New York in 1792; founded in 1804 a theological sem. in New York, in which he became prof. of theol. He was provost of Columbia Coll. 1811-16, pres. of Dickinson Coll. 1821-24, and in 1822 united with the Presb. Ch. D. Dec. 26, 1829.

**Mason** (JOHN Y.), LL.D., b. at Greenville, N. C., Apr. 18, 1799, grad. at the Univ. of N. C. in 1816; became a lawyer, served long in the State legislature, and became a judge in the dist. court of Va.; was M. C. 1831-37; became in 1837 a

judge of one of the Federal courts; was in the Va. constitutional conventions in 1828 and 1849; sec. of the U. S. N. 1846-49; U. S. minister to Fr. 1854-59. D. Oct. 3, 1859.

**Mason** (JONATHAN), b. at Boston Aug. 30, 1752, grad. at Princeton 1774; studied law under John Adams; was admitted to the bar 1777; delivered the official oration before the authorities of Boston Mar. 5, 1780, on the 10th anniversary of the "Boston massacre," of which he had been a witness; took a high position at the Boston bar; served repeatedly in the State legislature; was a member of the gov.'s council 1798; U. S. Senator 1800-03; took a prominent part in the debates of the Senate, especially in that upon the repeal of the Judiciary act of 1801; was M. C. from 1817 to 1820, when he resigned. He was an active and energetic politician of the Federalist party. D. Nov. 1, 1831.

**Mason** (LOWELL), Mus. Doc., b. in Medfield, Mass., Jan. 8, 1792, began his career as instructor and leader of choirs in Savannah, Ga., 1812; in 1821 published the *Handel and Haydn Collection of Ch. Music*; removed to Boston in 1827, and gave himself entirely to the task of instructing classes in vocal music and encouraging the public taste for music. To him Mass. is indebted for the introduction of music into the public schools. His labors soon became arduous and extensive. The musical education of the people was Mr. M.'s object. His own compositions were numerous. In 1855 the Univ. of New York conferred on him the degree of doctor in music. Mr. M. did more to make the practice of vocal music popular than to raise the standard of musical culture, and long before his death, Aug. 11, 1872, the influence of his school had yielded to the power of more finished art.

**Mason** (STEVENS THOMSON), b. in Stafford co., Va., in 1760, was ed. at William and Mary Coll.; served in the Revolution, becoming a col. when 20 yrs. old, and afterward a gen. officer; was a prominent member of the Va. convention of 1788, U. S. Senator 1794-1808. D. May 10, 1803.

**Mason** (STEVENS THOMSON), b. in Loudoun co., Va., in 1811, a son of Gen. John T. Mason and grandson of S. T. Mason; when 19 yrs. old became sec. of Mich. Terr.; acting gov. 1834-35, gov. of State 1836-40. D. Jan. 4, 1843.

**Mason** (THOMSON), brother of George, b. in Va. in 1730, studied law in Lond.; took an active part in opposing Brit. aggressions, writing in 1774 a series of papers in favor of resistance; was in 1778 a member of the supreme court of Va.; was appointed one of the revisers of laws of Va., and was member of legislature in 1779 and 1783. D. 1785.

**Mason and Dixon's Line**, the line which forms the S. boundary of Pa., separating it from Del., Md., and Va. From the celebrity which this term acquired during the anti-slavery agitation as a synonym of the divisory line between free and slave terr. it has been frequently confounded with the parallel of 36° 30', fixed by the "Missouri compromise" of 1820 as the N. limit for the extension of slavery into the Terrs. According to the original grants from the Crown of Eng. to William Penn and Lord Baltimore, the boundary between their respective colonies was fixed at the 40th parallel of N. lat. That line being found to pass N. of Phila. and to exclude Pa. from Del. Bay, negotiations ensued between the proprietors for the purpose of rectifying the blunder. An agreement was made between the proprietors (May 10, 1732) for fixing their boundary; and as Del. then belonged by purchase to the heirs of Penn, it was necessary to begin at its S. E. extremity, then fixed at Cape Henlopen. Certain points were agreed upon, and coms. were appointed to run these lines in 1732, 1739, and 1750, but disagreed, and chancery suits were the result. Finally, in 1763, the proprietors determined to send out more skilled maths. to complete the operations, and selected Charles Mason and Jeremiah Dixon, who verified the work of their predecessors, and ran the W. line, fixed at lat. 39° 43' 26.3" N., since known by their name. They began work in Nov. 1763, and were stopped by the Indians in the summer of 1767 at a point 244 m. W. of the Del. and only 86 m. E. of the terminus they were seeking. Stones were erected at intervals of 1 m., and every 5th stone was engraved on the opposite sides with the arms of the lords proprietors. The remaining part of the line was fixed in Nov. 1762, and was verified and permanently marked in 1784. In consequence of the accidental removal of the stone at the N. E. corner of Md., coms. were appointed by the 3 States in 1849 to revise the former survey. The result of this revision was to confirm the work of Mason and Dixon, and Md. gained by the operation a little less than 2 acres.

PORTER C. BLISS.

**Mason Bee**, a name applied to numerous bees, chiefly of the genus *Osmia*, which construct their cells of mud. Some species form cells of great beauty and perfection, and line them with a kind of silk.

**Mason City**, R. R. junc., Mason co., Ill., the centre of one of the richest corn-growing regions in Ill. Pop. 1870, 1615; 1880, 1714.

**Mason City**, R. R. junc., cap. of Cerro Gordo co., Ia., in the midst of an agricultural and stock-raising section; has water-power and limestone quarries. Pop. 1870, 1183; 1880, 2510.

**Maçonry** [Fr. *maçonnerie*; Ger. *Mauerwerk*] is the art of building in stone or brick with mortar, and is classified into stone M., brick M., and concrete or *béton*. Stone M. is divided into *cut stone* (or *ashlar*) M. and *rubble* M.; and rubble may be *coursed* or *uncoursed*, while the uncoursed may be *squared rubble*, showing only vertical and horizontal joints on the face, or *irregular rubble*, with the joints running in random directions according to the shapes of the stones. Concrete may be *brick, stone, gravel, or shell concrete*, depending on the material used for ballast. The front of a wall is termed its *face*, and the material composing it *facing*, as distinguished from the *back* and *backing*, which apply to the rear or inner surface of the wall. The interior is called the *heart*, and the material *heating* or *filling*. When the face or back of a wall is not vertical, but inclines toward the wall from bottom to top, the inclination is called the *batter*.



or *bâtit*. The method of arrangement of the bricks in order to secure strength of mass is called the *bond*. *Headers* are stones or bricks which show an end upon face and back of the wall, and therefore reach into the wall their entire length and bind it together transversely. *Stretchers* are laid to show their longest dimensions on the face or back, and to give longitudinal strength. For walls of stone M. not exceeding 3 ft. in thickness, each header should extend through from face to back, and is termed a *through*. In thicker walls the headers should reach back at least 18 inches beyond the contiguous stretcher, and are termed *binders*. The lower surface of a stone is termed its *lower bed*, the upper surface its *upper bed*. All the spaces between contiguous stones are also called joints. *Ashlar* is an external facing of cut stone laid with close joints in courses, the quality of the face-dressing being such as will best suit the character of the material and the design of the work under construction. In *rock-faced ashlar* the face of each block is the natural fracture of the stone, left undressed. The filling and backing behind an ashlar facing may be rough, irregular rubble, brick-work, or concrete. The ashlar should be well bonded to the hearting, for which purpose  $\frac{1}{8}$  to  $\frac{1}{2}$  of the entire length of each course should be headers. The *tails* of the headers, in order to secure a good bond with the hearting, are left with the rough rock-face on the sides. (Fig. 1 gives a transverse and a horizontal section of a sea-wall on a concrete foundation, with stone facing and concrete backing.) The practice of thinning off the blocks from a few inches from the face, so as to show close face-work, with little labor of stone cutting, as in Fig. 2, should be avoided. The method of building with headers and stretchers is not followed in laying the thin ashlar. The rise or height of headers should not exceed their width as seen on the face of the wall. Where the batter is great, the bed-joints should not be carried out horizontally to the face of the wall, for the reason that the lower edge of each face-stone would present an angle so acute as to be liable to injury from accidents. One method of construction recommended in such cases is to cut the beds of the stones so that at least 4 inches in width of the bed-joint shall be normal to the face of the wall, as shown in Fig. 3. A better design is to secure the requisite strength at the angle by allowing the stones to project beyond the face of the wall, as in Fig. 4. Indeed, it will generally be less expensive, and produce stronger work, to lay up the wall in offsets, as shown by the dotted lines of Fig. 4. Where it is difficult to get a solid foundation, additional thickness should be given to the wall at the base; and in order to lessen the weight and cost of the superstructure, without endangering its stability, it may be built hollow; a concave batter is sometimes given to the face. Fig. 5 shows a transverse section, and Fig. 6 a plan of a structure of this description. It is a river-wall in Sheerness, Eng., designed by Rennie.

Common *uncoursed* rubble is built with stones of random shapes and sizes as they come from the quarry. The only implements used in laying are the trowel and plumb-rule, and no attention is paid to courses. The interstices of the larger stones are filled in with those that are smaller and with spalls, all well bedded in mortar. The face and back of the wall should be well bonded to the hearting with headers, and the stones should be selected so as to fit together as closely as possible, and thus reduce to a minimum the volume of mortar necessary to completely fill all the voids; but no two stones should touch each other. For the angles or corners of a wall of this kind the stones should be as nearly rectangular as can be found. Ashlar is frequently introduced at the angles and around window and door openings to obtain architectural effect, after the manner of the *opus incertum* of the ancients. With stone of a dark color a fine effect can be produced by pointing the joints with white mortar.

FIG. 1.



FIG. 2.

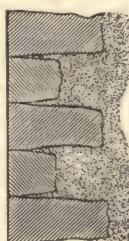


FIG. 3.

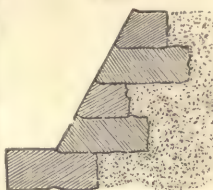
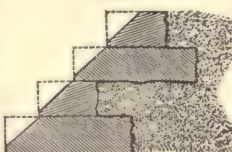


FIG. 4.



*Coursed Rubble, or Squared Rubble built in Courses.*—This differs from random rubble in being built of stones that are, at least approximately, rectangular in form, so that only vertical and horizontal joints are shown upon the face of the wall, and they vary considerably in thickness. Although

FIG. 5.

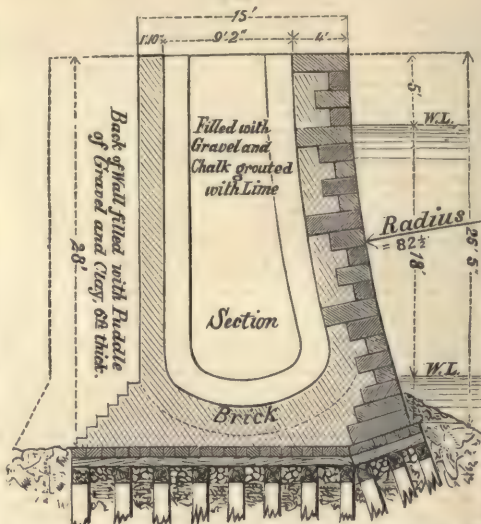


FIG. 6.



Plan.

blocks and of good size, a good strong bond can be secured by frequent headers. Indeed, the wall will possess greater longitudinal strength by carefully avoiding continuous horizontal joints.

*Brick M.*, when both the brick and mortar are of good quality and the work is well done, is strong and durable. Various kinds of bond are used, the most usual being the *English* and *Flemish*. Hollow brick walls are much used, the thickness of the inner shell being usually 4 inches, or the width of one brick. It is tied to the outer wall at frequent intervals with iron clamps, or more generally with bricks laid transversely or diagonally and bonded into the masonry at both ends. Moisture will not condense on the inner face of such a wall. The expense of firing out with wood and lathing is therefore saved, and the danger from fire lessened.

*Concrete (béton) M.* is admirably adapted to many important purposes. For foundations in damp and yielding soils and all kinds of submarine constructions: for quay-walls, jetties, piers; for foundations, hearing and backing of massive walls generally; for cisterns, reservoirs, and tanks; for tunnels and aqueducts, and for many other purposes, it possesses advantages over either brick or stone M. For submarine M. concrete possesses the advantage that it can be laid without exhausting the water, and also without the aid of a diving-bell or submarine armor. (See MAHAN, *Civil Engineering*.) From orig. art. in *J's Univ. Cyc.*, by GEN. Q. A. GILLMORE.

**Masonry.** See FREEMASONRY.

**Masorah, Masoreth, or Massoreth** [Heb. "tradition"], the technical name given to a collection of grammatical-critical notes on the Heb. text of the O. T., with the object of determining its divisions, grammatical forms, letters, vowel-marks, and accents. This species of authoritative commentary was rendered necessary by the fact that the early Heb. text, like Semitic writings in gen., consists of the consonants alone, without separation between the words, and consequently it was often a matter of no less delicacy than importance for the sense of the sacred text to discover which of several vowels should be employed in pronunciation.

**Mass**, one of the many names by which the holy Eucharist has been designated. It has been derived from the termination of the service, *Ita! Missa est*—"Go in peace! you are dismissed."

**Mass** [Lat. *missa*], in music. When large portions of the service are set to music, the composition is known as a mass. A full mass comprises the *Kyrie*, *Gloria in excelsis*, *Credo*, *Sanctus*, *Benedictus*, and *Agnus Dei*.



**Massachu'setts**, one of the E. or N. Eng. States of the

Amer. Union, and one of the original States of the confederacy of 1776-88, lying between 41° 14' and 42° 53' N. lat., and 69° 53' and 73° 32' W. lon. from Greenwich. It is bounded N. by Vt. and N. H., E. by the Atlantic, S. by the Atlantic and R. I. and Conn., and W. by R. I. and N. Y.; greatest length from E. to W., 180 m.; greatest breadth, 113 m.; total area, 8,315 square miles or 5,321,000 acres.



Seal of Massachusetts.

**Face of the Country.**—The W., middle, E., and N. E. sections are for the most part hilly and broken, and the S. E. more level and sandy, though with many rocks along the coast. The Taghkanic and the Hoosick ranges are separate ridges of the Green Mt. range of Vt. Of these the Taghkanic is much the highest. Saddle Mt., or Greylock, 3505 ft. high, and Mt. Washington, or Mt. Everett, 3624 ft., belong to this range. The Hoosick range maintains a somewhat regular elevation of from 1200 to 1600 ft. Farther E., near the W. bank of the Conn. River, are 2 isolated peaks, Mt. Tom and Sugarloaf, the former 1214 ft. high, and across the Conn. Mt. Holyoke, 910 ft. high; while still farther E. Wachusett Mt., in the tp. of Princeton, Worcester co., rises 2018 ft. The valley of the Conn., in Mass., is remarkable for the fertility of its soil. The E. and S. E. part of the State, including the island cos. and Cape Cod, is moderately level and sandy, but under careful cultivation much of it yields fair crops.

**Rivers and Lakes.**—The prin. rivers are the Conn., the Housatonic, the Hoosick, a tributary of the Hudson, in the N. W.; the Agawam or Westfield and the Deerfield, tributaries of the Conn., from the W.; and the Chicopee, with several branches, and Miller's River, E. tributaries of the same river; the Merrimack, which has its source in N. H., but flows for 35 m. in M., receiving in the State the Nashua and Concord rivers; the Charles, Taunton and branches, and the Blackstone. Wenham Lake, famous for its ice, is near Boston, and Quinsigamond Lake or Pond, for a long time the scene of the regattas of the colls., lies between Worcester and Shrewsbury.

**Bays, Islands, Etc.**—The coast of M. is deeply indented by bays, harbors, and sounds. The largest of these, beginning with the S. E., are Buzzard's Bay, almost landlocked by the Elizabeth Islands; Vineyard Sound, between the Elizabeth Islands and Martha's Vineyard; Edgartown and Nantucket harbors; Cape Cod Bay, ¼ landlocked, Wellfleet Bay, Plymouth harbor; Duxbury Bay; Mass. Bay, and within it Boston harbor; Lynn harbor, Nahant Bay, Marblehead, Salem, and Beverly harbors; Gloucester harbor or bay, Sandy Bay, and Annisquam harbor. There are hundreds of islands along the coast, Martha's Vineyard, Nantucket, and several of the Elizabeth group of good size.

**Mineralogy.**—Silver has recently been discovered in Essex co. Lead, copper, and zinc have been discovered in the vicinity of the Conn. River. Iron is found abundantly in the W. part of the State and to some extent in Plymouth and Bristol cos. Talcose slate, limestone, steatite, and soapstone all exist in large quantities in Berkshire, Hampshire, and Franklin cos.; glass-sand of excellent quality in Berkshire. Asbestos, plumbago, several of the ochres and ochreous earths, slate, and in Berkshire co. a beautiful white marble, are the other prin. minerals of the State.

**Vegetation.**—Much of the soil of M. is naturally sterile, and though originally covered with heavy forests of pine, hemlock, oak, chestnut, hickory, maple, and other deciduous trees, except in the S. E., where the sandy flats were treeless, yet when these forests were cleared the soil produced but scanty crops except by the aid of manure. The indigenous flora of the State was, nevertheless, copious both in quantity and variety of genera and species. Nearly all the trees, shrubs, and flowering plants indigenous in any part of N. Eng. and N. or Central N. Y. were natives of M.; and though cultivation of the soil has driven out some of them, their place has been supplied by many naturalized plants and trees, as well as some noxious weeds from other States and countries. It is not easy to speak in too high terms of praise of the industry, patience, and skill which the agriculturists of M. have exercised in bringing these lands, not naturally fertile, to so high a degree of productiveness. The red sandstone region of the Conn. Valley and the valley of the Housatonic, as well as some portions of the central cos. have a better soil and have been kept in excellent condition by skillful farming.

**Zoology.**—Of smaller game there are considerable numbers, rabbits, squirrels, and the various game-birds being tolerably abundant. Of the other larger birds the variety is not great. Two species of eagle are occasionally though rarely seen; no vulture is found in the State; the great owl, the fish-hawk and other species of hawks, several species of gulls, the brant, and wild-ducks, and most of the song-birds common to the N. States, are found in the State. There is the usual variety of batrachians and reptiles, though not

more than 3 species of the latter are venomous. The fish of the coast and rivers are abundant. The halibut, mackerel, cod, tautog, bass, etc. have the highest reputation.

**Climate.**—The climate is cool. The winters are generally long and severe, the summers short and warm. Snow falls usually during 5 or 6 months, and in rare instances exceeds 6 months. The amount of annual rainfall has been for a term of yrs. from 40 to 43.5 inches, and is very equably distributed through the seasons.

**Agricultural Products.**—The prin. crop is Indian corn—by census of 1880, 1,797,768 bushels; oats, 645,159 bushels. The amount of wheat, rye, and barley produced is trifling. Of tobacco, 5,369,436 lbs. were raised in 1880; wool, 299,069 lbs.

**Farm Animals.**—M. had, in 1880, 59,629 horses, 261,051 cattle, 67,979 sheep, 80,123 swine.

**Manufactures.**—M. is one of the heaviest manufacturing States in the U., producing every variety of cotton and woollen fabrics, iron and steel manufactures, wooden-ware, furniture, jewelry, machinery, glassware, etc. There were produced in 1880, of iron and steel manufactures, \$10,288,921 in value, employing capital of \$6,738,408 and 6513 hands, to whom wages amounting to \$2,576,539 were paid. Boston produced in 1880 total manufactures to the amount of \$130,531,963. The cotton manufactures of M. in 1880 employed 62,903 operatives, running 4,465,290 spindles.

**Fisheries** are very extensive and productive, aggregating more than half the product of the whole N. Eng. States. Cod, mackerel, haddock and bluefish are the prin. varieties, and the value by census of 1880 was \$8,141,750.

**Railroads.**—In 1881 there were in M. 2128 m. of R. R. in operation, costing \$152,843,129, with net earnings of \$9,221,102, and paying in interest and dividends \$7,114,939. The State is a network of R. Rs., crossing each other in all directions, and doing a heavy passenger and freight traffic.

**Finances.**—The taxable value of property as assessed in 1881 was—real estate, \$1,149,465,827; personal, \$498,274,149; total, \$1,648,239,976. The State tax was only 35 cents on \$1000, yielding \$4,950,000. Total taxes in 1881, for State, county, and town purposes, \$24,180,245, or about \$13.56 to each inhab. Amount of State debt, 1881, less sinking fund, \$19,749,272; total indebtedness, local and State, 1880, \$91,283,913.

**Commerce.**—The foreign commerce of M. in 1881 exhibited exports, \$72,100,193; imports, \$62,102,880. The internal commerce is large, and Boston is a great supply market for the neighboring States.

**Banks, Savings Banks, Etc.**—In Oct. 1881 M. had in operation 244 national banks, with capital of \$96,177,500; circulation, \$71,367,089; U. S. bonds to secure circulation, \$79,762,600; deposits, \$126,544,300. Beside these there were 6 State banks and trust cos., with deposits of \$10,131,176; 12 savings banks, with deposits of \$59,921,155, and 47 private banks, deposits, \$2,570,068. The insurance cos. insured risks to the amount of \$499,854,480 in 1880, receiving \$4,147,719 in premiums and paying \$2,639,495 for losses.

**Education.**—The number of children of school age (5-15 yrs.) in 1880 was 307,321, of whom no less than 306,777 were enrolled in public schools, with average attendance of 235,664. Public school expenditure, 1880, \$4,720,951, of which \$4,491,225 was for teachers and school-books. There are 7 univs. and colls., with 159 instructors, and 2009 students, paying in tuition \$150,335. There are 7 theological schools, 5 med., and 2 law schools. Number of newspapers and periodicals in 1880, 49, of which 49 were daily.

**Churches.**—The Congl. Ch. has the lead, with 528 chs. and 91,787 members; Baps., 289 chs., 48,883 members; M. E., 319 chs., 45,517 members; R. Caths., 272 chs.; Unitas, 185 chs. and 11,000 members. There are about 30 other denominations, with chs. varying from 100 down to 1.

**Population.**—In 1860, 1,231,066; 1870, 1,457,351; 1880, 1,783,085 (white 1,763,782; colored 19,303, including 369 Indians, 229 Chinese, and 8 Japanese).

**Principal Cities and Towns.** Pop. 1880.—Boston (cap.), 362,839; Lowell, 59,475; Worcester, 58,291; Cambridge, 52,669; Fall River, 48,961; Lawrence, 39,151; Lynn, 38,274; Springfield, 33,340; Salem, 27,563; New Bedford, 26,845; Somerville, 24,993; Holyoke, 21,915; Chelsea, 21,782; Taunton, 21,213; Gloucester, 19,329; Haverhill, 18,472; Brockton, 13,608; Newburyport, 13,358; Pittsfield, 13,364; Fitchburg, 12,429; Northampton, 12,172; Waltham, 11,712.

COUNTIES.	*Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
Barnstable	5-K	30,774	31,897	Barnstable	780
Berkshire	2-C	64,927	69,032	Pittsfield	tp. 13,364
Bristol	3-I	102,886	129,040	New Bedford	26,845
Dukes	6-J	3,787	4,300	Taunton	21,213
Essex	1-I	200,543	244,535	Edgartown	1,303
Franklin	2-E	32,635	36,001	Lawrence	39,151
Hampden	3-I	78,409	104,142	Newburyport	13,358
Hampshire	3-E	44,388	47,232	Salem	27,563
Middlesex	2-H	274,853	317,830	Greenfield	tp. 3,340
Nantucket	6-K	4,122	3,727	Springfield	tp. 12,172
Norfolk	5-I	89,443	96,507	Lowell	59,475
Plymouth	4-J	65,365	74,018	Nantucket	tp. 3,727
Suffolk	2-I	270,802	387,297	Deidham	tp. 6,233
Worcester	3-F	192,716	228,897	Plymouth	tp. 7,993
Total		1,457,351	1,783,085	Boston	362,839
				Fitchburg	12,429
				Worcester	58,291

**History.**—The evidence seems to be conclusive that S. E. M. was discovered by Leif Bjornsen and his brother Thorwald about 1000-03, named Vinland from the abundance of wild grapes. Nearly 200 yrs. later, in 1497, John Cabot and his son Sebastian again discovered the M. coast. The Eng. claimed it under Cabot's discovery, he having been at the time in their service. In 1602 Bartholomew Gosnold, with a

\* Reference for location of counties. See map of Massachusetts, in CONCORDANCE.



colony of 32 persons, landed in or near Salem harbor, and subsequently coasted along Cape Cod and discovered the Elizabeth Islands and the little island of No Man's Land. In 1605 another attempt was made at a settlement in Martha's Vineyard, by Martin Prynne; this failed 2 months later, as did that of George Weymouth in 1605, but the latter led to the formation of the Plymouth Co. in Eng. to whom was assigned N. Va., lying between 38° and 45° N. lat. After several attempts to found colonies under the jurisdiction of this co., the first which proved permanent was the Pilgrim colony, a body of Puritans who had migrated to Leyden, but resolved to emigrate to the New World. They sailed from Plymouth, Eng., Sept. 6, 1620, 102 in number, and entered what is now Provincetown harbor, Cape Cod, Nov. 11, and before landing organized a govt. After exploring the coast the colonists landed Dec. 22 at Plymouth. They endured great privations till 1623, when they gathered their first plentiful harvest. They organized and maintained a system of self-government, under which they prospered. Meanwhile other colonies were founded by Puritans within the present limits of the State; one at Salem in 1628, under John Endicott, which in 1630 was merged in a larger one undertaken in 1629 under John Winthrop, and which was connected with the transference of the govt. and patent of the Plymouth colony to N. Eng. About 1800 persons came over from Eng. in the 2 yrs. 1629 and 1630. Friendly and cordial relations were maintained between the 2 colonies, but each maintained its separate and independent govt. till 1692, when they were united under one charter. During this period of more than 60 yrs. both colonies had had troubles from without and within. In 1636 and 1637 troubles with the Pequot Indians led to the Pequot war. Internal difficulties led to dissensions, accusations, banishment, and severe punishments of the disaffected. The colonies had also serious difficulties with the Eng. govt., especially after the restoration of Charles II. The great struggle with the Indians in 1675 and 1676, known as King Philip's war, checked the prosperity of the colonies for a long time. One man in every 20 in the colonies had fallen, and  $\frac{1}{20}$  of the families were without shelter. The expense of the war was a little more than \$500,000, a sum equal to at least \$3,000,000 in our day. Before this war had ended new troubles with the king had begun. Prompted by the vindictive spirit of Edmund Randolph, Charles II. had at last decided to bring all the N. Eng. colonies under the sway of a royal govt. In 1684 the Eng. high court of chancery declared the charter of Mass. Bay colony forfeited. Joseph Dudley, a citizen of Mass. Bay, was appointed pres., under control of the revengeful Randolph. Two yrs. later, on the accession of James II., in Dec. 1686, Dudley was superseded by Sir Edmund Andros. Andros lost no time in asserting his power over all the N. Eng. colonies; he determined to make the humiliation of M. complete by exercising his authority with the utmost oppression and greed. His administration was endured for 2 yrs. and 4 months, and then, upon the first report that the prince of Orange had landed in Eng., Andros and all his coadjutors were arrested, imprisoned, and held for trial; the former deputy govt., Thomas Danforth, was made acting govt. till the king's pleasure should be made known. In 1690 M. took part in the intercolonial war between the possessions of Fr. and Eng. Sir William Phips, a native of N. Eng., was their commander in this colonial war, and was in 1692 appointed the first govt. under the new charter granted by the king, by which Massachusetts Bay and Plymouth were consolidated into one govt. During his administration the Salem witchcraft delusion occurred. The consolidated colony had at this time a pop. of about 47,000. There were frequent disturbances with the Indians for the next 23 yrs., but they were finally ended by the almost complete extermination of the Indian tribes adjacent. From 1744 to 1748, in the war between Eng. and Fr., M. contributed largely to the capture of Louisburg in 1745 and to the success of the Canadian expeditions. In the second war with Fr. in the following decade the colony again played a conspicuous part. Her enterprise, her rapidly increasing pop. (she had 247,000 in 1767), and her independent spirit seemed to have excited jealousy toward her. Oppressive measures of taxation were devised, and her commerce was hampered by restrictions. But the spirit of her people was not to be crushed. Every measure of oppression was resisted. The Boston massacre of 1770 increased the excitement of the people, and the destruction of the tea in 1773 in Boston harbor, the opposition to the Port Bill in 1774, etc. were the most prominent of the many events which immediately preceded the Revolution. The first blood of the Revolutionary war was shed at Lexington and Concord on Apr. 19, 1775; the battle of Bunker Hill on June 17 of the same yr. followed. In 1780 she adopted her const., and it was decided not long after that by a clause in the Bill of Rights prefixed to that const. slavery in the State was abolished. John Hancock, the patriotic leader of the colony in the Continental Cong., was her first State govt. An insurrection occurred in the W. part of the State in 1786, known as Shays's rebellion, arising from the poverty and distress of the people of that section and the severity of the taxes. The const. of the U. S. was ratified in Jan. 1788, by a State convention, by a vote of 187 to 168. In the division of parties which occurred at the beginning of the present century a large majority of the citizens of M. sided with the Federal party, and many of them were opposed to the war with G. Brit. in 1812. A number of delegates from the State appeared at the convention of the N. Eng. States which met at Hartford, Conn., in 1814, to confer upon their grievances. In 1820 the dist. of Maine was set off as a separate State. In the same yr. a convention met to revise the const. and 14 amendments, of which 9 were accepted and 5 rejected by the people. Other amendments have been adopted (26 in all) in the yrs. 1831, 1833, 1836, 1840, 1855 (6 in that yr.), 1857, 1859, 1860, and 1863. The amendments of 1857 changed the mode of electing reps. and senators to the State legislature.

## Governors.

<i>Of Plymouth Colony, elected.</i>		Jona. Belcher.....	Aug. 1739-41
John Carver.....	1620-21	William Shirley.....	1741-49
William Bradford.....	1621-33	Spencer Phips (acting).....	1749-53
Edward Winslow.....	1633-34	William Shirley.....	1753-56
Thomas Prence.....	1634-35	Spencer Phips (acting).....	1756-57
William Bradford.....	1635-36	The Council.....	Apr.-Aug. 1757
Edward Winslow.....	1636-37	Thomas Pownall.....	1757-60
William Bradford.....	1637-38	Thomas Hutchinson.....	June-Aug. 1760
Thomas Prence.....	1638-39	John Brooks.....	1760-69
William Bradford.....	1639-44	Sir Francis Bernard, Bart.....	1760-69
Edward Winslow.....	1644-45	Thomas Hutchinson (act. g.).....	1769-71
William Bradford.....	1645-57	Thomas Hutchinson.....	1771-74
Thomas Prence.....	1657-73	Thomas Gage.....	May-Oct. 1774
Josiah Winslow.....	1673-81	A Provincial Congress.....	
Thomas Hinckley.....	1681-86	Oct. 1774-July 1775	
Sir Edm. Andros, gov.-gen.....	1686-89	The Council.....	July 1775-80
Thomas Hinckley.....	1689-92	<i>Under the Constitution.</i>	
<i>Of Mass., chosen annually under First Charter.</i>		John Hancock.....	1780-85
John Endicott (acting).....	1629-30	James Bowdoin.....	1785-87
Matthew Cradock (did not serve).....		John Hancock.....	1787-Oct. 1793
John Winthrop.....	1630-34	Samuel Adams (act. g.).....	Oct. 1793-94
Thomas Dudley.....	1634-35	Samuel Adams.....	1794-97
John Haynes.....	1635-36	Increase Sumner.....	1797-June 1799
Henry Vane.....	1636-37	Moses Gill (acting).....	June 1799-1800
John Winthrop.....	1637-40	Caleb Strong.....	1800-07
Thomas Dudley.....	1640-41	James Sullivan.....	1807-Dec. 1808
Richard Bellingham.....	1641-42	Levi Lincoln (acting).....	Dec. 1808-09
John Winthrop.....	1642-44	Christopher Gore.....	1809-10
John Endicott.....	1644-45	Elbridge Gerry.....	1810-12
Thomas Dudley.....	1645-46	Caleb Strong.....	1812-16
John Winthrop.....	1646-49	John Brooks.....	1816-23
John Endicott.....	1649-50	Wm. Eustis.....	1823-Feb. 1825
Thomas Dudley.....	1650-51	Marcus Morton (act.).....	Feb.-July 1825
John Endicott.....	1651-54	Levi Lincoln.....	1825-34
Richard Bellingham.....	1654-55	John Davis.....	1834-Mar. 1835
John Endicott.....	1655-63	Samuel T. Armstrong (act.).....	1835-36
Richard Bellingham.....	1656-57	Edw. Waverton.....	1836-39
John Leverett.....	1657-73	Marcus Morton.....	1840-41
Simon Bradstreet.....	1673-94	John Davis.....	1841-43
Jos. Dudley, pres.....	1684-86	Marcus Morton.....	1843-44
Sir Edm. Andros, gov.-gen.....	1686-88	George N. Briggs.....	1844-51
Thos. Danforth (acting).....	1689-92	George S. Boutwell.....	1851-53
<i>Appointed by the King under the Second Charter.</i>		John H. Clifford.....	1853-54
Sir William Phips.....	1692-94	John W. Washburn.....	1854-56
Wm. Stoughton (acting).....	1694-99	Henry J. Gardner.....	1856-58
Richard Coote, earl of Bellomont.....	1699-1700	Nathaniel P. Banks.....	1858-61
Wm. Stoughton (acting).....	1700-01	John A. Andrew.....	1861-66
The Council.....	1701-02	Alexander H. Bullock.....	1866-69
Joseph Dudley.....	1702-Feb. 1715	William Claflin.....	1869-72
The Council.....	Feb.-Mar. 1715	Wm. B. Washburn.....	1872-May 1874
Joseph Dudley.....	Mar.-Nov. 1715	Thomas Talbot (act.).....	May-Dec. 1874
Wm. Tallar (acting).....	1715-16	William Gaston.....	1874-76
Samuel Shute.....	1716-23	Alexander H. Rice.....	1876-79
Wm. Dummer (acting).....	1723-28	Thomas Talbot.....	1879-80
Wm. Burnett.....	Jan.-Sept. 1728	John D. Long.....	1880-83
William Dummer (acting).....	Sept. 1728-June 1730	Benjamin F. Butler.....	1883-84
W. Tallar (acting).....	June-Aug. 1730	George D. Robinson.....	1884-96

REVISED BY A. R. SPOFFORD.

**Massagete** [of doubtful etymology, thought by some to be the Magog of the Bible], an anc. Turanian or Tur. tribe, inhabiting the steppes to the N. of the Jaxartes. According to Herodotus, it was with them that Cyrus of Pers. went to war, and fell in battle, 529 B. C.

**Massassoit**, the chieftain of the Pokanoket or Wampanoag Indians, found by the colonists of Plymouth, Mass., living in their vicinity in 1621 as ruler of the terr. from Cape Cod to Narragansett Bay. He made a treaty with the settlers at Plymouth Mar. 22, 1621, and maintained friendship with them until his death. His permanent residence was in the present township of Warren, R. I. He entertained Roger Williams for several weeks when banished from Mass. He was supposed to be 80 yrs. of age when he d. in 1661, leaving 2 sons—Mooanum and Pomotacum, called by the colonists Alexander and Philip. They succeeded him, the latter being the celebrated "King Philip."

**Masséna**, mah-sá-nah' (ANDRÉ), prince of Essling, marshal of Fr., b. May 6, 1758, at Nice, served for 14 yrs. in the Sard. army; entered the Fr. army after the annexation of Nice to Fr. in 1792; became chief of a battalion Aug. 1, 1792, and brig.-gen. Aug. 22, 1793. His exploits were his victory over the allied Aus.-Rus. army at Zurich Sept. 25, 1799, the siege of Genoa in 1800, and his defence of Aspern and Essling (May 21, 1809). In 1810 he received the highest command in Sp., but in the spring of 1811 he resigned his command on account of ill-health. D. Apr. 4, 1817.

**Massico** (the *Mons Massicus* of Lat. poetry), a mt. in It. famous in anc. and modern times for the Massic wine produced from its vineyards. On the S. slope is a town of the same name. The locality was on the frontier between Latium and Campania.

**Massicot** (Fr.), protoxide of lead, prepared without fusion. (See LEAD.)

**Massie** (NATHANIEL), b. in Goochland co., Va., Dec. 28, 1763; entered the Revolutionary army at the age of 17; studied surveying; settled in Ky. in 1783; became a resident of Manchester, O., in 1790, and laid out the town of Chillicothe upon his own land; was engaged in the Indian wars of the N. W. in which he gained the rank of gen. of O. militia; was a delegate to the convention which framed the O. const. in 1802; was frequently a member of the State legislature, having served one term as speaker of the senate; was a candidate for gov. in 1807, and declared elected, but resigned before entering upon the office. D. Nov. 13, 1813.

**Massillon**, city and R. R. centre, Stark co., O., 65 m. S. of Cleveland, on Tuscarawas River and O. Canal, in midst of Tuscarawas Valley coal-fields; has 3 quarries of Massillon white sandstone. Pop. 1870, 5185; 1880, 6836.

**Massillon**, mah-sél-yon' (JEAN BAPTISTE), b. at Hyères, Provence, Fr., June 24, 1663; entered the Congregation of the Oratory in 1681, went in 1696 to Paris, became R. Cath. bp. of Clermont 1717, was admitted to the Acad. in 1719, D. Sept. 18, 1742. His sermons are models of rhetoric.



**Mas'singberd** (FRANCIS CHARLES), b. in Lincolnshire, Eng., about 1800, grad. at Magdalen Coll., Ox., with honors in 1822; took orders in the Ch. of Eng. in 1824 and 1825, when he received the living of S. Ormsby. In 1847 he was made a prebendary of Lincoln, and was 1862-72 chancellor of the cathedral ch., and afterward a residentiary canon. Wrote *Hist. of the Eng. Ref., Ch. Reform, Law of Ch. and State*, etc. D. in Dec. 1873.

**Mas'singer** (PHILIP), b. at Salisbury, Eng., 1584; studied at St. Alban's Hall, Ox.; went in 1606 to Lond. His first play is the *Virgin Martyr* (1622). Among his best works are the *Duke of Milan, Fatal Doury, A New Way to Pay Old Debts*, and *The Picture*. D. Sept. 18, 1640.

**Mas'son** (DAVID), M. A., b. at Aberdeen, Scot., Dec. 2, 1822, ed. at Aberdeen and Edinburgh; was for a time a journalist; prof. of the Eng. lang. and lit. in Univ. Coll., Lond., 1852-65; became in 1865 prof. of rhetoric and Eng. lit. in the Univ. of Edinburgh, and was from 1859 ed. of *Macmillan's Magazine*. Wrote *Essays, Biographical and Critical, Life of Milton, Brit. Novelists*, etc.

**Mas'sorah**. See MASORAH.

**Master and Servant**. These terms indicate a mutual personal relation which implies on the one side authority and will to direct and appropriate, and on the other obligation, under direction, to perform labor. This relation grows necessarily out of that diversity of capacity among men which springs from difference of natural endowment and acquired wisdom and skill, out of the principle of division of labor, and out of recognized factitious distinctions based on wealth and social position. When the liberty and equality of men, as men, with regard to their rights, are recognized and respected, the parties enter into this relation voluntarily for their mutual advantage. The benefits on either side are defined by contract, the rights and obligations of which are guarded by law. But in the actual hist. of the world, under the sway of human selfishness, this natural order has been very extensively subverted. Masters have used their superior power to gain ownership of their fellow-men, and to hold them as servants bereft of freedom, subjected to their absolute control. Hence the existence of slavery almost universally under the anc. civilization; hence villeinage and serfdom in the Middle Ages; and hence, too, the domestic slavery of modern times. The consequent division of society into classes tended to degrade all forms of manual labor as more or less servile and disgraceful. Thus, in the palmy days of Greece and Rome all mechanical industry and mercantile operations were carried on by slaves for the benefit of their masters. But the spirit of Christianity has worked steadily an influence adverse to slavery in all its forms, and now almost throughout Christendom the claim of one man to own the person and labor of his fellow-man is abrogated. The great industries of society are raised to the dignity of honorable vocations. It is one of the problems of modern social science so to adjust this relation, and so to mould public sentiment concerning it, as to protect the rights of both parties in full recognition of their freedom and independence. This is closely linked with the *labor question* in its broad application. The solution of the problem is to be reached by magnifying to the common apprehension the dignity of "honest work well done" in every sphere. A. L. CHAPIN.

**Mastersingers** [Ger. *Meistersinger*], the name of a kind of literary guild or association which was formed in various Ger. cities in the 14th and 15th centuries, when poetry had died out at the courts among the Minnesingers and was taken up by the burghers.

**Mastic** [Gr. *μαστική*], literally, *chewing substance*, because it was used as a masticatory by the anc. as now by the Orientals], a gum-resin used as an ingredient of many varnishes. Alone, it is transparent, tough, brilliant, and delicate. It is obtained from cuts in the bark of *Pistachio lentiscus*, *P. Atlantica*, etc. It comes from Barbary, the Levant, and from Chi.

**Mastiff** [L. Lat. *mastivus*], a name applied to several distinct breeds of large watch-dogs. They resemble the bull-dog in courage and strength, but excel him in magnanimity, faithfulness, and affection for man. The Thibet M., from Central Asia, is one of the largest of the dog tribe. The so-called Cuban bloodhound is a M. of Sp. origin.

**Mastin** (CLAUDIS HENRY), M. D., LL.D., b. in Huntsville, Ala., June 4, 1826, ed. at the Univ. of Va.; grad. M. D. in the Univ. of Pa. 1849; went to Europe in 1850, and studied in Lond., Paris, and Edinburgh. Returning, settled in Mobile, where he practised, chiefly as a surgeon, in which capacity he served in the Confed. army. In Mar. 1874 delivered the annual address before the med. alumni of the Univ. of Pa., which conferred upon him the honorary degree of LL.D.

**Mastodon** [Gr. *μαστός*, a "nipple," and *δοῦς*, a "tooth"], an extinct genus of Tertiary and Quaternary Proboscidea, closely related to the elephant, but distinguished principally by the mammilliform crowns of the grinding teeth. The genus was well developed during the later Tertiary epoch, and several species existed during the Pliocene period in Amer. The *M. americanus*, the earliest and best known species, has been very fully described under the name *M. giganteus* by Dr. J. C. Warren, the description being mostly drawn from a very perfect skeleton discovered in a swamp at Newburg, N. Y. This skeleton measures 11 ft. in height, and 17 ft. in length to the base of the tail. The entire length of the tusk is 10 ft. 11 inches, about 2½ ft. being included in the socket. The fore foot measures nearly 2 ft. across. The bones were massive compared with those of the elephant. When alive this animal must have been 12 or 13 ft. high, and, including the tusks, about 25 ft. long. Other skeletons more or less complete have been discovered in Orange co., N. Y., in N. J., Ind., and on the banks of the Mo., while isolated bones and teeth have been found in nearly all parts of the U. S. and in Canada. This species seems to have been confined to the

Quaternary. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. O. C. MARSH.]

**Masûdî**, or **Al-Masûdî** (ALÍ-ABUL-HASSAN), b. at Bagdad about the close of the 9th century; received a brilliant education and spent many yrs. in travel. D. in Egypt in 956. His work, embracing the geographical and historical results of his travels, is the most celebrated of its kind in the Ar. lang., and abounds in curious information illustrating the manners, morals, and beliefs of the time. It is styled *Meadows of Gold and Mines of Gems*.

**Matagorda Bay**, an extensive bay of Calhoun and Matagorda cos., Tex. It receives the waters of the Colorado River, and Lavaca Bay, one of its arms, receives Lavaca River. The land about the bay is flat and much cut up by bayous, but a part affords rich pasturage. The entrance to the bay is by Pass Cavallo, Matagorda Peninsula, which separates the bay from the sea, is a low sand-spit, often marshy, and in some places is overflowed completely by high tides. Indianola, Pt. Lavaca, and Matagorda are the prin. towns on the bay.

**Matamoros** (MARIANO), b. in Mex. about 1770; was in 1811 priest of the v. of Janteloco, when the excesses of the Sp. soldiery induced him to join the insurgents who had proclaimed independence. He went to Izucar, S. of Puebla, then held by Morelos, who received him with great favor, and at once made him a col. In that capacity he soon showed such decided military talent as to be called "the right arm of Morelos." He bore a distinguished part in the successful expedition against Oaxaca, and was in command at the signal victory of San Augustin del Palmar (Oct. 1813). Morelos, having resolved to attack Valladolid, was repulsed and his forces shattered at the battle of Puruarán, in which M. was captured. He was shot a few days later at Valladolid (now Morelia) Feb. 13, 1814.

**Matanzas**, town of Cuba, on the N. shore of the island, at the head of a beautiful bay of the same name, 52 m. E. of Havana, with which it is connected by two lines of railway, is well built, and contains one of the best educational insts. in the W. I., the Empresa Acad. It is fortified, has a good harbor, and carries on a considerable trade. Pop. 36,102.

**Maté**, or **Paraguay Tea** [Sp. *yerba de maté*; maté is properly the vessel in which it is prepared], the dried and broken leaves and shoots of *Ilex Paraguayensis* and several other species of *Ilex* (order Aquifoliaceae), shrubs which grow in Brazil and Paraguay. The leaves are gathered, dried by artificial heat, and stored away for several months to cure. M. is used in most parts of S. Amer. much as we use tea and coffee, like which it abounds in caffeine.

**Materialism** [Lat. *materialis*, "matter"] is the doctrine that nothing exists but matter with its sensible properties. It is opposed to idealism, the doctrine that nothing exists but mind with its ideal phenomena. In its extreme form it would resolve all spiritual beings and phenomena into mere illusions, or explain them as refined material manifestations. M. is as old as philos. Gr. M. led the way. The Gr. philos., Leucippus, Democritus, and Epicurus, speculating upon the origin of the universe, posited an infinite number of atoms combining and recombining in mathematical proportions throughout space and time, until, after endless trials, all existing things have been produced. In these systems not only were solid objects, plants, and animals, regarded as mere masses of compounded atoms, but also the souls of men, which were supposed to consist of ethereal and luminous particles diffused like air or light through the body, and dispersed with it at death. Rom. M. followed as little more than a reproduction of the Gr., and had its chief representative in Lucretius, who expounded the doctrines of Epicurus in a majestic philosophical poem, *On the Nature of Things*. It. M. rose with the classical revival as a mock compromise between the dogmas of the Ch. and the speculations of the Alexandrian school of Aristotle. The leader of the movement, Pomponatius, held the mortality of the soul, the necessity of the will, and the embodiment of God in nature. The systems of Democritus and Epicurus were partially revived by Telesius, Campanella, and Magnenus, and fully sanctioned by Peter Gassendi, a Fr. ecclesiastic. Eng. M. at the same time was opening new paths. Thomas Hobbes, in *Leviathan*, described the soul as a corporeal substance receiving ideas as material images, the state as an incarnation of absolute power, and God as a name for the incomprehensible omnipotence of nature. He was followed by Locke, who deduced all ideas from sensation through reflection, and suggesting that reflection itself is a property of matter. Fr. M. grew out of the previous systems. Abbé Condillac illustrated the process of transforming sensations into ideas by an imaginary human being incased in marble and allowed to acquire successively the different senses and combine their impressions by acts of attention, memory, and judgment. La Mettrie, in *On Man a Machine and Man a Plant*, reduced the mind to a perishable mechanism. Baron d'Holbach, in his *System of Nature*, denied the existence of mind, freedom, and immortality, and maintained the eternity of matter, the indestructibility of force, the immutability of physical law. Ger. M. has since followed under a reactionary impulse against the long prevailing idealism. Schopenhauer substituted his Universal Will or Force for the Absolute Reason of Hegel; Feuerbach resolved his ideas into phosphates.

Numerous questions have arisen from time to time through its conflicts with opposing doctrines. A preliminary question is the essential nature of matter. The idealist ends by resolving all matter into mind. But the materialist starts with the idea of matter as an external independent something which he divides into invisible atoms, distributes through space and time, endows with motion, life, even sensation and thought, until he has resolved mind itself into mere matter. The next question is the connection of matter with force. Newton could only conceive of force as an expression of mind, of some voluntary agent impart-



ing it to the ultimate atoms of matter in the form of attraction, repulsion, and other properties; Leibnitz regarded the atoms themselves as intrinsically active substances termed monads; and Bosovich, in his dynamic theory, treated them as mere metaphysical points or centres of attraction and repulsion, thus virtually resolving all matter into force. The maxima of the modern materialists, Moleschott and Büchner, is, "No matter without force; no force without matter." Another question is the connection of matter with life. In the early speculations upon organized beings there was always supposed some immaterial principle or cause of life. Prof. Huxley has lately maintained that "protoplasm," the original organic matter of all living beings, is composed of the same atoms as ordinary lifeless matter, and differs from it only in the manner in which they are aggregated; so that there is no more reason for explaining vital phenomena by a supposed principle of vitality than to speak of aquosity as the cause of water.

A still more important question is the connection of matter with thought, with mind, and with will. Locke suggested the possibility of cognitive matter. Carl Vogt has described the brain as an organ secreting thought; Maudsley has defined the mind scientifically as an exalted natural force developed from the other chemical forces of the body; and Huschke has likened the relation between thought and the molecular movements of the brain to that between color and the vibrations of ether. All these questions have at length been brought together under the modern hypothesis of evolution. Büchner has revived the doctrines of Democritus and D'Holbach, maintaining the absolute eternity, infinity, and indestructibility of matter as the only real existence. Herbert Spencer, after representing a Creator as utterly inconceivable, has proceeded to unfold the whole knowable universe out of persistent force acting under laws from the primitive nebula up to the highest forms of human society. Prof. Huxley suggests that the existing world once lay potentially in the cosmic vapor, so that the present state of the fauna of G. Brit. might have been predicted from a knowledge of the primitive forces and molecules. And Dr. Tyndall discovers in the original matter of the world the promise and potency of every quality of life. (See *LANGE, Hist. of Materialism*. [From orig. art. in *J. d'Univ. Cyc.* by PROF. C. W. SHIELDS, D. D.]

**Mathematics** [*Gr. μαθηματικά*], the science that treats of the properties and relations of quantities. It is based on a few simple and universally admitted propositions, from which, as premises, the whole system is built up by a chain of rigid logical arguments. The science of M. is naturally divided into 3 branches: I. arithmetic; II. geometry; and III. analysis.

I. *Arithmetic* is that branch which treats of the relation of numbers expressed by the aid of figures and combinations of figures.

II. *Geometry* is that branch which treats of the properties and relations of geometrical magnitudes—that is, of lines, surfaces, and volumes—to which may be added angles.

III. *Analysis* is that part of M. in which the quantities considered are represented by letters and other symbols, and in which the operations to be performed are indicated by conventional signs. Analysis is usually divided into algebra, analytical geometry, and calculus.

Each of these branches is divided into 2 parts. The first part of each branch has for its object to investigate the principles peculiar to that branch, and the second part shows how to apply these principles to science and the arts. The first part of each branch, as thus pointed out, belongs to the field of pure M., and the second part may be termed applied or mixed M. The former parts make up the *science* of M.; the latter may be considered as forming the *art* of M. The *science* of M. forms an important element of a liberal education. It impresses the mind with clear ideas; it cultivates habits of close discrimination; it develops the powers of abstraction and generalization; it cultivates and expands the reasoning powers. The applications of M. aid in the discovery of new truths in science, and contribute vastly to the progress of every branch of art and manufacture. The mason computes the quantity of his material by the principles of geometry and the rules of arithmetic; the carpenter frames his building and adjusts its parts by the rules of practical geometry; the millwright computes the pressure of the water and steam, and adjusts all the parts of his machinery by rules evolved from analytical formulas; in fine, every workshop and manufactory is an embodiment by intelligent labor of some of the more difficult investigations of mathematical science. W. G. PECK.

**Math'er** (COTTON), D. D., F. R. S., son of succeeding, b. at Boston, Mass., Feb. 12, 1663, grad. at Harvard in 1678; became a teacher, and in 1684 was ordained his father's colleague over the North ch., Boston; labored with great zeal as a pastor, endeavoring also to establish the ascendancy of the chs. and ministry in civil affairs, and in the putting down of witchcraft by legal sentences. Author of *Memorable Providences relating to Witchcraft, Wonders of the Invisible World, Essays to do Good, Magnalia Christi Americana*, and other works, large and small. Was made D. D. in 1710 by the Univ. of Glasgow, and F. R. S. in 1713. He labored zealously for the benefit of the poor, for mariners, slaves, criminals, and Indians. His cruelty and credulity were the faults of his age. D. Feb. 13, 1728.

**Math'er** (INCREASE), D. D., b. at Dorchester, Mass., June 21, 1689, son of the succeeding, grad. at Harvard 1696 and at Trinity Coll., Dublin, 1698; preached in Eng. and Amer.; was ordained over the North ch., Boston, in 1664; was pres. of Harvard Coll. 1665-1701; received (1692) the first doctorate in divinity conferred in Eng.-speaking Amer.; procured in Eng. (1692) a new charter for Mass., which conferred upon himself the power of naming the gov., lieutenant, and council; opposed the severe punishment of witches; author of 92 publications, among which is *An Essay for the Recording of Illustrious Providences*. D. Aug. 23, 1723.

**Mather** (RICHARD), b. at Lowton, Eng., in 1596, studied at Ox.; became parish minister of Toxteth; was silenced in 1634 for nonconformity; went to N. Eng. in 1635; was minister of Dorchester, Mass., 1636-69; did much to settle ch. discipline, and was an able writer. D. Apr. 22, 1669.—Three of his sons, SAMUEL, INCREASE, and NATHANIEL, became noted divines.

**Mather** (WILLIAM WILLIAMS), LL.D., b. at Brooklyn, Conn., May 24, 1804, grad. at W. Pt. 1828; assistant prof. of chem. there 1829-35; first lieutenant in U. S. A. 1834-36; prof. of chem. Univ. of La. 1836; engaged in the N. Y. geological survey 1836-44; Ohio State geologist 1837-40, State geologist of Ky. 1839-53; prof. of natural science in the Univ. of O. 1842-45; its v.-p. and acting pres. 1847-50; ed. of *Western Agriculturalist* 1851-52; author of numerous geological reports and scientific papers. D. Feb. 27, 1859.

**Mathew** (THEOBALD), D. D., known as "Father Mathew," b. at Thomastown, Tipperary, Ire., Oct. 10, 1790; studied for a time at Maynooth Coll.; joined the Capuchins at Kilkenny, and was ordained a R. Cath. priest in 1814. He was distinguished for his laborious charities at Cork, especially in the cholera season of 1832. In 1838 he organized the first total abstinence society in Cork. He afterward travelled over G. Brit. and Ire., and induced hundreds of thousands to sign the temperance pledge. He labored 1849-51 in the U. S. D. at Cork Dec. 1, 1856.

**Mathews** (GEORGE), b. near Staunton, Va., Sept. 21, 1774, was admitted to the Ga. bar 1799; was appointed judge of the superior court of Miss. Terr. 1805, and transferred in the same capacity to New Orleans 1806, and on the organization of the State judiciary became presiding justice of the supreme court of La., which post he filled until his death. His decisions form an important portion of the jurisprudence of La. D. Nov. 14, 1836.

**Mathews** (WILLIAM), LL.D., b. at Waterville, Me., July 28, 1818, grad. in 1835 at Waterville Coll. (now Colby Univ.) and at Lane Law School, Cambridge. From 1841 to 1855 he was ed. of the *Yankee Blade*. Since 1861 prof. of rhetoric and Eng. lit. in Univ. of Chicago, Ill. Wrote *Getting on in the World, or Hints on Success in Life*.

**Mathura**, or **Muttra**, town of Brit. India, in the N. W. Provs., on the Jumna, is a decaying place, but as the birthplace of Krishna it is highly venerated by the Brahmans and visited by many pilgrims. Pop. 51,987.

**Matile** (GEORGE AUGUSTE), b. at La Chaux-de-Fonds, canton of Neuchâtel, Switz., May 30, 1807; studied law in Berlin, Heidelberg, and Paris, and was admitted to the bar in Neuchâtel in 1830. He served several terms in the legislature of his canton, and was appointed prof. of law at the Univ. of Neuchâtel in 1838, and one of the judges of the supreme court; emigrated in 1849 to the U. S.; was naturalized as an Amer. citizen in 1856, and appointed prof. of hist. at Princeton, N. J., in the same yr., and prof. of Fr. literature at the Univ. of Pa. in 1858. From 1863 he held various positions in the state dept. in Wash. Wrote *Autorité du Droit romain de la Coutume de Bourgogne et de la Caroline dans la Principauté de Neuchâtel, Histoire de la seigneurie de Valangin, La Loi Gombette*, etc. D. Feb. 6, 1881.

**Matsumai**, town of Japan, on the S. coast of the island of Jesso, in lat. 41° 32' N., lon. 140° E., at the head of a large bay which forms an excellent harbor. Has never been visited by a foreigner.

**Mat'tacks** (JOHN), b. at Hartford, Conn., Mar. 4, 1777; became a lawyer of Danville, Vt., 1797; removed in 1798 to Peacham; was much in public life; was a militia brig.-gen. during the war of 1812-15, M. C. 1821-25 and 1841-43, a judge in the State courts 1838-34, a member of the constitutional convention 1835, gov. of Vt. 1843-44. D. Aug. 14, 1847.

**Matteawan**, on R. R. Dutchess co., N. Y., on Fishkill Creek, 1½ m. above Fishkill Landing, has good water-power and important manufactures. Pop. 1880, 4411.

**Mattucel**, mat-too'-chee (CARLO), b. at Forlì, It., June 21, 1811, grad. at the Univ. of Bologna in 1828; began his scientific experiments at Forlì, but soon after went to Paris to prosecute them; appointed to the chair of physics in the Univ. of Pisa; in 1848 sent by the Tuscan gov. as civil com. into Lombardy with the Tuscan troops; later, on a diplomatic mission to the diet of Frankfurt. After 1849 he resumed his professorship at Pisa, and in 1859 the Tuscan gov. gave him a mission to the court of Berlin, afterward to the gov. of Turin; he took an active part in the moderate constitutional politics of It. In 1862 he became minister of public instruction for It. On the transfer of the cap. to Florence he was made director of the Museo di Fisica Fiorentina. D. at Leghorn 1868. Wrote *Cenni sull' Influenza dell' Elettività nella Formazione delle Principali Meteore Acquee, Sull' Influenza del Calore sul Magnetismo*, etc.

**Mat'thew** (SAINT). I. *Character*.—Among the 12 apostles there was only one whose previous occupation had made him familiar with the use of the pen; and this one, St. Matthew, seems also to have been the first among them to prepare an evangelical record. He was sitting at the receipt of customs on the border of the sea near Capernaum, filling the office of a publican. Jesus passing by, followed by a great multitude, noticed him, and discovered at first glance that there was in him a future apostle of the new faith. The publican obeyed without hesitation the call of the Lord, and in order to celebrate the career which opened before him he invited all his former colleagues to a feast in his house, together with Jesus and his disciples, desirous that they too should partake in some manner in the grace which had been conferred on him. Matthew means "a gift from God." The father of M. is called Alphaeus, but must not be confounded with Alphaeus called Clopas, who was the brother of Joseph and the uncle of Jesus. M. remained in Jerusalem, together with the 12, up to the yr. 60. Clement of Alexandria tells us of M. that he ate no meat, but only vegetables and fish. Various later traditions, originating between the 4th and 6th centuries, tell us that M. suffered martyrdom in Ar. or Per.



**II. The Gospel.**—All the Fathers agree that the apostle M. wrote a Gospel, but in the Heb. lang., and not in the Gr., in which is written the book contained in the canon under the name of Matthew. Nevertheless our Gr. Matthew does not make the impression of being a translation, at least not in the narrative parts. The lang. is vigorous, fresh, pure, like that of an original writing. Thence it has been inferred that the Gospel contained only the speeches of Jesus, and that the narrative part was added later as a historical framework, in which the primitive work of M. was inserted, translated into Gr. Accordingly, we must suppose that M. composed an Aramæan work which comprised only the teachings of the Saviour, arranged according to some leading principles. Thus, (1) the justice of the kingdom of heaven (v.-vii.); (2) the apostolate (x.); (3) the picture of the kingdom of heaven (xlii.); (4) the discipline of the Ch.; and, lastly (5) the consummation of the present era. Christ thus appeared as the divine legislator, king, and judge. This original work by M., in Aramæan, was the foundation of that *Gospel of the Hebrews* which was adopted by the Jewish Chr. communities of the first centuries. This Gospel needed a complement, and this need was supplied by the narrative part of our first Gr. Gospel, translated into Aramæan, and adorned with many legendary additions borrowed from an already falsified tradition. In the arrangement of the historical matter the same method of systematical grouping may be observed here as in the composition of the speeches. The work of M. bears, so to speak, its date marked on its face. This Gospel is a divine act, an official proclamation issued by the govt. of God. It is God himself who summons his people by a solemn ultimatum to recognize Jesus as Messiah, and threatens them with destruction if they will not obey. This is the reason why the Gospel opens with the genealogy of Jesus; the reason why the whole Gospel is a demonstration of the Messianic dignity of Jesus; why the 5 traits of the hist. of his infancy are accompanied each by a prophecy; why his residence in Galilee at the beginning of his ministration is justified by a prophecy of Isaiah; why the collection of the acts of power is grouped around a prophecy by Isaiah; why the collection of the words of wisdom centre in a prophecy by Isaiah. Moreover, there is no trait in the hist. of the Passion which is not accompanied by a prophecy, and the last words, "Go ye, therefore, and teach all nations, baptizing them," etc., give the programme of the work of the Messiah. By such a book God said to his people, "The forty years of repentance which were accorded to thee (Matt. xxiv. 34) will soon expire; acknowledge Jesus as thy Messiah or thou shalt perish," and its date is thus about 64, or 5 to 6 yrs. before the destruction of Jerusalem. M. forms evidently the transition from the O. to the N. T. His Gospel is the O. T. reflected in the N. Hence, it was always placed at the head of the evangelical collection and of the whole N. T. It is the *Genesis* of the N. T. [From orig. art. in *J's Unit. Cyc.*, by PROF. FRÉDÉRIC GODET, D. D.]

**Matthews** (GEORGE), b. in Augusta co., Va., 1739; served in the Indian and Revolutionary wars; prisoner at Germantown, Pa.; removed in 1785 to Oglethorpe co., Ga.; was gov. of Ga. 1789 and 1793-96, M. C. 1789-91, and engaged in Fla. in 1811 as brig-gen. of militia. D. Aug. 30, 1812. (See MATTHEWS, GEORGE.)

**Matthews** (JOHN), b. in S. C. about 1744; was an active patriot during the Revolution, speaker of the S. C. house of representatives, associate justice of the supreme court 1776, M. C. 1778-82, gov. of S. C. 1782-83, and in 1784 a judge of the court of equity. D. Nov. 1802.

**Matthews** (STANLEY). See APPENDIX.

**Matthias**, SAINT, the twelfth apostle in place of Judas Iscariot, chosen between Ascension and Pentecost.

**Matthias**, the assumed name of ROBERT MATTHEWS, a religious impostor, b. in Washington co., N. Y., about 1790; resided in Albany, when about 1830 he determined to become a religious leader. He claimed to have received a revelation, and undertook to convert the city of Albany, but his absurd pretensions were promptly refuted. Enraged at the failure of his projects, he prophesied the destruction of Albany, and proceeded to New York, where he created a great popular sensation. Having been accused of poisoning one of his wealthy disciples, he was tried and acquitted, but lost all influence, and d. some yrs. later in Ark.

**Matthias**, Ger. emp. from 1612 to 1619, b. Feb. 24, 1557, a son of Maximilian II., and ed. in Sp. at the court of Philip II. In 1577 he repaired secretly to the Netherlands, and made an attempt at managing affairs there, but failed, and withdrew in 1580. On June 14, 1612, he succeeded his brother, Rudolph II., as emp. of Ger. The differences between the Prot. Union, formed in 1608, and the Catholic League, formed in 1609, grew now into open controversies. In 1617 the bigoted archduke Ferdinand was appointed king of Bohemia, and on May 23, 1618, the Prot. inhabs. of Prague broke out in rebellion. Thus began the Thirty Years' war. D. Mar. 20, 1619.

**Matthias I., Corvinus**, king of Hungary from 1459 to 1490, b. in 1443, a son of John Hunyady, and ed. in Bohemia, where for a long time he was detained a prisoner; afterward he married the daughter of the Bohemian king, George Podiebrad. In Hungary a large party among the nobility was opposed to the election of M., and invited the Ger. emp., Frederick III., to the throne, while at the same time the Turks invaded the country. M. fought with great success against both his enemies. The Turks he drove out with heavy losses, and in a later war of 1485 he compelled Frederick III. to cede to him large parts of Aus., including Vienna. George Podiebrad having been excommunicated in 1469 as a Hussite, and a crusade being preached against him by Pope Paul II., M. invaded Bohemia in 1469, and by the final peace in 1470 received Moravia, Silesia, and Lusatia; he also gained some advantages over the Poles. M. possessed a fine taste for learning and art, and he was much beloved by his subjects. D. Apr. 7, 1490.

**Mat'tison** (HIRAM), D. D., b. at Norway, N. Y., Feb. 8, 1811; was a teacher for some years; joined the Black River (N. Y.) conference as a preacher 1836; removed to New York in 1852, and filled important pulpits until 1861, when he withdrew from the M. E. Ch. on account of slavery, but returned to it in 1868, and became sec. of the Amer. and Foreign Chr. Union. Wrote *The Doctrine of the Trinity, Astronomy, Spirit-Rappings, Resurrection of the Body*, and edited Burritt's *Geog. of the Heavens*. D. Nov. 24, 1868.

**Mattoon**, city and R. R. junc., Coles co., Ill., has mills, R. R. repair and car shops. Pop. 1880, 5737.

**Mattoon** (EBENEZER), b. at Amherst, Mass., Aug. 19, 1755, grad. at Dartmouth Coll. 1776; joined the Revolutionary army in Canada; served as lieut. of artil. at the battle of Bemis Heights 1777, and rose to the rank of major; settled in his native town as a scientific farmer; served often in the legislature; was for 20 yrs. sheriff of Hampshire co.; M. C. 1801-08, maj.-gen. of State militia 1797-1816, adjutant-gen. 1816, col. Anc. and Honorable Artil. Co. of Boston 1817, and member of State constitutional convention 1820. D. Sept. 11, 1843, having been blind nearly 25 yrs.

**Mauch** (mawk) **Chunck**, R. R. junc., cap. of Carbon co., Pa., 120 m. N. W. of New York, in the centre of the Lehigh anthracite coal-region. The first iron smelted by anthracite coal was made here. Pop. 1870, 3841; 1880, 3732.

**Maulmain**, or **Moulmein**, city of Brit. Burmah, Farther India, at the mouth of the Salween, in the Bay of Bengal, in lat. 16° 30' N. It is a flourishing place, important for its exports of teak. Beside teak, ivory, grain, wax, and gum are exported, and silks and cottons, wine and beer, tobacco, arms, and sugar are imported. The climate is hot and moist. Pop. 53,060.

**Maumee River** is formed by the union of St. Mary's and St. Joseph's rivers at Fort Wayne, Ind. It flows into Maumee Bay, the W. part of Lake Erie. It is navigable 8 m. to Maumee City, and in high water to Defiance, 50 m.

**Mau'na Ke'a** ("great mountain"), a volcano of the S. I. is nearly in the centre of the Island of Hawaii, and rises 13,600 ft. above the sea. The eruption of 1880-81 poured forth for 9 months a river of lava which ran 50 m., varying from a few hundred yards to 3 m. in width.

**Mau'ndy Thursday**, so called from *mandatum novum*, the "new commandment," given by Christ to his disciples to "love one another." On this day, in R. Cath. countries, the feet of pilgrims are washed in the ch., while the *Mandatum novum* is sung, and doles are given to the poor. M. T. is the same as the Holy Thursday in Passion Week.

**Maurice**, maw-riss', count of Nassau, prince of Orange, b. Nov. 14, 1567, at Dillenburg in Nassau, a son of William the Silent of Orange; studied at Leyden, and was proclaimed stadtholder of Hol. Zealand, and Utrecht after the assassination of his father in 1584, and appointed commander-in-chief by all the provs. after the recall of Leicester by Queen Elizabeth in 1587. He took Zutphen, Deventer, and Nymwegen in 1591, Geertruidenberg in 1593, Groningen in 1594. In 1597 he defeated the Spaniards at Turnhout in Brabant, and in 1600 at Nieuwport, near Ostende. But he opposed the armistice of 12 yrs. which Barneveldt succeeded in concluding with Sp. in 1609, and by which the United Provs. were acknowledged as an independent republic. After the execution of Barneveldt (in 1619) the popularity of M. was lost. D. at the Hague Apr. 23, 1625.

**Maurice**, duke of Sax., of the Albertine line, b. Mar. 21, 1521, at Freiberg, a son of Henry the Pious, joined the Prot. Ch. in 1539; married in 1541 a daughter of the landgrave Philip of Hesse, and succeeded his father on the ducal throne in the same yr. His relations with the emp. Charles V. were most amicable at this time, and he helped the emp. to crush the Schmalcald League at Muhlberg, Apr. 24, 1546. As a reward he received the possessions of the other line of the house of Sax., the Ernestine, and with the possessions followed the rank of elector. As soon as M. had reached his aim, the good relations with the emp. ceased. At last, having made a secret alliance with Henry II. of Fr. in Oct. 1551, he marched, in May 1552, on Innsbruck. By a hasty flight the emp. saved himself from being captured by M., but by the Peace of Passau (Aug. 2, 1552) he was compelled to consent to all his demands, the first of which was full religious liberty for the Prots. On July 9, 1553, M. was mortally wounded at Sievershausen, fighting against the margrave of Brandenburg, and d. 2 days afterward.

**Maurice**, count of Sax., known as MARSHAL SAXE, b. at Goslar Oct. 28, 1696, a son of Augustus II. the Strong, elector of Sax. and king of Poland, and Aurora von Königsmark. In 1720 he went to Fr., bought a regiment, was appointed maréchal de camp, and studied math., mechs., and fortification. In 1726 the estates of Courland elected him duke, but the project failed on account of Mentchikof's intrigues; taken up once more in 1728 by the dowager duchess, Anna Ivanovna, who wished to marry him, it was foiled by his dissipation. At the outbreak of the Aus. War of Succession he offered his services to his native country, but by the fault of Count Brühl they were not accepted, and he received a Fr. command. He took Prague by storm in 1741, and fought in Bohemia, Bavaria, and on the Rhine. But his fame he gained chiefly by his campaigns in Flanders from 1744 to 1748. He won a victory at Fontenay May 11, 1745, and at Roucoux Oct. 11, 1746. He took Brussels, Bergen-op-Zoom, Maestricht, and conquered the whole of Belg. He was made marshal-gen. of all Fr. camps and armies, and presented with the palace and estates of Chambord, where he led a princely life, and d. Nov. 30, 1750. Wrote *Réveries Militaires* and *Lettres de Mémoires*.

**Maurice** (JOHN FREDERICK DENISON), b. Aug. 29, 1806, in Normanton, Suffolk, Eng.; d. in Cambridge Apr. 1873; was the son of a Unit. clergyman; was ed. at Cambridge, and took a degree in law, his birth in a nonconformist sect obliging him to forego honors and degrees in other schools. He early took an interest in all questions that agitated thoughtful men in Eng., writing in the *Athenæum* and other



periodicals. In 1830 he joined the Established Ch., although holding the Church responsible for the degradation of the working-classes, and for the dissent that should have found room for expression within the Establishment. By his work, *The Kingdom of Christ, his Lectures on Education, his Thoughts on Conscientious Subscription, and Reasons for not Joining a Party in the Ch.*, he laid the foundation of the Broad Ch. M. was a preacher from the time of his ordination in 1831; from 1846-59 he was chaplain at Lincoln's Inn, and for the next 7 yrs. addressed intellectual audiences in De Vere st. His Warburtonian lectures on *The Epistle to the Hebs.*, his Boyle lectures on *The Religions of the World*, the lectures on *The Religion of Republican Rome, The Patriarchs and Lawgivers of the O. T., The Ten Commandments, etc.*, illustrate the vitality of his labors. His last works were on *Conscience and Social Morality*. Death surprised him in the fulness of his powers, while he was preparing lectures on *The Ethical Systems of Plato and Aristotle*. [From orig. art. in *J's Univ. Cyc.*, by ELIZABETH P. PEABODY.]

**Mauricius**, maw-rish'e-us (FLAVIUS TIBERIUS), emp. of Constantinople from 528 to 602 A. D., b. at Arabissus, Cappadocia, about 539, descended from a noble Rom. family. His reign is distinguished only by a series of wars with Persians and the Avars, in which the most prominent features were perpetual mutinies. One of these, under the leadership of Phocas, succeeded in overthrowing the emp. M. fled with his family from Constantinople, and sought refuge in the ch. of St. Autonomus, near Chalcedon, from which he was dragged and beheaded, Nov. 27, 602.

**Mauritania**, the anc. name of N. W. Afr., corresponding to the present Morocco and part of Algeria, and inhabited by the Mauri (Moors).

**Mauritius**, maw-rish'e-us, one of the Mascarene Isles in the Indian Ocean, situated 400 m. E. of Madagascar, in lat. 20° 32' S. and lon. 57° 46' E., and belonging to G. Brit. Area, 713 sq. m. Pop. 357,339. It is of volcanic origin, surrounded with coral reefs, and covered with mts. which present the most extraordinary outlines. The valleys contain a very rich soil. It was discovered in 1505 by the Port. As a Brit. possession it is very flourishing; sugar, coffee, and rice are extensively cultivated. Prin. town, Pt. Louis.

**Mauzy** (DABNEY H.), b. in Va. about 1824, grad. at W. Pt. 1846; entered the mounted rifles and served in the Mex. war; was prof. at W. Pt. 1847-59; wrote *Skirmish Drill for Mounted Troops*; entered the service of the Confed. States 1861; attained the rank of maj.-gen., and was in command of the defences of Mobile, Ala., when that place was captured, Apr. 10, 1865.

**Mauzy** (JEAN SEFFREIN), b. at Valréas, Venaissin, Fr., June 28, 1746, the son of a shoemaker, prepared himself for the Ch. at Avignon; came in 1766 to Paris, and attracted attention by his *loges*. In 1785 he was chosen a member of the Acad., and in 1789 he took his seat in the National Assembly as member for Peron. He was one of the most influential opponents of the revolutionary theories, but in 1791 he left Fr., went to Rome, and was made bp. of Nicæa *in partibus* in 1794, and cardinal in 1798. In 1806 he became reconciled to Nap. and returned to Fr., and in 1810 the emp. made him abb. of Paris, which position he lost on the restoration of the Bourbons. D. at Rome May 11, 1817. Wrote *Essai sur l'Eloquence de la Chaire*.

**Mauzy** (MATTHEW FONTAINE), LL.D., b. in Spotsylvania co., Va., Jan. 14, 1806; spent his childhood in Tenn.; entered the U. S. N. as midpn. 1825, serving on board the Brandywine during a voyage to Fr., and afterward on the Pacific coast; made a voyage around the world in the Vincennes, during which he began his *Treatise on Navigation*. He became lieut. 1836, and was appointed astron. to the Wilkes exploring expedition in the same yr., but resigned before sailing. In 1839 he met with an accident which resulted in lameness and a consequent permanent disability for active naval service. While confined from this cause he wrote a series of articles entitled *Scraps from the Lucky Bag*, chiefly devoted to the exposure of abuses in the navy. He had previously commenced an accumulation of hydrographical observations, and on being appointed keeper of charts and instruments at Wash. was enabled to enlarge the scope of his researches. In 1844 this bureau was united with the National Observatory, of which M. was made supt. In that yr. he communicated to the National Inst. a paper upon the Gulf Stream and other oceanic currents, in connection with great-circle sailing. The results of these researches were also embodied in the *Wind and Current Charts and Sailing Directions* issued by the observatory. In 1855 his great work, *The Phys. Geog. of the Sea*, was issued. In 1855 he was made a commander, but resigned in 1861 to enter the Confed. service, in which he obtained the rank of commodore; spent a yr. or two in Europe during the war, at the close of which he took service under the archduke Maximilian in Mex. as com. of emigration; again went to Europe, where he resided until 1868, in Rus. and in Eng., engaged in the preparation of a series of text-books. In 1868 he became prof. of physics in the Va. Military Inst.; declined in 1871 the presidency of the Univ. of Ala. D. Feb. 1, 1873.

**Mau'ser Gun**, *The*, the common name for the rifle used by the Prus. Inf., and invented in 1871. It combines the advantages of the Bavarian Werder gun with some new improvements introduced by Mau'ser, a gunsmith in Kammstadt, Württemberg.

**Mausoleum** [Gr. *Μαυσωλείον*], the tomb of Mausolus, king of Caria, erected at Halicarnassus by Artemisia, his widow, in 353 B. C. It surpassed all other structures of the kind so much by its magnificence that the name of Mausoleum came to be the generic term for a costly tomb.

**Mau'son**, on R. R., cap. of Juneau co., Wis., 124 m. W. of Milwaukee; has abundant water-power. Pop. 1870, 952; 1880, 1013.

**Mauvaises Terres** [Fr.], or **Bad Lands**, a name given to various desolate tracts in Dak., Neb., Col., and other portions of the U. S., but especially to a tract along

the White River, an affluent of the Mo. They are usually treeless, broken, and utterly waste regions of Tertiary formation, abounding in relics of extinct species of rhinoceros, hyæna, and other mammals. Some parts afford a scanty pasturage in the rainy season, but for the most part they are not known to have any valuable animal, vegetable, or mineral products.

**Mavors**. See *MARS*.

**Max'cy** (JONATHAN), D. D., b. at Attleborough, Mass., Sept. 2, 1768, grad. at R. I. Coll. (now Brown Univ.) 1787; was tutor there 1787-91; became pastor of the First Bap. ch., Providence, R. I., prof. of divinity in Brown Univ., and its pres. 1792-1802; pres. of Union Coll., Schenectady, N. Y., 1802-04, of the coll. at Columbia, S. C., 1804-30. He wrote, among other works, a course of sermons on the existence of God. D. June 4, 1830.

**Maxcy** (VIRGIL), brother of the preceding, b. at Attleborough, Mass., about 1785; studied law at Baltimore, Md.; settled in Md. and became a prominent advocate; prepared *A Compilation of the Laws of Md. from 1692 to 1800*; was a member of both houses of the legislature; solicitor of the U. S. treas., and appointed *chargé d'affaires* to Belg. 1837. Was killed in the explosion on board the U. S. steamer Princeton in the Potomac, Feb. 28, 1844.

**Maxey** (SAMUEL BELL), b. in Ky. about 1825, grad. at W. Pt. 1846; served as lieut. in the Mex. war, after which he resigned from the army, studied law, and settled at Paris, Tex. He entered the service of the Confed. States as a col. in 1861; rose to the rank of gen., resumed the practice of law after the close of the war, and was elected U. S. Senator for the term commencing Mar. 4, 1875, and re-elected for the ensuing term, 1881-87.

**Max'field** (THOMAS), b. in Eng. about 1730; was one of Wesley's converts at Bristol. He became the first Meth. itinerant lay-preacher. He was ordained by the bp. of London, made an advantageous marriage, attended the first Meth. conference at the Foundry June 25, 1744, and the third conference at Bristol 1746; suffered imprisonment and persecution; became separated from Wesley about 1764, in consequence of a doctrinal schism, and in company with Bell set up a congregation with 170 members, who seceded from the Foundry ch. He preached for 30 yrs. longer, was visited and comforted by Wesley many yrs. later when sinking under paralysis, and d. at Lond. about 1785.

**Maximilian I.**, b. at Neustadt, near Vienna, Mar. 22, 1459, succeeded his father, Frederick III., as emp. of Ger. in 1493, and d. at Wels, in Upper Aus., Jan. 12, 1519. After the death of Charles the Bold in 1477, he married his daughter and sole heiress, Mary, but Louis XI. of Fr. laid claims to several of the possessions. An agreement was made, according to which his daughter Margaret should marry the dauphin Charles, and receive Artois, Flanders, and the duchy of Burgundy as her dowry; but the Fr. govt. continued to stir up dissensions in the provs. of the Netherlands against the house of Aus. After the death of Mary of Burgundy in 1482, M. married by proxy Anne of Brittany, but this engagement was suddenly broken off; Anne married Charles VIII. of Fr., and he sent M.'s daughter Margaret back to Vienna. After his accession to the imperial throne M. married Bianca Sforza, a daughter of Galeazzo Maria, duke of Milan, and this marriage involved him in wars with Venice, Milan, the pope, Naples, Fr., and Sp. He was more successful in marrying his children, Philip and Margaret, to a Sp. prince and princess, thereby uniting Sp. to the possessions of the house of Hapsburg. He also laid the foundation for the annexation of Hungary to the Aus. crown by marrying his grandchildren into the royal family of that country. His govt. of Ger. was not without fruits, but Switz. became lost to Ger. during his reign.

**Maximilian II.**, b. at Vienna Aug. 1, 1527; succeeded his father, Ferdinand I., as emp. of Ger. in 1564, and d. Oct. 12, 1576. He was favorable to the Ref., and it was even hoped that he might join the Prot. Ch. This he did not do, but he showed himself very tolerant.

**Maximilian** (FERDINAND MAXIMILIAN JOSEPH), archduke of Aus. and titular emp. of Mex., b. at the palace of Schönbrunn, Vienna, July 6, 1832, was the second son of the archduke Franz Karl and of the archduchess Sophia Dorothea, and brother of the present emp. of Aus., Franz Joseph; was carefully ed., and trained in the naval service, which he entered in 1846; made several extended cruises; rose through the subordinate grades to the posts of rear-admiral (1854) and commander-in-chief of the Aus. navy; visited Gr., Syria, and Egypt in 1855; was viceroy of the Lombardo-Venetian kingdom 1857-59; married the princess Charlotte, daughter of Leopold I., king of the Belgians, July 27, 1857, and acquired great popularity at Milan; retired to Venice in 1859 on the outbreak of the It. war; visited Madeira with his wife; made a scientific tour in Brazil; visited Eng., and took up his residence at Miramar near Trieste. In 1861 Nap. III., when organizing the conquest of Mex., conceived the idea of investing M. with the future vassal crown of Mex. The varying fortunes of the Mex. campaign delayed the formal offer of the throne until the summer of 1863. As the result of a manipulation of the sentiments of the Mex. "Church party," an "Assembly of Notables" met in Paris July 10, 1863, and declared the will of the Mex. people to be the establishment of an empire in the person of the archduke Maximilian of Aus. The crown was formally tendered to M. by a Mex. deputation at Miramar Oct. 3, 1863. On Apr. 10, 1864, he signified his acceptance, and at once began to distribute offices, honors, and decorations. He landed at Vera Cruz May 28, 1864; was received with civic festivities at the cities of Córdoba, Orizaba, and Puebla; entered Mex. amid similar demonstrations of apparent popular enthusiasm June 12. A few days sufficed to prove the illusory character of the hopes that had been entertained by his Mex. partisans. Instead of frankly accepting the Ch. party as the only possible basis of his administration, M. quickly displayed a contempt for the wishes



and advice of his officious partisans, and addressed himself to well-known republicans for the organization of his cabinet. But M. soon found himself without the active support of any party. It was no longer doubtful that the existence of the "empire" depended upon the bayonets of his Fr., Aus., and Belg. legions. During the first yr. of M.'s "reign" the arms of Fr. were tolerably successful. But in 1806 the imperial cause rapidly declined through the vigor of the Juarist leaders in the N. and W., and the withdrawal of the Fr. auxiliary forces proved the signal for the advance of the republican govt. into Central Mex. Yielding to the suggestions of Nap., M. determined to abdicate, and in Oct. 1806 proceeded to Orizaba on his way to Europe. Unfortunately, the influence of the Ch. party was brought to bear upon the doomed prince, and he was induced to return to Mex. and throw himself upon the support of the "conservatives." A Mex. army was recruited in place of the Fr. auxiliaries, and the 2 military leaders of that party, Miramon and Marquez, were advanced to high command. The effort was hopeless, and culminated a few months later in the capture of M. and his prin. gens. After a trial by a military council M. was condemned to death along with his gens. Miramon and Tomas Mejia, and shot at Cerro de las Campanas, near Querétaro, June 19, 1867. His remains were removed to Vienna Jan. 1868.

**Maximianus** (CAIUS JULIUS VERUS), Rom. emp. from 235 to 238, b. in the latter part of the 2d century, of barbarian parentage; was proclaimed emp. on the assassination of Alexander Severus. His campaigns against the Gers. were successful, but his suspicion, rapacity, and cruelty knew no bounds. An insurrection in Afr. and the sympathy it found in It. threw him into a fit of frenzy. He hastened across the Julian Alps with his army, was stopped at Aquileia, killed by his own soldiers and his head sent to Rome.

**Maximus Tyrius**, a Gr. rhetorician and Platonic philos., flourished in the latter part of the 2d century A. D. We have 41 of his dissertations on philosophical subjects.

**Maxwell** (HUGH), b. in Scot. in 1787, was brought to the U. S. in childhood; grad. at Columbia Coll. 1801; became a prominent lawyer of New York and a leading Whig; was assistant judge-advocate-gen. U. S. A. 1814; dist. atty. for New York co. 1819, and again 1822-29; was collector of the port of New York 1849-53, and soon afterward retired from active business. D. Mar. 31, 1873.

**Maxwell** (SIR MURRAY), C. B., F. R. S., b. in Lancashire, Eng., in 1766, entered the naval service in childhood; became lieut. 1796 and capt. 1803; distinguished himself in the W. I. in the capture of the Fr. and Dut. colonies of St. Lucie, Tobago, and Guiana; accompanied the Jamaica squadron to the Mediterranean 1805; captured 7 Sp. vessels from under the batteries of Cadiz, and took many Fr. prizes on the coast of It.; was shipwrecked on the coast of Ceylon 1813; was made commander, and conveyed Lord Amherst's embassy to Ch. 1816; surveyed for the first time the Gulf of Pecheli, the coasts of Corea, and explored the Loo Choo group of islands; forced a passage to Canton after a sharp engagement with the Ch. forts; shipwrecked in the Philippine archipelago Feb. 18, 1817; knighted and pensioned by the E. I. Co.; commanded a squadron in Amer. waters; appointed gov. of Prince Edward Island May 1831, but before proceeding to his post d. at Lond. June 26, 1831.

**Maxwell** (ROBERT), LORD, b. in Scot. about 1480; was steward of Annandale 1514, warden of the W. Marches 1517, provost of Edinburgh 1524; made extraordinary lord of session 1533, lord of regency 1536; negotiated the marriage of James V. to Mary of Lorraine 1537; escorted James to Caerlaverock Castle 1542; had a share in the mutiny at Solway Moss Nov. 25, 1542; embraced the principles of the Ref., and caused the passage of an act, in Mar. 1543, authorizing the reading of the Scripts, in the vulgar tongue. D. July 9, 1546.

**Maxwell** (WILLIAM), b. probably in Ire. about 1735; entered the army in Amer. in 1758, during the Fr. war; remained in constant military service until and during the Revolution; was col. of a N. J. battalion in the Canadian campaign of 1776; appointed by Cong. brig.-gen. Oct. 23, 1776; commanded the N. J. brigade at Brandywine and Germantown; pursued Clinton in N. J.; took a leading part in the battle of Monmouth; was engaged in Sullivan's expedition against the N. Y. Indians 1779, and in the battle of Springfield, June 23, 1780, soon after which he resigned. D. Nov. 12, 1798.

**Maxwell** (WILLIAM), LL.D., b. at Norfolk, Va., Feb. 27, 1784, grad. at Yale 1802; studied law, and practised at Norfolk; was long sec. of the Va. Historical Society; became in 1827 literary ed. of the New York *Journal of Commerce*; was a member of the Va. house of delegates 1830, and of the State senate 1831-37; was pres. of Hampden-Sidney Coll. 1838-44. Wrote a *Memoir* of Rev. John H. Rice, D. D., and edited the *Va. Historical Register* 1848-53. D. Jan. 9, 1857.

**May** [Lat. *Maivus*], the 5th month of the yr. in the Gregorian calendar, consisting of 31 days, was by the anc. Saxons called *three-moete*, "three-milk month," because in this season cows were milked 3 times a day. During the Middle Ages the month of May was generally ushered in by some popular merriment. In Eng. the going out a-Maying was a very common custom in former days. On May 1, before sunrise, all the young folks repaired to the groves to gather flowers and branches with young foliage. With these the doors and windows of the houses and the Maypole of the village were adorned, and the day was spent in dancing around the pole. To preside at the festival a queen of May, the most beautiful girl of the village, was elected in Eng.; in Ger. a count of May, the wittiest and handsomest youth; and the life at court and in the castle was imitated in the village streets by the peasants.

**May** (SAMUEL JOSEPH), b. in Boston, Mass., Sept. 12, 1797, ed. at Harvard in the class of 1817; studied for the ministry at Cambridge; was ordained in Chauncey Place ch., Boston, Mar. 14, 1822; was settled at Brooklyn, Conn., in 1823.

pastor of the ch. at S. Scituate Oct. 26, 1836; in 1842 accepted the charge of the State Normal School at Lexington; in 1845 removed to Syracuse, N. Y., to become pastor of the Unit. society there, and there remained till his death, July 1, 1871. Not eminent either as preacher or as author, or shining in intellectual gifts, he was great in moral qualities of the rarest kind. As a writer he is chiefly known by his *Recollections of the Anti-slavery Conflict*. A memoir of Mr. M., by T. J. Mumford, was pub. in 1873.

**May** (THOMAS), b. at Mayfield, Sussex, Eng., in 1594, ed. at Sidney Coll., Cambridge, where he grad. 1612; commenced the study of the law at Gray's Inn, Lond., but was never admitted to the bar; inherited a considerable estate on the death of his father, Sir Thomas May (1616); became a favorite of Charles I.; pub. poetical translations of Virgil's *Georgics* and Lucan's *Pharsalia*, to which he added a *Continuation*. During his period of favor at court he produced 5 dramas and wrote the historical poems, *The Reign of King Henry II.* and *The Victorious Reign of King Edward III.* May abandoned the royal cause at the outbreak of the great rebellion, offered his services to the "Long Parliament," and obtained the double office of sec. and historiographer. In the latter capacity he pub. *The Hist. of the Parl. of Eng. which began Nov. 3, 1640, with a Short and Necessary View of some Precedent Years*; published by authority (1647), and afterward wrote an Eng. epitome with the title *A Breviary of the Hist. of the Parl. of Eng.* (1650). D. Nov. 13, 1650.

**May** (SIR THOMAS ERSKINE), K. C. B., b. in Eng. in 1815, ed. at Bedford School; entered the civil service of the Crown in 1831 as assistant librarian of the House of Commons; called to the bar at the Middle Temple 1838; pub. *A Treatise on the Law, Privileges, Proceeding, and Usage of Parliament* (1844); reduced to writing for the first time in 1854 the *Rules, Orders, and Forms of Proceeding of the House of Commons*; contributed to the *Penny Cyc.*, and pub. a *Constitutional Hist. of Eng. since the Accession of George III.* He was knighted 1866, and became clerk of the House 1871. Wrote *Hist. of Democracy in Europe*.

**Ma'ya**, a term employed in different senses in the Puranic mythology, in Buddhist legends in the Vedanta philos., and in some of the modern sectarian theologies of India. Originally it was the name of a goddess, the wife of Brahma, who, through her, created the universe; hence, when the universe came to be regarded as unreal, her name became in late Sans. a synonym for "illusion." Gotama Boeddha was the son of a queen named *Maya*.

**May-Apple**, the common name of the *Podophyllum peltatum*, a perennial herb, indigenous to the U. S. From a perennial creeping rhizome a slender stem about a foot high rises, which forks near the top into 2 petioles, each surmounted by a large peltate leaf. At the crotch of the division appears a solitary white flower. The fruit of the M.-A. is yellowish and fleshy, and about the size of a pigeon's egg. It is somewhat acid and mawkish in flavor, but may be eaten freely. The dried rhizome constitutes the drug *podophyllum*. Its virtues depend on a duplex resin improperly called *podophylline*, which is obtained in the form of a light brownish-yellow powder. This resin is a rough and harsh drastic purgative. In overdose it may cause serious irritation, and even inflammation of the intestinal canal, with severe purging, nausea, and vomiting.

**Mayas**, a race of Indians inhabiting the peninsula of Yucatan and the adjoining regions of Guatemala and Tabasco. They are generally regarded as the descendants of the builders of the ruins of Uxmal, Chichen-Itza, Palenque, and Copan. The origin of the race is usually referred to the Toltecs, who were driven from the table-land of Mex. by the Aztecs in the 11th or 12th century A. D. Tradition ascribes the origin of civilization in Yucatan to one Kukulkan, a prophet from the W., who is almost certainly identical with the Mex. Quetzalcoatl. The royal dynasty of Mayapan, according to tradition, was overthrown about A. D. 1400, from which period the decay of the cities may be calculated. A large number of the M. migrated at that time to the islands and shores of Lake Peten, where they are now known as Itzaes. The kingdom was about the same time broken up into numerous petty chieftaincies, in which condition the country remained at the time of the Sp. discovery. The M. of that period could scarcely be called civilized, though they retained some vestiges of an earlier culture. They practised many barbarous and bloody religious ceremonies, tattooed the person, painted the face and body, had only the rudest musical instruments, used arrowheads of fishbone or obsidian, and manufactured light garments of cotton. They were Christianized during the latter half of the 16th century, and led the lives of peaceful agriculturists until 1848, when an outbreak took place; the citizens of Sp. descent were massacred, and the Mex. rule over the greater part of Central and S. Yucatan was annihilated; the M. have maintained their independence to the present day, carrying on a constant warfare upon the frontier settlements. They are rapidly relapsing into heathenism, but still retain some vestiges of Chr. ceremonies. They are governed by a queen, who resides at Chan Santa Cruz, not far inland from Belize. Many expeditions sent against them from Mérida have been successfully resisted, only one having penetrated to their capital; and becoming bolder yr. by yr., they have advanced their frontiers northward, ravaging *haciendas* and villages, and even cities like Valladolid (1871). The M. lang. is akin to the Natchez. PORTER C. BLISS.

**May-Bug**. See COCKCHAFFER.

**Mayence**. See CÖLN.

**Mayer** (ALFRED MARSHALL), b. at Baltimore Nov. 13, 1836, was ed. at St. Mary's Coll., Baltimore; devoted his attention to the phys. sciences, in which dept. he became prof. in the Univ. of Md. 1856-58, in Westminster Coll., Mo., 1859-61, in Pa. Coll., Gettysburg, 1865-67, in Lehigh Univ., Pa., 1867-70, and in the Stevens Inst. of Technology, Hoboken, N. J., since 1871. He spent a yr. (1863-64) in scientific studies at the Univ. of Paris. At Lehigh Univ. he superintended the



erection of an observatory; was at the head of the expedition which observed the total eclipse of the sun at Burlington Ia., Aug. 7, 1869; was in 1873 one of the eds. of *Amer. Journal of Science and Arts*.

**Mayer** (BRANTZ), b. at Baltimore Sept. 27, 1809, was ed. at St. Mary's Coll., Baltimore; traveled in Chi. and the Indies; became a lawyer in 1832; went in 1841 to Mex. as sec. of legation; became ed. of the *Baltimore American*; author of *Mex. as it Was and Is*; *Mex., Aztec, Spanish, and Republican*; *Mex. Hist. and Archaeology*; *Mex. Antiquities*, and other works. D. Feb. 23, 1879.

**Mayer** (JOHANN TOBIAS), one of the most celebrated astronomers of the 18th century, b. Feb. 17, 1723, at Marbach, Württemberg; at 22 pub. a treatise on curves for the construction of problems in geom., and in the same yr. an *Atlas mathématique*; contributed largely to the Cosmographic Society of Nuremberg, of which he was one of the founders, one of his contributions relating to the librations of the moon having been translated and incorporated almost entire by Lalande in the 20th book of his *Astronomy*; in 1751 was appointed prof. in the univ. and director of the observatory at Göttingen, where, during the Seven Years' war, he prosecuted the work of preparing his catalogue of zodiacal stars which has been of such value to modern astron. This catalogue embraced the positions of 998 stars observed from 4 or 5 to 25 or 26 times each. He pub. also tables of the sun and of the moon. These tables were sent to Lond. and pronounced worthy of the attention of the admiralty, but it was only after his death, in 1762 (Feb. 20), that the merited recompense was awarded: the sum of £3000 sterling was paid to his widow. Mayer was the author of some very ingenious inventions, among them the repeating circle.

**Mayer** (JULIUS ROBERT), physicist of Württemberg, originator of the doctrine of the conservation of force, b. at Heilbronn Nov. 25, 1814; studied med., sailed in 1840 to Java, and remained in Batavia through the summer. While there he was surprised to find the color of the venous blood much more brilliantly red than he had observed it to be in Europe. He explained the phenomenon by the supposition that the amount of oxidation in the blood necessary to maintain the natural temperature of the body is less in hot countries than in cold. This observation turned his attention to a consideration of the nature and relations of all the phys. forces. His first publication on the subject contained a clear announcement of the theory of force to which his celebrity is mainly due, and which it was the object of later labors to develop and apply. In the close of this paper he presented a determination of the mechanical equivalent of heat, derived from observation of the elevation of temperature in air compressed by a descending column of mercury. The value thus obtained involves as a factor the specific heat of air, a constant which was not then accurately known. Dr. M.'s second publication appeared in 1845, and embraced a bold extension of the principles of his theory to the phenomena of organic nature. It was pub. under the title *Die organische Bewegung in ihrem Zusammenhange mit dem Stoffwechsel*. His *Celestial Dynamics* (*Beiträge zur Dynamik des Himmels*) made its appearance in 1848, and in 1851 he pub. a memoir entitled *Bemerkungen über das mechanische Äquivalent der Wärme*. D. Mar. 20, 1878.

**Mayfield**, Ky. See APPENDIX.

**May-Fly**. See EPHEMERIDE.

**Mayhem** [Late Lat. *mahānimum*, *mahemium*]. By the common law of Eng., M. consists of violently depriving a person of the use of any of his limbs or members which may be used in fighting, so that he is rendered less capable of protecting himself against assault or injury. But an injury which merely causes disfigurement, but does not lessen the capacity for fighting, is not M. Thus, it is M. to disable or injure a man's arm or leg, his hand or foot, to deprive him of a fore tooth, or to destroy his eye; but to cut off his ear or nose, to injure the lip, or to knock out a back tooth would not be M. In modern times, however, this common-law rule has been changed in some States by statute, and injuries merely causing disfigurement have been declared acts of M. M. at common law is a criminal offence; in the U. S. it is usually declared to be a felony. A civil action for damages may also be maintained for an injury of this kind by the person maimed, as an act of assault and battery.

**Mayhew** (EXPERIENCE), son of John, and great-grandson of Gov. Thomas Mayhew, b. in Martha's Vineyard Jan. 27, 1673; succeeded his ancestors in the pastoral charge over the Indians in Mar. 1694, and was employed by the Society for Propagating the Gospel to translate the Psalms and the Gospel of John into the Indian lang., which he had learned in childhood. He wrote *Indian Converts and Grace Defended*. D. Nov. 29, 1758.—His son, ZACHARIAH, was missionary at Martha's Vineyard from 1767 to his death, Mar. 6, 1806.

**Mayhew** (HENRY), b. in Lond., Eng., Nov. 25, 1812, was ed. at Westminster school; made a voyage in his boyhood to Calcutta, and served an apprenticeship to his father, a solicitor. He commenced a literary career by the farce of *The Wandering Minstrel*; founded a comic paper, *Figaro in London*; was one of the promoters of *Punch* (1841), and for some yrs. its chief ed. His chief work is *London Labor and the London Poor*.

**Mayhew** (IRA), b. at Ellensburg, N. Y., in 1814, removed to Mich. in youth; became a teacher and author of educational works. He was for many yrs. supt. of public instruction in Mich., and prepared, at the request of the legislature, his *Treatise on Popular Education*.

**Mayhew** (JONATHAN), D. D., son of Experience, b. in Martha's Vineyard Oct. 8, 1720, grad. at Harvard 1744; became minister to the W. ch., Boston, June 1747, retaining that position until his death. He took part in the political questions of the day as a friend of Otis and advocate of colonial liberty, and in his theological opinions inclined to the views afterward termed Unitarian. He issued many occasional discourses, one of which was a *Thanksgiving Sermon for the Repeal of the Stamp Act*. D. July 9, 1766.

**Mayhew** (THOMAS), b. in Eng. Mar. 1592, was a merchant at Southampton; came to N. Eng. in 1631; resided several yrs. at Watertown; obtained in 1641 from the agent of Lord Stirling a grant of a considerable portion of the island of Martha's Vineyard, with the title of gov.; began the colonization in 1642, aiding his son Thomas in converting the Indians, and through his influence they not only abstained from joining in Philip's war, but protected the white settlers. He founded Edgartown in 1647, preached in his old age to the Indians, as well as to the Eng., in place of his deceased son and grandson. From him was descended a remarkable series of missionaries to the Indians of Martha's Vineyard. D. Mar. 1682.

**Mayhew** (THOMAS), son of the preceding, b. in Eng. in 1621; went with his father to Martha's Vineyard in 1642 as minister to the settlers; learned the Indian lang., began in 1646 to preach to the natives, and in 1650 had 100 converts among them. He undertook in Nov. 1657 a voyage to Eng. for the purpose of obtaining aid for more extended Indian missions, but the vessel was lost at sea and all on board perished.—His sons, MATTHEW and JOHN, also preached to the Indians, the latter as a regular missionary, but d. before his grandfather, who became his successor.

**Maynadier** (WILLIAM), b. in Md. in 1806, grad. at W. Pt. 1827; served on duty at the school of practice at Ft. Monroe, and of which he was subsequently adjutant. Frequently assigned to ordnance duty while in the artill., he was, in 1838, on the increase of that corps, appointed capt. of ordnance, and assigned to the Pikesville (Md.) Arsenal, where he remained in command until 1842, when he was selected by the chief of ordnance as his prin. assistant, from which date he was associated in close official connection with the successive chiefs of that bureau. Major and lieut.-col. 1861, col. 1863, brevet brig.-gen. 1865. D. July 3, 1871.

**Maynard** (HORACE), LL.D., b. in Westborough, Mass., Aug. 30, 1814, grad. in 1838 at Amherst Coll.; was tutor and afterward mathematical prof. in E. Tenn. Univ.; admitted to the bar in 1844; represented Tenn. in Cong. 1857-63; suffered much from loss of property and exile during the war of 1861-65; was in Cong. again 1866-75, representing the Knoxville dist. until 1873, when he was chosen rep. at large. In 1875 he was sent as minister to Constantinople, and in 1880 became U. S. S. P. M.-gen. D. May 3, 1882.

**Maynard** (SIR JOHN), b. at Tavistock, Eng., in 1602, was ed. at Ox.; studied law at the Middle Temple; was elected to Parl. in 1625; called to the bar 1626; was distinguished in the Long Parl. as one of the prosecutors of Strafford and Laud, and afterward as an opponent of the assumption of supreme power by Cromwell, for which conduct he was twice sent to the Tower; became sergeant-at-law 1654, sergeant to the Commonwealth 1658, made king's sergeant and knighted 1660; took an active part in the "Convention Parliament" (1689) in obtaining the formal acceptance of the resignation of James II., and in the same yr. was made first com. of great seal. Wrote *Reports*. D. Oct. 9, 1690.

**Maynooth**, a v. of Ire., in the co. of Kildare, has a celebrated R. Cath. coll., with endowments for 500 students destined to become priests in Ire. It was founded in 1795.

**Mayo** (AMORY DWIGHT), b. in Warwick, Franklin co., Mass., Jan. 31, 1823, ed. at Deerfield Acad. and Amherst Coll.; studied for the ministry; from 1846-54 was pastor of the Independent Christian society in Gloucester, Mass.; from Oct. 1854 to Jan. 1856 preached in Cleveland, O.; from Jan. 1856 to Jan. 1863 was minister to the Division st. ch., Albany, N. Y.; from Jan. 1863 till July 1872 was settled in Cin., O., at the Ch. of the Redeemer (Unit.); since Nov. 1872 has been pastor of the Ch. of the Unity, in Springfield, Mass. Mr. M. has always been engaged in public-school work. Wrote *The Balance, Graces and Powers of the Chr. Life*, and *Symbols of the Capital*.

**Mayo** (WILLIAM STARBUCK), M. D., b. at Ogdensburg, N. Y., April 20, 1812, grad. in med. at the N. Y. Coll. of Phys. and Surgeons 1833; practised his profession for several yrs.; visited Sp. for his health; passed over to Morocco with the design of penetrating into the interior of Afr., but found his project impracticable. Several yrs. after his return to the U. S. he wrote *Kaloolah, or Journeys to the Djebel Kumri*, in which he utilized his knowledge of N. Afr. in presenting the adventures of his fictitious hero. He afterward wrote *The Berber, or the Mountaineer of the Atlas*, etc.

**Mayville**, city, cap. of Mason co., Ky., on R. R. and the O. River. Pop. 1870, 4705; 1880, 5220.

**Mayville**, Dak. See APPENDIX.

**Mayville**, on R. R., cap. of Chautauque co., N. Y., at the head of Chautauque Lake. Pop. 1870, 701; 1880, 362.

**Maywood**, on R. R., Cook co., Ill., 10 m. W. of Chicago. Pop. 1880, 716.

**Mazarin**, maz-a-reen' (JULES) [It. GIULIO MAZARINI], b. July 14, 1602, was ed. in the schools of the Jesuits at Rome; studied law at Alcalá and Salamanca; entered the military service of the pope, and was employed in some political missions; was introduced in 1628 to Richelieu, who had him appointed vice-legate of Avignon in 1634, made a cardinal in 1641, naturalized as Fr. citizen in 1639, and appointed his successor as minister; after the death of Richelieu (Dec. 4, 1642) M. governed Fr. for 15 yrs. with absolute power, though not without some violent interruptions. Twice before 1651 and 1653, during the wars of the Fronde, he had to resign his office and retire from the court. But after the end of the wars of the Fronde, M. re-entered Paris (Feb. 3, 1653) in triumph, and was received not only by the king and the court, but even by the people, with great ovations. The subsequent yrs. of his govt. were more quiet. He procured for Fr. the foremost place in the political system of Europe. Another idea of Richelieu's, the establishment of the absolute authority of the crown in Fr., he carried out with considerable success, but the interior administration, the finances, commerce, industry, agriculture, etc. were in confusion and decadence when he d. at Vincennes Mar. 9, 1661.

**Mazarredo y Salazar**, (JOSÉ MARIA), ADMIRAL, b. at



Bilbao, Sp., in 1744; entered the navy 1760; participated in the campaign against Algiers 1775; was instrumental in saving the remnant of the army from destruction; negotiated peace with the regency; was appointed maj.-gen. of naval force; took part in the naval operations against the Eng. 1780-83; made lieutenant-gen. 1789; appointed commander-in-chief of the Sp. navy, which he reorganized 1793; defended Cadiz against the Eng. July 1797; was ambassador to Paris 1799, and again 1804; was a partisan of Joseph Bonaparte, by whom he was made counsellor of state and minister of marine, which offices he held until his death at Madrid in 1812. Wrote *Rudimentos de Tactica Naval*.

**Mazdak**, a Per. religious enthusiast and founder of a sect, b. at Persepolis about A. D. 470; became mobed or chief priest at Nishapur, and on the occasion of a pestilence and famine in 500 presented himself to King Kobad as a prophet. His system was based upon the dualism of Manes, and his practical teaching was a form of communism. He converted the king, and his projects became law. Under Khosru Nushirvan, M. was put to death at Nahrwan between 530 and 540, with thousands of his followers, but his ideas took root after the rise of Islam in the following century.

**Mazep'pa** (JOHN), b. in 1645, descended from a noble family in Podolia; was ed. at the court of John Casimir of Poland. Surprised in an adventure with a Polish lady, her husband bound him stretched along the back of his half-wild horse, and put the animal to flight. It carried its owner to his own estate, but M. fled into the Ukraine and joined the Cossacks. He soon made himself very popular among them, and became sec. to their hetman, whom he overthrew in 1689, becoming hetman himself. In this position he gained the confidence of Peter the Great, who made him prince of the Ukraine. After the Peace of Altranstadt (Sept. 24, 1706) he opened negotiations with Charles XII. for the purpose of throwing off the Rus. authority. Peter the Great was informed of this treachery, but did not believe it; he sent the informers to M., who had them put to death. The czar afterward obtained proofs, and M. was compelled to join Charles XII. openly. He took part in the battle of Pultawa, June 27, 1709. D. 1710.

**Mazeres**, mah-zai', more correctly **Maseres** (FRANCIS), M. A., b. in Lond. Dec. 15, 1731, of a Fr. family; ed. at Kingston and at Cambridge, where he was made B. A. 1752 and M. A. 1755; pub. *A Dissertation on the Negative Signs in Algebra*, denying the propriety of such expressions as negative roots, etc.; called to the bar, and appointed atty.-gen. of Que.; returning to Eng., was made censor baron of the exchequer Aug. 1773, also agent to the Prot. settlers of Que. His friendship for Amer. led him to urge conciliatory measures toward the colonies, and his deep interest in the laboring classes resulted in the publication of his *Principles of the Doctrine of Life Annuities*. Beside many mathematical works, he edited or wrote *An Account of the Proceedings of the Brit. and other Prot. Inhab. of Que.*, *The Canadian Freeholder*, etc. D. May 19, 1824.

**Maz'zel** (PHILIP), M. D., b. in Tuscany in 1730; resided for some yrs. as a phys. at Smyrna; was engaged in mercantile business in Lond. from 1755 till 1773, when he came to Va. for the purpose of introducing the cultivation of the olive and other European fruits; became a correspondent of Jefferson; went to Europe in 1783 on a secret mission from the State of Va.; pub. at Paris *Recherches Historiques et Politiques sur les Etats-Unis de l'Amerique Septentrionale*; was subsequently in the service of the kings of Poland and Rus., and d. at Pisa, It., Mar. 19, 1816.

**Mazzini**, mahnt-see'ne (GIUSEPPE), the son of a phys., b. at Genoa on the 28th or 29d of June 1805. His first master was Giuseppe Patroni, a col. of artill. and a cousin of his mother. This man had the insight to divine the future greatness of his pupil. The Piedmontese revolution of 1821 made the deepest impression upon M., then a boy of 16, and he devoted himself to the liberation of his country. He studied at the univ., became acquainted with the brothers Ruffini, and confided to them his designs. At the age of 21 M. began to be known as an author, and he then commenced his political warfare with his pen. M. felt that in order to have a free country it was necessary first to liberate the lit. from arcadian and academic shackles, and make it a political instrument. M. began his politico-literary conflicts in the journal *L'Indicatore Genovese*. At an early age he took part with the Carbonarists, and was arrested in Genoa in 1820, and imprisoned at Savona. While there he became convinced that Carbonarism was no longer suited to the times, and conceived the idea of *La Giovine Italia*. Accused by the tribunal, he retired to Marseilles, and was afterward condemned *par contumace* to the gallows for conspiracy by Charles Albert. At Marseilles he united with Garibaldi in planning the insurrection of Genoa. When this plot failed, M. withdrew to Switz., and there formed a conspiracy to invade Savoy; this was the unfortunate expedition of 1834. After its failure he continued his machinations, proceeding to Paris and to Lond., where in 1839 he established a revolutionary committee. From Lond. he instigated various attempts at revolution in It. In the spring of 1848 he established in Milan *L'Italia del Popolo*, in which he manifested a strong opposition to King Charles Albert and the moderate monarchical party. The Guerrazzian triumvirate being formed in Tuscany, and M. chosen member of the Tuscan assembly, he hoped to secure the proclamation of a republic. Not succeeding in this, he withdrew to Rome, where the republic was proclaimed, and he himself became the first of the triumvirs. After the fall of Rome he first took refuge in Switz., then returned to Lond. There he incited the Its. to fresh insurrectionary movements, which proved unfortunate—that of Mantua in 1852, that of Milan in 1853, and that of Genoa in 1859. He co-operated in the expedition of Carlo Pisacane in S. It., which also was unfortunate in its termination, but which served as pioneer of the expedition of Gen. Garibaldi in Sic., made with the consent and encouragement of Count Cavour. In the events

which transpired in It. in 1859 and 1860, M. took no part; he was a mere spectator. What he desired above all things was the expulsion of the foreigner and the unity of It. These 2 objects were being accomplished; he did not applaud nor did he interfere. When it seemed to him that the It. monarchy had failed to satisfy the requirements of the people, he recommenced his conspiracies with a purely republican aim. But in this last period of his revolutionary labors his desire to separate republicanism from socialism and atheism is most noteworthy. For this reason, before his death he emphatically condemned the Commune of Paris and the objects and the acts of the Internationals. With the same zeal M. opposed the ultra doctrines of the pontifical syllabus. He d. in Pisa Mar. 10, 1872. [From orig. art. in *J's Univ. Cyc.*, by PROF. ANGELO DE GUERINATIS.]

**Mead** [Gr. μέθυ, "wine"], a drink made by fermenting a mixture of honey and water or the washings of honeycomb. It is sometimes flavored with aromatic substances. It is the same as hydromel and metheglin. It was a favorite drink among the Norse peoples of antiquity, and not unknown in anc. Gr. and Rome. It is very intoxicating.

**Mead** (CHARLES MARSH), b. at Cornwall, Vt., Jan. 28, 1836, grad. at Middlebury Coll. 1856 and at Andover Theological Sem. 1862; studied at Ger. univ. 1863-66; became prof. of Heb. at Andover 1866; has written several essays in periodicals, delivered 2 of the lectures in the Boston course on *Christianity and Scepticism*, and prepared an edition of Lange's *Erodus*.

**Mead** (LARKIN GOLDSMITH), b. at Chesterfield, N. H., Jan. 3, 1835; removed in childhood with his parents to Brattleboro', Vt., where he first made known his artistic genius by modelling in snow a colossal figure of an angel; became a pupil of Henry Kirke Brown at Brooklyn, N. Y., for 3 yrs., after which he produced in marble his *Recording Angel*, executed the colossal statue of *Vermont* for the dome of the State-house at Montpelier, and a statue of Ethan Allen for the portico of the same building. In 1862 he went to Florence, where he produced several fine statuettes. He returned to the U. S. some years later, bringing his *Returned Soldier*, *The Thought of Freedom*, and *Echo*, as well as a model for a monument to Lincoln, ordered for his tomb at Springfield, Ill., and inaugurated there Oct. 15, 1874. He has since executed several admired works.

**Mead** (RICHARD), M. D., F. R. S., b. at Stepney, near Lond., Aug. 11, 1673, ed. under Graevius at Utrecht; studied med. at Leyden and at Padua; settled at Stepney 1696; became phys. to St. Thomas's Hospital 1703, anatomical lecturer at Surgeons' Hall 1711; attended Queen Anne in her last illness; removed to Lond. 1714; was admitted fellow of the Coll. of Phys. 1716; was consulted by the govt. in 1719 as to the means of preventing the spread of the plague to Eng.; wrote a treatise on the subject, and was charged in 1721 with conducting experiments as to the effects of inoculation upon criminals condemned to death, which resulted favorably. In 1727 Dr. M. became physician-in-ordinary to George II. Wrote *A Mechanical Account of Poisons and Medicina Sacra*. D. Feb. 16, 1754.

**Meade** (GEORGE GORDON), b. in Cadiz, Sp., Dec. 30, 1815, his father being at the time U. S. navy-agent at that port; grad. at W. Pt. 1835, and appointed in the army a brevet second lieutenant, of artill., receiving his full rank the same yr. Remaining in the army but little more than a yr., during which time he was engaged in Fla. against the Seminoles, he resigned Oct. 1836, and became a C. E. for about 6 yrs., being employed by the govt. to assist in an elaborate survey of the mouths of the Miss. River. He was next engaged in the survey of the boundary-line of Tex., and subsequently in the survey of the N. E. boundary-line between the U. S. and G. Brit., where we find him in 1842, in which yr. he was reappointed in the army a second lieutenant of topographical engineers. In the Mex. war he served on the staffs of Gen. Taylor and of Gen. Scott in the battles of Palo Alto, Resaca de la Palma, and Monterey, winning the brevet of first lieutenant in his corps, capt. in 1856, and major in 1862. After the close of the Mex. war he was engaged upon light-house construction, and during the 4 yrs. preceding the c. war had charge of the geodetic survey of the great lakes. In Aug. 1861 he was appointed a brig.-gen. of volunteers, and placed in command of the second brigade of the Pa. Reserve Corps, which constituted a division in the Army of the Potomac, with which army he remained prominently identified until the close of the war. In the Va. Peninsular campaign of 1862 he took an active part in the battles of Mechanicsville, Cold Harbor, and Frazier's Farm, being severely wounded in the latter. Returning to the field as soon as his wound would permit, he was assigned to the command of a division, and distinguished himself in the battles of S. Mountain and Antietam, being placed in command of the 1st corps when Gen. Hooker was wounded at the last-named battle, where he was later himself slightly wounded. For these services he was promoted to be maj.-gen. of volunteers in Nov. 1862. Upon the recovery of Hooker he returned to the command of his division, and in Dec. 1862 at Fredericksburg he led the attack which broke through the right of Lee's line, but being outnumbered was driven back. In the latter part of this month he was promoted to the command of the 5th corps, and at Chancellorsville (May 1863) his sagacious advice so impressed Hooker that, upon requesting to be relieved, 3 months later, he designated M. as his successor, and on June 28, 1863, he was appointed to command in chief the Army of the Potomac, then scattered and moving to the battle-field of Gettysburg, at which he commanded. From that time he commanded for the Army of the Potomac until the close of the war. For his skill and valor at Gettysburg he received the thanks of Cong., and was promoted in the regular army to the rank of brig.-gen. The operations of the army during the winter of 1863-64 were unimportant, and before their return of the season for active operations Gen. Grant had been placed in



command of all the armies with the rank of lieutenant-gen. During the campaign which opened in May 1864 with the battle of the Wilderness, and only terminated with the surrender of the army of N. Va., M. discharged his duties in such a manner as to command the respect and esteem of the lieutenant-gen., and his services were recognized by his promotion to the rank of major-gen. in the regular army in Aug. 1864. After the close of hostilities he was (July 1, 1865) assigned to the command of the military division of the Atlantic, with his headquarters at Philadelphia, which post he held, with one short period of detached service in Ga., till his death, Nov. 6, 1872. [From orig. art. in *J.'s Univ. Cyc.*, by G. C. SIMMONS.]

**Meade** (RICHARD KIDDER), b. in Nansemond co., Va., in 1750, was ed. at Harrow School, Eng.; entered the Revolutionary army in 1775; took part in the battle of Great Bridge, near Norfolk (Dec. 1775), the first fought in that State; became aide-de-camp to Washington (1777-83), whom he attended in the principal battles of the war; attained the rank of col., and superintended the execution of Major André. He became a farmer in Frederick (now Clarke) co., Va., where he d. Feb. 1805.

**Meade** (RICHARD KIDDER), son of the preceding and brother of Bp. Meade, b. in Frederick co., Va., about 1795; became a lawyer and a prominent Dem. politician; was M. C. from 1847 to 1853, *chargé d'affaires* to Sard. 1853-57, and minister to Brazil 1857-61. He returned to Va. in 1861 and supported the Confed. movement. D. Apr. 1862.

**Meade** (RICHARD WORSAM), b. in Chester co., Pa., June 23, 1778, was son of George Meade, a wealthy merchant of Phila., distinguished for his patriotism. He settled at Cadiz, Sp., as a shipping merchant in 1803; rendered good service to the cause of Sp. independence during the war with the Fr. by importing from the U. S. supplies of flour into Cadiz when besieged, and was from 1805 to 1816 naval agent of the U. S. On May 2, 1816, he was imprisoned, on account of charges emanating from hostile individuals in the council of war, but was released in 1818 upon the demand of the U. S. govt. The ruin of his business gave rise to a claim against the Sp. govt., which was fruitlessly prosecuted for many yrs. He was said to be the first importer of sherry wine and of merino sheep into the U. S., and formed a gallery of paintings and statuary unrivalled by any private collection in the country. D. in 1838.

**Meade** (WILLIAM), D. D., b. in Frederick (now Clarke) co., Va., Nov. 11, 1789, grad. at N. J. Coll. 1808; was ordained in the P. E. Ch. in 1811; for many yrs. preached gratuitously near his home, beside contributing freely to educational and missionary work; became in 1829 assistant bp., and in 1841 bp. of Va.; was a recognized Low-Church leader; opposed earnestly the secession of 1861; was author of valuable devotional works, and of *Old Churches, Ministers, and Families in Va.* D. Mar. 14, 1862.

**Meadow Saffron.** See COLCHICUM.

**Meadville**, city and R. R. centre, cap. of Crawford co., Pa., on French Creek; has a c.-h., opera-house, and State arsenal; is seat of Allegheny Coll. (M. E.) and Meadville Theological School (Unit.). Pop. 1870, 7103; 1880, 8860.

**Meagher**, ma'ér (THOMAS FRANCIS), b. at Waterford, Ire., Aug. 3, 1823; studied at the Jesuit coll. of Clongowes, Kildare, and at Stonyhurst Coll., Eng.; became a favorite orator with the Young Ireland party of 1846-48; was sentenced to death for sedition, but the sentence was commuted to transportation for life; escaped from Tasmania in 1852, and came to New York; lectured in various parts of the country; became a lawyer, and wrote for the press; ed. of the *Irish News* in 1856; in 1861 a capt. and then major of the 69th N. Y. Volunteers; raised a brigade of Irish volunteers in 1862; commanded this brigade as brig.-gen. 1862-63; left the brigade after the battle of Chancellorsville; was assigned in 1864 to the command of the dist. of Etowah; in 1865 became sec. of Mont., and was acting gov. 1865-66. D. July 1, 1867.

**Meal-Worm.** See TENEBRIO.

**Mean** [Lat. *medius*]. The M. of 2 quantities is a quantity lying between them, and connected with them by some mathematical law. There are several kinds of M. values, the prin. ones being the *arithmetical M.*, the *geometrical M.*, and the *harmonic M.*

(1) The *arithmetical M.* of 2 quantities is  $\frac{1}{2}$  their sum; the arithmetical M. of several quantities is equal to their sum divided by their number; it is the same as their average.

(2) The *geometrical M.* of 2 quantities is the square root of their product; if several quantities form a geometrical progression, the first and last are called extremes, and all the others are said to be geometrical M. between them.

(3) The *harmonic M.* of 2 quantities is the reciprocal of the arithmetical M. of the reciprocals of the 2 quantities. Thus, the harmonic M. of 6 and 12 is  $1 + \frac{1}{\frac{1}{6} + \frac{1}{12}}$ , or 8. The harmonic M. of 2 quantities is a third proportional to their arithmetical and geometrical M.; that is,

$$\frac{a+b}{2} : \sqrt{ab} :: \sqrt{ab} : \frac{2ab}{a+b}$$

W. G. PECK.

**Means** (ALEXANDER), M. D., D. D., LL.D., b. in Statesville, Ireddell co., N. C., Feb. 6, 1801; received a classical education at the acad. at Statesville; removed to Ga., attended med. lectures at Transylvania Univ., Ky., and commenced the practice of med. in Covington, Ga., 1836. In the same yr. he was licensed to preach by the M. E. Ch. In 1834 he was called to the superintendency of the manual-labor school near Covington. On the organization of Emory Coll. at the same place (now known as Oxford) in 1838, he was chosen prof. of the phys. sciences; in 1840 was appointed prof. of chem. and pharmacy in the Med. Coll. of Ga., located at Augusta; in 1853 presided over the Masonic Female Coll. in Covington. In 1854 Dr. M. was called to the presidency of Emory Coll., but shortly after accepted the chair of chem. in the Atlanta Med. Coll. As a member of the

State convention of 1861 he voted against the ordinance of secession, but when it was carried he thoroughly identified himself with his native South. Since the war he has held the position of agricultural chemist for the State at the port of Savannah. His latest work is entitled the *Centennial of Chemistry*. D. June 6, 1883. A. H. STEPHENS.

**Means** (JOHN H.), gov. of S. C. 1850-52; became a col. in the Confed. service, and was killed at the second battle of Bull Run, Aug. 28, 1862.

**Measles**, mē'zls [Lat. *morbilli*] (*Rubeola*), the most frequent of the eruptive fevers. It is met with chiefly in the young (rarely in the first half yr. of life) and in such adults as have not contracted it in childhood. Most people are affected but once in a lifetime, but the cases of second, third, and even fourth attacks are not uncommon. Its contagion is most effective about the time when the eruption first shows itself, but it remains active until the skin has been restored, by peeling (desquamation) and successive development, to its normal state. The eruption consists of small elevated reddish spots (like a raspberry), which merge into each other and form discolorations of the size of a pea to that of a dime-piece, interrupted by normal white skin. In from 8 to 12 days after contagion a number of premonitory symptoms develop, such as cough (loose or barking), languid eyes, nasal catarrh, headache, and fever. At the end of 4 days the eruption appears, first on temples, forehead, and cheeks, progresses downward a day or two, and disappears in about 4 days. The skin will peel off in very small scales (not in flakes as in scarlet fever), and be in a normal condition after a week. Meanwhile the cough will become looser, the discharge from nose and bronchial tubes less, and fever subside. The large majority of cases run this mild and normal course with a very small mortality. But there are cases and epidemics accompanied with great danger in consequence of complications. The main danger lies in the accompanying inflammation of the bronchial tubes and lungs, which may prove fatal in a short time, or result in chronic inflammation and consumption. Beside these, inflammation of throat, ear (not so frequently as in scarlatina), eyes, and kidneys may remain behind. As these affections are very serious, every case, no matter how mild, ought to be seen once or twice by a phys. The usual treatment of mild cases consists in rest in bed from 3 to 8 days, moderate darkness, and cool temperature (67-68° F.) of the room, cooling beverages. Where cough is obstinate a child of 2 yrs. may take 25 drops of paregoric or 1 grain of Dover's powder at bed-time. In some cases there is a difficulty in regard to distinguishing M. from scarlet fever, especially where the former is also complicated with sore throat of a simple or diphtheritic character. The ushering-in symptoms belonging to the respiratory organs, described above, are characteristic of M., while scarlet-fever symptoms take hold of mouth, throat, and digestive tubes in gen. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. A. JACOBI, M. D.]

**Measures.** See WEIGHTS AND MEASURES.

**Meat or Flesh, Extract and Juice of** (*Extractum carnis*). Finely divided lean meat is covered with cold water and brought slowly to boiling; it is then strained and pressed. The extract may be used in the liquid state, or concentrated until it becomes semi-solid on cooling. This extract is now largely manufactured in S. Amer. and exported under the name of *Liebig's extract of meat*. It contains all the soluble constituents of the flesh except the albumen, which is coagulated by the boiling and removed in the straining. The following bodies have been identified: Creatine, creatinine, carmine, sarcine, inosine, inosates, phosphates, sulphates, and chlorides of potassium, sodium, calcium, magnesium, and iron. A large percentage of the extract consists of substances of which nothing specific is known. The acid reaction is due to free lactic and inosic acids.

**Liebig's Broth for Invalids.**—Half a lb. of finely chopped lean beef, recently killed, is placed in a pint of cold water, to which 4 drops of hydrochloric acid and a little salt have been added. After standing an hour the whole is strained through a hair sieve, without pressure. The residue on the sieve is treated with cold water till the whole extract equals a pint. It should be preserved in a refrigerator. It contains valuable constituents of the beef, which are not present when the extract is prepared by boiling, such as flesh-albumen, and the red coloring-matter which is rich in iron.

**Mecca**, mek'ka, city of Ar., the cap. of the province of Hedjaz, in lat. 21° 30' N. and lon. 40° 8' E., 65 m. E. of Jiddah, its port on the Red Sea. It is situated in a narrow and barren valley inclosed by naked hills, but is handsome and better built than most E. cities. M. was built about 450 A. D. It is the birthplace of Mohammed, and it contains the Kaaba. It has no manufactures and no trade. It depends wholly on the pilgrims who annually gather here to the number of 100,000. Pop. about 45,000, with lodging-room for three times that number. (See RICHARD F. BURTON'S *Personal Narrative of a Pilgrimage to Mecca and Medina*, 1855.)

**Mecca Balsam**, called also **Balm of Gilead**. The class of substances called balsams are, chemically, mixtures of solid resinous matters proceeding from the oxidation of essential oils, with some of the essential oils themselves from which they proceed. Common *crude turpentine* and *Venice turpentine* are familiar examples. The balsam of Mecca, when pure and genuine, is the resinous exudation from a plant that grows on the banks of the Red Sea, known to botanists as *Balsamodendron Gileadense*, a small evergreen shrub. In the E. it is much employed in med. and perfumery.

**Mechanical Calculation.** The employment of simple mechanical devices for assisting arithmetical computations dates from the origin of the science, as is shown by the etymology (Lat. *calculus*, "a pebble"), which indicates that the earliest "calculations" of a rude people were effected by means of an actual counting of grains of stone, each representing a unit of the staple of traffic. The second



step in the development of arith. must have been to make a single pebble represent a group of 5 or 10 units. The third step would be reached by making a pebble represent 100, when a problem of addition involving many thousands of units could be mechanically performed by the aid of a small number of pebbles of 3 different kinds. This was the principle from which originated the abacus. The Grs. and Roms. employed the abacus for their ordinary problems of arith., and similar instruments continued in common use in S. Europe till the end of the 15th century. Blaise Pascal constructed in 1642 a machine for performing the routine operations of arith. It consisted of a group of wheels and cylinders. On the convex surfaces of the latter were inscribed the numbers with which the operations were to be performed, consisting of the 10 figures of the decimal system, and the numbers adapted for the addition and subtraction of livres, sous, and deniers. These cylinders were connected by wheels in such manner that a single revolution of one wheel produced, according to the character of the desired operation, 10, 12, or 20 revolutions of the other wheels. The first cylinder was turned by hand, and the others were moved in conformity to the desired arithmetical rule. In 1822 Mr. Charles Babbage read 2 papers before the Royal Astronomical Society descriptive of a machine he had invented for solving mathematical problems of some complexity, and at the same time printing its own results by means of types. The subject was referred to the Royal Society, and a committee reported in favor of the invention, but the plan was extremely complicated, and the machine was never completed. The cardinal principle of Babbage's machine is the fact that if we begin with a table of logarithms or sines, then make a second table consisting of the differences between the successive numbers of the first, then a third from the differences of the second, etc., we ultimately reach a table in which all the numbers are the same. Reversing the process, and the first number of each table being given, the first table could be recovered by a series of additions starting from the table of equal numbers. Moreover, the machine stamps each figure as fast as calculated upon a stereotype plate, so that no errors of the press could be made in the publication of tables thus calculated. A machine for effecting the same object upon a different principle was commenced by 2 Sve. brothers, George and Edward Scheutz, in 1834, and successfully completed in 1853. It was purchased by the Dudley Observatory at Albany in 1856. It calculates to 15 places of decimals, impressing upon lead the result to 8 places, at the rate of 25 figures per minute. By taking out certain wheels and putting in others it will calculate and record in pounds, shillings, and pence; in degrees, minutes, and seconds; in tons, hundredweights, and pounds, etc. It has been employed at Albany in delicate astronomical calculations.

PORTER C. BLISS.

**Mechanical Powers**, certain elementary forms of mechanism in which the simplest possible material connection between 2 points or surfaces is such that the action of a force applied at one point in a given direction is caused to overcome a resistance at another point in any required direction. In its gen. acceptance the term "mechanical power" implies also the condition that an "advantage" is gained by the use of one of these elementary machines; or, in other words, that a small force acting through a given space may be made to overcome a greater force acting as a resistance through a less space. In any elementary machine the product of the force or effort into the distance passed over by its point of application must be equal to the product of the resistance multiplied by the distance passed over by its point of application. If the force or effort be a liquid pressure acting on a surface, the resistance being a corresponding liquid pressure acting on a different surface, then the volumes through which the 2 surfaces move under the influences of the action and reaction must be equal. Under these gen. definitions all the elementary machines which are met with in mechanical constructions, or which are employed by man and animals in locomotion, may be arranged under 4 heads. The classifications are the *lever*, the *inclined plane*, the *jointed links*, and the *hydraulic press*.

The *lever* is based on the theorem of *moments of forces*, and involves a rotation of a material, rigid bar or form about a point called the *fulcrum*. The moment of a force is the product of the force measured in units of force (lbs.), multiplied by the perpendicular distance from its line of action to the fulcrum. Whatever be the directions of the power, and the resistance, applied to 2 points of a lever, the products obtained by multiplying each by the perpendicular distance from its line of action to the fulcrum must be equal. The pressure upon the point of rotation in the fulcrum acts as a third force, which at any instant maintains the other two in equilibrio. To find this pressure in any given direction, it is only necessary to find the components of the other 2 forces, which act in directions parallel to the given direction, and the equilibrium is established by the general theorem of parallel forces—viz. the resultant of 2 parallel forces is always equal to their sum if they act in the same direction, and to their difference if they act in contrary directions. This resultant in the case of the lever is the pressure upon the fulcrum, acting in the direction of the greater force if the parallel components of the forces act in opposite directions, and in the common direction of the forces if they act in the same direction. The wheel-and-axle and the movable pulley are elementary machines, depending for their action on the principle of the *lever*, although sometimes classed as separate mechanical powers.

The *inclined plane* and the *jointed links* depend for their action on the theorem of the parallelogram of forces. Representing the relations between the height, length, and base of an inclined plane by the altitude, hypotenuse, and base of a right-angled triangle, the relation between the forces which cause a sliding of a body on an inclined plane is as follows: If the effort or power be applied parallel to the

length of the plane, and the resistance parallel to the height, the effort will be to the resistance as the height of the plane to the length. The jointed links, in which the relation between the power and resistance is found by the application of the parallelogram of forces possesses especial interest in being found applied in the mechanism of all walking or leaping animals. A few artificial constructions, among which may be named Hicks's press, are based on this mechanical power.

The *hydraulic press* is an elementary machine which depends for its action on the principle of distribution of pressures through the medium of a liquid. If a closed vessel filled with a liquid be tapped at any point, and a small piston be inserted in such a manner that an external pressure may be applied to the piston, no liquid being allowed to escape—when such a pressure is applied, every part of the internal surface of the vessel, equal in area to the piston, will feel the additional pressure independently of all the other parts. If one end of the vessel be closed by a tight piston movable outward, the total additional pressure upon the surface of this larger piston will be equivalent to the sum of all the additional pressures upon its parts, each of these small parts being equal to the area of the smaller piston. The force required to resist the total additional pressure on the large piston will then be as many times greater than the force applied to the small piston as the surface of the larger is greater than the surface of the smaller piston.

Ordinary machines, whether they be *prime movers*—i. e. whether they receive directly and utilize the action of muscular force, the force of gravity acting through falling water, the wind, or the moving force of heat—or whether they be secondary machines driven by prime movers, are elementary machines, or combinations of the elementary machines which have been named. W. P. TROWBRIDGE.

**Mechanic Falls**, on R. R. Androscoggin co., Me., 33 m. N. of Portland, has excellent water-power. Has an acad. Pop. 1880, 622.

**Mechanics** (Gr. μηχανική). The term "mechanics" was originally employed to designate the principles of action of machines; the science which embraces the laws of motion and force, commonly called the *science of mechanics*, having derived its origin principally from practical operations rather than from theoretical abstractions. The proficiency of the anc. in practical M. is sufficiently evinced by the descriptions of machines which have been preserved in their writings. Archimedes (287–212 B. C.) may even be said to have laid the foundation of theoretical M. in his investigations in regard to the lever, centres of gravity, etc. The theory of Aristotle, that a body contains in itself the principles of rest and motion, uninfluenced by external causes, continued, however, to be received until the time of Galileo (1564–1642). Galileo disputed the ideas of Aristotle, and by experiments on falling bodies showed the existence of a force independent of the falling body which produced a velocity of motion dependent on the time of descent. After this the science made slow but gradual progress, and was extended in its significance beyond the principles of mere mechanical contrivances to embrace the laws of force and motion, some writers on M. dividing the subject into 2 parts—*statics*, embracing the theorems which apply to bodies at rest under the action of natural forces; and *dynamics*, embracing the principles of equilibrium and action of bodies in a state of motion. Other writers subdivide the subject into 2—the M. of *solids* and the M. of *fluids*; and others, again, into *kinematics* or the laws of motion, geometrically considered, without reference to the causes of motion, and *dynamics*, the laws of motion and force. (See *DYNAMICS* and *MOTION*.) Benedetti (1590–90) was the first to discover the true cause of acceleration in falling bodies in properly considering the principle of inertia.

Of the principles which form the foundation of the science of M. or dynamics—viz. the principle of inertia, the equality of action and reaction, the non-dependence of the effect of a force on the previous motion acquired by a body, and the independence of the effects of forces which act simultaneously upon the same body—the first was recognized by Descartes (1596–1650), who called the force of continuance the indwelling force of the matter, a property called by Newton (1642–1726) *inertness*, while the resistance to change due to the body alone he called *inertia*. Guido Ubaldi (1545–1607) was the first to make an exposition of the principle of *virtual velocities*. The virtual velocity of a point due to a force is the motion of the point in a right line to a position infinitely near, projected upon the line of the force; and the *virtual moment* is the product obtained by multiplying the virtual velocity by the intensity of the force. Galileo announced the principle that two forces are in equilibrio if their moments are equal and opposed, the moments being proportional to the products of the forces by their virtual velocities. The conception of the parallelogram of forces is due to Galileo. The "Theorem of D'Alembert" (1717–83) is as follows: "If at any instant the forces of inertia of the different parts of a material system are joined to the other forces which act upon the system, a system of forces is obtained which will produce, at that instant, a condition of equilibrium in the material system."

The term "living force" is due to Leibnitz (1646–1716), who made a distinction between living and dead force: living force being such as causes motion, and dead force such as opposed by an immovable obstacle causes no motion. A contention arose between the followers of Descartes and Leibnitz in regard to the measure of force. Definitions were so arranged that by "quantity of motion" was to be understood the product of the mass into the velocity, and by "living force," the mass multiplied by the square of the velocity. Newton (1642–1726) conceived the idea that the proper measure of the  *motive force*  is the mass multiplied by the acceleration, and Helmholtz (1847) announced that all motive forces are *central forces*. All forces of attraction



or repulsion between 2 masses affect only the relative positions of those masses. The property called inertness—viz. that if there be no continuous action of forces upon a mass or material point, it either remains at rest or moves uniformly in a straight line—was announced by Descartes, Huyghens, and Newton. D'Alembert observed that if the acting forces upon a mass or material point are constant, and tend always in the same direction, the mass will move as if free.

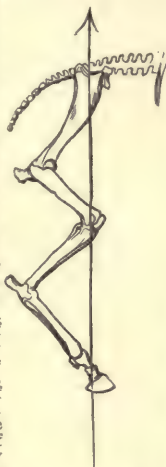
The following are general theorems relating to any system whatever:

1. The centre of gravity of any system acted upon by exterior force moves in the same path as if the whole mass of the system were concentrated at that point, and as though the exterior forces were transported parallel to themselves to that point.

2. "The increase in the sum of the moments of momentum of a system in reference to any axis during a given time is equal to the sum of the moments of all the impulses of the exterior forces with reference to the same axis in the same time."

3. The theorems of living force and of inertia belong to dynamics. W. P. TROWBRIDGE.

**Mechanics, Animal.** In animal mechanics the muscular force is utilized through either one of the elementary machines or mechanical powers, or through a simple combination of two or more of them. The employment of these elementary machines supposes a resistance or point of support which by its reaction enables the machine to act. In walking or leaping on the ground the "jointed links" or "knee-joint" is the simple machine employed when the body is raised from the ground, and the lever when a limb only is raised or moved, the earth furnishing the resistance in the first case, and the body in the second. The greatest effort of an animal is required in leaping or in hauling a load. The application of the principle of the lever involves the consequence that the bones of the limbs in these efforts sustain great cross-strains, which from their structure they are not calculated to bear. The bones of the hind leg of the horse, for instance, are arranged as in the engraving, and whether in leaping or in hauling (or rather pushing) a load, the action of the muscles of the hinder parts is to straighten out the links which form the hind legs. The ground gives a point of support, but not a fulcrum in the sense of the lever; and instead of the greatest effort being a cross-breaking effort, it is transmitted through the axes of the bones, in which direction, as short columns, they are capable of withstanding very great pressure. When the limbs are raised from the ground the body acts as the point of resistance, and the bones act generally as levers; but when the ground forms the point of resistance, the principle of the lever does not furnish the means of calculating the effort necessary to elevate the weight of the body. Swimming animals usually make use of the "inclined plane," combined with the lever or the jointed links, although some animals, like the cuttlefish, make use of an apparatus which involves the principle of the hydrostatic press: a quantity of water being drawn into the body by a large opening, and then ejected by a smaller opening with a greater velocity. The operation of flying is nearly identical, on mechanical principles, with that of swimming. W. P. TROWBRIDGE.



**Mechanicsburg, O.** See APPENDIX.  
**Mechanicsburg, on R. R.** Cumberland co., Pa., 8 m. W. of Harrisburg; contains Irving Female Coll. and Cumberland Valley Inst. Pop. 1870, 2569; 1880, 3018.

**Mechanicsville, N. Y.** See APPENDIX.  
**Mechanicsville, a v. in Va.,** about 7 m. N. E. of Richmond, which gives its name to a battle fought near by between the Confed. and Union forces June 26, 1862, being the opening engagement of the "Seven Days." The advance of Fitz John Porter's corps had posted itself upon the left bank of Beaver Dam Creek, about 1 m. from M., where they were attacked by the divisions of A. P. Hill and Longstreet, late in the afternoon. The Union position was a strong one, the banks of the creek in front being high and almost perpendicular, while the approaches to it were over open fields swept by artill. The Confeds., moving resolutely forward, were baffled by the abatis and exposed to a disastrous artill. and musketry fire, before which, after repeated assaults, they were compelled to retire. Firing was, however, maintained until 9 p. m. This battle was sustained on the Union side mainly by the brigades of Seymour and Reynolds, the remainder of the corps not being warmly engaged. Gen. Longstreet places the loss of the Confeds. between 3000 and 4000. The Union loss was less than 400.

**Mechi, me'ke** (JOHN JOSEPH), b. in Lond., Eng., May 22, 1802; became in youth a clerk in a mercantile house, and afterward set up a cutler's shop; amassed a large fortune by the sale of razor-strops; in 1840 purchased 170 acres of poor land at Tiptree Heath, Essex, where by deep drainage, steam-ploughing, and the use of liquid manures he carried on farming at a handsome profit; became in 1856 sheriff of Lond.; alderman 1857-65; wrote *Letters on Agricultural Improvements, Experiments in Drainage, How to Farm Profitably*, D. Dec. 26, 1880.

**Mechlin, mek'lin** [Ger. *Mecheln*; Fr. *Malines*], city of Belg., in the prov. of Antwerp, on the Dyle. It is the see of the abb.-primate of Belg., and has an ecclesiastical sem. and other educational insts. Its cathedral was erected in the

12th century, and adorned by paintings of Rubens and Van Dyke. Pop. 42,381.

**Mecklenburg Declaration of Independence,** a series of resolutions adopted in May 1775, at a meeting held at Mecklenburg, N. C., embodying many of the essential features of the Dec. of Ind., put forth July 4, 1776. For a full account of this document, see *J. s. Univ. Cyc.*, articles "Declaration of Independence, the Mecklenburg," by F. A. P. BARNARD, LL.D., and "Mecklenburg Declaration of Independence, History of," by PORTER C. BLISS.

**Mecklenburg-Schwerin**, grand duchy of N. Ger., bounded N. by the Baltic, and E., S., and W. by Prus. Area, 4834 sq. m. Pop. 577,065, chiefly of Slavonian origin. The ground is low and level, dotted with small lakes and covered with forests. Along the shore of the Baltic the soil is sandy or marshy, but farther inland it is fertile. Rye, wheat, flax, and tobacco are raised; cattle and horses are reared. Cap. Schwerin.

**Mecklenburg-Strelitz**, grand duchy of N. Ger., consisting of Stargard, between Mecklenburg-Schwerin and Pomerania, and Ratzeburg, between Mecklenburg-Schwerin and Lauenburg. The total area is 997 sq. m. Pop. 100,269. Cap. Neu-Strelitz.

**Medals**, large coins struck or cast on extraordinary occasions in commemoration of conspicuous events or in honor of remarkable persons. The Grs. struck no M., and the Rom. brass *medallions* represent only political or religious ideas in an allegorical manner. The first M. of modern times were designed by painters and sculptors, made of lead and bronze, and cast in moulds of clay or fine sand taken from models of wax. Subsequently the art was adopted by the goldsmiths, and M. were made in *repoussé* work or in chasing in the precious metals (Cellini). In the beginning of the 16th century M. were made in Ger. in boxwood or soapstone, from which moulds were made (Albert Dürer). At the beginning of the 17th century Camello began to cut steel dies; a master-mould or model of raised steel was made, and soft iron dies stamped from it. The oldest M. known is that of David II., king of Scot., of gold, and made between 1320 and 1370. From the 15th century there is a succession of M. down to our time in most European countries.

**Med'ary** (SAMUEL), b. in Montgomery co., Pa., Feb. 25, 1801; became a printer and Dem. politician; was for many yrs. ed. of the *O. Statesman*, and afterward of the *Columbus (O.) Crisis*; was appointed minister to Chili 1855, but did not accept; gov. of Minn. Terr. 1857-58, of Kan. 1859-60. D. Nov. 7, 1864.

**Medea** (Gr. *Μήδεια*), in Gr. mythology, the daughter of Æetes, king of Colchis, famed as a sorceress. She assisted Jason in getting the Golden Fleece, became his wife, and went with him to Greece. Repudiated by her husband, she destroys Glauce, daughter of the king of Corinth, her rival, and slays her own children by Jason. She at last became immortal and espoused Achilles in Elysium.

**Medford, on R. R.**, Middlesex co., Mass., 5 m. from Boston, contains a public library, and is the seat of Tufts Coll. Pop. 1870, 5717; 1880, 7573.

**Medford, Wis.** See APPENDIX.

**Med'ia**, a terr. of Asia, bordering N. on the Caspian Sea, and bounded on the other sides by Parthia, Assyria, and Per. The Medes were closely allied to the Pers. in lang. and religion, and they distinguished themselves by their horsemanship and their skill with the bow. They came first into notice when attacked by the Assyrians about 830 B. C. In 625 B. C. they overthrew the Assyrian empire. The revolt of the Pers. under Cyrus brought the Median kingdom to an end, 558 B. C.

**Media, on R. R.**, cap. of Delaware co., Pa., 13 m. W. of Phila., contains the Delaware Co. Inst. of Science. The Pa. Training School for Feeble-minded Children is located about ½ m. beyond borough limits. Pop. 1870, 1045; 1880, 1919.

**Medical Electricity.** Until late yrs. electricity has not been used to any extent as a therapeutic means in the treatment of disease. Recent investigations have shown what real value this powerful agent has in many forms of nervous disease, notably in paralysis and neuralgia. Three forms of electricity are employed—viz. the induced current, the galvanic current, and the static current. The 2 first are examples of dynamical electricity, and the other of frictional electricity. Galvanic electricity, or galvanism, and induced electricity, or faradism, as it has been called out of compliment to its discoverer, Faraday, are the 2 modes generally made use of, while frictional electricity is but rarely resorted to. Faradism is furnished by an instrument containing a coil of wire surrounded by another, the inner one containing in its centre a bundle of wires or a rod of soft iron. Through these coils a galvanic current is passed.

For the application of electricity to the body we make use of various appliances called *electrodes*. These are either sponge-covered or present a polished metallic surface to the skin. For active effect the metallic electrodes are the best. Neuralgias are best treated by these, either bare or covered by a piece of buckskin. The electric brush is often used to restore diminished cutaneous sensibility. It consists of a number of fine wires bound together in a handle. This electrode, as well as the other metallic ones, are used upon the dry skin. The galvanic battery should include appliances for breaking the current, reversing it, and increasing or diminishing its intensity.

The action of the faradic current upon the surface of the body is but local. It does not affect the deeper muscles nor nerves. Its action upon the skin is its characteristic property. The sensation produced by the galvanic current is one of warmth, like that which always follows the application of local stimulants, such as liniments or a mustard plaster. The application of the electrodes of a battery of moderate strength to any part of the head or face will be attended by the occurrence of flashes of light appreciated by the individual, a metallic taste, giddiness, dizziness, and



a peculiar sensation at the root of the nose. The passage of such a galvanic current, according to neurotherapists in general, is followed by beneficial results in many diseases of the brain.

We use galvanism and faradism for the relief of pain and spasm, for the improvement of the nutritive processes, to restore lost muscular power, for stimulation of sensation in peripheral or deep nerves, for stimulation of secretion, to affect the organs of special sense, to influence circulation by means of the vaso-motor system, to produce absorption of fluids, morbid tissues, and deposits, to procure sleep, and in the form of the galvano-cautery for surgery. We employ both forms of current in the treatment of paralysis, the galvanic perhaps being the most important for paralysis from central diseases. There are many cases of paralysis in which faradic currents will produce no muscular contraction, while the galvanic current will be followed by vigorous contractions of the muscles. In cases of this kind (lead paralysis is an example) we begin treatment with the galvanic, and afterward use the faradic. Local paralyses are best treated by the faradic current. A very important class of cases calling for treatment is that which includes neuralgia and other nervous diseases symptomized by pain. We may either apply it to a nerve-trunk or directly to the skin.

The galvanic current is the most appropriate for the *medicæ*, and faradic for the *immediate* application. The faradic current is of great use for many of the headaches, particularly those of a rheumatic character. Forms of hysteria are particularly under the control of galvanism. Writer's cramp and chorea are benefited to some degree by both currents. Obstinate constipation and many diseases of women are improved by electrical treatment. Little can be said of its value in the treatment of skin diseases. Electricity has produced very few authenticated cures, and those reported are undoubtedly due for the most part to other remedies. Care must be exercised by all persons who use electricity and are not experienced, to avoid applying strong currents to the head. It is unadvisable to use it for over 10 or 15 minutes at a time, and then very carefully. [From *orig. art. in J.'s Univ. Cyc.*, by ALLAN McLANE HAMILTON, M. D.]

**Medical Jurisprudence.** See JURISPRUDENCE, MED.  
**Medical Evidence of Experts.** See JURISPRUDENCE, MEDICAL.

**Medici**, med'e-chee, a famous Florentine family, who early became prominent in public affairs, figuring largely in the 14th century. They were merchants. COSIMO DE' M., the Great, b. 1389, was the son of Giovanni, gonfaloniere of Florence, and won great influence with the people. He patronized art, and d. Aug. 1, 1464, and after death was honored as *pater patriæ*.—His grandson, LORENZO THE MAGNIFICENT, b. Jan. 1, 1448, was the patron of Gr. learning and of all the liberal arts, being himself no mean poet. He brought Florence to its great pitch of power, and exercised influence throughout It. D. Apr. 8, 1492.—His son, Pope LEO X., did much to advance the fortunes of his family.—COSIMO, b. June 11, 1519, the first grand duke of Florence, was declared grand duke by Pius V. 1569, and d. Apr. 21, 1574. The grand ducal line of the M. family ended in 1743 with Jean Gaston de M. (1671-1737), but the princely line of Ottaviano, the ducal house of Sarto, etc., have perpetuated the name till our times. The popes LEO X. and XI. and Clement VII., Queens Catharine and Marie de Médicis of Fr., some eminent cardinals and dukes of Urbino, were also of this family.

**Medicine**, med'e-sin [Lat. *medicina*, from *mederi*, to "heal"], the art and science of curing disease. Its origin dates back to the early existence of the human race. M. in its primitive state comprised a recognition of the relative virtues of different articles of food, an empirical use of medicinal herbs and roots, and superstitious rites. The methodical study of M. began in the fabulous age of Egypt. At first the method pursued was to expose the sick by the wayside, that passers-by who had suffered from similar maladies might declare the means of cure. But later the sick were required, upon recovery, to go to the temple and record on tablets their symptoms and remedies. The temples of Canopus and Vulcan were the repositories, and a skilled priesthood arose which framed a code controlling public hygiene, individual regimen, and the treatment of disease. Thus, far back in a period of mythology Egypt possessed a store of medical knowledge, had able surgeons, many devoted to the study and pursuit of a single specialty, as lithotomy. The early M. of Gr. is legendary. *Æsculapius*, instructed in the healing art by Chiron the Centaur, became so skilled that he incurred the displeasure of Pluto, and was stricken by a thunderbolt from Jove. He became the god of M., temples were erected bearing his name, and the officiating priesthood were designated the *Asclepiadæ*. The sons of *Æsculapius*, *Machaon* and *Podalirius*, accompanied the Grs. in the Trojan war. *Hygieia*, the goddess of health, and *Hercules*, reputed to cure epilepsy, were also worshipped. The practice of the *Asclepiadæ* was simple. The temples were located in salubrious places, their interior purified by burning fragrant incense and secret remedies. Thither the sick were brought for treatment. Recourse was had to baths, gymnastics, mineral and thermal springs, and the use of unguents. Remedies were prescribed by the oracle and skill of the priesthood. Votive tablets inscribed with records of the disease and cure were deposited within or placed upon the columns and gates. *Pythagoras* and the sect which took his name supplanted the *Asclepiadæ*. They promulgated the knowledge, before a secret, sought the philo. of disease, but confined their treatment to dietetics and hygiene. The *Pythagoreans* declined about 500 a. c. *Hippocrates* was b. in the yr. 460 a. c., and d. in 357 a. c. He is known as the "father of physio." He acquired anat. by dissection of animals, and was skilled in surgery. His study of symptoms and diseases was careful and accurate; he

recognized stages and crises in disease; he relied upon the power of Nature, which he termed "first of physicians;" stimulated when Nature failed, moderating when her forces were excited. His remedies were mainly vegetable and dietetic. With the founding of the Alexandrian Library (320 b. c.) the Alexandrian school began. Most celebrated were *Erasistratus* and *Herophilus*. Two Alexandrian schools of M. flourished successively—the "Empirical" of *Philenus* and *Serapion*, who relied only on experience, and the "Methodists," who asserted that the body was permeated in health by atoms which entered from without and moved freely in every part and direction of the organism. Disturbances of this perfect relation by constriction or relaxation were states of disease, and all medication was therefore by astringents or relaxants.

M. was introduced into Rome from Gr. 200 b. c. *Asclepiades*, who practised at Rome 100 b. c., was a Methodist. Chief among Rom. phys. was *Celsus*, "the Cicero of medicine." *Claudius Galen*, known as *Galen*, was esteemed infallible authority for fully 12 centuries. He was b. at Pergamos A. d. 180, but lived and practised at Rome. He was ed. at Alexandria, and his knowledge of anat. was matured by dissection of animals. He was a "Humoralist," regarding disease as due to putridity of the "four humors"—blood, phlegm, bile, and black bile. The Methodists, on the other hand, found disease only in the tissues, and were known as "Solidists." So long as M. was swayed by theories, the conflict of "Humoralism" and "Solidism" was constantly revived. During the Dark Ages M. declined in Europe, but was preserved and advanced by the Ar. school, which dominated from the 9th to the end of the 14th century. The It. schools succeeded the Ar. *Mondini* of Bologna dissected before the class in 1315, and wrote imperfectly on anat. To *Andreas Vesalius*, prof. at Padua, who pub. his great work in 1543, anat. owes its origin and permanent impetus. *Vesalius* was followed by *Eustachius*, *Fallopis*, *Sylvius*, *Pachioni*, and others whose names now exist in anatomical nomenclature. In A. d. 1622 *Aselli* of Milan described the lacteals, in 1628 *Harnvey* announced the circulation of the blood, in 1661 *Malpighi* of Bologna detected the movements of the red blood-globules, in 1690 *Leeuwenhoek* of Delft demonstrated the capillaries. The researches of *Viennensis*, *Haller*, *Meckel*, and *Scarpa*, the separation of the cerebro-spinal and ganglionic nervous systems by *Bichat*, the treatise of *Sénac* (in 1749) on the action and diseases of the heart, of *Avenbrugger* (in 1761) on percussion of the chest, the first work on pathology by *Morgagni* in 1763, the recognition of nerve origins, of the ganglia, and different faculties in the brain by *Willis* and others, the writings of *Sydenham* and *Huxham*, the discovery of vaccination by *Jenner* in 1796, are a few of the very many scientific truths which warrant us in speaking of M. as a science. The status of M. was again elevated. The barber-surgeons of Paris were abolished by law in 1743, at Lond. in 1745. Clinical teaching was inaugurated at Padua in 1758. Schools of M. were established in Eng., Fr., and Ger. During the 19th century this devotion to the development of technical and scientific investigation, rather than to speculation, as the true basis of the treatment of disease, has steadily increased, and warrants the belief that we are erecting a system of scientific M. E. DARWIN HUDSON, JR.

**Medicine Lodge**, Kan. See APPENDIX.

**Med'ick** [Gr. *Μήδικη*], so called because they were believed to be natives of *Medial*, a name for several luguminous herbs of the genus *Medicago*, resembling clover, and often cultivated, especially in Europe, as forage-plants. Several species are naturalized in the U. S. from Europe; others are cultivated as ornamental plants.

**Medill** (JOSEPH), b. in N. B., near Me., Apr. 6, 1823; removed in childhood to Massillon, O.; studied law; founded in 1849 a "Free-Soil" paper at Coshocton; established at Cleveland in 1852 a Whig paper, the *Forest City*, which in the following yr. was merged in the *Leader*; was in 1854 one of the organizers of the Rep. party in O.; went to Chicago soon after, and with 2 partners bought, in May 1855, the *Tribune*. He was in 1870 a member of the Ill. constitutional convention, and was the author of the minority representation clause; was appointed in 1871 a member of the U. S. civil service commission, and elected mayor of Chicago. He spent a yr. in Europe (1873-74), and on his return purchased a controlling interest in the *Tribune*, of which he became ed.-in-chief.

**Medill** (WILLIAM), b. in 1805 in New Castle co., Del.; studied law; was admitted to bar of O. in 1832; was often in State legislature, and twice chosen speaker; M. C. from O. 1839-43; first assistant P. M.-gen. 1845-49; then com. of Indian affairs; chairman of State constitutional convention of 1850; lieut. gov. of O. 1851-53; gov. 1853-56; first comptroller of treas. under Pres. Buchanan. D. Sept. 2, 1885.

**Medina**, me-dee'nah, city of Ar., in the prov. of Hedjaz, 250 m. N. of Mecca and 132 N. E. of Jemb, or Yambu, its port on the Red Sea. It is situated in a fertile and well-watered valley on the E. slope of a lofty mt.-range, and is surrounded with high stone walls flanked with towers and defended by a strong castle. It is a handsome and well-built town. Its importance is derived from its mosque, which contains the tomb and mausoleum of Mohammed, annually visited by over 50,000 pilgrims. Mohammed died to M. in 622, and d. there in 632 A. d. Pop. 18,000.

**Medina**, me-d'ina, Orleans co., N. Y., on R. R. and the Erie Canal. Has 2 acads. Pop. 1870, 3831; 1880, 3832.

**Medina**, on E. R. cap. of Medina co., O. Has a normal school. Pop. 1870, 1159; 1880, 1484.

**Mediterranean Sea, The**, is the large sea bounded by the continents of Europe, Asia, and Afr., 2300 m. long, 1200 m. broad between Tunis and the Bay of Sidra, and covering an area of 977,000 sq. m. It forms many gulfs, as those of Lyons, Genoa, Taranto, Lepanto, Koron, Kolokythia, and Salonica on the shores of Europe; on the shores of Asia, Adramyti, Smyrna, Adalia, and Iskanderun; on the



shores of Afr., Sidra and Cabes; and bearing different names in the different localities—as, for instance, the Tuscan, Ionian, Adriatic, and Egean seas. Its depth in the Strait of Gibraltar is 5500 ft., but on the line between Sic. and Cape Bon in Afr. only 200 ft., in some places even not more than 40 ft. It communicates E. with the Black Sea through the Strait of Constantinople, and W. with the Atlantic through the Strait of Gibraltar. It receives the waters of several large rivers, the Ebro, Rhone, Po, and Nile.

**Med'lar** [A.-S. *mǣl*], the fruit of *Mespilus Germanica*, the medlar tree of Asia and Europe, belonging to the order Rosaceæ. The fruit is not eaten until over-ripe.

**Med'ley** (JOHN), D. D., b. in Eng. in 1804, grad. at Wadham Coll., Ox., in 1826 with honors; was several yrs. vicar of St. Thomas's, Exeter, prebendary of the cathedral, and in 1845 was consecrated first Anglican bp. of the see of Fredericton, comprehending the prov. of N. B.

**Med'ows** (Sir WILLIAM), K. B., b. in Eng. Dec. 31, 1738, entered the army in 1756; served with distinction in Ger. 1760; came to Amer. in Sept. 1775 with the 55th regiment; commanded the 1st brigade of grenadiers; was wounded at Brandywine and at the capture of St. Lucie 1780; was made col. of the 89th regiment, and sent as maj.-gen. to India 1781; was gov. of Madras 1790-92; led the right wing of Cornwallis's army at the siege of Seringapatam 1792; became lieutenant-gov. Oct. 1793; was gov. of the Isle of Wight, and commander-in-chief in Ire. 1801-03. D. Nov. 14, 1813.

**Medusa**. See Gorgon.  
**Medusa** [so called from its tentacles, often poisonous to the touch, and likened to Medusa's snaky locks], properly the name of a genus of Discophoræ, an order of radiates of the class Acalephæ (jelly-fishes). The term is, however, extended to the whole order (called true Medusæ) and to the order Ctenophoræ (Beroid Medusæ). The genus belongs to the family Cyaneidæ.

**Meek** (ALEXANDER BEAUFORT), b. at Columbia, S. C., July 17, 1814; removed with his father in 1819 to Tuscaloosa; grad. in 1833 at the Univ. of Ala.; was admitted in 1835 to the bar, and became ed. of a Dem. newspaper; served 3 months in 1836 in the Seminole war, and on his return became atty.-gen. of Ala.; ed. the *Southron* 1839; was 1842-44 judge of the court of Tuscaloosa co., law-clerk to the solicitor of the U. S. treas. 1845, U. S. dist. atty. for S. Ala. 1846-50, a journalist of Mobile 1848-53; went in 1853 to the legislature, where he originated the free-school system of Ala.; became in 1854 judge of the city court of Mobile; speaker of the house of Ala. 1859. Author of a legal *Digest*, *The Red Eagle*, *Passages in S. W. Hist.*, etc. D. Nov. 30, 1865.

**Meek** (FIELDING BRADFORD), b. at Madison, Ia., Dec. 10, 1817; became early interested in study of the Silurian fossils, which are very abundant there; engaged in commercial pursuits, continuing, however, his scientific studies; was employed as an assistant in the U. S. geological survey of the upper Miss. country; worked as an assistant of Prof. Hall at Albany on the palæontology of N. Y.; brought a collection of fossils from the *Mauvaises Terres* or "Bad Lands" of Dak. for Prof. Hall; took up his residence at Wash., D. C., and devoted most of the time while living there to reporting on organic remains brought in by govt. exploring expeditions; his most important papers were given in *Paleont. Cal., Reports Ill. State Geol. Survey, Paleont. State Geol. Survey of O.*, etc. D. Dec. 28, 1876.

**Meer'schaum** [Ger. "froth of the sea," so named from its lightness and white color], a compact mineral with a smooth feel, soft when first dug out of the earth, but hardening to 2.0 and 2.5. In composition it approaches silica, 60.9 per cent.; magnesia, 26.1 per cent.; water, 12 per cent. It is obtained from Tur., Asia Minor, Morocco, etc., where it is used as a substitute for fuller's earth; its prin. use, however, is as a material for the bowls of tobacco-pipes.

**Megaceros Hibernicus** [Gr. μέγας, "great," and



Irish Elk.

κέρας, "horn"), the Irish elk, an extinct species of stag or deer of large size, remains of which are found in the Qua-

ternary deposits of marl below the peat-swamps in Eng., and especially in Ire. This animal was much larger than any existing species of the group. The Irish elk became extinct before the beginning of the historic period, although perhaps contemporaneous with man in the Brit. Islands.

**Megadermat'idae** [Gr. μέγας, "great," and δερμα, "skin"], a family of Bats confined to the Old World, comprising genera *Megaderma* and *Nycteris*.

**Megalosau'rus** [Gr. μέγας, "large," and σαῦρος, "lizard"], a large carnivorous reptile from the Oolite and Wealden of Eng., belonging to the order Dinosauria, and exemplifying the carnivorous type of that order, as *Iguanodon* does the herbivorous. *M. Bucklandi*, the best known species, was perhaps 30 ft. in length, and attained a weight of 2 or 3 tons.

**Megapod'idae** [from the generic name *Megapodius*, μέγας, "big," and πούς, "foot"], a family of gallinaceous birds whose representatives are chiefly Australian, and there are popularly known as brush turkeys and mound-birds. The different types of the group vary much in external appearance, some (*Megapodius*) reminding one somewhat of a rail or a hen that has lost her tail, while others (*Tallegallus*, etc.) rather resemble a turkey; the head and



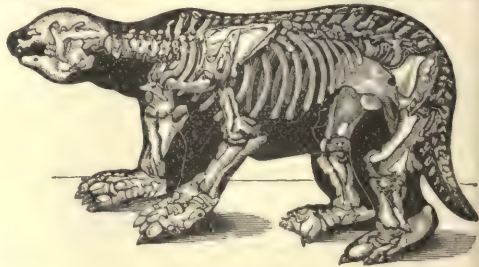
Nest of Megapodius.

neck are sometimes (in Megapodinae) thickly feathered, and sometimes (in Tallegallinae) sparsely feathered or almost naked; the bill is more or less like that of the common cock; the gape not deep; the nostrils are sub-central or somewhat anterior; the tarsi unarmed; the hind toe on a level with the fore ones; the tail is very variable in its development. The sternum is broad, and the middle and lateral portions are united for the greater part of their length, the lateral processes arising from or near the sides of the posterior half.

**Megara**, a celebrated city of anc. Gr. and the cap. of Megaris, a terr. bounded by Attica, Boeotia, Corinthia, the Saronic and the Corinthian Gulfs. As early as the 7th and 8th century b. c. it was a wealthy city. It formed many colonies, of which Chalcidion and Byzantium were the most remarkable.

**Megas'thenes**, a Gr. statesman and author in the service of Seleucus Nicator. He was sent as ambassador about b. c. 302 to the court of Sandracottos (Chandra-gupta), king of the Prasii. He resided here many yrs., and wrote a work upon the hist. and geog. of India, copious extracts from which are preserved in Strabo and other geogs.

**Megather'ium** [Gr. μέγας, "great," and θηρίον, a "wild



Megatherium.

beast"], an extinct genus of Quaternary mammals. This genus may be considered as typical of the extinct family of



Edentates, Megatheriidae. Their remains are more abundant in S. than in N. Amer., and show a much greater development of the order of Edentates than now prevails.

**Mehemet Ali**, meh'heh-met ah'lee, b. in 1769 at Kavalá, Macedonia, gave early proofs of the energy and enterprise of his character. In 1800 he came to Egypt at the head of the contingent which his native pt. sent to the Tur. army operating here against the Fr. He was soon at the head of the whole Albanian corps, and with great cunning utilized the confusion which reigned in the country after the departure of the Fr. In 1806 he was appointed gov. of Egypt by the Porte. The Mamelukes were the plague of the country. In 1811 he invited the greater number of their chiefs to a great festival at Cairo, and after the banquet he shot them down in the corridors of the palace. He cleared the country of robbers; introduced the cultivation of cotton, indigo, and sugar; organized an army on a European plan; created a fleet; established schools; built roads, etc.; but among his means of procuring money were arbitrary confiscations of private property and the exportation of the inhabs. of Kordofan to the slave-markets. The ambition of M. A. at last brought about an open conflict. Twice, after the battle of Konieh (Dec. 20, 1832) and of Nizeeb (June 24, 1839), it was in his power to crush the Ottoman empire, but both times it was saved by the intervention of Rus., Aus., and Eng. M. A.'s only ally was Fr. during the short ministry of Thiers, and he was restricted to the viceroyship of Egypt, which was made hereditary in his family. In the last yrs. of his life he fell into dotage, and d. Aug. 2, 1849.

**Méhu!** (ÉTIENNE HENRI), b. June 24, 1763, at Glivet, in the dept. of the Ardennes, Fr.; went in 1779 to Paris, where he studied under Gluck; achieved a most brilliant success by his composition of Chenier's song *Chant du Départ*; became prof. at the Conservatory; wrote 42 operas, the most remarkable of which was *Joseph*. D. at Paris Oct. 18, 1817.

**Meigs**, megz (MONTGOMERY CUNNINGHAM), b. at Augusta, Ga., May 3, 1816, ed. at the Univ. of Pa. and U. S. Military Acad.; grad. from the latter 1836, and appointed second lieut. of artil., which commission he relinquished in 1837, being transferred to the corps of engineers; became first lieut. of engineers 1838, capt. 1853. From 1836 to 1841 he was mainly engaged in the construction of Ft. Delaware, of the Delaware Breakwater, and in the improvement of the Delaware Bay and River; in charge of the construction of Ft. Wayne, Mich., and Fts. Porter and Niagara, N. Y., 1841-49; of Ft. Montgomery, N. Y., 1850-52. From Nov. 1852 to 1860 was engaged upon his great work of supplying the national capital with water from the Potomac; the Wash. aqueduct was designed and constructed under his personal direction, during which time he conducted the construction of the capitol extension and the P. O. extension. In Nov. 1860 he was sent to Fla. to put Fts. Jefferson and Taylor in a condition to resist attack; returning to Wash., he was by request relieved from other duties, Apr. 1861, and appointed chief engineer of the expedition for the relief of Ft. Pickens; appointed col. 11th Inf. May 14, 1861, and the next day quartermaster-gen. U. S. A., with the rank of brig.-gen., and as such directed the equipment and supply of our armies during the c. war; was at Chattanooga throughout its investment, and engaged in the battle of Nov. 23-25, 1863; during Gen. Grant's operations in the Wilderness, May 1864, was in charge of the base of supplies, and during the appearance of the Confed. forces in front of Wash. commanded a division composed of employes of the war dept. Brevetted maj.-gen. July 5, 1864. In Jan. 1865 he directed, at Savannah, Ga., the supply and refit of Gen. Sherman's army, just arrived from Atlanta, and in Mar., at Goldsboro, N. C., directed the opening of communications for the supply of that army on its arrival there and at Raleigh. Visited Europe 1867-68, since which he has inspected the operations of his dept. in Tex., Cal., Dak., Wyo., and Ari.; also the N. Pacific R. R. route to Red River of the N. In 1875 he was sent to Europe on special services, particularly to inspect the organization of the staff dept. of European armies. Retired 1882. [From orig. art. in *J.'s Univ. Cyc.*, by G. C. SUMMONS.]

**Meigs** (REYNOLDS JONATHAN, JR.), b. at Middletown, Conn., Nov. 1765, grad. at Yale in 1785; went to Marietta, O., 1788; became a lawyer there, and was much engaged in border warfare; chief justice of O. supreme court 1803-04; brevet col. U. S. A., serving in La. 1804-06; judge in La. 1805-06; U. S. dist. judge Mich. 1807-08; U. S. Senator, O. 1808-10; gov. of O. 1810-14; U. S. P. M.-gen. 1814-23. D. Mar. 29, 1824.

**Meissonier**, mā-sō-ne-ā' (JEAN LOUIS ERNEST), b. in Lyons, Fr., in 1813 (some say 1815); went to Paris as a youth, and entered the studio of Leon Cogniet. His special domain in art was disclosed in 1836 in a picture, *Le Petit Messager*, which attracted attention by the extreme delicacy of its execution and the compression of thought within the smallest compass. Thenceforth the painter devoted himself to microscopic art. He is peculiar in his power to give character to single figures and to groups of figures either in violent action or in repose. Among his best known pieces are *The Chess-Players*, *The Eng. Doctor*, *The Reader*, *The Painter in his Studio*, *The Guardhouse*, *The Bravos*, *A Man in Armor*, *Nap. III. at Solferino*.

**Mejía**, mā-hee'ah (IGNACIO), b. at Zimatlan, Mex., Aug. 14, 1814, was ed. in the Inst. of Arts and Sciences at Oaxaca; took up arms as a volunteer at the time of the Sp. invasion in 1829; became capt. of grenadiers in 1833, col. in 1846; was chosen to both houses of the state legislature; became military commander of Tehuantepec 1852; took an active part in behalf of the liberal cause during the "war of reform," with the rank of brig.-gen.; was defeated at Teotitlan del Camino (1860), but acquitted of all blame by a court-martial; took part in the battle of Pachuca (Oct. 20, 1861); was quartermaster of the "Army of the East" organized to repel the Fr. in Dec. 1861, and participated in the repulse of Lorencez from Puebla, May 5, 1862; but was taken prisoner on the capitulation of that city in May of the

following yr. and sent to Fr., where he remained until released in June 1864. In 1865 he was made gen. of division and minister of war, and held that post until 1876, when he was exiled, but returned to Mex. 1878.

**Mekhitar**, or **Mechitar**, mek'e-tar, the founder of a congregation of Armenian monks, called after him Mekhitarists, was b. Feb. 7, 1676, at Sebaste in Lesser Armenia. His true name was MANUK, but on entering a monastery in 1690 he received the name of Mekhitar, "comforter." In 1701 he founded in Constantinople a congregation with the purpose of uniting the Armenian and R. Cath. chs. Compelled to leave Constantinople on account of the persecutions of the Armenian patriarch, he moved in 1703 to Modon in the Morea, where he founded a monastery. Expelled from this place too by the war between Tur. and Venice, he repaired with his followers to the latter city, and having received the island of San Lazzaro as a possession for all future time, he built a new monastery here (1717), and d. Apr. 29, 1749.

**Me'la** (POMPONIUS), b. at Tingentera in Sp. in the beginning of the 1st century of our era, was the first Roman who composed a formal treatise on geog. His work *De Situ Orbis Libri III.* is still extant.

**Melancholia**. See INSANITY.

**Melanch'thon** (PHILIPP), b. at Bretten in the Rhenish Palatinate Feb. 16, 1497; was ed. at the Lat. school of Pforzheim, and studied at the univs. of Heidelberg and Tübingen. His Ger. name, SCHWABERD, "black earth," was by Reuchlin made into a Gr. form from μέλας and χθών. On the recommendation of Reuchlin he was appointed prof. of Gr. at the Univ. of Wittenberg in 1518. His immense learning and the wonderful clearness of his presentation of his subjects attracted crowds of students from all parts of Europe. But his highest fame he gained by his participation in the Ref., in which his superior knowledge, his systematic power, and his dialectic skill formed a necessary supplement to the labors of Luther. As early as 1519, at the Leipsic Disputation, he took up openly the defence of Luther's ideas. In 1529, at the Diet of Spire, he drew up the Protest of the evangelical minority, whence arose the name of Protestants; and in 1530, at the Diet of Augsburg, he wrote his most important work, the *Augsburg Confession*, which was signed by all the Lutheran princes. This work and the *Apology for the Confession* form the 2 prin. symbolical books of the Lutheran Ch. In the course of time a difference of views became apparent between him and Luther, and after the death of Luther this difference grew into one of party, the strict Lutherans and the Philippists. It is alleged that M. inclined more and more to the doctrines of Calvin concerning the Lord's Supper. On the other hand, his standpoint in the controversy of the Adipharists (1549), and still more his theory of synergism (1557), were considered as a leaning toward Rom. Catholicism. D. Apr. 19, 1560.

**Melbourne**, mel'burn, a city of Australia, the cap. of the colony of Victoria, on the Yarra-Yarra River, 9 m. above its mouth in the basin of Pt. Philip, in lat. 47° 48' S. and lon. 144° 57' E. It was founded in 1837. In 1881 it was the largest commercial port in the S. hemisphere, and an elegant city with 282,907 inhabs. This growth is mostly due to the discovery in 1851 of the gold-fields at Mt. Alexander and Ballarat, from 60 to 70 m. distant from M. The situation of M. is very fine. The streets are all paved and provided with gas and water, and many elegant buildings have been erected, among which is a well endowed univ.

**Melbourne** (WILLIAM LAMB), Viscount, b. at Melbourne House, Derbyshire, Eng., Mar. 15, 1779, was the second son of Sir Peniston Lamb, first Viscount Melbourne; was ed. at Eton and at Trinity Coll., Cambridge; studied politics and jurisprudence at the Univ. of Glasgow; was called to the bar at Lincoln's Inn Nov. 23, 1804; entered Parl. for Leominster and married Lady Caroline Ponsonby 1805; was elected member for Lander 1806, for Portarlington 1807, for Westminster 1812, for Peterborough 1816, and for the county of Hertford 1819; attached himself to the Whig opposition led by Fox, and continued a moderate opposition to the administrations of Perceval and Lord Liverpool; became chief sec. for Ire. on the accession of the Canning ministry Apr. 1827; succeeded to the title on the death of his father, July 1828; was a distinguished advocate of Catholic emancipation and of parliamentary reform; became sec. of state for the home dept. in Earl Grey's cabinet Nov. 1830, and on the retirement of the latter, July 9, 1834, succeeded him as first lord of the treasury, and premier; was dismissed in Nov. of that yr., but recovered his place in Apr. 1835, through the support of the House of Commons, and retained his position until Aug. 30, 1841. He was the responsible head of the Brit. govt. at the accession of Queen Victoria. D. Nov. 24, 1848.

**Melchites**, mel'kites [Syr. *melek*, a "king," because they belonged to the royal instead of the clerical and popular party], (1) a sect of Gr. Chrs. in Egypt, descendants of those who in the 5th century conformed to the orthodox Gr. faith, in opposition to the Coptic priests. (2) One of the branches of the R. Cath. Ch. in the E. They are strictly a branch of the United Grs., but are under a patriarch of their own. They are of the Eastern rite, use a Gr. liturgy, take the Eucharist in both kinds, and their priests and deacons may be married, but only once, and that before ordination. They are not numerous.

**Melchiz'edek** or **Melchisedec** [Heb. *Malki - zedek*, "righteous king"], a mysterious personage who appears but once in an historical light in the Bible (Gen. xiv. 18-20), but who was regarded by the writers of Psalm cx. and of the Epistle to the Hebs. (vi. 20; vii. 1-21) as a type of an order of priesthood superior to the Levitical, of which the Messiah was interpreted to be the fulfilment. M. in Gen. was "king of Salem" and "priest of the most high God;" he met Abraham on his return from the rescue of Lot and slaughter of Chedorlaomer, brought forth bread and wine, and offered a banquet to Abraham and the king of Sodom



in the valley of Shaveh, after which he blessed Abraham, and received from him tithes of the spoil.

**Meleager**, in Gr. mythology, a hero-hunter who killed the boar which Artemis sent to ravage the fields of Calydon, Ætolia, because Æneus, the king of the place, had neglected to offer up to her a sacrifice.

**Meleager**, a Gr. epigrammatist and cynic philos., the son of Eucrates, b. at Gadara in Pal., and lived in the middle of the 1st century a. c. Gr. Anthology contains 131 epigrams by him. He also made a collection of epigrams known in ancient times under the title *Στέφανος' Ἐπιγραμμάτων*, which is lost.

**Meleagride** [from *Meleagris*, the name of the common turkey], a family of gallinaceous birds. The turkeys have a characteristic form in the large upraised body, long neck, and small head; the head and neck are destitute of feathers, but have scattered "hairs," and are more or less carunculated; an extensible fleshy process is also developed from the forehead; the bill is moderate; the nasal fossæ are bare; the tarsi armed with spurs in the male; the hind toe elevated; the tail (about as long as the wing) is truncate, and has more than 12 feathers. The breast-bone, as will be readily recalled, has a long, narrow keel (the "liphosteon") extending far backward, while from near the front on each side, and separated by a very deep notch from the sides of the anterior portion, a wing-like process (the "metosteon") diverges backward, and extends far backward, but split into 2 parts, the external and internal xiphoid processes; the pelvis is peculiar in the extension of the postacetabular area (or that behind the insertion of the legs), which is greater than the anterior; the second metacarpal bone has a backward directed process, in this respect, as well as several others, differing from the guinea-fowls, to which they are most nearly related.

**Melgarejo**, mel-gah-ra'ho (MARIANO), b. in Bolivia about 1810, became a partisan leader in the c. wars; had been concerned in revolutions against every pres. of Bolivia for more than 20 yrs., when in Dec. 1864 he overthrew the govt. of his brother-in-law, Pres. Acha, and made himself dictator. He maintained himself in power for 5 yrs.; joined in 1865 the alliance of Ecuador, Peru, Bolivia, and Chili against Sp.; was overthrown by Morales in Jan. 1870; escaped to Peru, and was killed at Lima by his son-in-law, Gen. Sanchez, Nov. 23, 1870.

**Melia** [from *Melia*, its typical genus], a natural order of exogenous trees and shrubs, mostly tropical, to which belongs the china tree (*Melia azedarach*), naturalized in the S. U. S. from Asia.

**Melilot** [Lat. *melilotus*, "honey lotus," from its sweet smell], a name applied to various leguminous herbs of the genus *Melilotus*. *M. officinalis* (common M.), *M. alba* (sweet clover), and others are cultivated in Europe, but not much in the U. S., as forage-plants. These plants have the rich odor familiar in "sweet clover." The forage is eagerly eaten by cattle, and is of excellent quality, but not very plenty.

**Mell** (PATRICK H.), D. D., LL.D., b. in Walthourville, Liberty co., Ga., July 19, 1814. His parents both died when he was 14 yrs. of age, leaving him a penniless orphan. Having a good elementary education for one of his age, he earned means sufficient to support him 2 yrs. at Amherst Coll., Mass., and then became a Bap. minister. By constant study he rose to distinction, and soon after the organization of Mercer Univ. by the Bap. convention of Ga. he became prof. of anc. langs. In 1857 he was called to the same chair in the State Univ., and subsequently became vice-chancellor. For 15 yrs. he was pres. of the Ga. Bap. convention, and for 9 yrs. pres. of the S. Bap. convention. Has pub. *Corrective Ch. Discipline, an Essay on Calvinism, an Argument on the Subject of Slavery*, etc.

**Mellen** (PRENTISS), LL.D., b. at Sterling, Mass., Oct. 11, 1764, grad. at Harvard in 1784; practised law at Bridgewater, Mass.; removed in 1792 to Biddeford, Mass. (now in Me.), and in 1806 to Portland; was U. S. Senator from Mass. 1817-20, chief-justice of the supreme court of Me. 1830-34, and held other important public positions. D. Dec. 31, 1840.

**Melody** [Lat. *melodia*], in music, a connected series of single sounds, so arranged and linked together as to become capable of expressing some sentiment, and stirring up pleasurable, religious, patriotic, warlike, tragic, or other emotions. It is not every succession of sounds that can properly be called a "melody," for sounds in any number may be produced by voice or instrument which are unrelated, devoid of form, rhythm, accent, and symmetrical arrangement, and are therefore unmeaning, and incapable of awakening any feeling other than that of weariness. The music of the anc. Grs. appears to have been of a type not unlike this. The same may be affirmed, to a considerable extent, of the early music of the Ch., which, though much improved by the labors of St. Ambrose, and afterward by the learning and patience of Pope Gregory I., was, in modern judgment, bald, dry, and dreary. Even as late as the 14th and 15th centuries, or the period when the early masters of harmony were working out their elaborate fugues and canons, the distinctive beauties of melody were scarcely known. Hence the dryness and the hard mechanical stiffness of much of the music of their age. Musical thought, however rich in harmonious combinations, is not perfect without a certain leading theme or train of ideas to which all other things bear relation. In modern schools of music the cultivation of M. has risen to an importance which proves the value assigned it by the severest masters and professors of counterpoint. And this importance springs not only from the large space occupied by M. in its scientific relations, but also from the facility with which it is recognized and appreciated by the ordinary ear, and its power also in gradually leading the mind to a just conception of the harmonies dependent upon it. Without M. much of the gorgeous harmony now heard would be unintelligible to nine tenths of those who hear it; and to a popular audience the richest symphonies of a Beethoven or Mendelssohn would be a bewilderment were it not for those clear, captivating, and

ever-present lines of M. which enchain attention and take hold on the memory. [From orig. art. in *J.'s Univ. Cyc.*, by Rev. W. STAUNTON, D. D.]

**Melon** [Lat. *melō*], the large edible fruit of several species of annual running and climbing plants of the order Cucurbitaceæ, natives of Afr. and Asia. The true M. is the muskmelon (*Cucumis melo*), of many varieties and rich flavors. The *Citrullus vulgaris*, or watermelon, is prized for the coolness and sweetness of its abundant watery juice.

**Melpomene** [Gr. the "singer"], one of the nine Muses, the Muse of Tragedy.

**Melrose**, a v. of Roxburghshire, Scot., 31 m. S. E. of Edinburgh, contains the ruins of the celebrated Melrose Abbey. The abbey was founded in 1136 by David I., but destroyed in 1322 by the Eng. under Edward II. It was rebuilt in 1326 by Robert Bruce and David II., but suffered severely in 1385 and 1545 by the Eng., and still more during the Ref. While standing in its original splendor it was the finest structure in Scot., and a remarkable specimen of Gothic architecture.

**Melrose**, on R. R., Middlesex co., Mass., 8 m. N. W. of Boston. Pop. pt. 1870, 3414; 1880, 4560.

**Mel'vil** (Sir JAMES) OF HALLHILL, b. at Raith, Fifeshire, Scot., about 1535; went to Fr. as page to Mary Stuart, who was betrothed to the dauphin; was for 9 yrs. a gentleman of the household to the Constable Montgomery, and employed 3 yrs. at the court of the elector palatine; travelled in It.; returned to Scot. when his former mistress had become queen of Scots, and was appointed by her privy councillor and member of the royal household. He was closely connected with political affairs for several yrs., but having opposed the queen's inclination in favor of Bothwell after the murder of Darnley, he was obliged to consult his own safety by withdrawal from court. After the overthrow of the queen's party M. returned to court, enjoyed the confidence of the 4 successive regents who governed the country during the minority of the heir, and when King James assumed the direction of affairs was appointed a privy councillor. When James succeeded to the throne of Eng., M. retired to his estate at Hallhill, where he d. Nov. 1, 1607. Wrote *The Memoirs of Sir James Melvil of Hallhill, containing an Impartial Account of the most Remarkable Affairs of State during the Last Age*, not mentioned by Other Historians, etc.

**Melville** (ANDREW), b. at Baldovny, near Montrose, Scot., Aug. 1, 1545, was ed. at the Univ. of St. Andrew's; studied law and theol. at Paris and elsewhere on the Continent; became a teacher at Poitiers (1566), and soon afterward (1569-74) prof. at Geneva. Returning to Scot., in 1574 he was appointed prin. of the Univ. of Glasgow. In 1580 he was made prin. of St. Mary's Coll., St. Andrew's. In 1582 he preached the opening sermon before the Presb. Gen. Assembly, attacking the interference of the court with religious liberty, and headed a deputation which presented a remonstrance to King James at Perth. He was moderator of the Gen. Assembly in 1587, 1589, and 1594, was made rector of the univ. in 1590, and was recognized as the most prominent member of the Scot. National Ch. In May 1606, James then king of Eng., M. was summoned to Lond. with other Presb. divines to confer upon Scot. ecclesiastical matters, and, having denounced the abp. of Canterbury for encouraging popery, was committed to the Tower 1607, where he remained 4 yrs. In 1611 he was released at the request of the duke of Bouillon, who appointed him prof. of theol. at Sedan, where he d. in 1622. Wrote Lat. poetical paraphrases of portions of the Bible, and epigrams.

**Membré** (ZENOBIOUS), b. at Bapaume, Fr., in 1645; entered the Franciscan order; went as a missionary to Canada in 1675; accompanied La Salle upon his expedition to the W. rivers 1679; descended the Miss. with La Salle 1682; returned to Fr. the same yr.; wrote a narrative of the expedition; became warden of a convent at Bapaume; accompanied La Salle in his final expedition to Tex. by sea 1684, and remained in Ft. St. Louis, where, with his companions, he was massacred by the Indians in 1687.

**Memnon**, a name of several persons, the most remarkable of whom was the son of Tithonos and Eos, who after the death of Hector brought the Æthiopians to the assistance of Priam in the war against Troy. The name of Memnon was connected at the period of the Rom. empire with that of Amenhetp or Amenophis III. of the 18th Egyptian dynasty, about b. c. 1400, and attached to the northernmost of the seated colossal statues still remaining on the W. bank of the Nile at Thebes, where they formed part of a dromos or row of statues leading to the pylon or gate of the Amenophium, or palace of Amenophis, in that quarter. Certain parts of Egyptian Thebes were named Memnonia in honor of M. Some historical personages of this name are known, as a Rhodian who revolted against Artaxerxes Ochus and fled to Philip, king of Macedon, but subsequently returned to the service of Per.; d. b. c. 333. There was also an historian of this name, who wrote the local hist. of Heraclea of Pontus, it is supposed in beginning of 2d century a. n., and an Æthiopian people between the Nile and Astapus called Memnones.

**Memory**, the mind's faculty for connecting its past experience with its present self or "the faculty for retaining representatives of whatever has once been in the consciousness." (*Etichok*.) When this faculty is exercised involuntarily, it is *remembrance*, and when its exercise is occasioned by some intention or purpose of the will, it is *recollection*. Without this faculty our past experience would be a blank, and not only would all knowledge be limited to the field of the present moment, but all plans and calculations respecting the future would be impossible. Its value, therefore, cannot be exaggerated. Neither can its possibilities be overestimated. By trusting his M., even though it often fails him, and by giving himself with undivided attention to what he would remember, any person may increase his powers of M. to an extraordinary degree.

**Memphis**, a celebrated city, for more than 1000 yrs



the cap. of Egypt, was in the Delta, on the W. arm of the Nile, about 10 m. S. of Cairo. It was founded by Menes, the first king of the first dynasty, and was one of the most magnificent cities the world ever saw. After the building of Alexandria it began to decline, and soon fell into ruins.

**Memphis**, on R. R., cap. of Scotland co., Mo., 40 m. W. of Keokuk, Ia.; has an acad. Pop. 1870, 1007; 1880, 1418.

**Memphis**, city and important R. R. and commercial centre, cap. of Shelby co., Tenn., incorporated in 1827. The Miss. affords navigation at all seasons of the yr. between M., New Orleans, and St. Louis. Cotton is the chief article of commerce. The city possesses a fine water-front of nearly 2 m., and massive stone-paved wharves. On June 6, 1862, a short engagement took place near M., in which the Confed. fleet of 8 vessels was defeated by the U. fleet of 14 vessels, and the city thenceforth occupied by the U. forces; but in Aug. 1864 Forrest's cav. entered and took several hundred prisoners. Pop. 1870, 40,226; 1880, 33,592; 1885, about 45,000.

**Memphremagog Lake**, 35 m. long and from 2 to 5 m. in breadth, lying partly in Vt. and partly in Canada. Its shores are marked by bold headlands, and there are numerous wooded islands. Its waters flow N. into St. Francis River. The lake is navigated by steamers.

**Menabrea**, mā-nah-brī'ah (LUIGI FEDERIGO), COUNT, b. at Chambéry Sept. 4, 1809, of a Piedmontese family; studied math. at Turin; entered the Sard. corps of engineers, and was appointed prof. in technical science at the military acad. and at the Univ. of Turin. In 1848 he was employed in a diplomatic mission to the ft. duchies which were afterward annexed. In the war of 1859 against Aus. he was chief of the staff. As chief of the engineering dept. he fortified Bologna, Piacenza, and Pavia; was made a lieut.-gen. in 1860, and led the siege of Gaeta. In 1861 he became a member of the ministry of Ricasoli as minister of the marine. In 1866 he was It. plenipotentiary at the conclusion of peace between Aus. and Prus. In 1867, when the ministry of Rattazzi resigned, he formed a new cabinet, and took charge of the ministry of foreign affairs under difficult relations with Fr. In the Rom. question he defended the rights of It. against Fr. he spoke for the annexation of Rome, but he imprisoned Garibaldi for his arbitrary intermeddling. Only a few months after he entered office as pres. of the cabinet the imprisonment of Garibaldi brought him a vote of want of confidence in the house. He gave in his resignation, but was induced by the king to form a new cabinet. In May 1869 the financial difficulties made another reorganization of the ministry necessary, but even after the accession of the new ministers M. did not succeed in gaining the confidence of the house. On the opening of the session (Nov. 19, 1869) the govt. proposed Mari for pres. but Lanza was chosen. M. resigned immediately, and Lanza became pres. of the cabinet. M. is a great math. and physicist. Wrote *Études sur la série de Lagrange* and *Le génie italien dans la campagne d'Ancone et de la Basse-Italie*.

**Menai (men') Strait**, a narrow channel, 13 m. long and from 250 yards to 2 m. wide, between the island of Anglesea and Carnarvonshire, Wales, crossed by 2 bridges, the suspension and the Britannia bridge.

**Menander**, a celebrated Gr. dramatist, of whose works only fragments are extant, but whose character as a dramatic poet is well known to us through the imitations of Terence. He was b. at Athens in 342 B. C.; had Theophrastus for a teacher, Epicurus for a friend, Demetrius Phalereus for a patron; was invited by Ptolemy to his court at Alexandria, but declined to come; wrote about 100 comedies; was drowned 291 B. C., while swimming at the Piræus.

**Menant** (JOACHIM), b. at Cherbourg, Fr., in 1830; studied law; became one of the earliest Fr. decipherers of the cuneiform inscriptions of Assyria. He pub. *Zoroastre, Recueil d'Alphabets des Écritures cunéiformes, Éléments d'Épigraphie assyrienne*, etc.

**Menasha**, city and R. R. centre, Winnebago co., Wis., 18 m. N. of Oshkosh. Pop. 1870, 2484; 1880, 3144.

**Mencius**, men'she-us, the Latinized form of the Chi. MENG-TSE, "the teacher Meng," next to Confucius the most celebrated philos. of Chi. lit. He was born about 370 B. C. in the state of Tso. He lost his father very early, but his mother ed. him so carefully and conscientiously that "the mother of Meng" became proverbial among the Chi. When his studies were finished and his ideas ripened he travelled through all the petty kingdoms into which the Chi. empire was divided at that time, setting forth his views at the courts somewhat in the manner of Socrates. His success was small, and the last 20 yrs. of his life he spent in retirement among his disciples and writing his books. D. about 288 B. C.

**Mendæans**, a religious sect in Per. called also **Nazareans**, **Sabeans**, and **Christians of St. John**, residing chiefly in the vicinity of Bassorah. When discovered by Catholic missionaries about 1650, they numbered about 20,000 families, but are said to have dwindled to 1500 souls. Their hist. is involved in great obscurity. They assert Jesus to have been an impostor, and the Jehovah of the O. T. a spurious divinity. Their doctrines have been largely tinged with Per. dualism, and they recognize a double Supreme Being, male and female; the religious hist. of the world is a struggle between kingdoms of light and darkness.

**Mendaña de Neyra** (ALVARO), b. in Sp. in 1541; had resided in Lima for some yrs. when his uncle, Lope García de Castro, viceroy of Peru, gave him the command of an expedition sent for purposes of discovery among the islands of the Pacific. He sailed from Callao Nov. 19, 1567, with 2 small ships and 125 men; met with many adventures; discovered a numerous group of islands to which he gave the name of "Solomon Islands." He returned by way of Colima on the coast of Mex., reached Lima in Mar. 1568, and circulated reports of the wealth of the Solomon Islands. Twenty-seven yrs. later an expedition was formed for the colonization of the Solomon Islands, of which the command was given to M. He sailed from Callao Apr. 11, 1595, but

discovered another group, which he named the "Marquesas." Proceeding N. W., many other groups of islands were visited, but M. d. Oct. 17. His widow, Doña Isabel, took command of the expedition, and it was brought safely to Manila Feb. 11, 1596.

**Mendelssohn**, men'dels-són (MOSES), b. at Dessau, in the duchy of Anhalt, Ger., Sept. 6, 1795, of Jewish parents; studied the Bible, the Talmud, Maimonides, and afterward also modern lit., and became in 1750 tutor in a rich Jewish family at Berlin, and in 1754 bookkeeper in the firm. An accidental acquaintance with Lessing soon grew into an intimate friendship, and Lessing is said to have taken M. as a model for his *Nathan*. In 1763 his treatise on the *Evidence of Metaphysics* received a prize from the Acad. of Berlin. In 1767 he pub. his *Phædon*. In 1788 appeared his *Jerusalem*, in 1785 his *Morgenstunden*. D. Jan. 4, 1786.

**Mendelssohn-Bartholdy** (FELIX), b. at Hamburg Feb. 5, 1809; became the pupil of the romantic Berger for the piano, and of the severe Zelter for harmony; at 8 yrs. of age could read any music at sight, and write correct harmony. Up to 1826 his compositions showed less of the spontaneity of genius than of skill in scholastic forms. But in that yr. writing his *Midsummer Night's Dream*, he revealed the leading quality of his originality, the graceful vivacity of his fancy. In 1829 he left Berlin to travel through Scot., Eng., Ger., It., and Fr. In 1833 he was made musical director of the city of Düsseldorf. This office he kept but 2 yrs., and then moved to Leipzig, where he lived till his death, excepting during short periods of time. By his strong personal influence, his intelligent direction of the concerts of the Gewandhaus, and the establishment of the conservatory, he made Leipzig the leading city of Ger. for pure music. In 1837 he married Cecilie Jean Renaud of Frankfurt. D. Nov. 4, 1847.

Among his best-known works may be mentioned the oratorio *Elijah*, the oratorio *St. Paul*, the 42d Psalm, the *Midsummer Night's Dream*, the concerto for the violin, the first concerto for the piano, the third symphony (in A minor), and the overture *Fingal's Cave*. His chamber-music, *Songs without Words* for the piano, and his vocal quartets and songs are among the purest and most charming contributions to the art. [From orig. art. in *J's Univ. Cyc.*, by C. H. FARNHAM.]

**Mendez-Pinto** (FERNAN), b. at Montemor-o-Velho, near Coimbra, Port., about 1510, of poor parents; after various adventures in Europe he set out for the E. I., and arrived in 1537 at Diu, on the W. coast of India. He spent 21 yrs. in the E., was 13 times taken prisoner by the enemy, and 17 times sold as a slave. His captivities carried him from Egypt, Abyssinia, and Ar. through Per., India, Burmah, Malacca, Siam, Java, the Loo Choo Islands, Japan, Chi., and Tartary. M.-P. made 4 visits to Japan; entered the order of Jesuits at Goa, devoting the large fortune he had acquired to the establishment of a sem. in Japan. Obtaining a release from his vows, he returned to Port. in 1558; resided at court several yrs., and d. at Almada, near Lisbon, July 8, 1583. His book *Peregrinação de Fernan Mendez-Pinto* was printed in 1614, and is ranked among the Port. classics.

**Mendicant Orders**, and **Mendicants** [Lat. *mendicare*, to "beg"], persons who beg alms. Persons of this class have existed in all times, and Homer, Juvenal, Martial, and others speak of beggars. Apuleius has left a picture of the rogueries of the begging priests of the Syrian goddess—their public flagellations and ecstasies and their private gluttony and vice. This serves to remind us of the fact that begging has often been considered as a religious duty. The fakirs of India can claim a remote antiquity. In that land beggary and saintliness were almost synonymous. This facile method of gaining a living may have attracted to the profession many not remarkable for piety. At the same time, it must be remembered that if in the E. mendicant saints are in very small danger of starvation, the austerities and self-tortures common among them are not likely to attract any but the fanatical. These celibates, devoted to religious meditation and repentance, are clothed in filth, and may not even ask for their daily bread, the only petition allowed being to carry the open box into which freewill offerings may be thrown. The monstrous cruelties they inflict upon themselves sometimes end in lunacy, even when they are not prompted by a diseased brain. The central idea is that of conquering human feelings, emotions, loves, and hopes, and becoming absorbed in the contemplation of spiritual truth. In Buddhism clerical poverty is a leading rule. In Christendom the literal acceptance of some of the gospel precepts led to the development of the monastic spirit. Sometimes in individual seclusion, as in the case of the hermits and pillar-saints, and sometimes in organized communities of men and women, the doctrines of personal poverty and celibacy were wrought out with more or less of consistency and success. In the 13th century came the M. O. At one time the M. O. were so numerous that the gen. Council of Lyons (in 1274) limited them to the 4 orders of Dominicans, Franciscans, Carmelites, and Augustinian friars.

Begging was by no means an exclusively clerical profession in the Middle Ages. To the suggestions of idleness would be added the charm of variety and the pleasure of seeing the world. Among the mendicants named are the honest paupers who cannot obtain work; the bread-gatherers; the liberated prisoners who carried chains, and professed to have been captives among the infidels; the cripples (one is mentioned who obtained the leg of a dead thief, which he put on and tied his own leg up); knaves with the falling sickness, some of whom, by means of soap, made themselves foam at the mouth; blind rogues, some of whom, with bloody cotton tied over their eyes, pretended to have had their eyesight destroyed by robbers; women who lay outside chs. covered with a sheet, and asserted that they had recently been delivered and that the babe was



dead, or that they had given birth to a monster (at Strasbourg one of these *düts betterins* was found to be a man); vagrants who said they were of noble birth and had suffered by war, etc.; pretended merchants who asserted they had been robbed of their goods; women who said they were baptized Jewesses. There would seem to be very little essential variation in the fashion of roguery, for many of the tricks recorded of these early mendicants are still practised by the beggars of to-day. The "cunning Northern-beggar" would not change his rags for rich preferences, and acts many parts, being a poor old soldier, a sailor in old canvas clothing, a one-legged cripple, a mass of festering flesh infected with the falling sickness, and a burnt-out countryman. [From orig. art. in *J. s. Univ. Cyc.*, by W. E. A. Axon.]

**Mendizabal** (JUAN ALVAREZ Y.), b. in Cadiz, Sp., 1790, son of a Jewish tradesman named Mendez; was employed in the commissariat of the Fr. army of invasion 1808-13; engaged in a banking-house in Madrid; took part in 1819 in the conspiracy for the restoration of the const. of 1812; rendered important services in procuring funds for the revolutionary army 1820; aided the constitutional minister, Canga-Arquelles, in negotiating loans. In 1823, on the re-establishment of absolute govt., M. fled to Eng., where he established a successful mercantile house; negotiated a loan for Dom Pedro I., the ex-emp. of Brazil (1827), and effected other operations in favor of the Sp. govt. He was in consequence appointed minister of finance in June 1835; negotiated a fresh loan in Aug. before setting out from Lond. Received with honor in Madrid, he became pres. of the cabinet Sept. 14, promised to finish the Carlist insurrection in 6 months, but being unsuccessful, retired May 1836; was again in office from Sept. 1836 to Aug. 1837, was for several yrs. deputy for Madrid, again minister of finance under Espartero in 1841, obliged to escape to Port. on the fall of the latter in July 1843; lived in great splendor in Lond. and Paris; returned to Sp. in 1848. D. Nov. 3, 1853.

**Mendon**, Mich. See APPENDIX.

**Mendoza**, city and R. R. Junc., La Salle co., Ill. Pop. 1870, 3546; 1880, 4142.

**Mendoza**, de (ANTONIO), Conde de Tendilla, Sp. statesman and first viceroy (from 1535 to 1550) of Mex. His administration was marked by the highest order of statescraft, justice, and moderation during a revolt. During his administration the exportation of silver to Sp. exceeded \$32,500,000. Affairs in Peru having fallen into disorder, Charles V. transferred M. to that viceroyalty in 1550, as essential for the restoration of good govt.

**Mendoza**, de (PEDRO), b. in Sp. about 1487; proposed to undertake the discovery, conquest, and settlement of the S. portions of S. Amer.; sailed from San Lucas de Barrameda in Apr. 1535; ascended the Rio de la Plata as far as the island of San Gabriel; founded the city of Buenos Ayres, but lost a great part of the colonists in a war with the Indians; sent his brother, Gonzalo, to Paraguay, where he founded the city of Asuncion Aug. 15, 1536; embarked for Europe; was reduced to famine on the voyage, became a lunatic, and d. at sea in 1537.

**Menees** (THOMAS), M. D., b. in Davidson co., Tenn., June 26, 1823, grad. in med. in Transylvania Univ., Lexington, Ky., in 1846; returned to Springfield, and practised there until 1857, when he was elected to the State senate; then resumed his practice in Springfield. He was elected in 1861 to the Confed. Cong., and re-elected in 1863. In 1865 he went to Nashville. He was in 1873 elected prof. of materia medica and therapeutics in the med. dept. of the Univ. of Nashville; after filling that chair for one term he was transferred to the chair of obstetrics. In 1874 he was elected to the chair of obstetrics in the med. dept. of Vanderbilt Univ., and dean of the faculty.

**Menelaus**, king of Lacedæmon, son of Atreus and brother of Agamemnon, was the husband of Helen, and one of the most conspicuous figures in the Trojan war.

**Menéndez de Aviles**, b. at Aviles, Sp., in 1519, of a noble Asturian family; took service in the Sp. navy, and was for many yrs. a successful cruiser against Moorish and other pirates, and against the Fr. during the wars of Charles V. with that nation; commanded the fleet which carried Philip II. to Eng. 1554, of that which brought to Flanders the money and reinforcements which enabled Philip to win the battle of St. Quentin (1557), and of that which brought back the king and court to Sp. in 1559. He went several times to the W. I., and in 1565 Philip made him adelantado of Fla. The news of a Fr. colony having been planted in Fla. was a powerful incentive, and M. sailed from Cadiz June 29, 1565; went first in quest of the Fr. on St. John's River; discovered the bay and river, which he called St. Augustine, and established on its bank (Sept. 8) the town of the same name, the oldest now existing in the U. S. The Fr. fleet soon appeared in the Bay of St. Augustine with the intention of attacking the Sp. settlement, but it was driven off by a storm, and M. marched a force overland, with which he massacred the Fr. garrison at Ft. Caroline. The fort of Santo Lucia was built at Cape Canaveral, that of Santa Elena in what is now Pt. Royal harbor, S. C., and M. returned to Sp. D. at Santander Sept. 17, 1574.

**Menhaden**, **Moss-Bunker**, or **Bony-Fish**, the *Brevortia menhaden*, a fish of the herring family, extensively caught along the Atlantic coast. It is full of small bones. The fish are put up as sardines. They are decapitated, the tail cut off, and by being subjected to steam the bones are softened; they are then put in cotton-seed or other oil. They have been long caught for their oil, which is abundant and is used in leather-dressing, rope-making, and for adulterating higher-priced oils. The refuse, called fish-guano, is a valuable fertilizer. The business of making this oil and guano is extensively carried on along the coasts of N. Eng., L. I., and N. J.

**Meningitis**, men-in-jit'is [Lat. *meninges*, "membrane," and *-itis*, an affix denoting "inflammation"], inflammation of the membranes which envelope the brain and spinal cord,

termed cerebral, spinal, and cerebro-spinal M. according as the inflammatory process is limited to the region of the cerebrum or brain, the region of the cord, or involves the investments of both. Cerebro-spinal M. is usually epidemic. Acute M. is treated locally by cold applications and counter-irritants, internally by remedies reducing the action of the heart. In secondary M. we treat the primary disease, the exciting cause.

**Menonites**, a body of Chrs. deriving their name from Menno Simons (1496-1561). After the taking of Münster and the execution of the leaders of the Anabaptists, June 24, 1685, Menno Simons, who had been a R. Cath. priest, gave himself to the winning of the remnants, whom he united in the Netherlands and in N. Ger. While some of the earlier views of the Anabaptists were retained, their fanatical violence was completely set aside. The M. had ministers and deacons. Their discipline was very strict. They maintained that Chrs. should not bring lawsuits, demand interest, take oaths, nor serve as soldiers. They rejected infant baptism, but did not immerse. Some of them adopted feet-washing in connection with preparation for the Lord's Supper. They dropped all the views subversive of civil rule which had been held by the Anabaptists. Their ministry is unpaid, and not regularly educated. In the U. S. the M. are a body of considerable strength. On the invitation of Penn many immigrated in 1693-98. In 1735 there were about 500 families settled in Lancaster co., Pa. They have in Amer. about 500 chs., 250 ministers, and 60,000 communicants. The Reformed M. arose in Lancaster co., Pa., in 1811. They aim to restore the anc. faith and practice of their Ch. C. P. KRAUTH.

**Menominee**, on R. R., cap. of Menominee co., Mich., on Green Bay, at the mouth of the Menominee River, is an important shipping-point for lumber to Chicago; is engaged in mining iron and marble. Pop. 1880, 3288; 1884, 5578.

**Menomonee**, on R. R., cap. of Dunn co., Wis., 23 m. N. W. of Eau Claire. It is a depot for the fur-trade. Pop. tp. 1870, 2210; 1880, 4177.

**Mensuration** [Lat. *mensura*, a "measuring"], that part of practical geom. which teaches how to measure the area of figures and volume of solids by measuring certain lines and angles of the figures and solids. As every rectilinear plane figure can be decomposed into triangles, and every solid bounded by planes can be decomposed into pyramids, the measurement of the area of such figures and of the volume of such solids resolves itself into the determination, by the methods of elementary geom., of the sides and angles of certain triangles. But the determination of the length of curved lines, the area of plane surfaces bounded by lines which are not all right, of the area of curved surfaces, and of the volume of solids bounded by surfaces which are not all plane, requires the aid of the integral calculus.

**Mental Philosophy**. See PSYCHOLOGY.

**Mentaña**, a small place with an old castle, 13 m. to the N. E. of Rome, noted on account of the battle which took place here Nov. 3, 1867, in which the volunteers under Garibaldi were completely defeated by the papal troops, aided by the Fr. On the retreat the volunteers met with the It. army, which had entered the Papal States; they were disarmed, and Garibaldi himself was taken prisoner and brought to the fortress of Varginano, near Spezzia.

**Men'tchikof** (ALEXANDER DANIELOVITCH), PRINCE, b. at Moscow Nov. 27, 1672, and apprenticed to a pie-baker; attracted the attention of Lefort; enlisted in the regiment of Preobashenski; discovered a conspiracy among the Strelitzes; distinguished himself at the capture of Azov; accompanied the czar on his journey to Hol. and Eng.; gained his confidence; became after the death of Lefort his most intimate friend and adviser, and was made a prince in 1707 and field-marshal in 1709; won the battle of Kallisz 1706, contributed to the victory of Poltava 1709, conquered Pomerania in 1712, took Stettin in 1713, and his influence was felt in all branches of the civil govt. of Rus. But his rapacity was amazing, and when in 1713 he abandoned Stettin to Prus. without the consent of the czar, he was sentenced to death. The czar changed this verdict to a heavy fine, and even appointed him gov. of St. Petersburg, but he had lost his influence. Once more he came into power on the accession of Catharine I. in 1725, and when in 1727 she was succeeded by the young Peter II., he obtained absolute control of the govt. of Rus. He was just about to marry his daughter to the czar when he was overtaken by a conspiracy headed by the family of Dolgoruki, Sept. 1727, and banished to Siberia, where he d. Nov. 2, 1729.—His great-grandson, ALEXANDER SERGEVITCH MENTCHIKOF, b. in 1789, d. May 3, 1869, was aide-de-camp to the emp. Alexander in 1812-14, gov. of Finland in 1831, minister of marine in 1836, and commander-in-chief during the Crimean war.

**Mentz** [Ger. *Mainz*; Fr. *Mayence*; anc. *Moguntiacum*], city of Ger., in Hesse-Darmstadt, on the left bank of the Rhine, founded in the 2d century by the Romans, destroyed in the 5th by Attila, restored by Charlemagne. It is surrounded on all sides by strong fortifications. Its streets are crooked and narrow, but it contains many interesting buildings, and many beautiful promenades and public places. Among its manufactures, those of carriages, furniture, and musical instruments enjoy great repute, and its trade is considerable. Pop. 60,905.

**Menu**, or **Manu** [Sans. *man*, "to think"], the mythical ancestor of the human race in the Vedas and other sacred books of India. Several other M. are recognized in Hindoo mythology, forming a succession of 10 or 14 personages, each of whom was said to have created the world, and perished with it after a period of incalculable ages, called a *manwantara*, or "age of Menu." The authors of the Brahmanical code of social and religious ordinances gave their work the name of *Institutes of Menu*, thereby intimating that this code had been handed down from the earliest times; but at a later period, when the *origines* of the Vedic and Brahmanical religions had been confounded together by the



sacred caste which arrogated to itself the exclusive custody and interpretation of the anc. books. M. was represented as the author of the code bearing his name. The *Institutes of Menu* are the sacred books of the Brahmans, and chiefly devoted to the establishment of the system of caste and the definition of the social and religious duties of the members of the 4 castes.

**Menzel** (WOLFGANG), b. June 21, 1798, at Waldenburg, Silesia; served as a volunteer in the campaign of 1815; studied philos. and hist. at Jena and Bonn; was an enthusiastic disciple of Jahn, the founder of the Ger. Turners; lived from 1820 to 1824 as a teacher at Aarau, Switz., but settled in 1825 at Stuttgart, where he devoted himself exclusively to lit., and d. Apr. 23, 1873. Wrote *Geschichte der Deutschen, Streckverse, Die Deutsche Literatur*, etc.

**Mephistopheles.** See APPENDIX.

**Mercator** (GERARD), b. Mar. 5, 1512, at Rupelmonde, Flanders; studied philos., math., and the art of engraving at Louvain; attracted attention first by 2 globes he made in 1541 for Charles V.; moved in 1559 to Duisburg; pub. geographical works giving maps and descriptions of the world. D. Dec. 2, 1594. Wrote *Tabulae Geographicae ad mentem Ptolemaei Restitutae* and *Atlas sive Geographicae Meditationes*.

**Mercator's Chart**, a chart in which the meridians are represented by parallel straight lines, and circles of lat. by lines at right angles to the meridians. Longitudes are plotted from a scale of equal parts, and lats. from a varying scale so adjusted that the plot of a ship's course shall be a straight line. This varying scale, called a scale of *meridional parts*, is given in a tabular form in Bowditch's *Navigation*.

**Mercator's Sailing** is the method of solving problems in navigation in accordance with the principles of Mercator's chart.

**Merced**, on R. R., cap. of Merced co., Cal., 139 m. E. of San Francisco. This is the point of departure for the Yosemite Valley and Falls and the Mammoth Tree Grove. Pop. 1880, 1446.

**Mer'cer**, R. R. junction, cap. of Mercer co., Pa., 60 m. from Pittsburg. Pop. 1870, 1235; 1880, 2344.

**Mercer** (CHARLES FENTON), LL.D., b. at Fredericksburg, Va., June 6, 1778, grad. at Princeton 1797; was commissioned by Washington capt. of cavalry in 1798, in anticipation of war with Fr.; studied law; travelled in Europe 1802-03; became aide-de-camp to the gov. during the war of 1812; commanded the defences of Norfolk 1813, with the rank of brig.-gen.; served in the gen. assembly of Va. 1810-17; was chairman of the committee on finance in 1813, when he introduced the bill for the construction of the Chesapeake and O. Canal, and became pres. of the canal co.; was elected to Cong. as a Federalist in 1816, and remained in that body till 1840. In 1853 he visited Europe and conferred with the leading men of several countries in the interest of the complete abolition of the slave-trade. D. May 4, 1858.

**Mercer** (HUGH), b. at Aberdeen, Scot., about 1721, ed. at the Univ. of Aberdeen; became a phys., and served as assistant surgeon in the army of the "Young Pretender" in 1745; emigrated to Amer. In 1747, and settled as a phys. near the present town of Mercersburg, Pa.; volunteered in Braddock's campaign; was appointed capt.; was wounded in the battle on the Monongahela, July 9, and being unable to keep up with the fugitives, wandered through the wilderness alone for several weeks, until he finally reached Ft. Cumberland, 100 m. distant. In 1758 he was made lieutenant-col.; accompanied Gen. Forbes to Fort Duquesne (Pittsburg), and commanded that post for some time. He then settled as a phys. at Fredericksburg, Va.; was engaged in drilling and organizing the minutemen of Va. in 1775 and the militia in 1776; was appointed col. of the 3d Va. regiment Feb. 13, 1776, and at Washington's request was chosen by Cong. brig.-gen. June 5, 1776. He commanded the column of attack at Trenton, and advised the night-march upon Princeton, in which he led the advance, and at daybreak on Jan. 3, 1777, was mortally wounded at the commencement of the action of Princeton, and left for dead on the field. Removed to a neighboring farm-house, he d. Jan. 12, 1777.—His son HUGH (d. 1853) was at the expense of Cong.

**Mercer** (JESSE), b. in Halifax co., N. C., Dec. 16, 1769; moved to Ga., and after being ordained to the Bap. ministry took pastoral charge of a ch. in Wilkes co. in 1789; was an eloquent preacher, and perhaps did more to build up his denomination in the S. States than any other man. His collection of hymns, in a vol. entitled *Mercer's Cluster*, is still in use in almost all the S. Bap. congregations; wrote *Hist. of the Ga. Bap. Association*, and edited for many yrs. the *Chr. Index* of Ga. He was one of the most prominent and useful members in the constitutional convention of 1788. Having acquired a considerable estate, and being without children, he founded by a liberal donation an inst. of learning which was named Mercer Univ. This was at first established at Pennfield, but has since been moved to Macon, Ga. D. Sept. 6, 1841. (See his *Memoir*, by C. H. MALLORY.)

A. H. STEPHENS.

**Mercersburg**, on R. R., Franklin co., Pa., 10 m. W. of Greencastle, is the seat of Mercersburg Coll. It was formerly the seat of Marshall Coll. and the Theological Sem. of the Ger. Reformed Ch. Mercersburg Coll. was organized after the removal of Marshall Coll. to Lancaster, Pa. (1853), and occupies the same building. Pop. 1870, 971; 1880, 970.

**Merchantville**, on R. R., Camden co., N. J., 4 m. E. of Camden. Pop. 1870, 245; 1880, 439.

**Mercia**, the largest and most powerful of the 7 Sax. kingdoms in Eng., comprised the whole central part of the country from the Thames to Yorkshire; was independent from 565 to 825, then merged into the kingdom of Wessex.

**Mercury** [Lat. *Mercurius*, from *merx* and *mercari*], in Rom. mythology the god of commerce and gain, corresponding to the Gr. Hermes. A temple was built in Rome to M. 495 B. C., and an altar was raised to him near the Porta Capena, by the side of a well to which the merchants repaired on the festival of the god (May 25) to sprinkle

themselves and their goods with the waters of the well, that they might yield a large profit.

**Mercury**, the planet nearest the sun. Its mean distance from the sun is about 35,392,000 m.; the eccentricity of its orbit is 0.206138, so that its greatest and least distances are 42,669,000 m. and 28,115,000 m. He is always seen near the sun, his maximum elongation amounting only to about 27°, while his minimum amounts only to about 18°. In N. lats., moreover, M. is always S. of the sun when he attains his maximum elongation, and is therefore less favorably seen. M. completes a sidereal revolution in 87.9693 days, his mean synodical period amounting to 115.877 days. His orbit is inclined 7° 0' 8" to the plane of the ecliptic, an inclination greater than that of any of the primary planets, but far surpassed in the case of several of the planetoids or asteroids. Telescopic observation of M. has revealed very little of interest. [From orig. art. in *J.'s Univ. Cyc.*, by R. A. PROCTOR, F. R. A. S.]

**Mercury** [Lat. *Mercurius*]; synonyms, *Hydrargyrum* (which is its Lat. name, from the Gr. name, ὑδράργυρος, "liquid silver"), *Quicksilver*, *Argentum vivum*; Ger. *Quecksilber*; Fr. *mercure*, the only yet-known simple metal which assumes naturally a melted or liquid form.

**Occurrence and Preparation.**—Beside the native metal, it occurs chiefly as a sulphide, cinnabar, its most abundant ore. The most famous localities are in Cal., Sp., and Idria in Carniola. There are, however, numerous other undeveloped cinnabar-bearing regions in the Pacific States of Amer. Cinnabar is reduced to metallic mercury either by distilling with lime to combine with the sulphur, or by simply distilling in a current of air, which oxidizes the sulphur to sulphurous acid gas, leaving the M. free. Metallic iron has also been used to combine with and retain the sulphur. The reduced liquid metal is sent into commerce in bottles of wrought iron closed with screw stoppers, containing about 75 lbs. each.

**Properties.**—Pure M. is almost silver-white, of mirror-like lustre, which lustre it preserves perfectly in air free from sulphur. The worst enemies to its purity are other metals. No metal should ever be allowed to touch it except iron or platinum. The smallest proportion of lead, tin, and zinc causes it to tarnish constantly and lose its lustre, and injures its perfect liquidity, making it somewhat viscous and adherent to other bodies, so that it will "drag a tail" behind when flowing over a surface, rendering it useless for nearly all its practical applications without purification by processes which are none too easy. M. when pure has a density varying from 13.58 to 13.59 in the liquid form, but contracting, when frozen, to between 14.4 and 14.5. When it is frozen, which requires a reduction of temperature to just about 39° F. below zero, it forms a tin-like mass, which is crystalline, but nevertheless malleable. It boils, when pure, at a temperature variably stated at from 346.5° C. to 360° C., yielding a transparent colorless vapor 6.7 times as heavy as air. Some believe that minute impurities raise its point of ebullition, which may account for these variable figures. M., when exposed to the air at or near its boiling-point, is slowly oxidized to the red oxide; which, when exposed again to a still higher heat, is again decomposed into its elements.

**Uses of Mercury.**—The most important of these is in the working of the ores of gold and silver. It is also used in the amalgamation of the zincs of voltaic batteries, in making looking-glasses, in barometers, thermometers, steam-gauges and other pressure-gauges, in dental amalgams (with copper). In the laboratory it is a valuable agent also in eudiometry (for confining gases), in mercurial pumps, and in other ways. It is used for preparing several important medicinal compounds.

**Compounds of Mercury.**—Several of the *amalgams*, or compounds of M. with other metals, are useful substances. That with tin forms the coating on looking-glasses. *Sodium-amalgam* is used in the laboratory for a multitude of purposes, and in the arts in the amalgamation of the ores of the precious metals, and in the recovery of M. which has been employed for this purpose. The 2 chlorides of M., known commercially as *corrosive sublimate* and *calomel*, have already been described under their appropriate heads. The protoxide or red oxide of M., known as *red precipitate* in med., is formed both by heating M. in the air and by applying heat to the nitrate. The only other compound of importance is the sulphide, which, when artificially prepared, forms the beautiful pigment known as *vermillion*, and as found native is the mineral cinnabar. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. HENRY WURTZ, Ph. D.]

**Mercury, Medicinal Uses of.** The medicinal uses of compounds of M. are various. But there is a gen. affection of the system called *mercurialization*, induced by the steady impregnation of the blood with the metal, the symptoms of which are as follows: There are first a metallic taste in the mouth, a soreness of the gums, and a peculiar fetor in the breath. Next comes a tendency to increase of the secretions, especially of the saliva, to be followed by inflammation and fever. If the poisoning continue, this condition may lead to most disastrous consequences. Ulcers, gangrene, caries of the teeth, and hemorrhages may occur in the affected parts. Diarrhea, emaciation, grave impoverishment of the blood, with absorption of newly formed tissues, may result. While in this condition the internal organs are liable to inflame. Therapeutically, the induction of moderate grades of gen. mercurialization was formerly one of the commonest practices of the phys. But of late yrs. this practice has been steadily losing favor, and many phys. limit the medicinal use of gen. mercurialization to the single disease syphilis. But even here the old habit of pushing the drug to actual salivation has been wholly abandoned, and the development of a slight sponginess and tenderness of the gums is recognized as the utmost physiological limit of therapeutic mercurialization.

Other special properties and uses of mercurial prepara-



tions are as follows: In gen., the *mercuric* compounds are poisonous to all forms of life. When swallowed in poisonous dose they produce intense gastro-intestinal inflammation and death. If the sufferer live several days, salivation from absorption of the mercurial may occur. The antidote in mercuric poisoning is some form of albumen, as white of egg, milk, flour and water. But as the insoluble albuminates thus formed are again redissolved if left in the alimentary canal, the poison must be got rid of by emetics. The mercuric compounds used internally in med. are mercuric chloride (corrosive sublimate), mercuric iodide (red iodide), and mercuric cyanide. These are employed in minute dose to induce therapeutic mercurialization in syphilis, and in weak solution or in ointment as external applications in chronic skin disease. Corrosive sublimate in exceedingly small doses is also used internally in certain digestive derangements with diarrhoea. In striking contrast with the mercuric are the mercurous compounds and preparations of the metal itself. Those used internally in med. are mercurous chloride (calomel), mercurous iodide (green iodide), blue pill or blue mass, and mercury with chalk or "gray powder." These preparations have not the poisonous properties of the higher compounds. Given in small repeated dose, they are in some way slowly dissolved in the juices of the alimentary canal, become thus absorbed, and readily induce gen. mercurialization. They are accordingly much employed for this purpose in syphilis. In single large dose the tendency of the present group is to a cathartic effect. When so operating the mercurial is itself discharged before there is time for its solution and absorption. The stools produced are yellow and green, apparently from the presence of bile. Calomel is a good deal used as a purgative, and calomel, blue pill, and M. with chalk often prove curative in many intestinal derangements. Many other preparations of M. are used for certain special purposes. Mercurial or blue ointment is much used as a means of producing gen. mercurialization in syphilis, a small piece of the ointment being rubbed into the skin daily. Mercurous oxide (black oxide) and mercuric sulphide (cinnabar) are sometimes used to mercurialize in syphilis by the process of "fumigation," the compounds being volatilized by heat and allowed to precipitate upon the naked skin of the patient; calomel is also used for the same purpose. Mercuric oxide and ammoniated M. (white precipitate) are used only externally as gently irritant applications to sluggish sores. An acid solution of mercuric nitrate is used as a powerful caustic, and finally the yellow sulphate, or "turpeth mineral," is a prompt and non-nauseating but harsh and unequal emetic. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. EDWARD CURTIS, M. D.]

**Mercy, Sisters of**, a religious order founded in 1831 by Catharine McAuley at Dublin, adopted in 1835 the rule of St. Augustine, and was confirmed in 1840 by Pope Gregory XVI. After a preliminary postulancy of 6 months and a novitiate of 2 yrs. the Sisters become members of the order by taking the vows, binding for life, of poverty, chastity, obedience, and service of the poor, sick, and ignorant.

**Mer'edith** (WILLIAM MORRIS), LL.D., b. in Phila. June 8, 1799, grad. at the Univ. of Pa.; began legal practice about 1820; was much in public life in Pa.; sec. of the U. S. treas. 1849-50; atty.-gen. of Pa. 1861-67; presided over the Pa. constitutional convention; declined a position as counsel for the U. S. at the Geneva conference. D. Aug. 17, 1873.

**Mergus'ner**, a name given to several birds of the family Anatidae and the genus *Mergus*. The hooded M. of N. Amer. (*Mergus cucullatus*) is a beautiful water-fowl, known as hairy-head, water-pheasant, and hooded sheldrake. The red-breasted M., *M. serrator*, is common to both continents. They differ from the true ducks by their more slender bill.

**Mer'ida**, city of Mex., cap. of the state of Yucatan, 25 m. from the Gulf of Mexico, is handsome and well built, with a fine cathedral and univ., flourishing manufactures, and a brisk trade. A R. R. connects M. with the port of Progreso. Pop. 33,025.

**Mer'iden**, city, on R. R., New Haven co., Conn., 94 m. N. E. of New York. The growth of M. is due principally to its manufactures. The State Reform School is located here. Pop. 1880, 15,540.

**Merid'ian**, city and R. R. junc., cap. of Lauderdale co., Miss., 85 m. E. of Jackson, in heart of pine region of E. Miss., has 2 sems. M. was captured and partially burned by Gen. Sherman in Mar. 1864. Pop. 1870, 2709; 1880, 4008.

**Meridian of a Place**, the intersection of the earth's surface with a plane passing through the place and the earth's axis. It is a N. and S. line. If the plane of the M. of a P. is prolonged to intersect the celestial sphere, the line in which it cuts that sphere is the celestial or astronomical M. of the P. The *magnetic* M. of a P. is the intersection of the earth's surface with a vertical plane passed through the axis of a freely suspended magnetic needle at the place.

**Mérimée**, mā-re-mā' (PROSPER), b. at Paris Sept. 28, 1803; studied law and was admitted to the bar, but did not practice; held various positions in the civil service; succeeded M. Vitet in 1831 as inspector of the archaeological and historical monuments of Fr., and d. Sept. 23, 1870. He made his appearance in lit. in 1825 with *Théâtre de Clara Gazul*, which was followed in 1826 with *La Guzla*, a collection of lyrical poems. Both were pub. simply as translations, and for many yrs. the secret remained undiscovered; but their influence in propagating the ideas of the romantic school in Fr. was considerable. Afterward followed a series of novels or small romances, often based on some historical data, and delineating the character of the nation and the age with wonderful precision and vividness. *Colomba* may be mentioned as his masterpiece in this style.

**Mer'ivale** (CHARLES), D. D., b. in 1808, was ed. at Harrow, Halleybury, and St. John's, Cambridge, where he was a fellow, univ. preacher (1839-41), Hulsean lecturer (1861), and Boyce lecturer (1864-65); rector of Lawford 1848-70; chaplain to the speaker of the Commons 1863-67, and in 1869

became dean of Ely. He wrote *The Fall of the Rom. Republic*, *Hist. of the Romans under the Empire*, *Conversion of the Rom. Empire*, and *A Gen. Hist. of Rome*.

**Merivale** (HERMAN), C. B., D. C. L., elder brother of the preceding, b. in 1806, was ed. at Harrow and Trinity Coll., Ox., where he grad. in 1827; became a fellow of Balliol Coll.; was called to the bar at the Inner Temple 1832; was prof. of political economy at Ox. 1837-42; under-sec. for the colonies 1848-60; was perpetual under-sec. for India; author of *Lectures on Colonization*, *Historical Studies*, *Life of Sir Henry Lawrence*. D. Feb. 9, 1874.

**Meriwether** (DAVID), b. in Va. in 1755; served in the Revolutionary army; settled in Ga. in 1785; was several times a member of the State legislature; was M. C. 1802-07, where he was a prominent supporter of Jefferson, by whom he was appointed in 1804 a com. to the Creeks, and was associated with Gen. Jackson and Gov. McMinn of Tenn. in negotiating with the Cherokees the treaty of July 8, 1817, by which Ga. acquired a large terr. W. of Apalachee River; was a Presidential elector 1817 and 1821. D. Nov. 1825.

**Merle d'Aubigné**. See D'ARBIENÉ (J. H. M.).

**Mer'lin**, a little hawk of Europe, the *Falco aesalon*. It is swift and courageous, as well as docile in confinement, and was once extensively employed for hawking at small game. It is represented by the pigeon-hawk in the U. S.

**Merlin** (AMBROSIVS), an anc. Welsh prophet and enchanter, traditionally stated to have lived in the 5th century A. D. He figures largely in all the Arthurian poems from Spenser to Tennyson. A collection of prophecies ascribed to him were printed in Fr. in 1498, in Eng. in 1529, and in Lat. at Venice in 1554.—Another MERLIN, called *Caledonius*, or "the Wild," was said to have lived at Strathclyde in Scot. in the 6th century. He seems to have been a copy of his Welsh prototype.

**Mermaid** ("sea-maid"), an imaginary marine being, having the form of a woman to the waist, and ending in the tail of a fish. MERMEN, the males of this supposed species, are also described.

**Mer'oe**, the name of a modern dilapidated v., of an anc. city, and of an anc. kingdom in the upper valley of the Nile, above the fifth cataract. The v. is in lat. 17° N. The terr. of the kingdom was called an "island," bounded E. by the desert, W. by the Nile, and N. and S. by the Atbara and Azrek, the 2 main branches of the Nile. The country was noted for its fertility and wealth. The kingdom became prominent in the time of the Ptolemies. Pyramids and ruins of temples attest its former greatness. R. D. HUTCHCOCK.

**Me'rom**, the biblical name (Josh. xl. 5) for *Huleh*, a lake in N. Pal., triangular in form, the apex pointing southward, about 4 m. long, and at its greatest breadth 3½. The best description of it is in Macgregor's *Rob Roy*.

**Merovingians**, the first Frankish dynasty in Gaul, derived their name from Merwig or Merovæus. The most characteristic events in the hist. of the M. dynasty are the perpetual division and subdivision of the empire; the horrible feuds originated by the rivalry and hatred of Brunehild and Fredegonda, and the establishment of a peculiar office, that of *major domus*, which occasioned the overthrow of the dynasty in 752.

**Merrick** (JAMES), b. at Reading, Eng., Jan. 8, 1720, ed. at Trinity Coll., Ox., where he obtained a fellowship; took orders in the Ch. of Eng.; was author of *Poems on Sacred Subjects*, *Annotations*, *Critical and Grammatical*, on the Gospel of St. John, *The Psalms Translated or Paraphrased in Eng. Verse*, *Annotations on the Psalms*, etc. D. Jan. 5, 1769.

**Merrick** (JAMES LYMAN), b. in Monson, Mass., Oct. 11, 1803, grad. at Amherst Coll. 1830, and at Columbia Theological Sem. 1833; was a missionary to Per. 1835-45, and pastor of the Congl. ch. at Amherst, Mass., 1849 till his death. Wrote *Pilgrim's Harp*, *Life and Religion of Mohammed*, and a *Genealogy of the Merrick Family*. Translated *Keith on Prophecy* into Per., and left his property to found Per. scholarships in Amherst Coll. and Columbia Sem. D. June 18, 1866.

**Merrick** (PLINY), LL.D., b. at Brookfield, Mass., Aug. 2, 1794, grad. at Harvard in 1814; became a lawyer of Worcester, Mass., in 1817; practised also in Swanzy and Taunton; a judge of the common pleas 1843 and 1851, judge of a municipal court 1844, of the Mass. supreme court 1853-64; pres. of Worcester and Nashua R. R., and left large sums for benefit of schools of Worcester, Mass. D. Feb. 1, 1867.

**Merrill**, Wis. See APPENDIX.

**Merrill** (JOHN WESLEY), D. D., b. at Chester, N. H., May 9, 1808, grad. in 1834 at Wesleyan Univ.; studied divinity at Andover, Mass.; pres. of McKendree Coll., Lebanon, Ill., 1837-41; prof. of ethics, metaphysics, etc., in the Biblical Inst., Concord N. H., 1854-68; held various pastorates in the M. E. ch., chiefly in Mass.

**Merrill** (STEPHEN M.), D. D., b. in Jefferson co., O., Sept. 10, 1825; entered the O. conference in 1846; elected ed. of *W. Chr. Advocate* at Cin. in 1868; became bp. 1872.

**Merrill** (WILLIAM E.), b. at Ft. Howard, Wis., Oct. 11, 1837, grad. at W. Pt. 1859 at the head of his class, and appointed brevet second lieut. of engineers; first lieut. 1861, capt. 1863, and major 1867. Served in the c. war as assistant engineer in Va. and O., and subsequently as chief engineer of the Army of the Cumberland; engaged in the battles of Chickamauga, Missionary Ridge, Knoxville expedition, etc. until July 1864, when he was appointed col. of the engineer regiment of veteran volunteers, which he had organized, and with which command he was engaged in fortifying important points on the lines of military R. Rs. in Tenn., Ala., and Ga. Since the war he has served as chief engineer on the staff of the Lieut.-gen. of the army, and with his corps in the improvement of rivers, surveys, etc., in W.

**Merrimack**, Mass. See APPENDIX.

**Merrimack River**, in N. H. and Mass., is formed by the union of the Pemigewasset and Winnipisogee rivers at Franklin, N. H. It flows S. into Mass., where it curves toward the N. E., and reaches the ocean in lat. 42° 48' 27" N., lon. 70° 48' 46" W. On its banks are the cities of Concord,



Manchester, and Nashua, N. H., and Lowell, Lawrence, Haverhill, and Newburyport, Mass. It is a navigable tidal stream as far as Haverhill, 15 m.; above this point its channel is being fitted for navigation by the U. S. govt. At its mouth there is a bad and shifting bar. The river below the dam at Lawrence has valuable fisheries, but is chiefly important for its immense water-power.

**Merritt** (Wesley), b. in New York in 1836, grad. at W. Pt. 1860; brevet second lieut. of dragoons 1860, capt. 2d Cav. 1863. In the early part of the c. war he served on the staff of cav. commanders, and in Apr. 1863 accompanied Stoneman's raid to Richmond; was appointed a brig.-gen. of volunteers in June, and brevetted major the week following for Gettysburg and subsequent pursuit of the enemy; in 1864 was in command of a division under Sheridan, and subsequently at Opequan, Cedar Creek, and Fisher's Hill, where he won the brevet of maj.-gen.; at Five Forks, Sailor's Creek, and final surrender was distinguished, and promoted to be maj.-gen. from date of Five Forks. After the close of the war he was chief of cav. In various depts. till Feb. 1866, when he was mustered out of the volunteer service; in July following was appointed lieut.-col. of the 9th Cav., and subsequently served against the Indians on the plains. Became supt. W. Pt. 1882.

**Mersey**, a river of Eng., rises in the N. part of the co. of Derby, flows in nearly a westerly direction, expanding at Runcorn into a broad estuary, on the N. side of which is Liverpool, below which it joins the Irish Sea.

**Merthyr Tydvil**, town of Wales, in the co. of Glamorgan, on the Taff, is important on account of its iron-works and coal-trade. Pop. 48,857.

**Merton**, de (WALTER), b. at Merton, in Surrey, Eng., early in the 13th century; ed. at the convent of his native place; took holy orders; was appointed lord chancellor 1258, deprived of his office by the barons 1259, reappointed 1261, superseded 1263, and again reinstated in Nov. 1272; appointed bp. of Rochester Nov. 1274, when he resigned the great seal. He was reputed a man of great learning. D. Oct. 27, 1277. M. established at Basingstoke a hospital for poor travellers and decayed ministers, and founded at Ox. (Jan. 7, 1264) Merton Coll., gave it a further endowment in 1270, and saw it completed in 1274.

**Meru**, in Hindu mythology, was a fabulous mt. in the centre of the world, 80,000 leagues high, and surmounted by the heaven of Vishnu.

**Mescalita**, a river in Mex. emptying into the port of Zacatula on the Pacific. Rising in the state of Tlascala, as it passes Puebla it is known as the *Atoyac*, then as *Rio Pabiano*, and next as the *Rio de las Balzas*. With a gen. direction of S. S. W. and S., it is 450 m. long, and navigable in the last section, where it is locally known as *Rio Zacatula*. Engineers regard it as an important part of a practicable water-way across Mex. Its bed has furnished rich gold-placers, and it traverses a rich mineral region.

**Me'sha**, a king of Moab in the reigns of Ahaz, Ahaziah, and Jehoram, tributary to the kingdom of Israel, to which he annually paid "a hundred thousand wethers and a hundred thousand rams with their wool."

**Meshed**, city of Per., cap. of the prov. of Khorassan, situated on an elevated but fertile plain in lat. 36° 17' N. and lon. 59° 25' E. M. derives its importance from the circumstance that it contains the mausoleum of Imâm Riza, the founder of the Mohammedan sect of the Shi'ites. M. is a great trade-centre, and in several branches of industry its manufactures are celebrated; its carpets, shawls, light silks, and sword-blades are excellent; also certain kinds of earthenware, glass, and porcelain. Pop. about 60,000.

**Mesmerism**, Dr. Mesmer (b. 1733, d. Mar. 5, 1815) expounded in 1773 the results of certain experiments made by him, advancing the theory that some individuals might be rendered temporarily unconscious by others. He claimed that this state was a species of animal magnetism, and that the passage of powerful magnets over the surface of the body of some persons would induce in them a trance state. This condition received his name. About the same time Pusegine, his student, discovered somnambulism. For a number of yrs. it was looked upon as a species of witchcraft, and was forbidden by the Fr. and Ger. govts., and discontinued by the Ch. It was not till the yr. 1840 that the subject received proper attention. Before this it was considered dangerous to the morals of the people and productive of licentiousness. Notwithstanding its interest as a peculiar psychic state, it has been degraded and remained a comparatively unstudied subject. "Animal magnetism" is an ambiguous term. Science has demonstrated that a species of electricity is the product of the body, and is generated in the animal system. M. is based upon the predominance of one idea over all others. So absorbing is the fixation of the mind on this idea that the subject is unmoved by all outside influences. The first individual must resign or "give himself up" entirely, and simply be influenced afterward by the mesmerizer. This condition may be produced by looking fixedly at any small bright object held close to the face. After a few minutes the person will become very sleepy and the eyelids will droop. One of the most able and conscientious observers was Mr. Braid of Eng., whose system was known as *Braidism* or *hypnotism*, and Dr. Carpenter of Lond. testified to its feasibility and occurrence. When the mesmeristic state is produced there is a remarkable exaltation of one or more of the senses, so that the person mesmerized is very ready to receive suggestions implied by the tone of the voice, by the peculiar emphasis and manner of the mesmerizer.

A person mesmerized presents a peculiar appearance. There is first restlessness, faintness, and trembling, dilatation of pupils, and turning upward of the eyeballs, and finally sleep. The susceptibility of individuals varies greatly. A weak, nervous person or one possessed of sufficient faith is the best subject. It is very certain that all human beings exert a remarkable unconscious influence upon each other.

This theory of unconscious influence, a result of expectant attention, fully accounts for so called clairvoyance, mind-reading, M., and other astonishing performances. In all of the conditions "the directing power of the will is suspended, the intellect is in a state of exalted excitement, and the reflex power of the cerebrum stimulated. The mind is in a condition to receive ideas from outside, suggestions through the senses or evolved by the inner consciousness of the individual. In whatever mode the ideas have been brought before the consciousness, it is the essential characteristic of these states that the mind is entirely given up to that which may happen to be before it at the time; which consequently excites an uncontrolled directing power over the actions, there being no antagonistic agency to keep it in check." [From orig. art in *J.'s Unite. Cyc.*, by ALLAN McLANE HAMILTON, M. D.]

**Mesopotamia** [Gr. μέσος, "middle," and ποταμός, "river"], the name generally given in anc. times to the terr. lying between the Euphrates and the Tigris, and which the Arabs call *El Jezirah*, "the island."

**Mesozoic** [Gr. μέσος, "middle," and ζωή, "life"] Time, the great Reptilian Age of geol. which succeeded the Palæozoic and preceded the Cainozoic. It was divided into 3 periods—the Triassic (the oldest), the Jurassic, and the Cretaceous. In it the molluscan and reptilian types of animals began to decline. Palms and angiospermous plants, osseous fishes, birds, and mammals all first appear in the Mesozoic strata.

**Mesquite** (mes-keet') Grass, a name given in the S. W. U. S. to rich pasture grasses of the genus *Aristida*. They require a hard soil, without shade, and are of great value to stock-raisers where better grasses will not grow.

**Mesquite Tree**, the *Prosopis juliflora* or *Prosopis glandulosa*, a small thorny and gnarled tree, ranging from Tex. to S. Amer., of the order Leguminosæ, sub-order Mimosa. Its branches yield abundantly a gum which is a good substitute for gum arabic. The long pods abound in a thick, sweet, edible pulp. Both bark and wood are rich in tannic acid, and are excellent materials for tanning. *P. odorata* (screw mesquite), is thus called from its twisted pods.

**Messalina**. See APPENDIX.

**Messe'nia**, an anc. terr. of Gr., consisted of the S. W. part of the Peloponnesus, between the sea and Laconia. After 2 wars with Sparta (743-724 a. c. and 685-668 a. c.) the Messenians were subdued by the Spartans. When the power of Sparta was broken by Epaminondas, he restored the Messenians to freedom, and M. flourished anew as an independent state until conquered by the Romans in 146 a. c.

**Mes'ser** (Asa), D. D., LL.D., b. at Methuen, Mass., in 1769, grad. at Brown Univ. 1790, where he became tutor 1791, prof. of langs. 1796, of math. and natural philos. 1799, and pres. 1802, holding that position until 1836, when he resigned. He was licensed to preach 1792, and ordained 1801, but was never settled as a pastor. He filled several civil offices at Providence. D. Oct. 11, 1836.

**Messiah** is the name in the sacred Scripts, and in the usage of Jew and Chr. ascribed to that holy Person in whom the hopes of redemption centre. It is equivalent to the Gr. *Χριστός*, the Anointed. In the O. T. the person of the M. is ever involved in the future redemption. Hence we must treat of the M. under the more gen. head of *Messianic Prophecy*, the revelation of the fulfilment of redemption through the M.

MESSIANIC PROPHECY unfolds in the Mosaic, Davidic, and prophetic periods of biblical theol.

I. *The Mosaic Period*.—Immediately after the Fall, in the midst of the condemning sentences of God, the hope of redemption was planted as a seed wrapped up in the shell of the curse.

(1) The Protevangelium is a generic prophecy, bringing into contrast the seed of the woman and the seed of the serpent: the human race struggling, suffering, but finally victorious over the forces of evil. And as these forces of evil culminate at the end as well as the beginning in the serpent, the devil, so implicitly the human race is to be conceived as culminating in a personal head at the victorious end as well as at the sad beginning.

(2) As a new era begins with the departure from the ark, so there is an appropriate advance in the promise of redemption. The blessings of Noah rise up over against his curse. The blessing of Shem is the presence and indwelling of God, whose advent is promised to dwell in the tents of the Semites. Here the divine line of Messianic prophecy begins.

(3) Abraham's blessing unfolds the Protevangelium. It is a divine call, with the inst. of a covenant relation and a promise which includes a promised land, a promised seed, and a blessing to all nations through the seed.

(4) The patriarch Jacob on his death-bed divides the promised land among his sons, singling out Judah as the one through whom the covenant blessings especially unfold.

(5) On the arrival of Israel at Mt. Sinai, prior to the giving of the law, a covenant relation was established by which Israel becomes God's purchased possession, a kingdom of priests, and a holy nation.

(6) The same factor in the Abrahamic promise fully unfolds on another side through the foreign prophet Balaam, who sees a star or sceptre rising out of Jacob, subduing the nations far and near.

(7) Moses is the suitable organ of the final Messianic prophecy of this period. The mediator of his people, establishing the typical insts. of salvation and proclaiming a divine law, which was no less prophetic, he was in his own person the most appropriate type of the prophet who was to fulfil his work, his insts., and revelations.

II. *The Davidic Period*.—A new era begins with the organization of the kingdom of David and the establishment of the religious and political centre at Jerusalem.

A. *The Davidic Psalms*.—(1) Ps. ex. cites a divine oracle and oath, and from these as a basis represents the M. going



forth to battle, engaged in the struggle, and triumphant. The typico-prophetic viii. psalm presents the ideal man, made to fall a little short of the divine, destined to have dominion over all creatures.

(2) Ps. lxviii. describes Jehovah's march and conquests, with the blessings of his advent, with a more gen. reference to all Israel, while in Ps. xviii. this gen. reference arises out of a particular reference to hist. of the Psalmist himself.

(3) A group of Messianic psalms arises from David's experience of suffering as an innocent victim of unjust persecution. They describe sufferings which transcend anything in David's historical experience. In the depths of his own sorrows David comes to woes of which he has an ideal experience through foreboding and presentiment in anxiety respecting his son.

(4) The hopes of the Psalmist of communion with God after death in the typical Ps. xxxi. 5, xvii. 15, and xvi. 9-11 become typico-prophetic in his experience of preservation from corruption in the grave and life in the divine favor.

B. *Psalms of Solomon and his Singers.*—(1) In Ps. ii. the M. is represented calmly seated at the right hand of Jehovah on Mt. Zion, in the relation of sonship. Ps. lxxii. presents the aspirations of the M. and their realization. Ps. xlv. represents the M. espousing the nations through the type of the marriage of Solomon with Pharaoh's daughter.

(2) A group of psalms describes the reign of Jehovah in the holy city—viz. Ps. xlii. xlvii. xlviii. and lxxxvii.

C. Psalms reflecting the sad experience of the disastrous times of Rehoboam, which the aged singers pour forth in mournful strains of plaintive expostulation and yearning for Jehovah's advent.

III. *The Prophetic Period* begins with the decline of Israel, and is subdivided by the stages of that decline.

*Stadium 1st.*—(1) Joel declares the advent of Jehovah. (2) Amos represents the house of David, which has been reduced to a ruined hut, as rebuilt.

(3) Hosea carries out the idea of the Pentateuch, that idolatry is whoredom, in 3 symbolical transactions.

*Stadium 2d.*—Israel having gone into exile, the moral struggle is more immediately about Jerusalem as a centre until the exile of Judah. There are 2 revivals, accompanied with Messianic prophecies—one in the reign of Hezekiah, the other in that of Josiah. The former (1) is introduced by Micah. (2) Isaiah, the greatest of all prophets, takes up the entire body of previous Messianic prophecy in order to reproduce it in new forms and fresh development. The second revival under Josiah has its Messianic prophets, Habakkuk, Zephaniah, and Jeremiah, the 2 former merely reproducing the ideas of Joel and Isaiah, Jeremiah giving a new advance.

*Stadium 3d.*—The period of the exile and restoration is rich in Messianic prophecies, which assume the symbolical and apocalyptic form. Ezekiel develops both sides of the subject. Daniel represents the kingdoms of the world in conflict with the kingdom of the M. The restoration is accompanied by the prophets Haggai, Zechariah, and Malachi.

The advent began with the birth of Jesus Christ, and continues throughout these latter days of the dispensation of grace until the second advent in glory at the end of the world. This distinction of advents is not made in the O. T., but first by the advent itself and the prophecies of Christ and his apostles. Hence, while the first advent fulfils all those references on the divine side to the outpouring of the Spirit, the establishment of a new covenant with new insts. of salvation, and the growth of the kingdom under Jehovah's favor, and on the human side to the more humble features, as of the prophet like Moses, the suffering servant of Jehovah, etc., yet the great mass of Messianic prophecy is referred by the N. T. writers to the second advent—on the divine side in judgment, on the human side in glory. And yet the human and the divine lines, which in the O. T. remain ever apart, converge in Jesus Christ the God-man at his first advent, who in his first state of humiliation and his final state of glory either has fulfilled, or is yet to fulfil, all the law and the prophets. (See NEUMANN, *Die messianischen Erscheinungen bei den Juden.*) [From orig. art. in *J.'s Univ. Cyc.*, by Prof. C. A. Briggs.]

**Messina**, mes-see'nah, a large seaport town of Sic., which gives name to the prov. It lies in lat. 38° 17' 38" N., lon. 15° 35' E., and rises amphitheatre-like from the sea, backed by the rocky extremity of the Siculo-Calabrian Apennines. The harbor of M., the largest and safest in the kingdom of It., is deep, spacious, well furnished with quays, and defended by a fort and citadel. Having suffered so often from earthquakes and bombardments, it now consists in the main of fine new buildings, with well-paved streets and spacious squares, flanked by stately palaces and adorned with fountains and statues. It existed as a town long before the foundation of Rome. It suffered during the Punic and the Rom. c. wars, also from the Goths and the Saracens. In 1282, 12,000 Frenchmen perished here in the Sicilian Vespers. In 1848 M. threw off the Bourbon yoke, but was reduced to submission. In 1860 it was restored to liberty by the arms of Garibaldi. Pop. 126,496.

**Messina Strait**, of It. *Faro di Messina*; Lat. *Mamer-tinum fretum*), a narrow channel of water connecting the Ionian and the Tyrrhene seas, and dividing Sic. from Calabria; length 26 m., greatest width 12 m., least 2 m.

**Mestizo**, mes-tee'zo [Sp. "mixed"], in Sp. Amer., a half-breed, the offspring of a white father and an Indian mother. The white characters usually predominate.

**Metallurgy**, met'al-lur-je (Gr. *μεταλλουργός*), is the science and art of preparing metals from their ores; and the "metallurgist" is strictly one who prepares metals from their ores, and performs in addition operations necessary to the production of a finished raw material.

The minerals from which the useful metals are obtained do not form more than  $\frac{1}{100}$ th of the earth's mass, so far as known. The basic elements of the remaining 99 per cent. include such metals as aluminium, sodium, potassium, etc.,

which, though employed to a limited extent, are not technically classed among the "useful metals." At present, iron, copper, lead, zinc, tin, silver, gold, mercury, nickel, antimony, bismuth, and perhaps platinum, may be ranked among the useful metals; while arsenic, potassium, sodium, aluminium, and magnesium have found some application, though a very limited one in the case of the last.

The science of M. includes the processes for obtaining all the metallic elements, but in practice the art of M. is restricted to the production of the useful metals alone. Those minerals which contain enough metallic base to make its extraction profitable are called *ores*. It is rare to find an ore consisting entirely of the metal-bearing mineral, other non-metallic minerals being nearly always mixed mechanically with it. This useless rock is technically known as the "gangue." Two general kinds of gangue are distinguished: First, earthy gangue, which is either acid, from a preponderance of silica, or basic, when lime, magnesia, alumina, and iron most frequently occur. In this case 2 methods of removing the associated rock may be used. One is mechanical, the ore being crushed fine and passed through machines which cause a separation of the heavy ore from the lighter gangue by virtue of their different specific gravities; or by subjecting the crushed ore to some uniform force which affects the 2 minerals differently. The other mode of separating the gangue is by fusion with fluxes. A "flux" is any substance which will make the ore fusible and fluid at temperatures which are within our control. The second kind of gangue is one that consists of a metal-bearing mineral, with which is associated the mineral containing the object of the metallurgist's labors. Among metals occurring in this manner the most frequent examples are tin, copper, lead, nickel, gold, silver, and others in pyrite (a bisulphide of iron).

Most ores consist of both earthy and metalliferous minerals, and therefore require both mechanical and chemical processes for their treatment. Three general classes may be recognized by the character of the negative element combined with the metal: (1) Native metals, in which no acidifying element occurs. These native metals are, however, never pure, but are always alloyed. They are gold, silver, copper, platinum, and bismuth. (2) Sulphides, or compounds of the metal with sulphur as the negative element. Copper, lead, silver, mercury, iron, antimony, nickel, and zinc form such compounds. (3) Oxides, which form by far the largest and most important class. Iron, copper, lead, tin, zinc, and all the rarer metals belong to it. Many metals occur in 2 or in all 3 of these classes.

The processes by which a metal is extracted from its ore are not governed by the metal itself, but by the negative element with which it is combined. In carrying out these different processes a great variety of reactions are employed. Two grand modes of producing these reactions are employed, the dry and the wet. In the former the fluidity necessary for the free action of the substances employed is obtained by heat; in the latter, by solution in a liquid. These 2 modes are often combined in treatment of an ore.

The *metallurgy of the native metals* consists usually in a combination of mechanical and chemical processes. When the ore occurs in a vein, as copper, and sometimes gold and silver, the vein-rock must be crushed fine; and the most common apparatus for this work is the stamp-mill. The succeeding operations are intended to effect the separation of the metallic grains, either by means of gravity or by taking up the metal (in the case of gold and silver in mercury). Several modes of utilizing the force of gravity are employed. One of the most common is to run the stream of "slime" (the ore and water) over coarse blankets. The metal, being heavier than the rock, sinks to the bottom of the stream, and is caught in the meshes of the blankets, from which it is afterward removed by washing them in a tank of water. Many other mechanical methods of separation are also used. When mercury is used, as in the case of gold and silver ores, the operation is known as "amalgamation." A large part of the gold and all of the platinum obtained is found in sands and deposits of gravel. In this case the stamp-mill is not needed. Of the metals so far considered, native copper and platinum are obtained only by washing, gold and silver by washing or amalgamation.

Next to these processes in point of simplicity is the *metallurgy of the oxides*. These ores include the most important metals known, such as iron, copper, lead, tin, and zinc. With the exception of iron, all of these are used pure in the arts, and the mode of treating the ores is to heat or fuse them in direct contact with the fuel. The affinity of carbon for oxygen is so strong at high temperatures that the elements in the ore are dissociated, the oxygen uniting with the fuel and passing off as a gas, leaving the metal to run out in a fluid state. Most ores give up their oxygen at the comparatively low temperatures afforded by the common "shaft furnace." Ores of iron, which are more "refractory"—that is, do not give up their oxygen with the same ease—require "blast furnaces." The product of the blast furnace is always a carbide of iron, called pig iron. Iron ore being a compound of iron and oxygen, and pig iron being a compound of iron and carbon, it is evident that the work of the blast furnace consists in removing the oxygen from the ore and substituting a small amount of carbon in its place. Zinc differs from the other oxides in being volatilizable at high temperatures, and it is therefore obtained by "distillation." The ore is ground fine, mixed with a pure carbon-fuel, like charcoal or anthracite, and placed in a tube made of fire-clay. This is heated to whiteness, at which temperature the carbon attracts the oxygen of the ore, leaving the zinc to distil off as metal. In front of the tube are placed condensers of clay and sheet iron, in which the metal collects.

The *metallurgy of the sulphides* is more complicated than that of either of the above classes. The metals of this class are (1) volatilizable and (2) non-volatilizable. The former



include mercury and zinc. The compound of mercury and sulphur, cinnabar, is not stable at high temperatures if sufficient air is present, the sulphur oxidizing and leaving the metal free. The ore is therefore heated to redness with access of air, when the mercuric sulphide distills off, and in doing so breaks up into mercury and sulphurous acid. The vapor so breaks up through large chambers, where the metal condenses and runs out. The sulphide of zinc, called blende, is converted to oxide by "roasting." It is then treated like the oxide.

In the treatment of the non-volatilizable metals 3 general processes are followed: (1) Roasting and reaction; (2) roasting and reduction; (3) precipitation. The first two depend upon the removal of the sulphur by roasting; and this operation, which is exactly the opposite of reduction, has a "reverberatory furnace," which is in all respects the exact opposite of the shaft-furnace. Roasting and reduction consists in allowing the oxidation of the ore to become complete, and then treating the product as above described for the oxide class. Lead, copper, antimony, nickel, and iron are obtained by this method.

The outline of metallurgical practice here given relates only to the most general principles. It is rare that an ore can be smelted at once to metal of purity sufficient for its immediate use in the arts. A refining process is almost always applied to the metal; and very often the process of smelting is lengthened out by making each operation incomplete, and thus obtaining the metal by a gradual elimination of the elements combined with it. The reason for this is, that the impurities are always more volatilizable or more oxidizable, or their oxides are more reducible, than the metal itself, and by repeatedly subjecting the compound to operations which affect its constituents in different degrees a complete separation is effected. The metal is often combined with some element that admits of perfect subsequent separation, and this compound is then passed through the purifying operations, in which there is a gradual concentration of the metallic base. The element employed for this purpose is sulphur.

The products of the fusion of an ore are threefold: (1) That containing the metal. This may be either metallic or a "matte" when it contains sulphur, or "speise" when it contains much arsenic or antimony. (2) That containing the gangue and fluxes; it is the stony part of the ore melted to a glass, and is called "slag" when the bases are chiefly non-metallic, and "cinder" or "scoria" when the base is chiefly a metallic oxide. (3) The gaseous products, which, beside the products of combustion, contain the oxygen of the ore and such other constituents of it as are volatile. At the present day the most prominent question in M. is the economical use of fuels. Great care is taken in large works to make useful every element in the ore that has a market value. To this end, metallurgical establishments are now large manufactories of sulphuric acid, arsenic, iron, and copper vitriol, such paints as zinc white, smalt, etc. The most noticeable instance of this economy is the manufacture of sulphuric acid from pyrite, a bisulphide of iron.

The wet method of treating ores consists in bringing the metal into solution, and then precipitating it by some agent. Sulphuric and hydrochloric acids are those usually employed. Examples of such treatment are mostly confined to the M. of gold, platinum, and bismuth, all high-priced metals. The most usual mode of accomplishing solution is employed with the sulphides, which are carefully roasted in such a manner that the product is not an oxide, but a sulphate of the metal to be extracted. The roasted material is then treated with water, which dissolves the sulphate, leaving the oxides, and the metal is then precipitated by some reagent. Copper precipitates silver, and iron precipitates copper. Copper, silver, and nickel are the metals most frequently extracted by the wet way, but it is also applied to gold, platinum, and bismuth. For poor ores it is usually much cheaper than the dry method, but when the ore is rich, or if the gangue is a substance soluble in acid, the use of acid and labor may be so great as to make the dry method preferable. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. J. A. CHURCH.]

**Met'als** [Gr. μέταλλον]. The elementary bodies known as the metals are especially characterized by their peculiar and generally high lustre, known as the metallic lustre; by very great opacity; and, with few exceptions, by their high specific gravity. The color of the M. is generally white, although of various tints; zinc and lead having a bluish, bismuth a reddish, and calcium a yellowish tint. Gold is yellow, and copper red. The M. have generally a high specific gravity, but potassium, sodium, and lithium are lighter than water, while magnesium and aluminium have a specific gravity of 1.75 and 2.56 respectively. Of the others, the more important vary from arsenic at 5.88 to platinum at 21.5. **Malleability**, or the property of flattening more or less under pressure or blows, is possessed by a large number of the M. Related to malleability is **ductility**, the property of being drawn into wire; but as this depends partly on the power of resisting a strain, or tenacity, the most malleable M. are not necessarily most ductile.

**Conductivity of Heat**.—Silver, 1000; copper, 736; gold, 532; tin, 145; iron, 119; lead, 85; platinum, 84; bismuth, 18. The linear expansion of metal rods by heating from 0° to 100° C. is expressed by the following fractions: Iron,  $\frac{1}{810}$ ; gold,  $\frac{1}{682}$ ; copper,  $\frac{1}{584}$ ; silver,  $\frac{1}{594}$ ; lead,  $\frac{1}{351}$ ; zinc,  $\frac{1}{333}$ . Platinum expands only  $\frac{1}{1167}$ .

The fusibility of the M. covers a very wide range, mercury being liquid at ordinary temperatures, and platinum requiring the heat of the oxyhydrogen blowpipe for its liquefaction. Osmium is the most refractory of the M., volatilizing without fusing at a temperature capable of volatilizing platinum. The fusing points of the following M. are: Mercury, 39.44° C.; tin, 227.8°; cadmium, 228°; bismuth, 258°; lead, 325°; zinc, 412°; silver, 1023°; copper, 1091°; gold, 1252°; cast iron, 1530.

**Volatility**, or the property of assuming the gaseous state, is known to be possessed by most of the M., and is probably a property of them all. In hardness the M. vary at ordinary temperatures from the fluid mercury and soft, waxy potassium to the exceedingly hard chromium and manganese, capable of scratching glass and hardened steel.

The M. are found both free and combined in nature. Gold and platinum almost invariably occur free. Mercury occurs mainly as sulphide, and sometimes metallic. Silver is often found native, but more generally as sulphide. Copper mainly as sulphide, generally with sulphide of iron, also very commonly as carbonate and oxide, and in a few localities large deposits of native copper are found. The iron ores are the oxides and carbonate. Lead occurs mainly as sulphide, but the carbonate is also an important ore. Tin is found as oxide; the sulphide is a less esteemed ore, although abundant in the Eng. mines. The most valuable zinc ores are the carbonate and sulphide; the oxide is less abundant. Nickel and cobalt occur chiefly as arsenides and sulphides; bismuth, antimony, and arsenic are found combined with sulphur, and also native, in sufficient quantities to be worked. There are 49 of the elements universally considered as M., tellurium, which is sometimes reckoned as the 50th, being generally classed among the metalloids with selenium, to which it bears close relations.

**Specific Gravities of Metals at 15.5° C.**—Platinum, in thin wire, 21.50; gold, 19.50; uranium, 18.40; tungsten, 17.60; mercury, 13.59; palladium, 11.30-11.80; lead, 11.45; silver, 10.50; bismuth, 9.90; copper, 8.96; nickel, 8.80; cadmium, 8.70; molybdenum, 8.63; cobalt, 8.96; manganese, 8.00; iron, 7.79; tin, 7.29; zinc, 6.86-7.1; antimony, 6.80; arsenic, 5.88; aluminium, 2.56-2.67; magnesium, 1.75; sodium, 0.972; potassium, 0.865; lithium, 0.593. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. H. B. CORNWALL.]

**Metaphysics** is the science of cognitions for which no other evidence can be given than their logical necessity.

**Met'calf** (THERON), LL.D., b. at Franklin, Mass., Oct. 16, 1784, grad. at Brown Univ. 1805; became a reporter of the Mass. supreme court in 1839, and was one of its judges 1848-65; author of numerous vols. of legal reports, digests, etc., and ed. of important legal works, especially *Digest of Cases in the Mass. Supreme Court*, and *Metcalf's Reports*, 1840-49. D. Nov. 13, 1875.

**Met'calfe** (THOMAS), b. in Fauquier co., Va., Mar. 20, 1780, removed in early youth to Ky., where he was bred a stone-mason; became a political orator in 1809; fought at Ft. Meigs in 1813, and was thenceforth much in public life; was M. C. 1819-29, gov. of Ky. 1828-32, State senator 1834, pres. of the board of internal improvement 1840, U. S. Senator 1848-49. D. Aug. 18, 1855.

**Metel'lus**, the name of a Rom. family belonging to the plebeian gens Cæcilia, distinguished as much for the virtue as for the talents of its members. It first became known in hist. during the first Punic war, when Lucius Cælius Metellus was elected consul in 251 B. C., and it seems to have become extinct at the beginning of our era. Its most conspicuous members were (1) QUINTUS CÆCILIUS METELLUS MACEDONICUS, who defeated the Macedonians in 148 B. C. and the Achæans in 146 B. C.—(2) QUINTUS CÆCILIUS METELLUS NUMIDICUS, who fought successfully in 108 B. C. against Jugurtha, king of Numidia, but was superseded by Marius.—(3) QUINTUS CÆCILIUS METELLUS CÆLER, who was prætor in 63 B. C., and contributed to the suppression of the conspiracy of Catiline.

**Metempsychosis**, me-temp-se-kō'sis [Gr. μετά, "after," and ἐμψύχω, to "vivify," to "animate"], the transit of the soul from one stage of being or life to another. As the belief that the soul after death appears again in animals or in men and women is spread all over the world, it would appear to be the first form in which the idea of immortality occurs to man. The early Egyptians saw in it an explanation of the sufferings endured by many men on earth, which sufferings were otherwise inexplicable. But it was in India that M. was most ingeniously and extensively developed. To the pure theism of the early Jews and Arabs, or of the Shemitic race, who simply held that God directly made and willed all things, the idea of M. was utterly opposed. Consequently the O. T. contains no trace of the transmigration of souls. But after the building of the second temple foreign speculation and superstition flowed in on them freely. The *Gilgul Neshamoth*, or theory of M., forms an important doctrine in the Cabala, and ere long a mass of wild and beautiful legends arose to illustrate it. The Grs. derived the doctrine of M. from teachers who had taken it from Egypt or India. Tales had taught it at an early period, and it was subsequently greatly developed by Pythagoras, Plato. There is, in fact, every reason for believing that there were no religious or spiritual systems of antiquity which did not eventually include M., strange as it appears to us at the present day. Gnostics and Manichæans welcomed it, and the more mystical of the Ch. Fathers found in it a ready explanation of the fall of man and the doctrine of evil spirits. It passed from the E. through such insts. as the Caïrene House of Light and the Knights Templars, into the obscure sects of the Middle Ages in Europe. The Taborites, an extreme branch of the Hussites, are said to have believed in transmigration. [From orig. art. in *J.'s Univ. Cyc.*, by C. G. LERLAND.]

**Met'eorite, Meteor'olite, or Aërolite**. These are used synonymously to denote a solid body that has fallen from the heavens. Of the three, meteorolite is perhaps the most correct and expressive, being derived from the Gr. μετέωρα, a "meteor," and λίθος, a "stone." It is not to be confounded with those small luminous bodies that flash across the sky every bright night, visiting us in large numbers at stated periods, and called shooting stars; for these last are doubtless composed of very attenuated matter, and never leave any solid residue behind them. A genuine meteorite may flash across the sky, become visible, and yet pass on without sending to the earth any evidence of its



true character; but it is very doubtful if one of these bodies ever became entangled in our atmosphere without ultimately falling to the surface of the earth and constituting an addition to our globe. These bodies have been observed to fall in all ages of the world, and doubtless the earliest account we have of any one of them is to be found in the 11th v. of the 10th chap. of Josh.; at any rate, the phenomenon referred to in that v. can be interpreted by reference to some of the more modern falls of meteoric stones. But one of the most remarkable falls recorded in anc. hist. is that of the Thracian stone mentioned by Pliny in the 58th chapter of his second book of nat. hist. It fell near *Ægospotamos* in Thrace 467 B. C. Pliny describes it as being as large as a cart (which, however, gives us a very indefinite idea of its size, the carts of those days being much smaller than those now in use); he describes it also as being of a burned color. It was held in veneration by the inhabs. of the country, and the time of its fall served to fix the period of certain important events, as evidenced by the following statement to be found in the *Parian Chronicle*: "From the time when the stone fell at *Ægospotamos*, and the poet Simonides, who d. at the age of 90 during the archonship of Theagenides at Athens, is 205 yrs." Another anc. and memorable meteoric fall is now at Mecca; for the celebrated black stone, *Hajar el Aswad*, that forms an object of adoration of the pilgrims to the Kaaba at Mecca, is doubtless one of these bodies; and some think, with very good reason, that the image which fell down from Jupiter (referred to in the 35th v. of the 19th chap. of Acts), and was worshipped by the Ephesians, was also an aërolite. [From orig. art. in *J. S. Univ. Cyc.*, by PROF. J. LAWRENCE SMITH, LL.D.]

**Meteorology** (Gr. *μετεωρολογία*), the science that treats of the earth's atmosphere and its relations to all the various features of the weather. A distinction is properly made between meteorology and climatology, in that the latter deals with the condition of the atmosphere at the surface of the dry land, in so far as it influences animal or vegetable life, while M. extends its scope to the whole atmosphere, over the ocean as well as over the land, at great as well as at small elevations, and deals with mechanical and physical problems that are foreign to climatology.

**Temperature and Moisture.**—In dealing with the phenomena of the atmosphere deductively, we have to begin with the consideration of the density of the air, the inequalities of which are the direct cause of the gen. currents as well as of the local winds. Given the distribution of density, and the resulting currents of air should be deducible by the laws of mechs. This density depends upon temperature, aqueous vapor, and pressure. The temperature may be regarded as regulated by, first, the radiation from the sun, subject to the absorption of such solar atmospheres or other envelopes as may exist; second, the absorption by the air of the heat radiated into it from the sun, either directly or after reflection from the earth or clouds; third, the radiation into space of the heat thus received from the sun; fourth, the mutual conversion of heat and molecular work. The amount of heat annually received from the sun is probably not constant. Köppen seems to have shown that the quantity of heat received increases and diminishes to a slight extent parallel with the increase and diminution of the solar spots. It follows, therefore, that there is a slight secular change, while other investigations show that there are also sensible hourly changes in the intensity of solar radiation. Neglecting these smaller changes, Sir William Thomson finds that the average quantity of heat received by the earth from the sun, converted by Joule's unit, is, for an area of 1 square foot exposed perpendicularly to the direction of the solar rays, 83 ft.-lbs. per second. This number relates to the heat received at the outer surface of our atmosphere. The quantity absorbed by the atmosphere will depend upon the chemical const., or the mechanical purity of the atmosphere at that place, and upon the thickness of the stratum of air traversed by the solar rays; which thickness depends principally upon the lat. of the station and the apparent altitude of the sun above the horizon. For the lat. of Paris, from various measures made in different parts of the world, it may be concluded that on the driest, clearest days 15, but on ordinary days 25 per cent. of the solar heat is absorbed by the atmosphere before the rays reach the earth, the sun being supposed in the zenith. The solar radiation diminishes in a geometrical ratio as the thickness of the absorbent increases in an arithmetical ratio. It is therefore possible to express pretty approximately the law of diminution of the heat received from the sun with the increase of the zenith distance of that luminary. As a result of careful calculations it appears that of the total amount of heat received by the entire earth during the yr. from the sun, only about 0.66 reaches its surface, even on the assumption of a uniform cloudless sky. If, however, we consider that the average cloudiness of the entire globe is not far from  $\frac{6}{10}$ , it is evident that we must diminish this number to  $\frac{4}{10}$  of its present value; from which it appears that in the average condition of the atmosphere, so far as our observations have made it known to us, about  $\frac{27}{100}$ ths, or  $\frac{1}{4}$  of the solar radiation that is incident upon our atmosphere, actually reaches the surface of the ground. Of the work done by the  $\frac{73}{100}$ ths which is absorbed by the atmosphere, but little account has been taken, thus far, in M. Doubtless, its most important function is the performance of molecular work—viz. the preservation in an invisible state of that aqueous vapor which, if allowed to condense into cloud, would cover the whole earth with a perpetual canopy of fog. Of the  $\frac{27}{100}$ ths that reach the earth's surface, we may consider that almost the whole of it penetrates the earth or water on which it falls, and is retained there for a greater or less period—some only for a fraction of a second, some for many days. A small portion of the heat received at the surface of the solid earth is, by conduction, conveyed toward the interior so long as the latter is cooler than the surface. The larger portion of the heat is, how-

ever, immediately (and the whole ultimately) given by radiation (as ultra red rays) back to the adjacent or lowest stratum of air, while a very sensible quantity is absorbed in various chemical and organic processes, of which those of prin. importance to M. are the evaporation of water, ice, or snow and the development of vegetable growth. The radiative and conductive powers of the various components of the earth's surface are, however, not sufficient thus immediately to relieve the surface of all the heat received from the sun; the temperature of the soil consequently continues to increase, at least in clear weather, so long as the sun remains near the meridian. The surface of the earth, therefore, continues to warm up the lowest stratum of the atmosphere until a considerable time after the sun has passed the meridian, and until the combined amount of heat received at the surface, both from the sun and from the next lowest stratum in the earth, equals its own combined evaporative and radiative power.

The results of the processes of radiation may be approximately said to be—(1) The land is warmed more rapidly and cooled more rapidly than the ocean. (2) The air in contact with the land receives its heat more rapidly than that in contact with the ocean. (3) The air over the ocean or over fields of snow or over regions covered with heavy vegetation receives more moisture than that over the arid portions of the earth. (4) Those portions of the lowest stratum of atmosphere which are specifically lighter are forced by the surrounding heavier gas to rise, in doing which they allow the neighboring air to flow in, producing winds or currents, while the rising lighter portions expand, thereby consuming a portion of their superabundant heat in molecular work, and losing a greater portion by radiation to the colder strata about them. (5) It is by the conductive process referred to in the last paragraph that it becomes possible for the heat received at the earth's surface to be dissipated into empty space. (6) The total movement of the atmosphere as measured at the surface of the earth in units of force must, on the average of the yr., be nearly equivalent to the mechanical equivalent of the total amount of heat received by the surface of the earth, or  $45 \times 10^{16}$  ft.-lbs. per second. (7) When over a given region the sun's direct heat is entirely, or almost entirely withdrawn, and radiation from the earth's surface has continued to deplete its store of heat, until it is no longer able to heat up the lowest stratum of the superincumbent atmosphere to a temperature above that of neighboring regions, that layer of air ceases to have any buoyant power, and remains lying quietly on the earth's surface; which quiescence, however, does not hinder the transmission through it of radiations from the surface of the earth. This may continue at least until an equilibrium is established between the temperature of the ground and the temperature of the entire mass of air above it; and long before this point is reached it usually happens either that the sun rises or that either dew or hoar-frost forms on the surface of the ground, or else fog forms in the air immediately above, or, more frequently still, layers of strati or cirri cloud form in the higher atmosphere. In either of these latter cases the fog or cloud, acting as a covering to the earth's surface, neutralizes any further radiation therefrom. (8) The capability of the earth and atmosphere at any season or any place, to convey away the heat received by them is approximately shown by the interval elapsing after noon at which the maximum of the temperature takes place, and by the range between the maximum temperature of the afternoon and the minimum temperature in the morning; or, still better, by the interval of time elapsing between such maximum and minimum. (9) The study of local winds is thus seen to be a mechanical problem whose data are local topography, etc.

**The Movements of the Air.**—Were the earth or air perfectly quiescent, meteorological phenomena would be reduced to the most absolute uniformity; the variations introduced by the movements of the air, as primarily due to the varying densities of its various parts, and as affected by the rotation of the earth, constitute the most prominent phenomena of the weather. The influence of the rotation of the earth has, since the enunciation by Hadley (1735) of his theory of the trade-winds, been more or less imperfectly taken into account by numerous writers. But both in respect to priority and in fulness of detail, as well as in the comprehensiveness of their scope, the works of Prof. William Ferrel of Wash. are pre-eminent, and especially worthy of our attention, as they have served to establish on a firm foundation the dynamics of M. He says: "There are 4 principal forces which must be taken into account in a correct theory of the winds. The first arises from the greater specific gravity of the atmosphere in some places than others, on account of its condition as to temperature and the dew-point. . . . This is the *primum mobile* of the winds, and all the other forces concerned are dependent upon it for their efficiency. A second force arises from the tendency which the atmosphere has, under the influence of gravity, when from any cause it has risen above the general level, to flow to places of a lower level. These 2 preceding forces generally produce counter-currents. Again, when a particle of air has been put in motion toward the N. or S., the combination of this motion with the rotatory motion of the earth produces a third force, which causes a deflection of the motion to the E. when this motion is toward the N., and a deflection to the W. when it is toward the S. . . . The fourth and last force arises from the combination of a relative E. or W. motion of the atmosphere with the rotatory motion of the earth."

The subdivision of each hemisphere into continental and oceanic areas introduces further complications into the systems of winds and pressures; thus, for instance, over the N. Atlantic and N. Pacific oceans the regions of maximum pressure and of calms lie to the southward of the corresponding regions over the continents. Moreover, the belts of maximum pressure are most clearly perceived when the



movements of the air meet with the least resistance. They are, therefore, in both hemispheres, pushed over to the E. sides of the oceans. It is not possible in this brief introduction to deductive M. to detail the laws partly belonging to mechanics and partly to molecular physics that lead to the minor phenomena of diurnal barometric variations, formation of rain and snow, etc. Equally difficult would it be to give here any satisfactory account of the methods, partly philosophical, but principally empirical, by means of which the information given daily on the synoptic weather-maps of Europe and Amer. is made available for the prediction of the weather 12 or 24 hours in advance. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. CLEVELAND ARBE.]

**Meteors.** The word *meteor*, from the Gr. *μετεωρος*, means a "thing in the air" or "above the ground." It has been used to denote many different objects and phenomena, generally of short duration, that have their place in the atmosphere. Thus, there are *aërial M.*, as winds, tornadoes, etc.; *aqueous M.*, as fogs, rain, snow, hail, etc.; *luminous M.*, or those due to the action on light of elements in the air, as rainbows, halos, parhelia, mirages, etc.; *electrical M.*, as lightnings, auroras, etc.; and *igneous M.*, as shooting or falling stars, star-showers, bolides or fireballs, aërolites or meteorites, etc. In present usage the term *meteor* is generally limited to the last group, or to the igneous M.

**The Meteors are Astronomical Phenomena.**—It is now universally admitted by astronomers that igneous M. are caused by small bodies called *meteoroids*, which have been travelling about the sun in their orbits, but now come into the earth's atmosphere, and, in general, burn up.

**Star-shower of Nov. 13.**—On the morning of Nov. 13, 1833, from about 3 o'clock till daylight, large numbers of shooting stars were seen throughout the W. hemisphere. The very important fact was noticed that wherever the observer might be, the paths of the M. across the sky were always directed from a point in the constellation Leo, and that this point kept its place among the stars notwithstanding the earth's rotation. This fact could be explained only by assuming that the paths of the M. through the air were parallel to each other, and were directed from the constellation Leo; also that the M. were of cosmical not of terrestrial origin. Further research established that there had been star-showers on the following earlier dates:

Nov. 13, 1832;	Oct. 25, 1593 (O.S.);	Oct. 15, 1002 (O.S.);
" 12, 1698;	" 23, 1366 "	" 14, 994 "
" 9, 1698;	" 19, 1302 "	" 15, 981 "
Oct. 18, 1602 (O.S.);	" 17, 1101 "	" 13, 902 "

These dates show a cycle of about 33 yrs., with a change of date of about 3 days in a century, the apparent change of 12 days in the 17th century being due in the main to the difference between old and new style. The cycle, the change of date, and the radiation all implied that the M. belonged to a group of bodies revolving about the sun in similar elliptic orbits. It was also found that only 5 possible orbits could explain the cycle and the radiation, and that one, and only one, of these explains the change of date. This is an orbit whose period is 33½ yrs., inclination 17° 45', eccentricity about .10, and motion retrograde. According to expectation, the M. appeared again in thousands on the morning of Nov. 14 in 1866, 1867, and 1868.

**Comet 1866.**—A comet passed its perihelion in Jan. 1866, which has an orbit very nearly identical with the common orbit of the M. as thus determined. In fact, the comet is travelling with the group, and near the head of it.

**The Biela Comets and the Andromedes.**—A comet of short period, making 3 circuits in 20 yrs., was discovered in 1772, and observed in 1805, 1826, 1832, 1845, and 1852. In 1845 it was seen to be separated into 2 parts, about 150,000 m. from each other. In 1852 the 2 comets were about 1,200,000 m. from each other. Since that time they have never been seen. The earth's orbit came very close to the comet's orbit, the earth crossing the comet's path at first early in Dec., but afterward, owing to the action of Jupiter on the comet, late in Nov. Shooting stars were seen in considerable numbers Dec. 7, 1798, and Dec. 8, 1838, and at the latter time were observed to radiate from Andromeda; they are hence called *Andromedes*.

**Theory of the Meteors.**—We may then regard the meteoroid as a small solid body describing its long elliptic orbit about the sun, like any comet. The number of such small bodies is so great that every day many millions of them come within 4000 m. of the earth's centre. They are entirely invisible until, at a height of less than 100 m. from the ground, they enter air dense enough to resist their motion and create light. The air being compressible, an intense heat is developed directly in front of the body. The anterior surface is in consequence melted away, the melted matter being wiped off by the air. This streams back, forming in part the apparent flame and the train of the M. Its own firmer constitution prevents the meteorite from like condensation and internal heating, and it therefore proceeds many m. before it is entirely destroyed. Under favorable circumstances of velocity, chemical and mechanical constitution, and size, the meteoroid is not entirely scattered, but, breaking up into fragments, comes to the ground in a shower of stones. These stones often show traces of the flow of melted matter, also evidences of successive fractures, and even the partially developed cracks which with further action would have become fractures. The meteorites are all evidently fragments, not separate formations. They are in the heavens, to some extent at least, grouped in streams along the orbits of known comets, and hence have some common origin with them. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. H. A. NEWTON, LL.D.]

**Methodism.** The title "Methodists" was applied to Wesley and some of his Ox. associates not in derision, but as expressive of the regularity of their religious habits. The little association, begun in 1729, grew slowly, and consisted in its 6th yr. of only 14 members, the most memorable of

them being John and Charles Wesley and George Whitefield. (See *WESLEY*.) The yr. 1730 is considered the epoch of M. In that yr. Wesley began the erection of his first chapel at Bristol, opened his famous "Old Foundry" in Lond., and formed in the latter city his first "society," which he says was the "rise of the UNITED SOCIETY"—that is to say, of organized M. It soon extended over G. Brit. and into Ire. Additional "societies" were continually formed; *General Rules* were prepared for them by John and Charles Wesley jointly. These "Rules" are the recognized "terms of membership" throughout the Meth. communion, and they are thoroughly practical, requiring as the "only condition" "a desire to flee the wrath to come and be saved from sin," and the exemplification of this desire, first, by the avoidance of certain specified vices; secondly, "the doing good of every possible sort, and as far as possible to all men." The societies were divided into "classes" of about 12 persons each, and placed under the inspection of select "leaders." The "class meeting" has since been the germ of almost every Meth. ch. in the world. Each member contributed a penny a week and a shilling a quarter for the support of the cause, and thence arose the whole financial system of M. The clerical laborers could not supply the increasing local societies; laymen of natural talents were therefore recognized, first as "exhorters," and then as "local preachers," to conduct their public services in the absence of their clerical guides. Wesley soon called out some of his ablest "local preachers" into the general field, to travel and preach, and thence arose the lay *itinerant ministry*. To give regularity to the labors of these lay evangelists, they were assigned to different sections of the country; thence came the Meth. "circuit." Over a given number of these circuit preachers presided a select itinerant, and thence arose the "district," with its "presiding elder" in Amer., its "chairman" in Eng. This officer assembled the preachers and other "official members" of each circuit 4 times a yr., for the better regulation of their work; thence arose the "quarterly conference," a similar gathering from all the circuits of a dist. constituted the "district conference;" the yearly gathering of all the preachers of all the dists., for the revision of their entire work and its redistribution for the ensuing yr., made the "annual conference." The latter, however, preceded, chronologically, the other forms of "conference," Wesley having held the first session in 1747. In Amer. the great territorial range of the denomination has rendered necessary a quadrennial session called the "general conference," composed of delegates from all the annual conferences. Beside these peculiarities, M. has some minor functions or distinctions which have contributed much to its popular effectiveness. Its "love-feast" was borrowed, through its early Moravian associates (see *WESLEYS*), from the agapæ of the primitive Ch. The "band meeting" was also copied from the Moravians. The "watch-night" is usually celebrated on New Year's Eve, its services closing with silent prayer at midnight.

The *theology* of M. may be said to be substantially that of the Ch. of Eng., though it eliminates the alleged Calvinistic teachings of the Thirty-nine Articles. Wesley was thoroughly Arminian, and his followers are universally such. The "minutes" of his early conferences record many discussions with his assembled preachers on theological subjects. Certain compilations from these documents, together with his sermons and his notes on the N. T., are recognized as the theological standards of the Eng. or Wesleyan Meths. In the U. S. his abridgment of the Anglican Articles is the only authoritative Methodist standard.

**Wesleyan Meths.** is the title of the Brit. parent body. During Wesley's life it was chiefly controlled by his patriarchal authority. He left, however, a "Deed of Declaration," recognized in 1794 by the high court of chancery, providing for the govt. of the "connection" after his decease. By this deed the annual conference is composed of 100 travelling preachers, with power to fill vacancies in their number. They are the "legal conference," but the other travelling ministers attend their sessions and share in their debates, without the right of voting. The pres. of the conference is elected for 1 yr., and has during this term the gen. supervision of the denomination. It has missions in Ire., Fr., Switz., Ger., It., Gibraltar, India, Ceylon, Chi., S. and N. Afr., the W. I., Canada, Brit. Amer., Australia, and Polynesia; and conferences, affiliated and subordinate to that of Eng. in Ire., Australia, Canada, E. Brit. Amer., and Fr.

The *Calvinistic Meths.* arose from a difference between Whitefield and Wesley respecting the Calvinistic doctrines. Personally they became cordial friends again, but their followers were never reunited. The Calvinistic Meths. were finally organized in 3 denominations. The first was called *Lady Huntingdon's Connection*. Her ladyship was their liberal patron and their chief director. Their pastors were settled, they used the liturgy of the national Ch., but their system of govt. was essentially congregational. They early established a theological school, which still exists under the title of Cheshunt Coll. The second body of Calvinistic Meths. was called the *Whitefield Meths.* They no longer exist as a "connection" or denomination, but some of their early chs. survive among the independent congregations of Eng. The third and greatest result of Calvinistic M. was that which bears the title of the *Welsh Calvinistic Meths.* Whitefield's ministerial incursions into Wales contributed much to their early success, but their chief founders were Howell Harris, Griffith Jones, Daniel Howlands, Howell Davies, and Thomas Charles, the last surviving long enough to shape the later hist. of the denomination. Its first "association" was held in 1743; in 1785 it was more thoroughly organized, chiefly under the influence of Charles. In the U. S. they have 4 conferences.

The *Wesleyan Meth. New Connection* is the title of an organization originally composed of about 5000 seceders from the parent connection, who for certain alleged grievances withdrew in 1797, under the leadership of Alexander Kil-



ham. The New Connection adopted equal lay and ministerial representation in its conference. The New Connection in Canada has recently united with the Wesleys.

The *Primitive Meths.* are distinguished by their zeal and success, and form one of the most important branches of the great Meth. family. It was organized in 1810. It revived Wesley's custom of "out-door preaching," and licensed women to preach. Its ch. govt. is notably liberal toward the laity,  $\frac{2}{3}$  of its annual conference being laymen.

There was a distinct body of *Primitive Wesleyans of Ireland*; it rejoined the parent "Wesleyan Connection."

Beside the above, there are minor sects of Meths. in Eng., among which may be mentioned—(a) *The Band-room Meths.*, so called from a "band-room" in Manchester where they were accustomed to assemble. They seceded in 1806. They have annual conferences, but no salaried ministry. They have changed their name to the *United Free Gospel Churches*. (b) *The Prot. Meths.*, chiefly seceders from the Wesleyan societies of Leeds, who became disaffected in 1828 because the societies placed an organ in one of their chapels. (c) *The Wesleyan Meth. Association* originated in 1835 by a secession chiefly under the direction of Rev. Dr. Samuel Warren. The *Prot. Meths.* of Leeds united with these Association Meths. in 1828. (d) *The Reformed Meths.* These last-mentioned 3 bodies have been consolidated under the title of the *United Meth. Free Churches*.

The *Methodist Episcopal Church* is the title of the earliest Meth. organization in the U. S. Philip Embury, with other Wesleyan immigrants from Ire., began to hold meetings for preaching and prayer in New York city as early as 1766. In 1767 they worshipped in a rigging-loft, which was thronged, and in 1768 they built the famous old "John st. chapel," supposed to be the first Meth. ch. erected in the W. hemisphere, though about the same time Robert Strawbridge (another Irish Wesleyan) began to preach, formed societies, and built a small chapel on Sam's Creek, Frederick co., Md. The Ch. generally recognizes the date of Embury's labors (1766) in New York as the epoch of Amer. M. In 1769 Wesley sent over 2 of his itinerants, Pillmoor and Boardman, who labored successfully in and about New York and Phila. They were followed in 1771 by Wright and Asbury. The latter became the representative character and most effective bp. of the denomination, and did more for its outspread and permanence than any other man in its hist. In 1773 Wesley sent over 2 more itinerants, Rankin and Shadford; and this yr. is also memorable for the session of the first Amer. Meth. conference. It was held in Phila., and reported 1160 members of society and 10 preachers—the same number of the latter as constituted Wesley's first conference in Eng. 29 yrs. before. In 1784 it enrolled 15,000 communicants. There were now 84 preachers, travelling 46 "circuits," and by this time a considerable native ministry had been raised up. Hitherto the Meths. had been dependent on the colonial Eng. Ch. for the sacraments, none of their own preachers having yet been ordained, but in this yr. Wesley ordained 2 of his Eng. itinerants to the function of presbytery, and consecrated Rev. Dr. Thomas Coke as a supt. or bp., and sent them to Amer. with authority to organize the scattered societies as a distinct Ch. under the title of "The Methodist Episcopal Ch. in the U. S. of Amer." Coke and his 2 presbyters assembled a gen. conference about Christmas at Baltimore, where the plan appointed by Wesley was adopted, and Asbury (at Wesley's suggestion) was ordained successively deacon, presbyter, and bp. Amer. M. had now become a consolidated and distinct Ch.; in 1792 regular "general conferences" were created, meeting quadrennially, and comprising all the travelling preachers who could attend. It was found necessary at last, by the growth of the ministry, to make the general conference a *delegated* body. It assembled as such, for the first time, in 1812, at the Old John st. ch., New York. In 1872 the popular demand for lay representation having prevailed, the delegates consisted of 1 minister for 45 of the preachers, and 2 laymen for every annual conference.

The quadrennial general conference is the supreme assembly of the Ch. It elects the bps., who are, in fact, but its executive agents; it makes all laws except minor local regulations, which are left to the annual conferences; it is itself under constitutional restraints, called "Restrictive Rules," which can be suspended or changed only by the concurrence of specified majorities in the gen. conference and in all the annual conferences. The preachers are appointed at the annual conferences for 1 yr., but they can be assigned for 3 successive yrs. to the same appointment. The bps. make these appointments, aided by the presiding elders. The bps. are required by an organic law of the Ch. to travel at large. The denomination has a powerful publishing inst. called the "Book Concern," in 2 large establishments—one in New York, the other in Cin.—with depositories in other cities from Boston to San Francisco.

One of the most momentous events in the history of the M. E. Ch. was its division, by the separation from it of all the conferences (save one) in the slaveholding States, and their organization as the "Methodist Episcopal Church South;" by which measure were severed from the parent Ch. 1474 travelling preachers, 2550 local preachers, 330,710 white members, 124,811 colored members, and 2978 Indian mission converts, making an aggregate of 463,428. At the gen. conference of 1844 the anti-slavery controversy, which had long agitated the denomination, culminated in measures which led the S. delegates to declare that it would be impossible any longer to maintain S. Methodism in connection with the N. portion of the denomination. The conference thereupon made provision for a separate organization of the S. contingent on the necessity of any such division. This necessity was subsequently asserted by S. conferences, quarterly and annual, and a convention was held at Louisville, Ky., in 1845, at which the new Ch. was definitively organized. (See *METHODIST EPISCOPAL CHURCH SOUTH.*) Both chs. have since the c. war had signal success.

The M. E. Ch. has foreign missions in Mex., S. Amer., Swe., Nor., Den., Ger., Switz., It., Bulgaria, Afr., India, Chi., and Japan. In Afr. (Liberia) it has a conference, a colored bp., a weekly journal, and schools. In Ger. it has a conference, a theological sem., and a "book concern," with 1 quarterly, 2 semi-monthly, and 2 monthly periodicals. It has also a conference in India. Its home missions are numerous and notably successful, especially among our Ger. and Scandinavian pop.

The *Methodist Protestant Church* arose from a controversy in the M. E. Ch. against the alleged exclusively clerical govt. of the denomination. It was organized at a convention held in Baltimore, Md., in 1880. As the Prot. Meths. demanded not only lay representation, but the abolition of episcopacy, the concession of the former by the parent Ch. has not succeeded in bringing them back again to its fold.

The *Wesleyan Meth. Ch.* originated chiefly in the anti-slavery controversy; the question of lay representation, however, became one of the motives of its organization. Some of the most zealous anti-slavery preachers in the M. E. Ch. called a convention at Utica, N. Y., in 1843, where the new Ch. was formed. They have annually elected pres. of conferences and stationed chairmen of dists. Their preachers are appointed by a committee, the conference having authoritative revision of the appointments.

The *African M. E. Ch.*, whose members are sometimes called *Allenites*, was organized at Phila. in 1816, under the guidance of Richard Allen, afterward Bp. Allen. *Zion African M. E. Ch.* originated in a secession of colored people from the M. E. Ch. of New York city in 1819. The *Colored M. E. Ch. in Amer.*, consisting mostly of former Afr. members of the M. E. Ch. S., was formed on Dec. 16, 1870. No white person is admitted to its membership. The *United Brethren in Christ*, though bearing the same name as the Unitas Fratrum, or Moravians, have no relations with the latter, but are Meths., and are often called *German Meths.* They date from 1800, the yr. of their first conference, and have numerous societies in the Middle and W. States. The *Evangelical Association* is also an organization of Ger. Meths., sometimes called *Abrights*, from the name of their prin. founder. They have bps., a gen. conference, and annual conferences. The *Free Meth. Ch.* was formed in 1860. They disclaim episcopacy, but have an elective supt., whose term of service is 4 yrs.; otherwise they copy the discipline and also the theol. of the parent Ch.

The *Canada Wesleyan Meths.* were organized in 1828. The *E. Brit. Amer. Wesleyan Meths.* are now united with the *Canada Wesleyan Meths.* in the *Canada Meth. Ch.* The *M. E. Ch. of Canada* was founded in 1828 by Canadian Meths. who were dissatisfied with the action of the majority of their brethren, who in their reorganization after the separation from the Ch. in the U. S. declined to continue the episcopal govt. under which they had hitherto existed and prospered. The minority organized separately on the model of the parent Ch.

The following table, presented at the Ecumenical Meth. Conference, held in Lond. 1881, will supply the statistics of M. omitted in the preceding brief account:

#### I. *British Wesleyan Methodism.*

BRANCHES.	Local preachers.	Travelling ministers.	Members.
England.....	24,400	2,571	501,390
Ireland.....	1,800	250	24,237
Australia.....	3,800	476	69,147
France.....	.....	29	1,844

#### II. *Other British Methodists.*

Primitive.....	15,600	1,150	185,316
Welsh Calvinistic.....	562	18	120,000
United Free.....	3,403	432	79,756
New Connection.....	1,205	183	31,652
Bible Christian.....	1,874	302	31,542
Reform Union.....	562	18	7,745

#### III. *U. S. and Canada—Episcopal.*

Methodist Episcopal.....	12,555	12,096	1,743,000
Methodist Episcopal, South.....	5,832	4,004	840,000
African M. E.....	3,168	1,498	215,000
African M. E., Zion.....	2,500	1,500	191,000
United Brethren.....	.....	2,200	158,000
Colored M. E.....	683	640	112,300
Evangelical Association.....	600	893	112,200
M. E. Canada.....	300	282	28,000
Union American M. E.....	22	110	2,600
British M. E.....	20	45	2,200

#### IV. *U. S. and Canada—Non-Epis.*

Methodist Ch., Canada.....	8,540	1,200	123,013
Methodist Protestant.....	925	1,314	113,405
American Wesleyan Ass'n.....	200	250	25,000
Independent Methodists.....	.....	24	12,550
Free Methodists.....	233	313	12,600
Primitive (Canada).....	270	97	8,307
Bible Christians.....	197	81	8,000
Primitive (U. S.).....	162	196	3,210

Summary.—I.....	30,000	3,326	596,588
II.....	23,206	2,103	456,081
III.....	25,680	23,268	3,404,300
IV.....	5,537	3,476	906,085

	84,413	32,172	4,762,944
Add ministers.....	.....	.....	32,172

Total..... 4,795,116

A. STEVENS.

**Methodist Episcopal Church South.** The introduction of Methodism into Amer. dates from 1766, but it was not till 1784 that it received a distinct ecclesiastical organization. The first quadrennial General Conference met in New York in 1812, and for 32 yrs. the Ch. flourished as a united and powerful organization. It became, indeed, too unwieldy for one Gen. Conference jurisdiction, and this,



with the question of slavery, rendered a division necessary. At the Gen. Conference held in New York in 1844 measures were adopted for a separation of the Ch. into 2 distinct organizations. A provisional "Plan of Separation" was agreed upon, of which the following were the essential features:

"Resolved, by the delegates of the several annual conferences in Gen. Conference assembled—1st, That should the conferences in the slaveholding States find it necessary to unite in a distinct ecclesiastical connection, the following rule shall be observed with regard to the N. boundary of such connection: All the societies, stations, and conferences adhering to the Ch. in the S. by a vote of a majority of the members of said societies, stations, and conferences shall remain under the unmolested pastoral care of the S. Ch.; and the ministers of the M. E. Ch. shall in no wise attempt to organize chs. or societies within the limits of the Ch. S., nor shall they attempt to exercise any pastoral oversight therein, it being understood that the ministry of the S. reciprocally observe the same rule in relation to stations, societies, and conferences adhering, by vote of a majority, to the M. E. Ch.; provided also, that this rule shall apply only to societies, stations, and conferences bordering on the line of division, and not to interior charges, which shall in all cases be left to the care of that Ch. within whose territory they are situated. 2d, That ministers, local and travelling, of every grade and office in the M. E. Ch., may, as they prefer, remain in that Ch. or without blame attach themselves to the Ch. S." Provision was also made for a division between the 2 organizations of the "Book Concern" and other property belonging to the Ch.

The S. conferences organized according to the provisions of this Plan, and at the first Gen. Conference (in 1848) Joshua Soule, senior bp. of the M. E. Ch., and Bp. Andrew adhered S., and were recognized in their episcopal character; and William Capers, D. D., and Robert Paine, D. D., were elected and consecrated as their colleagues. Lovick Pierce, D. D., was appointed to bear the fraternal regards of the conference to the Gen. Conference of the M. E. Ch., which met in Pittsburgh in 1848, but that conference declined to receive him in his official character, and repudiated the "Plan of Separation" as null and void. A refusal to divide the Ch. property with the S. Ch. led to litigation, which was finally terminated by a decision of the supreme court of the U. S., which recognized the validity of the Plan agreeably to the claim of the M. E. Ch. S.

At first the bps. of the M. E. Ch. (N.) declined to exercise their functions in the S., but during the war (1862-65) and since, in obedience to the instructions of their Gen. Conference, they have organized annual conferences in all parts of the S., as have also the "African" and "African Zion" connections, thus taking from the M. E. Ch. S. a large part of its colored members, of whom it numbered nearly 200,000 in 1860. At the Gen. Conference of the M. E. Ch. in 1872, messengers were appointed to bear fraternal greetings to the Gen. Conference of the M. E. Ch. S., which met in Louisville in 1874. The conference responded fraternally to their communications, and authorized the bps. to appoint coms. to bear fraternal greetings to the Gen. Conference of the M. E. Ch., which was to meet in 1876, and to adjust existing difficulties between the 2 connections.

Though all the Arminian Meths. in the world agree in the great essentials of Methodism, yet there is considerable difference in matters of polity. The "two Methodisms," *e. g.*, differ as to the relative powers of the bps. and the Gen. Conference—the M. E. Ch. S. holding that the bps. are a co-ordinate branch of the govt., and cannot be deposed by a delegated gen. conference, except as they may be excommunicated by regular process of trial; which was the vexed question that divided the Ch. in 1844. The M. E. Ch. S. admits of lay representation in the annual conferences, as well in the Gen. Conference, which the M. E. Ch. does not. There are also differences in the organization and powers of dist. and quarterly conferences, and other points which render an organic union undesirable. [From orig. art. in *J. S. Univ. Cyc.*, by PROF. T. O. SUMMERS, D. D., LL.D.]

**Methomania** [from the Gr. μέθη, "drunkenness," and μανία, "mania"], also called **Dipsomania**, is a morbid craving for intoxicating substances, and originates from the depression of the nervous system and gen. weakness of all the vital processes which follow after inebriation.

**Methuen**, on R. R., Essex co., Mass., has good water-power, furnished by the Spicket River. Pop. pt. 1870, 2959; 1880, 4392.

**Methyl** [Gr. μέρα, "with," and ἔλκ, "wood"], the first member of the series of alcohol radicals, bearing the same relation to methyl alcohol that ethyl bears to common alcohol. It is a colorless and odorless gas, which burns with a bluish flame. M. enters into the composition of a great variety of interesting compounds—methyl- or wood-ether, methyl alcohol, compound ethers, amines, etc.

**Methyl Alcohol, Methyl Hydrate, Carbinol, Pyroxylic Spirit, or Wood-Naphtha.** It is found associated with acetic acid in the watery product from the distillation of wood.

**Preparation of Commercial Wood-Spirit.**—The crude watery liquid (*pyroigneous acid*) obtained by the distillation of wood is redistilled: the first tenth which passes over is rectified over slaked lime, whereupon considerable ammonia is given off; sulphuric acid is then added, which fixes the remaining ammonia and precipitates some tarry matter; the liquid is redistilled and rectified several times over quicklime. Oak wood yields about 2 gals. crude wood-spirit to the cord. The crude product has a strong aromatic odor, and turns brown on keeping. It contains considerable quantities of acetone, methyl-acetate, ethyl-acetate, and lignone or xylene, which is the dimethyl-acetate of ethylene.

**Properties.**—M. A. is a colorless, mobile liquid, having a purely spirituous odor, like that of common alcohol. Sp. gr. = 0.8142 at 0° C. It boils at 60°–66.5° C., according to the

nature of the vessel, and bumps strongly while boiling. It burns with a pale flame, and is used as a substitute for alcohol in spirit-lamps. It mixes with water, alcohol, and ether, and dissolves fixed and volatile oils and most resins. By oxidation it is converted into formic acid. Calcic hypochlorite (bleaching-powder) converts it into chloroform. In Eng. a mixture of 90 parts of common alcohol and 10 parts of M. A. is known as *methylated spirits*, and paying no revenue tax is largely used in the arts as a substitute for alcohol.

**Methylamine, Methylammonia**, an organic base which consists of ammonia in which 1 atom of hydrogen has been replaced by methyl. It is a colorless gas, having a strong ammoniacal odor. It turns reddened litmus-paper blue, fumes with hydrochloric acid, burns readily, and is more soluble in water than any other known gas. The aqueous solution is very caustic, and resembles aqua ammonia in its properties.

**Methylene.** This compound, the first and simplest of the olefines, is not known with certainty in the free state.

**Methylene, Bichloride, or Chloromethyl**, a clear, very volatile, inflammable liquid of an agreeable chloroform-like odor, boiling at 88° F. It was introduced into med. as an anesthetic in 1867 by Dr. B. W. Richardson of Lond. As such it surpasses even chloroform in speed of action and absence of disagreeable after-effects, but, unfortunately, like chloroform, is not entirely safe. It is administered by inhalation through a special apparatus.

**Metre.** See METRIC SYSTEM.

**Metre** [μέτρον, "measure"], the arrangement of rhythmic feet into groups constituting lines or stanzas. In Eng. verse a *foot* is a binary or triple group of syllables which admit of being distributed into rhythmic periods by means of the presence or absence of accent, or the distribution of strong or weak effects. Feet are the measures of verse, the form of which depends on their number, kind, and succession; and when the groups of feet are too long to be readily seized by the listener, they fall into rhythmic prose.

**Metric System, The, of Weights, Measures, and Moneys**, a system designed to remove the confusion arising out of the excessive diversity of weights and measures prevailing in the world, by substituting in place of the arbitrary and inconsistent systems actually in use, a single one constructed on scientific principles and resting on a natural and invariable standard. The proposition for the creation of such a system originated in 1790 with Prince Talleyrand, then Bishop of Autun. He recommended the length of the pendulum beating seconds in lat. 45° as a suitable linear basis, and introduced into the National Assembly of Fr. a decree embodying this proposition and providing for a scientific determination of the exact length of this pendulum by a commission to be composed in equal numbers of members of the Fr. Acad. of Sciences and of the Royal Society of Lond. This decree with some modification was adopted, and the king, Louis XVI., was requested to open a correspondence on the subject with the king of G. Brit., which he did; but owing to the temper and the public troubles of the times this overture met with no response. Similar applications to other nations were more successful, and in subsequent proceedings, Sp., It., the Netherlands, Switz., Den., and Swe. participated by sending delegates to an international commission. The system itself was however matured by the labors of a committee of the Acad. of Sciences, embracing Borda, Lagrange, Laplace, Monge, and Condorcet, 5 of the ablest maths. of Europe. Their report, dated Mar. 19, 1791, after considering the comparative fitness, as a standard of length, of the pendulum and of the earth itself in some one of its natural dimensions, decided in favor of the latter, and recommended as the standard unit of linear measure, one ten-millionth of the quadrant of a terrestrial meridian. The report was communicated to the Assembly and received its sanction. Committees of the Acad. were then charged with the duty of making the necessary determinations of the standard units, including those of capacity and weight as well as that of length. An arc of the meridian passing through Paris and extending from Dunkirk to Barcelona was measured trigonometrically by Delambre and Méchain, an operation of immense labor which occupied 7 yrs.; the object being to ascertain with the greatest exactness the length of the linear base, called the **METRE**. It was resolved to make the unit of volume equal to the capacity of a cubical vessel measuring  $\frac{1}{10}$  of a metre on its edges; and the standard of weight, the actual weight of distilled water which should fill such a vessel at the temperature of maximum density. The weight of a given volume of water under these conditions was therefore made a subject of elaborate investigation by a committee of the Acad., and in conformity with the results obtained the standard unit of weight, called the *gram*, was fixed at one one-thousandth part of the standard weight above mentioned, which being one thousand grams in weight is called the *kilogram*.

On the 4th day of the month Messidor, in the 7th yr. of the Republic "one and indivisible," the international commission above referred to, after having carefully tested the accuracy of the standards prepared by the committees of the Acad., proceeded in a body to the Palace of the Archives in Paris, and there deposited the standard metre, a simple bar of platinum, which represents the linear base of the system, and the standard kilogram, a simple cylinder, also of platinum, which represents the unit of metric weights. The value of these units had, however, been ascertained much earlier with an accuracy sufficient for all practical purposes; and by a law passed Aug. 1, 1793, the M. S. was established as the only legal system of weights and measures for Fr. and the Fr. colonial possessions. The system has since been successively adopted by Hol., Belg., Sp., Port., It., the Ger. empire, Swe., Nor., Aus., Tur., Gr., Roumania, Brit. India, Mex., New Granada, Ecuador, Peru, Brazil, Uruguay, the Argentine Confederation, and Chill. Switz., without adopting the system in full, has given to all her standards metric



values, and Den. has done the same for her standard of weight. In G. Brit. the use of metric denominations in business transactions has been made legally permissible; but, by a singular inconsistency, the metric weights and measures themselves are not allowed to be kept in tradesmen's shops, and employed in actual commerce. In the U. S. metric weights and measures were legalized by an act of Cong. passed July 27, 1866, and at the same time the Bureau of Weights and Measures at Wash. was directed to prepare and furnish to the executive authorities of the several States authenticated standards for the verification of metric weights and measures used in commercial affairs. The aggregate pop. of the countries in which the M. S. has been established by law amounts to nearly 500,000,000; of those in which it has been partially introduced, to about 2,000,000, and of those where its use is legally permissible, to 82,000,000 more. It has thus been adopted by largely more than  $\frac{1}{2}$  the civilized and Chr. world.

The question has been somewhat discussed whether the prototype metre of the Archives is really, with great severity of exactness, as it purports to be, one ten-millionth part of a terrestrial quadrant. This question complicates itself with the further question, What is the true figure of the earth? There is no doubt at all of the accuracy of the measurement made by the Fr. geodesists; but they measured only about  $10^6$  of the Paris meridian, and from this measurement deduced the length of the entire quadrant of  $90^\circ$  by calculation on the supposition that the earth is a regular spheroid having an ellipticity of  $\frac{1}{300}$ th. The investigations of Gen. T. F. de Schubert of the Rus. army, and of Capt. A. R. Clarke of the Brit. Ordnance Survey, have made it probable that the earth is an ellipsoid of 3 unequal axes, rather than a spheroid, and that the meridian passing through Paris is a trifle longer than the Fr. computers supposed. If this is so—a thing, however, which must be yet regarded as doubtful—the prototype metre of the Archives is by a very minute fraction (hardly more than one two-hundredth of an inch) less than one ten-millionth of the Paris meridian quadrant. On the other hand, it is, on the same supposition, with almost mathematical exactness, the one ten-millionth part of the meridian quadrant passing through N. Y. city.

These discussions, and the desirability of settling all doubts as to the stability of the system and the permanency of its unit—bases, as well as of providing authenticated copies of the prototype standards to be distributed to the govts. of all metric nations, and of securing such standards against the danger of alteration in all coming time, led to the assembling at Paris, in the yr. 1870, of an international commission to consider and adjust all questions connected with this subject. In this commission 30 independent powers were represented. The deliberations of the commission, interrupted by the war of that yr. between Fr. and Ger., were subsequently resumed, and resulted at length in an international convention providing for the maintenance at Paris of an International Bureau of Weights and Measures, to be supported by *pro rata* contributions from all the signatory powers, and charged with the care of the prototype standards, and with the duty of constructing and verifying copies of these standards not only for the powers interested but for other govts. or even for corporations and individuals who should apply for them and should be willing to pay the expense attending their construction and comparison. This convention was signed in Mar. 1874, the diplomatic representative of the U. S., Mr. Washburne, being, by consent and direction of the Pres., one of the signers. It was resolved by this commission that the prototype metre and the prototype kilogram of the Archives shall be recognized and perpetuated forever as the true bases of the system, without regard to any doubtful questions which have been raised as to the exactness of their correspondence with their theoretic values.

The units of the M. S. are 5—viz. 1. The METRE—the unit of length = 3.280899 ft. = 39.37079 inches.

2. The ARE—the unit of surface—the square of 10 metres = 119.60332 square yards.

3. The LITRE—the unit of capacity—the cube of  $\frac{1}{10}$  of a metre = 0.26418035 gals. = 1.0567454 qts. = 2.1134906 pints.

4. The STERE—the unit of solidity = 1 cubic metre = 35.320636 cubic feet = 1.308764 cubic yards. This unit has fallen into disuse.

5. The GRAM—the unit of weight = 15.43234874 grains troy. Each unit has its decimal multiples and submultiples; that is, weights and measures 10 times larger or 10 times smaller than the unit of the denomination preceding. These multiples and submultiples are indicated by prefixes placed before the names of the several fundamental units. The prefixes denoting multiples are derived from the Gr. lang. and are—*deka*, ten; *hecto*, hundred; *kilo*, thousand; and *myria*, ten thousand. Those denoting submultiples are from the Lat., and are, *deci*, tenth; *centi*, hundredth; and *milli*, thousandth.

The unit of itinary measure is the KILOMETRE, which is equal to 0.62138 m.

The unit of land measure is the HECTARE = 2.47114 acres.

The unit of commercial weight is the KILOGRAM, equal to 2.20462125 lbs. avoirdupois.

The system of Fr. moneys is connected with that of metric weights by the creation of a coin of standard silver (9 parts pure silver and 1 of alloy) to represent the monetary unit, called the FRANC, having the weight of exactly 5 grams; the coins of higher and lower denominations being multiples and submultiples of this. As in the coinage system of Fr. gold and silver are equally standard metals, it is necessary that their relative values, weight for weight, should be determined by an arbitrary ratio. This ratio is fixed by law at  $15\frac{1}{2}$  to 1; and accordingly the 20-franc piece of gold, commonly (though not legally) called the napoleon, has the weight of 20 times 5 grams divided by  $15\frac{1}{2}$ , which is equal to 6.4516 grams of standard gold. F. A. P. BARNARD.

**Metronome** [Gr. μέτρον, "measure," and νόμος, "a di-

vision"], in music, an instrument for the measurement and regulation of time. As the directive terms usually prefixed to musical compositions can only give to the performer an approximate idea of the rate or velocity intended by the composer, various means have been employed to indicate the speed with more precision. The M., invented by John Maelzel, a mechanician in the service of the emp. of Aus., and brought into use in the early part of the present century, is a simple but ingenious contrivance by which any degree of slowness or rapidity can be marked, and practically shown with the greatest exactness.

**Metropolis City**, cap. of Massac co., Ill., 40 m. above the mouth of the O. River. Pop. 1870, 2490; 1880, 2668.

**Metternich**, met'ter-nik (CLEMENS WENZEL NEPOMUK LOTHAR), PRINCE, b. at Coblenz May 15, 1773; studied jurisprudence; was appointed Aus. ambassador at the Hague in 1794, but returned to Vienna after the conquest of the Netherlands by the Fr.; married in 1795 the granddaughter and sole heiress of Prince Kaunitz; was employed at the Cong. of Rastadt (1797-99), and went in 1801 to Dresden as ambassador, in 1803 to Berlin, and in 1806 to Paris; on Oct. 8, 1809, was made minister of foreign affairs, and on May 25, 1821, chancellor of the empire, which positions he held till Mar. 13, 1848. He kept Aus. out of the great conflict of 1813, and at the Cong. of Vienna (1814), of which he was unanimously chosen pres., he procured for Aus. a great extension of terr. and a prominent position in Ger. and It. For the next 30 yrs. he actually stood at the head of the continental politics of Europe, and succeeded in suppressing almost every national or liberal movement in Europe. On Mar. 13, 1848, the revolution in Vienna compelled M. to flee for his life. He resided in Lond. till Nov. 1849, when he returned to Vienna, where he lived in retirement till he d. July 11, 1859.

**Metz**, a city and fortress in Alsace-Lorraine, on the Moselle. The town is beautifully situated on both sides of the river, which divides into several arms, surrounded by mts., and is one of the strongest fortresses in the world. Seven strong forts crown the hills around it. It is the seat of the highest authorities of Lorraine, of a bp., of a civil and commercial tribunal, etc., and has an acad., a coll., 2 sems., a school of artill., a museum with collections of Rom. antiquities, coins, and pictures, a library containing 30,000 vols., a botanical garden, and an arsenal. The most important public buildings are the cathedral of St. Stephen, a Gothic structure, commenced in the 13th century; the ch. of St. Vincent, commenced in the 13th century; the ch. of St. Eucharius, from the 12th century, and the palace of justice, from the 18th. Brushes, fur, felt, leather, paper, soap, silk, woollens, embroideries, drugs, etc. are manufactured, and a brisk trade is carried on in wine, timber, corn, and hides. Pop. 53,131.

M., whose ancient name was *Divodurum* or *Mediomatrix*, was destroyed by Attila in the 5th century, then became the cap. of Austrasia, fell on the division of the empire of Charlemagne to Ger., and was established as a free imperial city, governed by a count in the name of the emp. In 1444 the Fr. besieged the city without taking it, but in 1552 it fell into their hands. The Prot. princes of Ger., with the elector Maurice of Sax. at their head, asked King Henry II. of Fr. to aid them against the Ger. emp. Henry entered Lorraine with 35,000 men, and demanded free passage through the cities, also through M. But his troops, having entered the city, remained there. The emperor Charles V. besieged it in vain from Oct. 1552 to Jan. 1553. The Fr. considered themselves as yet only the protectors of the city; Louis XIII. was the first who exercised the rights of a sovereign, and made it in 1633 the seat of a parl.; by the Peace of Westphalia in 1648 the authority of Fr. over it, as well as over Toul and Verdun, was acknowledged and guaranteed. But by the war of 1870-71 the state of affairs was entirely changed. The fortress, which had been much strengthened by Nap. III., formed the prin. point of support for the imperial army drawn up along the Ger. frontier, and after the first defeats served as a retreat for the largest part of the army, numbering more than 180,000, under Marshal Bazaine. But before the marshal could lead this army out for operations in the open field he was shut up in the fortress by the manoeuvres of the Gers. Prince Frederick Charles inclosed M. with an army of 200,000 men, and thus the memorable siege began which ended with the surrender both of army and fortress. On Oct. 27 the capitulation was concluded. By the Peace of Frankfurt (May 10, 1871) M. was ceded to the Ger. empire, and the Ger. military administration has strengthened the fortress. [From orig. art. in *J's Univ. Cyc.*, by AUGUST NIEMANN.]

**Meuse**, mîz, a river of Europe which rises in Fr. in the S. of the dept. of Haute-Marne, and proceeding N. crosses the N. W. corner of the dept. of Vosges, and traverses the depts. of Meuse and Ardennes, through the wild, mountainous region of which latter, still known as the "Forest of Ardennes," it pours through a romantic gorge; on reaching Sedan it enters Belg., and at Namur, where it receives on the left its largest tributary, the Sambre, changes its course to N. E., and passes Liege, where it is augmented by the Ourthe; separates Dut. from Belg. Limburg, passing Maestricht and Roermond, at the latter of which it receives the Roer; at Bommel it draws so close to the Rhine as to be brought into communication with it; resumes its W. course, and finally turning N. W. joins the left bank of the Waal, one of the arms of the Rhine, and gives its name to the mighty accumulated flood of these streams, which proceeding W. is divided near Dordrecht into 2 great rivers, the one of which bends round to the N. and reaches Rotterdam; the other branch continues W.; and shortly after the 2 branches again unite and discharge themselves, amid shoals and quicksands, into the N. Sea. Total length, 580 m., of which 460 are navigable.

**Mex'lo**, on R. R. Limestone co., Tex., 231 m. N. W. of Galveston, has an acad. Pop. 1880, 1298.

**Mexican Languages**. See INDIAN LANGUAGES.



**Mex'ico** (Sp. mēh'-he'-ko) [from Aztec, *Mezihli*, a name of the tutelary divinity], **United States of**, a federal republic of N. Amer., and, next to the U. S., the most populous and wealthy country of the New World, occupies the whole breadth of the continent between the U. S. on the N. and Central Amer. on the S. E., stretching from the Gulf of Mex. and the Caribbean Sea on the E. to the Pacific Ocean on the W. and S.

*Area and Population.*

STATES.	Sq. miles.	Pop.	CAPITALS.	Pop.
Aguas Calientes.	2,895	140,430	Aguas Calientes.	25,000
Campéche.	25,832	90,413	Campéche.	15,190
Chiapas.	16,048	209,362	San Cristobal.	8,500
Chihuahua.	83,746	225,941	Chihuahua.	12,116
Coahuila.	50,890	130,026	Saltillo.	20,000
Colima.	3,743	65,827	Colima.	23,572
Durango.	42,510	190,846	Durango.	27,119
Federal Dist.	461	439,769	Mexico.	300,000
Guanajuato.	11,411	834,849	Guanajuato.	56,112
Guerrero.	24,551	301,498	Chilpancingo.	3,800
Hidalgo.	8,163	427,390	Pachuca.	22,000
Jalisco.	39,168	983,484	Guadalajara.	78,600
Lower California.	61,582	30,208	La Paz.	2,396
Mexico.	7,838	710,579	Toluca.	18,000
Michoacan.	25,689	661,634	Morelia.	20,400
Morelos.	1,776	159,160	Cuernavaca.	16,320
Nuevo Leon.	23,635	203,284	Monterey.	33,811
Oaxaca.	33,591	744,000	Oaxaca.	26,228
Puebla.	12,021	784,466	Puebla.	64,588
Querétaro.	3,207	203,290	Querétaro.	27,560
San Luis Potosi.	27,500	516,466	San Luis Potosi.	34,300
Sinaloa.	36,198	196,491	Culiacan.	7,878
Sonora.	79,021	115,424	Ures.	9,700
Tabasco.	11,851	104,747	S. Juan Bautista.	6,800
Tamaulipas.	30,225	140,137	C. Victoria.	7,800
Tlaxcala.	1,629	138,998	Tlaxcala.	4,300
Vera Cruz.	26,232	542,918	Jalapa.	14,200
Yucatan.	29,567	302,319	Merida.	32,000
Zacatecas.	22,998	422,906	Zacatecas.	35,000
Total.	743,948	10,046,872		

**Physical Features.**—M. proper consists of a vast table-land 6000 to 8000 ft. above the sea, with narrow fringes of semi-tropical terrace-lands (*tierras templadas*) varying in elevation from 3000 to 5000 ft., and lowlands (*tierras calientes*) stretching from the sea-coasts to the bases of the mts. The 2 latter regions sometimes penetrate far within the central mt.-system, along the courses of streams, expanding into broad fertile valleys. The mt.-system of M. is the N. prolongation of the Cordillera of the Andes, divided into several branches. The *Sierra Madre*, or "mother-range," extends from the Isthmus of Tehuantepec to the N. frontier of the republic, skirting the Pacific at a considerable distance inland. A coast-range projects northward along the Gulf of Mex., rising to the height of 17,879 ft. in the peak of Orizaba; the central range, or *Cordillera de Anahuac*, which surrounds and separates the valleys of Mexico and Puebla, reaches the altitude, in Popocatepetl, of 17,784 ft., while its twin volcano, Iztacchihuatl, attains 15,705 ft., and the *Nevalo de Toluca* 16,616 ft. The central table-land of M., broken by numerous transverse ranges into a series of great valleys, sometimes scores of miles in width, descends gradually northward, and Northern Mexico consists of a similar series of mts. and valleys at a less elevation. In Eastern Mexico the peninsula of Yucatan is a vast plain rising but slightly above the sea.

**Climate.**—There are in tropical M. but 2 seasons, the rainy and the dry, of irregular duration, usually extending from May to Oct. and from Oct. to May, respectively, the heaviest rains occurring in Sept. The dry season is marked by frequent *nortes*, or gales of wind, sweeping southward across the Gulf of Mex., rendering navigation somewhat perilous during their continuance.

**Rivers.**—From its phys. configuration M. has few large or navigable rivers. The largest is the Rio Bravo or Rio Grande del Norte, forming the boundary with Tex., and navigable for vessels of light draught for a small portion of its lower course. On the Pacific slope the largest river is the Lerma, which rises in Lake Lerma in the central valley of Toluca, flows W. through Michoacan and Jalisco, traversing Lake Chapala, and forming numerous cataracts. It is wholly unnavigable, and the same may be said of the Mescala or Rio de las Balsas, which flows W. 400 m. to the Pacific.

**Geology and Mines.**—M. is eminently a country of mineral wealth, and its production of the precious metals was for more than 3 centuries subsequent to its discovery greater than that of any other country. Its geol. has always been subordinated to its mineralogy, and is therefore very imperfectly known. Granite forms the foundation of the central table-land and of the great mt.-system of Oaxaca, the mineral-bearing superstructure being chiefly porphyry. Caverns are numerous. Much of the country has been the scene of volcanic action. Iron is found in immense masses. Copper, usually associated with gold, is found in considerable quantities. Quarries of marble, alabaster, gypsum, and rock-salt are numerous; sulphur is found in the craters of the volcanoes, and mineral springs occur in many localities. Cinnabar or red sulphuret of mercury has been found in small quantities in many states. Bismuth occurs in several states; platinum has recently been discovered, and coal has been found in small deposits in many quarters. Gold was the chief mineral treasure of the Aztecs, and that metal soon became subordinate to silver. Silver early became, and will ever remain, the staple production of M. The supply is practically illimitable. Though many thousands of mines have been abandoned as unprofitable, the introduc-

tion of improved processes of extraction and reduction and of cheap transportation through railway extension will augment the yield of silver to an indefinite extent, more especially if supplies of coal and quicksilver should in any way become cheap and abundant. The silver mines, neglected for a long time, were partly reopened in 1864. The richest of all the mines now worked are those of Real del Monte and Pachuca, situated about 60 m. from the city of Mexico, and belonging to an Anglo-Mexican company.

**Vegetation and Agriculture.**—Beside the European cereals, roots, and fruits, M. produces a surprising variety of useful indigenous plants and trees. There are over 100 species of timber trees and cabinet woods, 17 oil-bearing plants and trees, 12 species of dyewoods, 8 of gum trees, and over 60 of medicinal plants. Indian corn is everywhere the staple food of the aboriginal pop.; wheat and barley grow to perfection in the central valleys; rice, sugar-cane, tobacco, cotton, coffee, cacao, and indigo thrive in the *tierras calientes* and *tierras templadas*, where oranges, lemons, olives, mangoes, bananas, pineapples, grapes, sweet potatoes, yuca, and scores of luscious wild fruits abound. The maguay of the *tierras frias* furnishes a palatable fruit, while its fermented juice, the famous *pulque*, constitutes the national beverage; and in Yucatan a plant of the same species affords the *henique*, a fibre which now constitutes the chief wealth of that peninsula. Many varieties of cactus are found. The mulberry thrives, but the rearing of silkworms has fallen into insignificance. The great cotton-producing regions are the N. states. The tobacco, cacao, and coffee are reputed equal to any in the world. The market of M. is more abundantly and cheaply supplied with flowers than that of any other city in the world.

**Animal Kingdom.**—All the European domestic animals are successfully reared, and the N. states are noted for their vast herds of cattle, droves of horses, and flocks of sheep. Among the wild animals are the puma, jaguar, ocelot, wolf, and coyote, with several species of bears, deer, and monkeys. Alligators abound in the lagoons and rivers of the lowlands; rattlesnakes and other venomous ophidians are common, as well as many kinds of noxious insects, especially scorpions and tarantulas. A great variety of brilliantly colored parrots, humming-birds, and song-birds are found in the forests, as also many wild fowl and game birds. The coasts are well supplied with fish, and pearl-fishing is a valuable industry in the Gulf of Cal. Amber is found on the coasts of Yucatan.

**Industry and Manufactures.**—Agriculture is the occupation of the mass of the aboriginal pop. Petty industries, such as the manufacture of earthenware, clay and rag figures, wooden toys, sweetmeats, artificial flowers, and other ornaments, are largely carried on in the cities, the goldsmiths especially excelling in filigree-work. Superior glassware and porcelain are made at Puebla, Texcoco, and other cities. In Leon, Celaya, Salvatierra, and other central cities the manufacture of *rebocos* or shawls, the weaving of cotton and woollen cloths by hand, and the manufacture of saddlery, all of fine quality, have acquired a great development. There are a few iron-foundries, paper, grist, and saw mills, but the latter are surprisingly rare. Cotton and woollen factories are as yet in their infancy, though a few are found in each of the prin. cities, and they form a notable feature at Puebla, Querétaro, Guadalajara, Colima, and Saltillo. The manufacture of sugar is carried on upon a vast scale in Morelos.

**Commerce.**—The exports of M. for the yr. 1882 were valued at \$5,516,658, of which one half went to the U. S. Of the total of exports, the precious metals amounted to more than \$3,412,753, the other leading articles being hides, henquien or Sisal hemp, lumber, coffee, vanilla, cochineal, cattle, tobacco, india-rubber, orchil, indigo, and sarsaparilla. The leading articles of importation are cotton, linen, woollen, and silk fabrics, wrought and unwrought iron, machinery hardware, and provisions.

**Railways and Telegraphs.**—M. had more than 3000 m. of railway open for traffic in 1883. The Mex. R. R., 263 m. long, from Vera Cruz to the city of M., with branch to Puebla, 29 m., was commenced, under State aid, in 1852, and completed in 1872. The Mex. Central R. R. is completed from the city of M. to El Paso, 1224 m., connecting at that point with U. S. R. R.s. The Mex. Central R. R. has several branches. The Mex. National R. R. has about 700 m. of its various divisions completed. Other R. R.s are in progress. The total length of telegraph lines, in 1883, was 16,938 m. There were, at the same date, 460 telegraph offices, receipts \$399,814.

**Administration.**—The federal national govt. is administered according to the provisions of the liberal republican const. of 1857, twice overthrown and restored (1858-60 and 1863-67), and considerably amended in 1873-74. The pres. is chosen by indirect popular suffrage every fourth yr.; the supreme judiciary and both houses of Cong. are elected in the same manner, the former and the senate for terms of 6 yrs., the house of deputies for 2 yrs. The chief-justice is *ex-officio* v.-p. The senate existed for short periods under 2 former const., but was abolished in 1853, and not restored until the constitutional amendments of 1874, by virtue of which the new senate was elected in 1875. The states have local const. with elective gov. and legislatures. The powers of the various branches of the national govt. closely resemble those of the U. S. The revenues are largely derived from export and import duties, and amounted (budget of 1883-84) to \$34,660,000. The expenditure was \$30,730,936. The national debt, chiefly held in Eng., amounts to about \$144,000,000. The Mex. army consists of 23,367 men. The navy is little more than nominal, consisting chiefly of 4 steamers constructed for coast-guard purposes.

**Religion.**—By the const. of 1857 all religions are equally protected, but none officially recognized by the state.

**Education.**—Special schools of law, med., music, agriculture, engineering, mines, commerce, fine arts, the sciences and lit., and a military coll. are now maintained by the



federal govt., beside various grades of lower schools for both sexes, amounting in the city of M. to above 200, beside 100 private schools. The state govts. support common schools at all the centres of pop., and insts. for higher education at the caps. The total number of public schools throughout the republic amounts to nearly 4000, and is rapidly being extended. There are also schools for deaf mutes, for the blind, and for juvenile delinquents, beside many insts. supported by private beneficence.

**History.**—The Mexicans at the beginning of the 19th century were a composite people, but the Indian element was so largely in the ascendant that persons of pure Castilian blood, though settled for generations in the country, were regarded by the mass of the nation as foreigners. Unfortunately, it was precisely this class which monopolized the posts of honor and influence, as well as the great landed estates and the commercial wealth of the country. The revolution of 11 yrs. duration which resulted in the independence of M. in 1821 was directed not so much against the abstract right of the Sp. crown as against odious caste-distinctions and scandalous oppressions. The native element not only obtained the ascendancy, but ruined the fortunes of the colonial aristocracy, and even expelled all natives of Sp. from M. (1829). The earliest independent govt. of M., that presided over by the liberator Iturbide (1821-23), was from the first intended not as a change of system, but merely a change of *personnel*, and it was only when the royal house of Sp. had refused to permit one of its princes to assume the crown of M. that Iturbide himself was proclaimed emp. The "republic" proclaimed by Santa Anna at Vera Cruz Dec. 1822 had originally little but the name in common with other republics, but the const. adopted in 1824 made liberal drafts upon that of the U. S. The change of system thus attempted to be introduced was too radical to be permanently carried out, and the reformers, who in 1833 passed laws abolishing convents, suppressing the compulsory payment of tithes, and otherwise curtailing the power of the clergy, precipitated the downfall of the const. The numerous "constitutions" that prevailed in M. under military leadership for the ensuing 20 yrs. were for the most part mere pretexts for dictatorship, and M. never obtained a thoroughly republican form of govt. until the triumph of the "plan of Ayutla" overthrew the fifth dictatorship of Santa Anna (Aug. 1855) and prepared the way for the constituent convention of 1856. That body promulgated (Feb. 5, 1857) a const. which is still the organic law of M. It represents in many respects the most advanced principles of modern republicanism, and could not triumph over the privileged classes without 2 desperate struggles, known in Mex. hist. as the "war of reform" (1857-60) and the "Fr. intervention" (1861-67), to which latter period belongs the ephemeral "empire" presided over by the Aus. archduke Ferdinand Maximilian (1864-67). In both these struggles the master-spirit, the genuine representative of republican M., was the Indian statesman Benito Juarez, pres. of M. from Dec. 1857 till his death, July 18, 1872. His chief assistant in the maintenance of independence was the minister of foreign affairs, Sebastian Lerdo de Tejada, who became pres. Gen. Porfirio Diaz, the successor of Gen. Manuel Gonzales, was inaugurated pres. of Mexico, Dec. 1, 1884.

PORTER C. BLISS.

**Mexico**, a state of the republic of the same name, bounded N. by the state of Hidalgo, E. by Tlaxcala and Puebla, S. by Morelos and Guerrero, and W. by Michoacan, with an area of 7838 sq. m., exclusive of the Federal Dist. embraced by it. Two mt.-ranges and elevated valleys, with numerous lakes, constitute the peculiar phys. features of the state. The main valley, that of Mexico, separated on the W. by a mt.-chain from the more elevated valley of Toluca, is oval in form, and has a circumference of 200 m. along the crest of the mts. which environ it on all sides. The S. valleys of the state are within the *tierras calientes* of the Pacific slope, producing sugar, coffee, and other tropical staples, while the plateau is fertile in cereals and the maguay. The mts. of the state are mineral-bearing, yielding gold, but particularly silver, also copper, cinnabar, lead, sulphur, antimony, lithographic stone, with quarries of fine marble and other valuable building-stone. Its manufactures are cotton and woollen cloths, glass and porcelain, chocolate, sugar, salt, and soda. The state govt. is administered by an elective govt., who appoints his secs., and a legislature of a single chamber, having a member from each of the 16 dists. into which the state is divided. Pop. 710,579. Public instruction is receiving the special attention of the public men of the state, and a literary inst. at Toluca, a thorough collegiate school, is well supported by the state. [From orig. art. in *J. S. Univ. Cyc.*, by THOMAS JORDAN.]

**Mexico**, a city and federal dist., cap. of the republic of the same name, is situated in lat. 19° 25' 45" N., lon. 99° 7' 8" W. from Greenwich, at an elevation of about 7435 ft. above the sea. Built upon the ruins of the Aztec cap. in 1521-22, upon uniformly level ground, the streets are about 40 ft. wide, well paved for the most part, well lighted, and lined by structures of a solid, handsome arch. The chief structure is the cathedral, erected upon the site of the great teocalli of the Aztec Mars. On the S. of the cathedral is the chief square, or Plaza de Armas, which is 810 by 600 ft. The E. side of the same is occupied by the govt. palace, which contains the residence of the pres., bureaux of the cabinet ministers, etc. Under the Sp. régime this was the residence of the viceroys. The city is well provided with markets, which are supplied with vegetables and flowers. The National Museum contains a rare collection of articles throwing light upon the aboriginal hist. of M. The Acad. of San Carlos, founded by Charles III. of Sp., contains the largest and most valuable collection of paintings in Amer. Several societies are fostered by the govt., such as that of nat. hist., of mines, and of geog. and statistics. The National Library has 103,000 vols. Two noble aqueducts constitute a striking architectural feature of the city. The

pop. of the city was 137,000 in 1803, and is now about 300,000. The pop. of the Federal Dist. (81 sq. m., including the cities of Tacubaya, Guadalupe, and Tlalpam) is 439,769.

**Mexico**, city and R. R. June, cap. of Audrain co., Mo., contains a female sem. Pop. 1870, 2602; 1880, 3835.

**Mexico**, on R. R. Oswego co., N. Y., 15 m. E. of Oswego, has an acad. Pop. 1870, 1204; 1880, 1273.

**Mexico, Gulf of**, is a vast inlet of the Atlantic on the E. shore of N. Amer., between the 2 peninsulas of Yucatan and Fla., bounded by Mex., the U. S., and the island of Cuba; area, nearly 800,000 sq. m. The Gulf Stream enters it through the Yucatan Channel, traverses it in a curved line, and leaves it through the Fla. Channel.

**Meysbeer**, mfer-bär (GIACOMO), b. in Berlin Sept. 5, 1794, d. in Paris May 2, 1864; had a genius for music, and enjoyed the benefit of the best teaching that could be commanded. His proficiency as a pianist became soon manifest, but the ambition to excel as a dramatic composer carried him away. The chief operas of M. are *The Prophet*, *Dinorah*, *Robert le Diable*, etc.

**Meysersdale**, Pa. See APPENDIX.

**Meze'reon** [Per. *Madzaryoun*], in materia medica, the bark of *Daphne mezereum*, *D. laureola*, *D. gnidium*, and other species of the genus, handsome shrubs of Europe and Asia, sometimes seen in cultivation in the U. S. The bark has strongly irritant-narcotic properties.

**Mikao**. See JAPAN.

**Miami** (mi-ah'me) **River**, of O., rises in Hardin co., runs in a S. W. course, passing the cities of Troy, Dayton, and Hamilton. It is a rapid stream, flowing through a beautiful, fertile, and populous valley, and joining the O. below Cin. A canal has been cut along the river. It is 150 m. long, and furnishes much water-power. Its ultimate source is 1335 ft. above sea. The **LITTLE MIAMI** is a smaller unnavigable stream, flowing through a fertile and hilly region to the E. of the M. into the O. 6 m. above Cin.

**Miami'sburg**, R. R. June, Montgomery co., O., in the centre of the tobacco-growing region of the Miami Valley, 50 m. N. of Cin.; has extensive water-power. Pop. 1870, 1425; 1880, 1936.

**Miami University**, at Oxford, Butler co., O., incorporated in 1809; commenced as a grammar school in 1818, and as a coll. in 1824. It derives its origin from a grant of the tp. of Oxford, made by Cong. to O. in 1803, to be held in trust for educational purposes. The univ. is governed by a board of 18 trustees appointed by the govt. of the State.

**Miantonomoh**, sachem of the Narragansett Indians and nephew of Canonicus, assumed the govt. about 1636, in which yr. he concluded an alliance with the govt. of Mass. He aided the colonists in the Pequod war 1637, and was friendly to Roger Williams and other early settlers of R. I., to whom he made grants of land. Having engaged in war with Uncas, sachem of the Mohegans, he was taken prisoner, carried to Hartford, and by the advice and consent of the govt. of the United Colonies was put to death by the tomahawk, Sept. 1643, near Norwich.

**Miasma**, mi-az'ma [Gr. *μιασμα*, "stain," from *μιαίνω*, "to contaminate"], an emanation, especially that from the earth in low marshy dists., which is capable of penetrating the human system, and producing therein certain manifestations of disease. It probably consists of cryptogamic growths, the product of vegetable fermentation.

**Miaulis**, mi-aw'lis (ANDREAS VOKOS), b. in 1768 or 1773 at Negropont; settled in Hydra, where he built up an extensive commercial business; joined in 1821 the Gr. revolution; was made commander-in-chief of the Gr. fleet, and achieved several brilliant successes, but retired in 1827 when Lord Cochrane was placed at the head of the Gr. navy; was member of the provisory govt. established in Hydra; one of the deputation which in 1832 went to Munich to offer the Gr. crown to King Otho. D. June 24, 1835.

**Miau-tse**, a race of hillmen inhabiting the mts. of Chi. They are essentially the same with the Karens of Burmah. Many of them are independent.

**Mica** [Lat. *micare*, to "shine"]. The M. constitute a group of very interesting and widely spread minerals, belonging to the Unisilicates, and containing silicic acid, with varying proportions of the alkalies, magnesia, lime, and protoxides of iron, with the sesquioxides of aluminium, iron, and manganese, usually a little fluorine, and more rarely titanium. The M. occur generally in thin, shining scales, usually transparent. More rarely, some of the M. are found in large plates, and occasionally 6-sided prisms. Unless decomposed they are distinguished by a very easy cleavage, splitting readily into extremely thin, elastic laminae, and showing usually a pearly lustre on the cleavage faces. At present M. is exported from this country to Europe. The demand for M. exceeds the supply, and hence it is a valuable article of commerce.

**Mic'ah**, one of the minor Heb. prophets, was b. at Moresheth, near Gath. He lived in the latter half of the 8th century B. C. He was an older contemporary of Isaiah. M.'s prophecies refer chiefly to the fate awaiting the 2 Heb. nations.

**Mica-schist**, a metamorphic, stratified, schistose, crystalline rock, always foliated in texture and composed of variable proportions of mica and quartz. It gradually passes in one direction into gneiss and in another into quartz-schist.

**Michael Angelo**. See ANGELO BUONARROTI.

**Michelet** meesh-eh-lä' (JULES), b. at Paris Aug. 21, 1798, and ed. at the Lyceum of Charlemagne, in which he was elected prof. in 1821. After the revolution of 1830 he was appointed chief of the historical section of the royal archives, and in 1838 prof. of hist. and morals at the Collège de France. In 1851 he lost his position both at the archives and at the univ., as he refused to take the oath of allegiance to Louis Nap. Wrote *Histoire de France, Les Juifs, Du Prêtre, de la Femme, de la Famille, L'Oiseau, L'Insecte, L'Amour*, etc. D. Feb. 9, 1874.



**Michigan**, mish'-gan, one of the N. Central States of

the U., lying among the great lakes, and forming on its N. line a part of the N. boundary of the U. S. between 41° 42' and 48° 22' N. lat., and 82° 26' and 90° 30' W. lon. Its N. boundary is the line running through Lake Superior, which forms the boundary between the U. S. and Brit. Amer.; its E. boundaries are the north-easternmost channel of the straits connecting Lake Superior and Lake Huron, Lake Huron, St. Clair River or Strait, Lake St. Clair, and the Detroit River or Strait; the S. boundary of the lower peninsula is a part of the States of O. and Ind.; the upper peninsula is bounded on the S. by Lake Huron, the Straits of Mackinaw, Lake Mich., Green Bay, and the N. line of Wis.; the W. boundary of the lower peninsula is Lake Mich.; of the upper peninsula, Lake Superior and Wis. Area, 58,915 sq. m. or 37,705,600 acres.

**Face of the Country.**—The State is divided naturally into 2 irregular peninsulas, separated from each other by the Straits of Mackinaw, the lower having its projection northward; the upper, eastward. The latter has a rugged, mountainous, and broken appearance, a range of mts. called the Porcupine Range forming the watershed between the streams flowing into Lake Superior and those flowing into Lake Mich. From this range there proceeds on either side an elevated table-land sloping gradually toward the lakes. The country is rocky, abounding in mineral wealth, but generally sterile. The lower or S. peninsula is very nearly level. The watershed is nearer Lake Huron than Lake Mich., and has a gentle slope toward the latter; the shores of the lakes are often steep and elevated.

**Coasts, Lakes, Bays, and Rivers.**—The extent of the lake-coast of M. is very great, exceeding 1100 m., and including numerous bays and excellent harbors. The N. peninsula has Keweenaw Bay, Marquette harbor, Tequamenon Bay, the bays and inlets around St. Mary's River; and on its S. shore, Mackinaw Bay and Strait, the Big and Little Bays de Noquet, and the long and deep Green Bay. The lower peninsula has on the Lake Huron side Thunder Bay, Saginaw Bay, and the roadsteads of Port Huron, the St. Clair and Detroit rivers, and Lake St. Clair; and on Lake Erie, Monroe harbor. On the W. or Lake Mich. side are several artificial harbors, such as New Buffalo, South Haven, Grand Haven, and Ludington, and farther N., Grand Traverse and Little Traverse bays. Beside the four great lakes and St. Clair there are hundreds of small lakes; the larger share of these is in the N. peninsula, though the S. has a considerable number. The prin. rivers of the State are in the upper peninsula; the so called Detroit and St. Clair rivers are only straits connecting the lakes with each other. The islands are very numerous: Isle Royale in Lake Superior, the Beaver, Fox, and Manitou isles in N. part of Lake Mich., Bois Blanc in Mackinaw Straits, Drummond Island in Lake Huron, Sugar Islands in Straits of St. Mary.

**Geology and Mineralogy.**—From the extreme end of Keweenaw Point, in the upper peninsula, we find the copper-bearing strata, extending westward to the Minn. line. These strata are perhaps more fully charged with copper ores of great richness and value than any other copper-bearing rocks in the world. Beyond these, on the N. W. shore of the peninsula, at the back of the long promontory of Keweenaw Point, these copper-bearing rocks are overlaid by sandstone. The lower peninsula is composed wholly of the groups of the Appalachian series, the coal-measures, the highest member of the series, occupying the central portion of the peninsula and covering an area of 7000 sq. m. The coal-field proper extends from about the middle of Saginaw Bay to the line of the Mich. Central R. R. The coal is bituminous and of fair quality, though not the best. Salt is another product of the coal measures, and immense quantities are made, of excellent quality, in the neighborhood of Saginaw Bay. In Bay, Saginaw, and Kent cos., outside the coal-field, the underlying Carboniferous limestone crops out, yielding at some points plaster of Paris and gypsaceous shales. Around these appear the Portage and Chemung groups, principally slates and sandstones. The prin. value of these is to give fertility to the soil; they contain no minerals of importance. The production of copper and iron from the ores, and of salt from the salt-springs of the Saginaw region, has placed M. in the first rank of mining States, and her other productions of the quarry and mine, such as the slates from the upper peninsula, coal, gypsum, grindstones, petroleum, building-stone, etc., though important in themselves, are hardly to be considered in connection with these greater interests.

**Soil and Vegetation.**—It was long supposed that the soil of the S. peninsula of M. was too swampy and its climate too deadly to make it habitable. And yet this region has proved to be the garden of the N. W. The forests of pine, spruce, hemlock, and tamarack proved to be themselves sources of wealth, and the soil of the lower peninsula was found to possess remarkable fertility. The soil of the upper penin-

sula is more sterile, but will yield fair crops with diligent cultivation, while its immense mineral wealth renders it desirable for a residence independent of the qualities of its soil. The timber of this region is mostly white pine, spruce, hemlock, birch, aspen, oak, elm, maple, and ash. Indian corn will not always ripen, in consequence of the shortness of the season, but wheat, rye, barley, and oats do well. In the S. peninsula Indian corn and all the cereals grow very abundantly, and the State is one of the great grain-growing States. The S. W. part is also noted as a fruit-region, supplying peaches, pears, and apples to the whole N. W.; the upper portion of this S. peninsula is remarkable for its fine forests, and its pine, spruce, hemlock, and cedar lumber is largely exported. Its forest trees also include black walnut, sugar-maple, hickory, oak, basswood, linden, ash, beech, elm, locust, dogwood, sycamore, chestnut, tamarack, and cypress.

**Zoology.**—The black bear, wolf, lynx, wild-cat, panther, fox, weasel, marten, badger, skunk, mink, otter, raccoon, opossum, marmot, beaver, hare, rabbit, and squirrel are yet in considerable numbers; the elk is rare, while deer are plenty. The lakes abound in fish, and the trade in white-fish is very large. Much pains have also been taken by the coms. of fisheries to stock the waters of the State with salmon, shad, trout, black bass, and other edible fish. The birds of the State are numerous, and many of them are very beautiful in plumage and melodious in song.

**Climate and Meteorology.**—The lower peninsula, being almost surrounded by large bodies of water, has a milder climate than regions farther E. in the same lats, but the upper peninsula has a rigorous climate in winter and a short, hot summer. The mean annual temperature of the lower peninsula is about 47.25°, that of the upper peninsula about 40.40°.

**Agricultural Products.**—The census of 1880 shows a crop of Indian corn in M. of 32,461,452 bushels; wheat, 35,532,543 bushels; oats, 18,190,793 bushels; potatoes, 10,924,111 bushels. Of tobacco, only 83,969 lbs. were raised; of coal, 100,800 tons were mined in 1880. In wool M. ranks third among the producing States, having yielded 11,858,497 lbs. in 1880.

**Farm Animals.**—In 1880 there were in M. 378,778 horses, 891,631 cattle, 2,189,389 sheep, and 964,071 swine.

**Manufactures.**—This State is extensively engaged in manufacturing lumber, for home consumption and for export; 3,938,187,227 ft. were manufactured in 1880. The production of salt was 12,425,885 bushels in 1880, valued at \$2,271,913, and exceeding any other State. The copper mines of M. produce over \$9,000,000 in value annually. The pig iron and iron ore produced amounted to 2,036,121 tons, valued at \$19,457,427. Her iron and steel manufactures amounted to \$4,591,613, employing 3069 hands, and paying \$922,597 in wages. The manufacturing industries of all kinds in this State aggregate 8873 establishments, with 77,591 hands, \$92,990,959 capital invested; wages paid, \$25,313,682; total value of products, \$150,715,025. Detroit produced manufactures to the value of \$30,181,416 in 1880.

**Fisheries.**—The lake fisheries of M. produced \$716,170 in the census yr. 1879, employing 1781 fishermen. White-fish constitute more than half the total product.

**Railroads, Etc.**—In 1880 there were in operation 3607 m. of railway, costing \$136,086,961, with net earnings of \$6,706,566; amount paid in interest and dividends, \$5,402,362. The shipping interest is large, M. having 470 sailing and 393 steam vessels, with tonnage of 162,196 in 1881. There is a ship-canal at St. Mary's Falls and also in Houghton co.

**Commerce and Navigation.**—The foreign commerce of M. (principally with Canada) amounted to \$8,311,417 exports, and \$2,460,962 imports. There were 2949 vessels entered and 2852 cleared at Detroit in 1879, and at Huron 905 vessels entered and 844 cleared.

**Finances.**—The taxed valuation of property in 1881 was \$810,000,000, real and personal; State tax, 12.78 cents on \$100; amount raised for State expenditure, \$804,831; total taxation, State, city, and town, 1880, \$5,632,677; State debt in 1881, \$904,150; total debt, local and State, \$8,803,144.

**Banks, Savings Banks, Etc.**—There were, in Oct. 1881, 80 national banks in M., with \$14,806,617 capital; circulation, \$5,614,977; U. S. bonds to secure circulation, \$6,375,300; deposits, \$24,363,956. Of State banks and trust cos. there were 28, with \$9,292,348 deposits; 1 savings bank, with \$2,586,087 deposits, and 144 private bankers, with \$6,164,062 deposits. In 1880 there were 211 insurance cos. doing business; risks, \$1,523,454,000 for that yr.; premiums, \$30,661,480, and losses, \$11,457,967.

**Education.**—The number of children of school age (5-20 yrs.) in 1880 was 506,221, of whom 362,459 were enrolled in the common schools, with average attendance of 263,775. Total expended for public schools, \$3,112,468, of which \$1,920,615 was for teachers' salaries. School-houses, 8608; teachers, 8608. There are 9 colls. and univs., with 138 instructors, and 2232 students, paying \$81,760 tuition fees. There were, in 1882, 452 periodicals pub. 35 of them daily.

**Churches.**—The M. E. Ch. has 573 chs. and 61,701 members; Baps, 336 chs., 27,036 members; Lutherans, 224 chs., 27,750 members; Congregationalists, 236 chs., 17,064 members; Presbys., 173 chs., 16,576 members; R. Caths., 229 chs., and about 25 other denominations, from 125 to 1 ch. each.

**Population.**—From the time when the Territory was set off from Indiana Territory to the present the State has shown a remarkably rapid increase in population, rising from 551 pioneers in 1800 to the following figures: in 1870, 1,184,059; 1880, 1,636,937 (white 1,614,560, colored, 22,377, including 7249 Indians, 27 Chl., and 1 Japanese); 1884, 1,856,100.

**Principal Cities and Towns, Pop. 1880.**—Detroit, 116,340; Grand Rapids, 32,016; Bay City, 20,639; East Saginaw, 19,016; Jackson, 16,105; Kalamazoo (tp.), 13,552; Muskegon, 11,262; Saginaw, 10,525; Flint, 8409; Lansing (cap.), 8319; Ann Arbor, 8061; Adrian, 7849; Battle Creek, 7663; Manistee, 6930; Alpena, 6153; Ishpeming, 6039; Ypsilanti, 4984; Monroe, 4930; Grand Haven, 4892; Marquette, 4690; Coldwater, 4681; Pontiac, 4509; Niles, 4197; Ionia, 4190; Ludington, 4190.



COUNTIES.	*Ref.	Pop. 1880.	Pop. 1884.	COUNTY TOWNS.	Pop.
Alcona.....	4-J	3,107	4,033	Harrisville.....	549
Alcona.....	7-H	37,815	38,724	Alpena.....	2,805
Alpena.....	4-J	8,789	32,717	Bellevue.....	9,210
Antrim.....	4-J	8,897	8,790	Bellevue.....	65
Areneac.....	5-J	1,804	4,092	Omer.....	1,014
Baraga.....	2-F	1,804	3,040	L'Anse.....	2,638
Baraga.....	7-I	25,317	24,217	Hastings.....	2,638
Bay.....	5-J	38,081	51,263	Bay City.....	29,415
Benzie.....	4-J	3,423	4,394	Benzie.....	775
Berrien.....	8-G	36,785	37,414	Berrien Springs.....	758
Branch.....	8-I	27,941	27,678	Coldwater.....	5,102
Calhoun.....	8-I	38,452	41,526	Marshall.....	4,081
Cass.....	8-H	22,009	21,268	Cassopolis.....	912
Charlevoix.....	4-J	5,175	5,308	Charlevoix.....	512
Cheboygan.....	3-I	6,524	9,373	Cheboygan.....	2,369
Chippewa.....	2-I	5,348	8,372	Saulte de S. Marie.....	1,947
Claire.....	7-I	4,187	5,496	Harrison.....	129
Clinton.....	7-I	28,100	27,185	Saint John's.....	2,375
Crawford.....	6-I	11,159	2,380	Grayling.....	846
Delta.....	3-G	6,412	9,997	Escanaba.....	4,339
Eaton.....	7-I	31,225	31,929	Charlotte.....	3,588
Emmett.....	3-I	6,329	7,945	Harbor Springs.....	9,035
Genesee.....	7-I	39,520	38,925	Flint.....	373
Gladwin.....	7-I	1,127	1,539	Gladwin.....	1,897
Grand Traverse.....	4-H	8,492	12,111	Traverse City.....	900
Gratiot.....	6-I	21,336	25,090	Ithaca.....	3,550
Hillsdale.....	8-J	32,723	31,695	Hillsdale.....	1,882
Houghton.....	1-E	22,473	26,151	Houghton.....	4,643
Huron.....	6-K	24,951	26,088	Marquette.....	712
Ingham.....	7-I	33,676	34,960	Mason.....	1,115
Ionia.....	7-I	33,872	39,652	Ionia.....	1,115
Iosco.....	5-J	6,873	10,622	Tawas City.....	1,115
Isabella.....	1-E	19,159	16,077	Mt. Pleasant.....	1,115
Ile Royale.....	L. Su.	55	55		
Jackson.....	4-J	42,031	45,359	Jackson.....	19,136
Kalamazoo.....	8-H	34,342	35,447	Kalamazoo.....	13,938
Kalamazoo.....	4-J	2,937	4,499	Kalamazoo.....	496
Kent.....	7-H	75,253	84,765	Grand Rapids.....	41,934
Keweenaw.....	7-I	4,470	4,671	Eastland.....	165
Lapeer.....	7-K	3,233	7,574	Baldwin.....	2,897
Lapeer.....	4-H	30,138	30,118	Lapeer.....	838
Leelanaw.....	8-J	6,253	7,180	Leland.....	9,380
Lenawee.....	8-J	48,343	49,324	Adrian.....	2,071
Livingston.....	7-I	22,351	21,573	St. Ignace.....	2,236
Macomb.....	2-I	2,902	5,163	St. Ignace.....	3,827
Macomb.....	7-K	31,627	31,330	Mt. Clemens.....	10,373
Manistee.....	5-H	12,532	19,859	Manistee.....	168
Manistee.....	3-H	1,334	973	St. James.....	5,618
Marquette.....	5-F	25,304	31,370	Marquette.....	5,433
Marquette.....	5-H	10,065	13,431	Ludington.....	5,917
Meosota.....	6-I	13,973	20,632	Big Rapids.....	5,578
Menominee.....	3-F	11,947	19,129	Menominee.....	1,529
Midland.....	6-I	6,893	8,784	Midland.....	5,216
Muskegon.....	5-I	1,553	2,385	Lake City.....	1,740
Monroe.....	8-K	33,424	33,344	Monroe.....	1,740
Montcalm.....	6-I	33,148	35,423	Stanton.....	846
Montmorency.....	4-J	1,914	3,641	Hillman.....	17,845
Muskegon.....	7-H	26,586	37,381	Muskegon.....	1,967
Nawasaga.....	6-H	14,888	19,055	Nawasaga.....	5,348
Oakland.....	7-K	41,837	41,167	Pontiac.....	464
Oceana.....	6-H	11,899	14,557	Hart.....	139
Ogemaw.....	5-J	1,914	3,641	West Branch.....	1,855
Ontonagon.....	2-D	2,545	4,838	Ontonagon.....	472
Oscoda.....	4-J	10,777	13,960	Lawrence.....	292
Oscoda.....	4-J	487	1,376	Mio.....	5,914
Otsego.....	4-I	1,974	3,907	Gaylord.....	325
Ottawa.....	7-H	33,126	36,308	Grand Haven.....	171
Presque Isle.....	3-J	3,113	4,067	Rogers City.....	1,282
Roscommon.....	6-J	2,418	2,418	Saginaw.....	1,482
Saginaw.....	6-J	59,095	75,813	Saginaw.....	7,922
St. Clair.....	7-K	46,197	46,813	Port Huron.....	183,248
St. Joseph.....	8-H	26,626	26,299	Centreville.....	5,916
Sanilac.....	6-K	29,341	29,623	Sandusky.....	1,181
Schoolcraft.....	2-G	1,575	3,353	Manistique.....	1,451
Shiawassee.....	7-J	27,059	28,093	Corunna.....	1,282
Tuscola.....	6-J	25,738	29,935	Caro.....	1,482
Van Buren.....	8-H	30,807	30,446	Paw Paw.....	1,482
Washtenaw.....	8-J	41,848	41,704	Ann Arbor.....	183,248
Wayne.....	8-K	166,444	189,348	Cadillac.....	5,916
Westford.....	5-H	6,815	10,538		
Total.....		1,636,937	1,856,100		

\* Reference for location of counties. See map of Michigan.

† Formed since census of 1880.

**History.**—M. derives its name from the Indian words *Mitchi Saugweigan*, signifying "lake country." The first settlement was made in 1641 at the Falls of St. Mary, in the upper peninsula. In 1668 Allouez, Dablon, and James Marquette founded the mission of St. Mary at St. Mary's Falls. In 1671 Father Marquette laid the foundations of a fort at Michilimackinac (now Mackinac). In July 1701 a colony was planted at Detroit by M. Antoine de la Motte Cadillac. On Sept. 8, 1760, the Fr. surrendered to the Eng. Crown Detroit, Michilimackinac, and all other places within the govt. of Canada then remaining in the possession of Fr. Silver and copper were discovered, and the mines worked to some extent in 1772 and 1773. During the war of the Revolution M. was included within the bounds of Canada, and was not the scene of any battles. It was formally surrendered, June 1796, and was included in the N. W. Terr. This Terr. was divided into two May 7, 1800, and the E. portion, which included M., was called Indiana Terr. On June 30, 1805, Ind. Terr. was divided, M. Terr. was organized, and Detroit made cap. On June 18, 1812, war was declared between the U. S. and G. Brit., and Gen. Hull appointed commander-in-chief of the forces of the N. W., but within 37 days he ingloriously surrendered Detroit and its fort to the Brit.; but the naval battle of Lake Erie (Sept. 10, 1813) resulted in the restoration of M. to the U. S., and Sept. 29, 1813, Detroit was occupied by a detachment of Gen. Harrison's army. In Oct. 1813 Lewis Cass was appointed gov. of M. Terr. In 1823 a legislative council of 9 members, appointed by the Pres. from 18 persons elected by the people of the Terr., was ordered, and entered upon their duties in June 1824. They, with the gov., constituted the actual govt. of the Terr. In 1835 a controversy arose between M. and O. in regard to their boundary-line. A const. was adopted and a State govt. elected in 1835, which were accepted by Cong. June 15, 1836, and the State admitted into the U. with the condition that M. should accept the boundary claimed by O. This was finally accepted under protest Dec. 15, 1836, and the State was allowed to record its vote for Pres. that yr.,

though it was not formally declared a State by act of Cong. until Jan. 26, 1837. On May 16, 1847, the seat of govt. was removed from Detroit to Lansing. In 1850 a constitutional convention was held, and a new const. reported and ratified by the people in Nov. of that yr.

#### Governors.

Under French Dominion.		Indiana Territory.	
Samuel Champlain.....	1622-35	Wm. Henry Harrison.....	1800-05
M. de Montigny.....	1636-47		
M. d'Alibout.....	1648-50	Michigan Territory.	
M. de Lauson.....	1651-56	William Hull.....	1805-13
M. de Lauson (son).....	1656-57	Lewis Cass.....	1813-31
M. d'Alibout.....	1657-58	George B. Porter.....	1831-34
M. d'Argenson.....	1658-60	S. T. Mason, <i>ex-officio</i> .....	1834-35
Baron de Avangour.....	1661-63	State.	
M. de Mesey.....	1663-65	Stevens T. Mason.....	1835-40
M. de Courcelles.....	1665-72	William Woodbridge.....	1840-41
Count de Frontenac.....	1672-82	J. Wright Gordon (acting).....	1841-42
M. de la Barre.....	1682-85	John S. Barry.....	1842-45
M. de Noville.....	1685-89	Alpheus Felch.....	1846-47
Count de Frontenac.....	1689-98	Wm. L. Greenly (acting).....	1847
M. de Callieres.....	1699-1703	Epharoditus Ransom.....	1848-49
M. de Vaudreuil.....	1703-25	John S. Barry.....	1850-51
M. de Beauharnois.....	1726-47	Robert McClelland.....	1852-53
M. de Galigniere.....	1747-49	Andrew Parsons (acting).....	1853-54
M. de la Jonquiere.....	1749-52	Kinsley S. Bingham.....	1855-55
M. de Quesne.....	1752-55	Moses Wisner.....	1859-60
M. de Vaudreuil de Cavag-		Austin Blair.....	1861-64
nac.....	1755-63	Henry H. Crapo.....	1865-68
		Henry P. Baldwin.....	1869-72
		John J. Bagley.....	1873-77
		Charles M. Croswell.....	1877-81
		David H. Jerome.....	1881-88
		Josiah W. Begole.....	1883-85
		R. A. Alger.....	1885-87
Territorial.—N. W. Territory.			
Arthur St. Clair.....	1796-1800		

REVISED BY A. R. SPOFFORD.

**Michigan City, R. R. Centre, La Porte co., Ind., 70 m. E. of Chicago;** has the N. Ind. State prison, and an extensive lake trade in lumber, salt, and iron ore. Pop. 1870, 3985; 1880, 7366.

**Michigan, Lake,** the second in area of the great lakes of the St. Lawrence basin, and the only one entirely within the limits of the U. S. Area, 25,600 sq. m. Its greatest length 440 m.; average depth 900 ft.; height of surface above the ocean, 578 ft.—the same as that of Lake Huron's shores are generally low and often sandy. It has comparatively few bays or very good harbors. The prin. bays are Green Bay in Wis. and Grand Traverse Bay in Mich. It receives many streams the mouths of which in some instances (as at Chicago) have by artificial means been converted into capacious harbors. It has the State of Mich. on the E. and N. W. and Ill. on the W., while its S. extremity reaches Ill. and Ind. It has extensive fisheries.

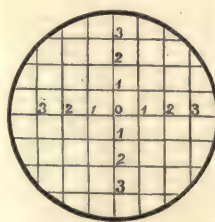
**Michigan University,** at Ann Arbor, Mich. Cong. in 1826 set apart 2 tps. in the Terr. of Mich. for the future foundation of a univ., which was accordingly established by the first legislature of the new State Mar. 18, 1837, though not opened until Sept. 30, 1842. It is supported by the State, and open to both sexes on payment of a small matriculation fee and an annual payment of \$30 to \$35. To the original academic inst. a med. dept. was added in 1850 and a law dept. in 1859, and subsequently a school of pharmacy, a homoeopathic med. coll., and a dental coll. The libraries contain over 40,000 vols.; the various museums have above 320,000 specimens. A fine observatory was erected by citizens of Detroit in 1854. The grounds embrace 40 acres, and the buildings were erected at a cost of \$470,000. The fund, derived from the sale of lands, now yields about \$38,000 annually. A tax levied by the State for the univ. yields about \$38,500. The govt. is in the hands of 8 regents, elected by the popular vote of the State.

**Michoacan,** me-sho-ah-kahn, state of the Mex. confederation, extends along the Pacific from lat. 18° to 21° N.; area, 25,689 sq. m., with 661,634 inhabs., most of whom are mestizos and Indians. The middle part is mountainous, traversed by the Sierra Madre; the mts. are of volcanic origin, rich in metals, and covered with vast forests. The soil is everywhere extremely fertile, and the climate mild and healthy. Shawls, blankets, and silverware are manufactured; silver, gold, and copper are mined. Cap. Morelia.

**Micras'ter** [Gr. μικρός, "small," and ἀστὴρ, "star"], a genus of Echinoida or sea-urchins belonging to the family Brissidae, and occurring fossil in the Cretaceous formation. *M. cor-angulum* is one of the characteristic fossils of the Upper Chalk of Europe.

**Microm'eter** [Gr. μικρός, "small," and μέτρον, "measure"], an apparatus for measuring small distances.

FIG. 1.



The term is usually limited to a contrivance placed in the field of view of a telescope or microscope. The simplest form of M. is the reticulated M. shown in Fig. 1, which consists of a network of lines whose distances apart are known for the telescope to which it is applied. The apparent size of an object in the field of view then becomes known by noting how many divisions of the M. are occupied by its image. Scales ruled on glass are sometimes substituted for the reticle. These lines are rendered visible at night by artificial light.

The filar M., shown in Fig. 2, is composed of a rectangular frame *a a a a*. Two rectangular forks, *b b b* and *c c c*, slide in this frame and can be moved by the screws *f, f*, by turning the graduated heads *g, g*, which are graduated usually into 100 equal parts; at *a* and *a* are 2 pointers. If the head is turned so that 100 divisions will pass the point *a*, obviously we move one of the forks a distance equal to













Long. W. 87° from Greenwich 86H 85I 84J 83K 82 L



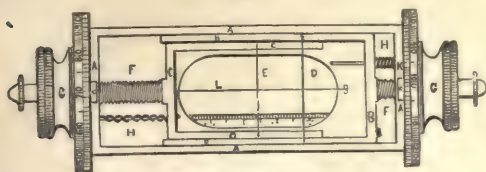






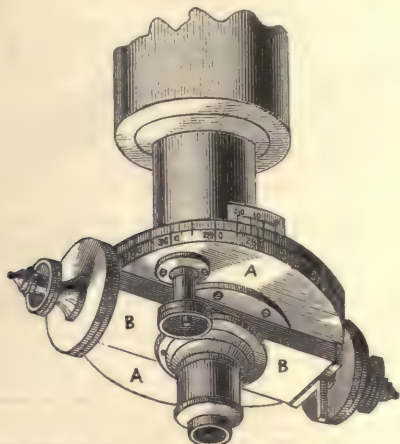
the distance between the threads of the screw *f*. The forks carry 2 spider-lines, *e* and *d*. The distance apart of any 2 points in the field of view may be determined by making the line *e* bisect one of them, and the line *d* the other, and at the same time having the line joining them parallel to *l*. For every entire revolution of the screw *f* the

FIG. 2.



line *e* or *d* passes over a single tooth of the comb *c*. By noting the number of teeth included between the lines *e* and *d*, and also noting the readings of the pointers *a* and *a*, the exact distance between the 2 points becomes known, expressed in terms of the distance between the threads of the M. screw *f*, which has usually about 100 threads to the inch. One division on the head of the M. screw would

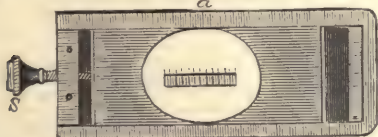
FIG. 3.



in this case be equal to one ten-thousandth of an inch. When the filar M. is attached to a graduated circle, so that it can be rotated around the axis of a telescope, as shown in Fig. 3, it is then called a position M. The spider-lines are illuminated by lamplight at night.

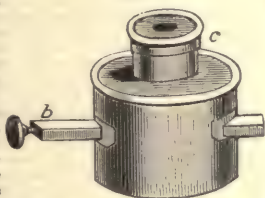
The first form of instrument is called the heliometer, and is superior to the position M. in that much larger dis-

FIG. 4.



tances can be measured. The second form is known as the double image eye-piece M. Either the reticulated or

FIG. 5.



the distance between 2 points may easily be determined in terms of the scale divisions. [From orig. art. in *J.'s Unt. Cyc.*, by L. WALDO.]

**Micronesia**, the gen. name given to the small islands E. of the Philippines. The Caroline and Marshall Islands are the prin. divisions.

**Microscope**, mikrō-skōp. Those objects which are too minute to be seen by the unaided vision are brought into view by the instrument called *microscope* (from μικρός, "small," and σκοπεῖν, "to see"). By a *simple M.* is understood a single lens or set of lenses, by means of which the object is viewed directly. The ordinary hand-magnifier or pocket-lens is an example. Here 1, 2, or 3 lenses may be employed. A more convenient form consists in having the simple M. mounted upon a stand provided with an arm made to move up and down by means of a rack and pinion or other device. Under the head of *compound M.* may be included those furnished with an object-glass, and an eye-piece, or ocular, which further amplifies the image formed by the object-glass. A stand furnished with stage or ob-

ject-carrier, quick and slow motions for focussing, with many accessories, constitutes the complicated though easily managed modern instrument.

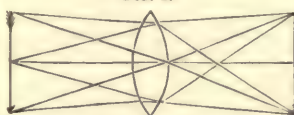
**Lenses**.—A lens is a piece of glass or other transparent substance having its 2 surfaces so formed that the rays of light in passing through it have their direction changed, and are made to converge or diverge from their original parallelism or to become parallel after converging or diverging. When a ray of light passes in an oblique direction from one transparent medium to another of a different density, the direction of the ray is changed both on entering and leaving; this influence is the result of the law of refraction, that a ray of light passing from a rare into a dense medium is refracted toward the perpendicular, and *vice versa*. Lenses

FIG. 1.



are of various forms, and change the course of light passing through them according to their special figure. In Fig. 1 are represented the different shapes of lenses. *a* is simple parallel glass, *b* a meniscus or concavo-convex lens, *c* a double concave, *d* a plano-concave, *e* a double convex, and *f* a plano-convex. In the optical construction of the M., convex and concave lenses are chiefly employed, the convex being the most important form, as the concave is used more for the purpose of correcting the errors which exist in simple convex glasses. The course of parallel rays when they pass through a convex lens is changed, and brought to a point called a focus, the *principal focus*, and the distance from the centre of the lens to this point is the focal length. Diverging rays are rendered parallel in their passage through a convex lens. A concave lens refracts light in exactly the opposite manner from a convex; hence, parallel rays are caused to diverge, etc. By means of a convex lens a great number of rays proceeding from some point of an object are united in one point; each ray carries with it the image of the point from which it proceeded; therefore all the rays united form an image of the object, and the image is brighter in proportion to the number of rays united. "If an object be placed at twice the distance of the prin. focus, the image, being formed at an equal distance on either side of the lens, will be of the same dimensions with the object." (Fig. 2.)

FIG. 2.

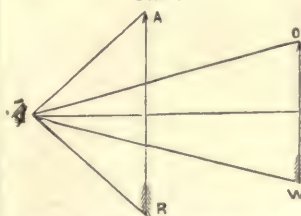


2.) As the object approaches the lens, the image increases both in size and distance from the lens; and as the object is withdrawn from the lens, the image is smaller and closer to the glass.

**Aberration**.—Images formed by simple lenses are first distorted, and secondly surrounded by a colored fringe. These defects are due to the spherical form in which the lenses are ground, as practically such curves as the ellipse and hyperbola cannot be accurately made. The rays of light, then, in passing through a convex lens are not all brought to the same focus, but those on the periphery come to a point first—i. e. nearest to the lens—and then those rays passing through closer to the centre, afterward or farther from the lens. This produces a curved image, and is called spherical aberration. A concave lens has precisely the same defects, but of an opposite character; hence, by combining the convex and concave a compound lens is obtained in which figure-distortion is greatly reduced. Chromatic aberration is due to the fact that the light, in its passage through the lens has the more refrangible rays brought to a focus first, and those of less degree at a greater distance from the lens. Chromatic aberration can be corrected by the combination of 2 media of opposite form and of different refracting and dispersing power; and by the neutralizing of the dispersion the refraction is not entirely overcome, but only modified.

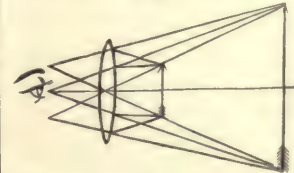
**The Magnifying Power of a Lens**.—In order that an object may be seen, it must be at such a distance as to form an image of some appreciable size upon the retina; and it must furthermore be sufficiently illuminated to produce an impression. The apparent size of an object depends upon the angle which it subtends to the eye, or the angle formed by 2 lines drawn from the extremities of the object to the centre of the eye. (Fig. 3.) The lines from A and R form twice the angle at the

FIG. 3.



centre of the eye that O and W. do; therefore, the object O W seems  $\frac{1}{2}$  the size of A R. The angles formed as just described are called the visual angles. When a convex lens is interposed between a near object and the eye, it reduces the divergence of the rays forming the pencils issuing from it, and in this manner enables the rays to enter the eye so that an image may be formed upon the retina. (Fig. 4.)

FIG. 4.



In the simple M. several lenses may be used, but they



all act as a single glass; in the compound M. there are 2 parts, the object-glass, which may be a single lens, and the eye-piece or ocular, and this can also be a single lens. (Fig. 5.) The object-glass C D forms an enlarged and inverted image, A' B' of the object A B, and the eye-glass L M receives the diverging rays from this image, as if from an object, and brings them to the eye at E, so that the object appears greatly magnified, on the same principle as the simple instrument. By approaching the object to the objective, and moving the ocular to a greater distance from the object-glass, the image is increased in size; and, conversely, by increasing the distance from object to object-glass, and lessening that between the latter and eye-glass, the image is reduced in size. In order that a greater portion of the object may come within range of the eye-piece, and so be made visible, a third lens is placed between the objective and the eye-glass. As the third lens limits the circle of light or field of view which is seen in looking into a microscope, it is called the *field-glass*. The eye-glass and field-glass together are considered as one, and termed eye-piece or ocular.

The *object-glass* is the part of the instrument that requires the greatest amount of care and skill in construction. The distortions known as spherical and chromatic aberration are the obstacles to be overcome in the construction of the object-glass. Now, it has been shown that, by combining a double convex lens of crown glass with a plano-concave of flint, the spherical and chromatic errors may be remedied—not in a single combination of flint and crown glass, but by means of 2 or more so called achromatic lenses. It is found in practice that larger pencils free from errors can be transmitted by employing 3 compound lenses, the middle and posterior combinations being so united as to act as a single lens, together balancing the aberrations of the more powerful anterior combinations. (Fig. 6.)

In many objectives it is required that there should be what is termed a large "angle of aperture," by means of which the definition is much improved. The angle of aperture is that angle which the most extreme rays that are capable of being transmitted through the object-glass make at the point of focus. A much larger quantity of light passes through a lens of high angular aperture. The lenses constructed upon the principles given are termed *dry lenses*—i. e. a layer of air is between the objective and the front of the combination; for higher powers, however, the *immersion system* is now generally used, which is simply the intervention of a drop of water between the object and the lens, and consequently the rays of light from the object pass through water instead of air. The interposition of the water seems to prevent reflection of certain rays which would otherwise be lost; and therefore with the immersion system a greater amount of light can pass into the glass.

Reference has been made to the *stand*, which carries the eye-piece and object-glass, together with the object. In the more perfect forms the stage or object-carrier is moved by milled heads up and down and from side to side; at the same time it can be caused to rotate concentrically. Below the stage is what is termed the sub-stage, into which can be fitted the "achromatic condenser," "polariscope," and various other accessories. The sub-stage is provided with centring screws, rotation, and vertical motion. The achromatic condenser is for the purpose of concentrating the light which is reflected from the mirror, and in this manner any amount of illumination of the object is produced. By means of the polariscope the effect of polarized light may be studied upon the minute structures. In like manner, the addition of the "spectroscopic eye-piece" enables the smallest portions of substances to be submitted to the spectroscopic test. The various accessories which are of so much value to the M. can be best studied in the larger works devoted to the special subject. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. J. W. S. ARNOLD, M. D.]

**Midas**, a common name among the Phrygian kings; Herodotus mentions 3. One of them, a son of Gordias by Cybele, was a pupil of Orpheus, promoted the worship of Dionysus, who gave him the power of transforming everything he touched into gold. But the man would have starved to death had not the god helped him a second time. By bathing in the river Pactolus the auriferous power was transferred from the body of M. to the waters of the river, and they became henceforth productive of gold. Another time he was chosen umpire in a musical contest between Apollo and Pan. He gave the prize to Pan, and the angry god punished him by changing his ears into those of an ass.

**Mid'delburg** (PAUL), b. at Middeburg, island of Walcheren, in 1445; studied at the Univ. of Louvain; took holy orders, and was appointed chaplain at the ch. of St. Bartholomew in his native city; but, preaching a little too zealously against ignorance, drunkenness, and gluttony, he was expelled from the city, and returned to Louvain, where he lectured on math. Chosen by the grand council of Venice to the chair of math. in Padua, he afterward became phys. to the duke of Urbino, on whose recommendation he was appointed bp. of Fossombrone in 1494 by Pope Alexander VI. With Julius II. and Leo X. he stood in great

Fig. 5.

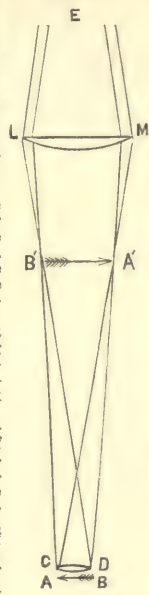
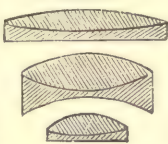


Fig. 6.



favor, and presided over the fifth Lateran Council (1512-18). D. at Rome Dec. 15, 1534. He was one of the first to urge the necessity of reforming the calendar, and wrote *Paulina, de recta Pasche Celebratione, et de Die Passionis Domini nostri Jesu-Christi, Epistola ad Universitatem Lovaniensem: De Paschate recte observando*.

**Middle Ages.** This is the term generally used to designate that great historical period lying between the anc. and modern epochs of the world's civilization.

1. **Chronology.**—The mediæval period begins with the overthrow of the Rom. power by the Gers. and the settlement of the Vandals, Goths, A.-S., Franks, and Burgundians upon Romanic soil in the last half of the 5th century, and ends with the great events of the 15th and 16th centuries—viz. the invention of printing, the discovery of Amer., the employment of gunpowder, the development of the absolute monarchy in the state, and the Ref. in the Ch.

2. **Events.**—The cardinal events of the M. A. were:

(a) The reaction of the spirit of nationality against the artificial union of the Frankish European empire, producing the treaty at Verdun in 843 A. D., whereby the empire was divided into 3 independent kingdoms, corresponding in their territorial extent to the geographical basis of 3 distinct types of nationality, which may be termed from that time forward It., Ger., and Fr.

(b) The reaction of individuality against the authority of law imposed from without, splitting Europe up into a multiplicity of petty sovereignties.

(c) The great invasion of the Scandinavian vikings (836-912 A. D.), striking the death-blow to the tottering Carlovingian powers, already threatened by the Saracens in the S. and the Magyars in the E.

(d) The settlement of the Northmen upon the terr. of N. Fr., founding there the dukedom of Normandy, accepting the culture of the Romanized Franks both in state and Ch., setting the great N. into connection with the Continent, and opening it to the influences of Christianity and the civilization of the Romanic world; and then from this continental basis making conquest both of Eng. (1066 A. D.) and S. It. (1024-35 A. D.).

(e) The Crusades, 8 in number, and reaching chronologically from 1096 to 1270 A. D. In this great European movement, in which the chivalrous type of Christianity culminates, the peoples of Europe, impelled chiefly by the power of religious fanaticism, threw themselves back upon Asia with the nominal purpose of freeing the Holy Sepulchre from the desecrations of the Turks. Six millions of men perished in these undertakings. Among these the nobility as a class suffered far the most severely. The establishment of a political connection with Asia had led to the establishment of an intercourse and trade which enriched the burgher class as much as the wars had impoverished the nobility. The political power passed over more and more to the cities and the burgher class, and the old feudal const. began to be undermined. The results as regards the Ch. were of a double nature. Its temporalities had been immensely increased, but its moral power entered upon the period of its sinking.

(f) Lastly, we mention the re-establishment of the Carlovingian imperium by Otho the Great (962 A. D.), under the name of "Holy Roman Empire of the German Nation," thus bringing, both for weal and for woe, the Ger. and Rom. into direct contact with each other, and paving the way for that great conflict between pope and emp. for the supremacy over European Christendom which, of all the movements of the M. A., was the most continuous, important, and heavy with results.

3. **Spirit and Genius of the Middle Ages.**—Defiant self-reliance upon rude phys. force in regard to the attainment of all things temporal, and superstitious subjection to a sacerdotal order in regard to things unseen, unknown, and represented as eternal; narrow selfishness in regard to the duties and functions lying near and in the common course, connected with the most chivalrous devotion to the mystical, the undefined, and the distant; the direst immorality and disobedience to law and order, coupled with the most exaggerated and enthusiastic religiosity; bold adventuresomeness without defined purpose; fancy and imagination without reflection; faith without reason; devotion without humanity—these are some of the contradictions which characterize the mediæval spirit.

4. **Institutions of the Middle Ages.**—This spirit and genius incorporated itself in the two all-comprehending insts., the feudal state and the hierarchical Ch. The spirit of the age was far too objective to conceive of the authority of law as based upon the common consciousness of the governed. Under such an order the common man could only protect himself by contracting for his protection by some great man. The cost of such protection to the common man was the surrender of his own land to the ownership of the lord, retaining only the possession of the same as a fief, and rendering certain tributes or services to the lord for such possession and protection. The vassals of the same lord were connected with each other through their feudal relation to a common lord, and different lords only through their feudal relation to a common superior, and so on until the sovereign lord of the land was reached. In regard to the Ch. the same externality of idea manifests itself in the conceptions of authority and grace. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. JOHN W. BURGESS, LL.B.]

**Mid'dleboro',** R. R. junc., Plymouth co., Mass., has an acad., a public library, and large manufacturing interests. Pop. 1870, 4687; 1880, 5237.

**Mid'dlebury**, cap. of Addison co., Vt., on R. R. and Otter Creek, which furnishes good water-power. It has marble quarries, is incorporated, and is the seat of Middlebury Coll., founded in 1797. Pop. 1880, 1834.

**Middle Park**, in Grand co., Col., consists of several minor parks, the whole some 15 m. wide and 70 m. long. It is an elevated basin, surrounded by mts. of gneiss, and



abounding in grass, timber, and lignite. Its drainage is by tributaries of the Colorado of the West.

**Middleport**, Meigs co., O., on R. R. and O. River. Pop. 1870, 2295; 1880, 3032.

**Middleton** (ARTHUR), b. in S. C. in 1743, was a son of HENRY MIDDLETON, who was pres. of Cong. 1774-76, and the latter was a son of ARTHUR MIDDLETON, who was gov. of S. C. 1725-31. The younger Arthur M. was educated at Harrow, Westminster, and Cambridge, Eng., where he grad. in 1764; was in Cong. 1776-77; signed the Dec. of Ind.; assisted by arms and by the effective use of his pen in the cause of freedom; was long a prisoner of war, and suffered great pecuniary losses in the Revolution; was again in Cong. 1781-83. D. Jan. 1, 1788.

**Middleton** (HENRY), son of the preceding, b. in 1771; was 1801-18 a State legislator of S. C., gov. 1810-12, U. S. minister to Rus. 1820-31. D. June 14, 1846.—His son ARTHUR (1795-1853) was for some time in the U. S. diplomatic service.—Another son, HENRY, b. 1797, grad. in 1815 at W. P. L., studied at Edinburgh, was admitted in 1822 to the bar of Charleston, and became a political and economical writer of distinction.—JOHN IZARD MIDDLETON, a brother of Henry, senior, b. 1785, ed. at Cambridge, Eng., resided for many yrs. in Paris, and wrote *Cyclopean Walls*. D. Nov. 1849.

**Middleton** (PETER), M. D., b. in Scot., ed. at Edinburgh. In 1750 he assisted Dr. Bard of New York in making the first recorded dissection in Amer.; in 1767 took part in establishing a med. school in New York, in which he was prof. of physiology and pathology and instructor in materia medica 1767-76; was gov. of King's (now Columbia) Coll. 1775; wrote med. works. D. 1781.

**Middletown**, city and R. R. centre, port of entry, and semi-capital of Middlesex co., Conn., on W. bank of Conn. River, 31 m. above its mouth and 15 m. S. of Hartford. The town was settled in 1650, and the city was incorporated in 1784. The river is navigable here for vessels of 10 ft. draught, and the tide rises from 18 to 24 inches. The vicinity is rich in minerals, some of which, as columbite, are very rare. M. has a fine custom-house, a c. h., and a public library; is the seat of the Wesleyan Univ. (Meth.), and of the Berkeley Divinity School (Epis.). Here are the Conn. hospital for the insane and the Conn. industrial school for girls. Pop. 1870, 6923; 1880, 6826.

**Middletown**, R. R. junc., Newcastle co., Del., 52 m. S. W. of Phila., at the head of the great peach dist. of Del. and Md.; has an acad. Pop. 1870, 915; 1880, 1280.

**Middletown**, R. R. centre, Orange co., N. Y., 67 m. N. W. of New York; here is the State homoeopathic asylum for the insane. Pop. 1870, 6049; 1880, 8494.

**Middletown**, R. R. centre, Butler co., O., 32 m. N. of Cin. Pop. 1870, 3046; 1880, 4538.

**Middletown**, on R. R., Dauphin co., Pa., has important manufactures. Pop. 1870, 2080; 1880, 3351; 1885, 5000.

**Midge** [A. S. *mygge*], a name applied in Eng. to dipterous insects resembling gnats and mosquitoes in their habit of feeding upon the blood of men and animals. In the U. S. the name is especially given to the *Cecidomyia tritici*, a wheat M., a most destructive insect, which lays its eggs in the blossoming ears of wheat. Deep ploughing destroys many of them by burying their cocoons deeply in the earth.

**Midhat Pasha**, b. in Constantinople about 1830, ed. partly in Constantinople and partly in Paris; became *vall* or commander of the sandjaks of the Danube in Bulgaria, and in 1867 pasha or gov. of Bulgaria; in 1872 recalled to Constantinople as grand vizier, and continued in power (except for a short time) through the reigns of Abd-ul-Aziz, Murad V., and the first 6 months of Abd-ul-Hamid, when he was dismissed and exiled. He defended Tur. ably in the conference of Dec. 1876, and presented to the powers a const. which he had prepared and caused the sultan to sign. With 8 others, he was convicted and sentenced to death, 1881, for murder of ex-Sultan Abd-ul-Aziz. By order of Sultan Abd-ul-Hamid the sentence was changed to banishment. D. May 11, 1884.

**Mid'ianites**, an anc. Ar. race, the descendants of Midian, the fourth of the 6 sons of Abraham by Keturah. They were idolaters. They appear to have dwelt mainly to the S. of Moab. The Sinaitic peninsula was a part of their terr., and the Tawarah Arabs, now dwelling there, are supposed to be their descendants.

**Mid'land**, on R. R., cap. of Midland co., Mich., 21 m. N. W. of E. Saginaw. Pop. 1870, 1160; 1880, 1529.

**Mid'raah** [Heb. "explanation"], a gen. name for the Talmudical writings of the Jews, including the Halacha and the Haggada, and constituting a large body of lit.

**Midwifery**. See OBSTETRICS.

**Mil'lin** (THOMAS), b. in Phila. in 1744, was ed. at Phila. Coll.; became a merchant, and in 1772-73 was in the legislature; went to Cong. in 1774; joined the Revolutionary army; rose to be brig.-gen. in 1776 and maj.-gen. in 1777; withdrew from active service after the battle of Germantown; was sent to Cong. in 1782, becoming its pres. in 1783; speaker of the State legislature in 1785; was in the convention of 1787 which formed the U. S. const.; pres. of the Pa. executive council 1788-90, pres. of the State convention of 1790, gov. 1791-1800. D. Jan. 21, 1800.

**Mignot**, mèn-yâ' (FRANÇOIS AUGUSTE MARIE), b. at Aix, Fr., May 8, 1796, was educated at Avignon; studied law at the Acad. of Aix; removed to Paris in 1822; produced *Histoire de la Révolution Française*, *Histoire de Marie Stuart*, *Éloges Historiques*, etc.; in 1830-48 director of archives of foreign ministry; member of Inst. and of the Acad., and commander of Legion of Honor.

**Mignonne**, min-yo-net' [Fr. "little darling"], the *Rosa odorata*, an herb sometimes half shrubby, a native of N. Afr., universally cultivated for its delicious fragrance.

**Miguel**, me-gel' (DOM MARIA EYARISTO), b. at Lisbon Oct. 26, 1802, the third son of John VI., king of Port., by the Sp. princess Carlotta Joachina; went in 1807 to Brazil with

his parents, fleeing from the Fr. armies. Here he grew up entirely neglected. When he returned to Europe in 1821 he could neither read nor write. Soon after the return of the royal family to Portugal he began to form conspiracies against his father; open revolt followed. The plan was to depose the king, and, if necessary, to kill him. He escaped on board an Eng. man-of-war, and by his escape Dom M.'s plan was foiled. The prince was banished from Port. May 12, 1824. On May 10, 1826, John VI., and in order to prevent a c. war the eldest son, Dom Pedro, emp. of Brazil, resigned the Port. throne in favor of his daughter, Maria da Gloria, and offered her hand to Dom M. He assented, made oath on the const., and entered on his regency during the minority of Maria. But he soon broke his oath, subverted the const. by the aid of the clerical party, assumed absolute power, and ruled Port. for several yrs. by terror. But in 1838 Dom Pedro arrived at Oporto with a Brazilian fleet. In 1833 he conquered Lisbon, and on May 26, 1834, Dom M. was brought to Genoa by a Port. man-of-war, having agreed never to re-enter Port. As soon as he arrived at Genoa he protested against the agreement, but the only result of the protest was that he lost his pension from Port. and all his property was confiscated. D. at Brombach, Baden, Nov. 15, 1866.

**Mikado**, mo-ka-hô, the titular name of the Japanese emp. The present M. was b. in 1852, or, according to the Japanese calendar, in the yr. 2512. His name is MU-TSU-HITO, the son and rightful heir of Osa-hito, whose posthumous name was Komei Tenno, and whose reign lasted 30 yrs. Soon after the death of the father, in 1867, many circumstances conspired to force the late "tycoon" to abdicate the ruling position which he and his predecessors had held as usurpers for several hundred yrs., and which event was the pivot upon which the late revolution in Japan rested. On attaining the requisite age of 16, Mutsu-hito was crowned in the city of Osaka. One of his first acts after that event was to grant an audience to the representatives of foreign powers then in Japan, which was the first time that such an audience had ever taken place. Soon afterward, and before the close of 1868, he removed his residence to Yedo, which he decreed should be called *Tokio*, or the "Eastern capital." In his personal appearance the M. is rather taller than the average of his countrymen; he takes delight in cultivating his mind, and is a hard student; he frequently presides at the meetings of his privy councillors; visits the executive depts. to see that all is going on properly; and has surrounded himself with the wisest statesmen in his empire. With such a worthy ruler, and such a progressive people as the Japanese have already proved themselves to be, the empire of Japan may well count upon a great future of prosperity and happiness. F. A. P. BARNARD.

**Mik'nas**, *Mequinez*, or *Meknaza*, town of Morocco, situated on a fertile plain, watered by the Bet River, and covered with olive-groves. It is fortified, neatly built, and contains a magnificent palace built of marble and surrounded by beautiful gardens. The sultan resides here during the summer. A considerable trade and manufactures of leather and earthenware are carried on. Pop. 55,000.

**Mil'an**, large town of N. It., in lat. 45° 28' N., lon. 9° 11' E., lying in the centre of the great fertile plain of the Po, between the Alps and the Apennines, the Adriatic and the Ligurian seas. The Olona, a small stream, washes its S. wall, and the town is connected by navigable canals with the Adda, and, through the Ticino, with the Po. Railways unite M. with all the large towns of It. The circumference of the city, following the ramparts, is about 8 m. The streets are generally broad and very clean, but the palaces lack the mediæval grandeur of those of Florence. The cathedral, an It. Gothic structure, is one of the most splendid temples in the world, being exceeded in size only by St. Peter's and the cathedral of Seville. The Piazza del Duomo, an open space around the cathedral, has recently been enlarged, but still does not afford a satisfactory view of this marvellous building. Passing over other very noteworthy chs., that of St. Ambrose, founded in 387 by the illustrious abp. himself, is of the greatest interest to the arch., the antiquarian, and especially to the lover of early Chr. art. Near Santa Maria della Grazie, in which are very interesting frescoes, etc., is the convent containing Da Vinci's *Last Supper*. It would be impossible here even to hint at the endless artistic and literary treasures existing in M. The Brera Gallery, the National Library, the famous Ambrosian Library, and the adjoining Gallery of Art are the most noteworthy. In addition to public collections, M. boasts 26 private picture-galleries of more or less interest. There are 15 museums of nat. hist., 14 of medals and antiquarian objects generally. The charitable and educational insts. of M. are on a most liberal scale. The schools, acads., musical conservatories, etc., of M. have a high reputation. The theatre La Scala is one of the largest in Europe. The old and new public gardens furnish charming promenades. Among the recent improvements in the city should be mentioned the Victor Emmanuel Gallery, or arcade. The geographical position of M. secures it an immense inland trade, chiefly in grain, rice, cheese, silk, etc. Pop. 214,004.

**Milan**, Mo. See APPENDIX.

**Mil'burn** (WILLIAM HENRY), b. at Phila. Sept. 26, 1823; removed in childhood to Jacksonville, Ill.; studied at Ill. Coll., notwithstanding almost total loss of sight; became a Meth. itinerant preacher at the age of 20, chiefly in the S. States; was settled for a time at Montgomery, and afterward at Mobile, Ala.; became chaplain to Cong.; went to Eng. in 1859, and lectured with success in the prin. cities. On his return he was ordained in the P. E. Ch., but returned in 1872 to Methodism. He is widely known as "the blind preacher" and as a popular lecturer; has written *Rifle, Axe, and Saddle-Bags*; *Ten Years of Preacher Life*, etc.

**Mil'dew** [A. S. *mildeaw*; Ger. *Mehlthau*, "mealdew"], the popular name of certain minute parasitic fungi in which agriculturists and horticulturists find one of their most



dangerous enemies. The most important of these parasitic fungi are those which infest the cereals and often injure the grain-crops very materially, such as the wheat M., the red rust, the smut, and the bunt. As a preventive against this disease the seed-wheat is treated to a bath of a solution of sulphate of copper, which kills the spores carried along with the grain. Another very injurious and widely disseminated M. is that which attacks the grape-vine, destroying the foliage, and thereby preventing the fruit from ripening. It appears as grayish spots on the young shoots, the under surface of the leaves, and the stems of the fruit. As a remedy against this disease the vines and trellises are sprinkled in early spring, when the buds first appear, with a solution of 8½ ounces of common salt and 4 ounces of saltpetre, with 36 ounces of water, to which are added 10 drops of oil of rosemary and 10 drops of oil of lavender, 1 part of this solution being mixed with 100 parts of water. The solution is applied by the aid of a syringe. Afterward, when the leaves have expanded, they are well dusted with flowers of sulphur by the aid of a bellows especially contrived for the purpose.

**Mile** [Lat. *mille passuum*, a "thousand paces," of 5 Rom. ft. each], the name for a great number of linear measures, each remotely derived from the Rom. M. The geographical M. is one minute of the earth's equator; the Ger. geographical M. is 4 times as long as ours. Our statute M. was fixed in Queen Elizabeth's time at 5280 ft., and is not changed.

**Miles** (NELSON A.), b. at Wachusettsville, Mass., Aug. 8, 1839; entered the volunteer service as lieutenant in the 22d Mass. Volunteers Oct. 1861; was distinguished at Fair Oaks and at Malvern; became adjutant-gen. of a brigade; was appointed col. 61st N. Y. Volunteers Sept. 30, 1862, which he commanded at Fredericksburg; was severely wounded at Chancellorsville; was appointed brig.-gen. May 12, 1864; was distinguished in the Richmond campaign of 1864; appointed brevet maj.-gen. Dec. 1864; col. of 40th Inf. U. S. A. July 28, 1866; transferred to the 5th Inf. Mar. 15, 1869, and commissioned brevet brigadier and brevet maj.-gen. U. S. A. Mar. 2, 1867; brig.-gen. U. S. A. Dec. 1880.

**Miles** (W. PORCHER), b. in Charleston, S. C., July 1828, grad. at Charleston Coll., and studied law; was assistant prof. of math. in Charleston Coll.; mayor of Charleston 1856 and 1857, and introduced improved police and drainage systems; was distinguished for gallant and humane labors during the yellow-fever season at Norfolk, Va., 1855; M. C. 1857-61, and afterward a Confed. col. and M. C.; was pres. of Univ. of S. C., but resigned 1882.

**Miles City**, Mont. See APPENDIX.

**Mile-tus**, one of the most flourishing cities of Ionia, was on the Sinus Latmicus, opposite to the mouth of the Meander, and existed as a town at the time when the Grs. planted their first colonies in Asia Minor; but on the arrival of the Ionians under Neleus all the male citizens of the anc. pop. were massacred. M. soon became one of the most powerful maritime and commercial places of the Mediterranean. After its unsuccessful revolt against Per. in 500 B. C. under Histæus, its strength was broken.

**Milford**, New Haven co., Conn., on R. R. and L. I. Sound, at the mouth of the Wepowaug River. Pop. tp. 1870, 3405; 1880, 3347.

**Milford**, Kent co., Del., on R. R. and Mispillion River, is a shipping-point for produce. Pop. 1870, 1150; 1880, 1240.

**Milford**, Iroquois co., Ill., on R. R., 10 m. S. of Watseca. Pop. 1870, 230; 1880, 612.

**Milford**, R. R. junc., Worcester co., Mass., 30 m. S. W. from Boston, is one of the largest boot-manufacturing centres in the country. Pop. 1870, 9690; 1880, 9310.

**Milford**, Mich. See APPENDIX.

**Milford**, on R. R., Hillsborough co., N. H., 50 m. N. W. of Boston, was incorporated 1794. Granite-quarrying an important branch of industry. Pop. tp. 1870, 2606; 1880, 2398.

**Military Frontier**, The, was formerly an independent crown-land of the Aus. empire, a belt of land stretching along the Tur. frontier from the Adriatic Sea to Transylvania, and bounded N. by Croatia, Slavonia and Hungary, and S. by Bosnia, Servia, and Wallachia, comprising an area of 12,800 sq. m., with 697,516 inhabitants. Its organization was thoroughly military. The estates formed fiefs, which the state gave, not to individuals, but to families, on the condition that all male members of the family should do military service from their 20th yr., by which means it became possible for the Aus. emp. to have an army of from 40,000 to 50,000 men always ready on the frontier.

**Milk** [Sax. *melce*; Ger. *Milch*; Fr. *lait*; Lat. *lac*], the liquid secreted by the mammary glands of female Mammalia for the nourishment of their young. M. is generally a white, often bluish, rarely yellowish liquid; opaque, possessing a slight but pleasant odor, and an agreeable sweetish taste. Its specific gravity varies from 1.018 to 1.045. The reaction of fresh M. has long been a subject of discussion among chemists, the majority of whom assert that it is generally faintly alkaline. Saxhelt believes that M. possesses what he calls an *amphigenic* reaction—i. e., that it simultaneously reddens blue litmus paper and blues red paper, owing to the fact that it contains both acid and neutral phosphates of the alkali metals. A. Vogel has examined this question further, using a very neutral tincture of litmus instead of paper. He states that he has never found fresh cow's M. to exhibit a decided alkaline reaction. M. becomes acid on keeping, by the conversion of a portion of the lactine (lactose or sugar of M.) into lactic acid.

The *Composition of Milk*.—M. is an emulsion; it consists of water, holding in solution casein or cheese, lactine or sugar of M., and various alkaline and earthy salts; and in suspension in this solution, or serum, fatty matter, butter, in the form of colorless transparent globules from  $\frac{1}{1000}$ th to  $\frac{1}{2500}$ th of a line in diameter. These globules of fat were formerly believed to be encased in an albuminous envelope, which is ruptured during churning, thus allowing the globules to agglutinate into masses of butter. This has been

disproved by Von Baumbauer and F. Knapp. Schwaller still claims the existence of a membrane. On account of the lenticular action of the fat-globules the light is dispersed in all directions, and the M. appears white and opaque. This opacity of M. is due to suspended caseous matter.

(1) The fat contained in M. constitutes usually from 2.50 to 6 per cent. of the entire weight, the extremes noticed being 0.666 in a poor sample of human M. and 13.3 in the M. of a bitch. It is a mixture of several neutral fats or glycerides, chiefly the liquid oleine and the solid palmatine and stearine, with small quantities of myristine, butyrine, caproine, capryline and caprine. To these latter bodies are due the peculiar taste and odor which distinguish butter from other natural fats. Butter does not contain margarine, as is generally stated in older works. (See MARGARIC ACID.) When M. is allowed to stand the fat-globules rise to the top and form a layer of cream. This separation of fat and serum is never complete; each retains part of the other.

(2) The casein is an albuminoid body, containing, deducting ash, carbon, 53.5 to 54; hydrogen, 7.1 to 7.04; nitrogen, 15.6 to 16; sulphur, 0.9 to 1.0; oxygen, 22.1 to 22.6. It is present in M. to the extent of from 2 to 6 per cent. Pure casein is scarcely soluble in water, while its compounds with alkalis are very soluble. In M. it exists in combination with soda. Acids, even in minute quantities, withdraw the alkali and precipitate casein. The spontaneous coagulation of M. is due to the formation of lactic acid. Casein precipitated by an acid retains an acid reaction, no matter how thoroughly it is washed. Earthy and metallic salts precipitate casein. It is also coagulated by rennet. Coagulated casein is soluble in caustic alkalis; in common sodic phosphate, neutralizing it; in alkaline carbonates, common salt, ammoniac chloride, potassic nitrate, and borax. Moist, well-washed casein dissolves completely in water containing 0.0005 per cent. of hydrochloric acid, and the solution, when filtered from a trace of fat, has all the characteristics of a solution of albumen. Ordinary solutions of casein are not precipitated by heat, but form films when heated in the air which are not soluble in dilute acids or alkalis. The same film is found when M. is heated in the air. The compound of casein and lime prepared from clotted M. is imputrescible, and is employed in distemper painting. Artificial coral jewelry is now made from casein colored with vermilion. Soluble casein is coagulated by the gastric juice and then gradually digested.

(3) Albumen and other nitrogenous bodies are said by some chemists to exist in M., and it would be very remarkable were casein to be the only nitrogenous body present in an animal fluid. An albuminous body, not coagulated by rennet, but precipitated by boiling, has been noticed in M., and especially in colostrum, which is supposed to be albumen. Lactalbumen and lactoproteine are 2 albuminous substances which, according to Commaille, occur in M. Galactine is a nitrogenous body obtained, according to Morin, from M.

(4) Lactine, lactose, or M.-sugar is an important constituent of M. It varies in quantity from 1.5 to 9 per cent. It is manufactured in considerable quantities in Switz., Silesia, and elsewhere. It is slow and difficult of solution in cold water, requiring 6 times its weight; it is soluble in 2 parts of hot water. It has a faint sweet taste, but in the solid state feels gritty between the teeth. In contact with casein or gluten it undergoes lactic fermentation; but some alcohol is always produced, especially when nothing is added to neutralize the acid as it forms.

(5) The salts of M. vary in quantity from 0.10 to 2 per cent. They consist of (a) sodic and potassic chlorides, phosphates, carbonates, and casein compounds, soluble in water, and (b) calcic, magnesic, and ferric phosphates, and calcic fluoride, insoluble in water. In the ash the soluble salts are about equal in quantity to the insoluble. Weber found in the ash of cow's M. 14.18 per cent. of potassic chloride, 4.74 of sodic chloride, 23.46 of potassa, 6.96 of soda, 17.34 of lime, 2.30 of magnesia, and 28.4 of phosphoric acid, with a little carbonic and sulphuric acid (5).

*Colostrum* is the M. secreted during the first 2 or 3 days after parturition. It is generally a turbid, yellowish liquid, of sticky consistence and strong alkaline reaction. It contains the usual constituents of M., though in much larger quantities—often 40 per cent. of solids; that from cows, asses, and goats contains an excessive proportion of casein, while lactine is found in excess in human colostrum. It also contains albumen and peculiar granular bodies. The secretion of normal M. begins on the 4th day at the earliest, usually between the 6th and the 10th day.

I. Cow's MILK.—Cow's M. has generally a pure white or yellowish-white color. Its specific gravity is variously stated from 1.025 to 1.0396. Dr. Stevenson Macadam of Edinburgh, Scot., examined 44 samples of pure M., and found the specific gravity to range from 1.0284 to 1.0357, averaging 1.0322. W. Fleischmann tested 124 cows in Ger., and found the M. to vary from 1.0295 to 1.0343, averaging 1.0317, only 3 samples being below 1.030. Officers Jepson and Gardner of the sanitary police of New York tested 44 cows on the Harlem R. R. and 65 in Orange co., N. Y., and E. Waller, Ph. D., tested 86 cows in Orange co., 7 of which were Alderneys. They found the extremes 1.02958 and 1.03558 at 60° F., or 102 and 122 on lactometer, which has the 100-mark at 1.029 and the 0 at 1.000. The solids in cow's M. vary from 11.64 to 19.34 per cent., averaging 13 to 14 per cent.

The quantity of M. furnished by a cow varies with the breed, the age of the cow, the age of the calf, the food, and the treatment and housing. Boussingault observed the yield of M. of 7 cows at Bechelbronn. Each cow received daily 93 lbs. of hay or a proportionate quantity of roots. The yield during 309½ days was 3968.9 gals. of M. equivalent to 7.2 quarts per day each. During July and Aug. the average was over 11 quarts; during Feb. and Mar., only 4.2 quarts. Another cow averaged 6.4 quarts daily during the time she gave milk.



4.2 quarts M. = 11 lbs., 11 quarts = 29 lbs., containing—  
 Butter ..... 5. oz. to 13.9 oz.  
 Sugar and soluble salts..... 7.5 " " 21.35 "  
 Caseine and insoluble salts... 8.4 " " 23.65 "

Total solids..... 1 lb. 5. oz. to 3 lbs. 11 oz.

The yield of M. diminishes as the calf grows older. An observer tested the daily yield of a cow, dividing the 10 months after the calf was born into 6 periods of 50 days each, obtaining the following results: The average daily yield during the first 50 days was 24 quarts; second, 20 quarts; third, 14 quarts; fourth, 8 quarts; fifth, 8 quarts; sixth, 6 quarts. The average yield for the 10 months was 13.66 quarts. The total yield for the first 50 days was 1200 quarts; second, 1000 quarts; third, 700 quarts; fourth, 400 quarts; fifth, 400 quarts; sixth, 300 quarts. Total yield for 10 months, 4000 quarts. O. C. Wiggin, the milk inspector of Providence, estimates the average yield of each cow, good, bad, and indifferent, throughout the State of R. I., to be 1866 quarts per annum. Some yielded as little as 1000 quarts. He thinks the yield should be brought up to 2200 quarts at least. Dr. Voelcker, chemist to the Royal Agricultural Society of Eng., reports that 65 cows (short-horns) averaged 642 U. S. gals. = 2568 quarts per annum, the food being grass and hay, with roots and straw in winter. As each cow is estimated to have eaten 28 tons of 2240 lbs. of this food per annum, we have 1 lb. of milk for every 11 or 12 lbs. of grass.

The composition of cow's milk varies within certain limits; it is affected by a variety of circumstances, as the breed of the cow, her age, the age of her calf, nature of her food, time of milking, frequency of milking; and it is even found that the last M. which comes down at a milking is richer in butter than that which is first drawn. The following analyses illustrate these statements:

THE COMPOSITION OF COW'S MILK.

	Fat.	Caseine and albumen.	Sugar.	Salts.	Water.	Total solids.	Solids not fat.
Vernole and Bequerel, 46 analyses.....	4.51	4.86	4.15	0.65	85.76	14.17	9.66
Henri and Chevallier, average.....	3.13	4.48	4.77	0.60	87.02	12.98	9.95
Payen, average.....	3.20	4.20	4.80	0.70	87.60	12.40	9.20
Boussingault, average.....	4.10	3.20	5.10	0.20	87.40	12.60	9.50
Poggiale, 10 analyses.....	4.38	3.80	5.27	0.27	86.28	13.72	9.34
Muspratt, average.....	4.43	3.74	4.33	0.57	86.43	13.27	9.84
Dieulauf, several anal.	3.11	4.18	4.22	0.55	87.64	12.36	9.25
Haidlen, average.....	3.00	4.22	4.39	0.49	87.30	12.70	9.70
Gorup-Besanez, average	4.21	5.40	4.04	0.55	85.79	12.30	9.99
Dr. Letheby, ".....	3.90	4.10	5.20	0.80	86.00	14.00	10.10
W. Brinton, ".....	4.50	5.50	3.50	0.70	86.00	14.00	9.50
Jagielski, ".....	3.60	5.10	4.60	0.60	86.10	13.90	10.30
J. König, ".....	3.00	4.00	5.00	0.70	87.30	12.70	9.70
O. A. Cameron, 40 anal.	4.00	4.10	4.28	0.62	87.00	13.00	9.00
S. Macadam, 44 anal.....	2.42	3.81	4.91	0.69	87.96	12.04	9.62
Alex. Müller, 59 ".....	4.03	3.33	4.70	0.73	87.19	12.81	9.76
W. L. Scott, average.....	3.57	4.55	4.90	0.74	86.24	13.76	10.19
O. C. Wiggin, 58 cows.....	4.01	4.99	4.29	0.79	85.92	14.08	10.07
H. W. Vaughan, 30 anal.	4.96	4.29	4.23	0.81	85.71	14.29	9.33
Average.....	3.709	4.369	4.543	0.635	86.66	13.32	9.52

COMPLETE ANALYSIS OF MILK BY HAIDLEN.

Water.....	87.300
Butter.....	3.000
Caseine.....	4.820
Sugar.....	4.390
Phosphate of lime.....	0.230
Phosphate of magnesia.....	0.042
Phosphate of iron.....	0.007
Chloride of potassium.....	0.144
Chloride of sodium.....	0.024
Soda, combined with caseine.....	0.042

100.

The Brit. Society of Public Analysts have fixed the following minimum:

Fat.....	2.50
Solids not fat.....	9.00
Total solids.....	11.50
Water.....	88.50

100.

The treatment of cows exerts an important influence on both the quantity and quality of the M. The judicious dairyman finds it to his advantage to "treat the cows gently, to provide warm, clean, and well-ventilated barns, with ample, dry, well-drained yards, abundantly supplied with pure water; to feed them liberally, without forcing. Milking should not be prolonged to time of calving, but the cows should be allowed 8 or 10 weeks for recruiting, when they will begin the new season with renewed vigor and the promise of a more abundant yield of M." (O. C. Wiggin.)

The souring of milk is due to lactic fermentation (see FERMENTATION), by which the lactose or sugar of M. is transformed into lactic acid, which precipitates the caseine as curd by withdrawing from it the soda which holds it in solution. Bechamp attributes the souring of M. to microzymes which are present in the M. when it comes from the cow. The effect of rennet in coagulating M. is not fully understood. It has been supposed to be due to the conversion of a little lactose into lactic acid. M. is coagulated by acids, alum, various other salts, tannin, alcohol, wood-naphtha, etc. The souring of M. during thunder-storms has been explained by attributing it to the ozone of active oxygen which is produced in the air by electrical discharges. It is said that the addition to the M. of a small quantity of borie acid retards the separation of cream and prevents souring for several days. Schwalbe states that the addition

of mustard oil, 20 drops to the pint, prevents coagulation for weeks, even in summer. Coagulation is retarded by boiling and by the addition of small quantities of carbonate of soda, or potassa, borax, nitrate of potassa, chloride of sodium (common salt), etc. The following process for preserving M. is said to be in use in the vicinity of Paris: To each quart of M., before the cream has risen, 6 grains of bicarbonate of soda are added, it is then placed in bottles, which are tightly corked and are then placed in a water-bath and heated to 190° F., no higher, and maintained at this temperature for 4 hours. They are then made perfectly tight with wax, and the M. will keep a long time.

Artificial milk was made at Paris during the siege by the following process:

1. Cane-sugar, glucose, or milk-sugar... 40-50 grams.
2. Albumen (dry)..... 20-30 "
3. Sodie carbonate..... 1-2 "
4. Olive oil or horse fat..... 50-60 "
5. Water..... 500 "

Heat the whole to 122° F., and dilute to 1 litre. A. Gaudin recommended the use of sugar and the fat and gelatine of fresh bones.

Condensed Milk.—Within a few yrs. a very important industry has been established with the object of condensing and preserving M. The first efforts were directed to the preparation of "desiccated M." The M. was evaporated at a low temperature, and a little sugar added when the process of evaporation was nearly completed; the residue was pulverized, and constituted a yellowish-white powder, which dissolved for the greater part in hot water. The solution resembled M., and answered very well when fresh M. could not be obtained, as on shipboard. It could be preserved with care in closed bottles for several months. It was found necessary to remove a portion of the cream before evaporation, as otherwise the product soon acquired a taste and smell of rancid butter. Its imperfect solubility in water, and its deficiency in the agreeable taste of fresh M., prevented its extensive introduction. The condensation of M. did not become a success till the introduction of the vacuum-pan, which makes it possible to boil it down very rapidly at a very low temperature—below 160° F.—thus preserving its flavor unimpaired. This is an Amer. industry, and has been introduced into Europe by Amer. cos. Condensed M. is now extensively manufactured in the U. S., Switz., Ger., Eng., and Ire. The M. is strained, heated in cans or pails placed in a vat of water kept hot by a steam-coil, then brought to a boil in an open vessel by the aid of steam, strained, and introduced into the vacuum-pan, where it is rapidly concentrated to any desired degree. The vacuum-pan is a close vessel of copper, egg-shaped, about 6 ft. high and 4½ ft. in diameter. It is heated by a steam-jacket and coil. In the dome on one side is a small window, through which gas illuminates the interior, while on the opposite side is an eyeglass through which all the movements of the seething M. can be observed, and the boiling by this means regulated. A vacuum is maintained by a powerful air-pump. The preliminary boiling has for its object the expulsion of the gases of the M., which would cause it to foam in the pan, and also perhaps to add to the keeping quality of the M. by destroying the mould-germs (see FERMENTATION)—not, probably, as many think, to coagulate albumen. Much of the M. is simply concentrated for immediate use without any addition of sugar. Such M. is extensively used in New York, being by many preferred to fresh M. It is served fresh every day, but will keep 2 or 3 days if necessary. The writer had occasion to investigate this subject at Purdy's Station on the Harlem R. R., at the works of the Amer. Condensed Milk Co., for the Dept. of Public Charities and Correction. When 1700 quarts of M. were condensed in the ratio of 430 quarts to 100, the following results were obtained on analyzing samples of the M. before and after condensation:

Fat.....	3.89	13.12
Caseine.....	3.88	14.44
Sugar.....	4.08	16.30
Salts.....	0.76	2.60
Water.....	87.45	53.54

100.

100.

Some of the companies formerly skimmed the M. before they condensed it, and sold the cream separately. This fraud is no longer practised to any great extent:

	American.	Eagle.	New York.	National.
Fat.....	16.29	14.36	14.28	13.97
Caseine.....	17.26	15.07	13.96	14.02
Sugar.....	10.64	11.64	13.90	10.44
Salts.....	2.77	2.10	2.00	2.33
Water.....	53.04	56.83	55.86	59.24

100.

100.

100.

100.

In addition to this M., which is condensed for immediate use, another variety is made for keeping which is known as "preserved" or "canned" M. It receives an addition of cane-sugar, and is hermetically sealed in cans. When properly prepared it keeps for yrs. The following analyses indicate the character of this "preserved" M.

	Borden's, U. S.	Aylesbury, English.	Cham, Swiss.	Kempton, Bavarian.	Sasin, Hungarian.
Fat.....	9.55	11.73	8.67	13.14	17.89
Caseine.....	10.26	15.17	13.67	12.21	13.27
Albumen.....				7.93	7.46
Milk-sugar.....	53.34	16.24	10.82	17.93	22.70
Cane-sugar.....		29.46	40.48	24.11	18.44
Salts.....	1.91	2.30	2.23	3.87	5.10
Water.....	25.94	25.10	24.13	20.81	15.14

100.

100.

100.

100.

Cream is a distinct layer which forms on the surface of M. when it is allowed to stand a few hours. It consists of M. with an increased percentage of fat, produced by the rising of a considerable portion of the fat-globules from the



M. below. The quantity of cream does not indicate the absolute proportion of fat, as of 2 samples of M. with the same percentage of fat, one may throw up a layer of cream twice as bulky as that on the other. The specific gravity of cream is less than that of M.—about 1.012 to 1.019.

*Skimmed milk* is the portion left after the cream has been removed. It is poor in fat, and necessarily heavier than the M. which yielded it—from 1.031 to 1.036.

*Buttermilk* is the M. which is left when the greater portion of the fat-globules of cream have been agglomerated into butter by churning. It has the composition of M. deprived of most of its fat, and does not differ from skimmed M.

*Curd* is the coagulated caseine of M.: if made from whole M., it contains the fat: from skimmed M., it is nearly free from fat: from cream, it is very rich in fat.

*Cheese* is curd which has been salted, often colored artificially, and flavored, and then allowed to undergo a kind of fermentation by keeping. (See BUTTER and CHEESE.)

The following analyses by Alex. Müller show the composition of these preparations and their relation to M.:

	Whole milk.	Skim. milk.	Cream.	Butter-milk.	Butter.	Salt water.
Whole product.	100.	90.	10.	6.	4.	0.1
Fat .....	4.00	0.55	35.00	1.67	85.00	
Caseine, etc. ....	3.25	3.77	2.20	3.33	0.51	3.40
Sugar .....	4.50	4.66	3.05	4.61	0.70	4.70
Salts .....	0.75	0.78	0.50	0.77	0.12	0.79
Water .....	87.50	90.64	59.25	89.62	13.67	91.11
	100.	100.	100.	100.	100.	100.

The butter was analyzed unsalted, the salt water worked out of the butter, and analysis calculated without the salt.

The milk of diseased cows is always dangerous, and should never be used.

The alcoholic fermentation of milk for the preparation of alcoholic beverages has been mentioned under KOUMISS.

*The adulteration of Milk.*—Numerous substances are mentioned by writers as used to adulterate M., such as the following: (1) water; (2) chalk and carbonates of soda and potassa; and borax, to neutralize acidity, the first mentioned to hide watering as well; (3) turmeric, annatto, and caramel (burned sugar), to conceal the blue color of skimmed or watered M.; (4) flour, starch, emulsions of almonds or hempseed, and cerebral matter (sheep's brains), to thicken watered M. and conceal blue color; (5) sugar, gum, dextrine, and salt, to increase the specific gravity and conceal watering. The writer is satisfied that the only substances used at present are water, and possibly carbonate of soda and burned sugar. All these adulterants, save water, are so readily detected that their use would be too dangerous for even the most abandoned milkmen. Hundreds of analyses made by the health authorities of New York and by the milk inspectors of Boston and Providence have failed to show the presence of any adulterants save those last mentioned. The adulteration with water and the skimming off of the cream are the common frauds practised in this country. This fraud, beside being expensive, exerts a most unfavorable influence on the health of young children, especially as it is aggravated by the previous skimming of the M. and consequent impoverishment of the fatty constituent. In some cases diseases have been introduced by the use of foul water, as in Lond., where an outbreak of typhoid fever was traced to the water added to the M., which was poisoned with sewage.

*The detection of adulteration in the case of water is not always possible.* As the percentage of water in genuine M. varies, it is only possible to prove adulteration when the percentage of water exceeds the maximum quantity in pure M. Three methods are in use for testing the quality of M.: (1) determining the specific gravity; (2) determining the percentage of cream; (3) analyzing the M.

(1) *Determining the specific gravity by the hydrometer (see HYDROMETER),* called when graduated for this purpose a *galactometer* or *lactometer*. As M. is heavier than water, any dilution will reduce the specific gravity. The lactometer merely determines the specific gravity. In using the lactometer a certain specific gravity must be selected as a minimum below which no genuine M. ever goes. The specific gravity 1.029 has been fixed by Dinocourt, who originated the lactometer, as the proper minimum. This standard has been adopted by the Health Dept. of New York. In graduating the lactometer, 100 is placed at the standard of 1.029, and 0 at 1.000, the gravity of water, the intervening space being divided into 100 divisions. The point to which the lactometer sinks in the M. under examination indicates the percentage of M. in 100 parts. Thus, if the lactometer sinks to 80, the M. must consist of at least 20 parts or per cent. of water and 80 of M. But this assumes the original M. to have had a gravity of only 1.029, which is lower than any genuine M. Good M. of a gravity of 1.034 requires an addition of 16.67 per cent. of water to bring it down to 1.029. After this dilution, 20 per cent. of water must be added to this watered M. to bring it down to 80 on the lactometer. The lactometer errs, therefore, in not showing the dilution of good M. down to our low standard, and consequently in reporting only a portion of the dilution. The writer caused the M. of over 1000 cows at dairies in N. Y. and N. J. to be tested; several of the cows were Alderneys, whose M. is rich in cream, and the specific gravity was almost invariably about 1.029, or 100 on the lactometer. In the 4 or 5 cases in which it fell below 100, either the cows were sick or warmed, it consequently becomes lighter; it should always be tested at 60° F., or at least the temperature should be noted. A sample of M. which stood at 100 by the lactometer at 60° F. was found by the writer to stand at 106 at 44° F., at 98 at 66° F., at 90 at 80° F., and at 74 at 100° F. As a general rule, the M., being kept cool to preserve it,

is below 60° F.; consequently, it stands better by the lactometer than it would at the standard temperature. Skimming increases the gravity of the M., and makes it stand better by the lactometer. From these statements it is seen that the lactometer is only an imperfect test for frauds of the milkmen: (1) It does not show moderate watering of good M.; (2) the watering which it records is only a fraction of that actually practised; (3) if the M. is skimmed before it is watered, the lactometer does not detect the frauds, which neutralize each other as far as specific gravity is concerned. In the face of these defects, if the lactometer shows the M. to be below 100, there then is no doubt as to its having been watered. Numerous convictions for watering have been secured in New York by the use of the lactometer, the M. inspected having stood as low as 80, 70, and even 50, by this test.

(2) *Determining the Percentage of Cream.*—This is accomplished in a tube which is graduated into 100 parts, and which measures the cream. This has been called a lactometer or creamometer. This is a very imperfect method for testing M. as the percentage of cream is not an accurate measure of the fat in the M. H. Schroeder tested this point with the following results in several samples of M.:

Samples	No. 1.	2.	3.	4.	5.	6.
Fat .....	5.54	4.87	4.09	5.38	8.13	4.09
Cream .....	21	16	10	10	12	13

(3) *Partial or complete analysis:* is the most certain method of detecting adulteration: either determining the percentage of fat, and of solids beside fat, or making a separate determination of each constituent. In either case we are compelled to do exactly what we did in applying the lactometer—establish an arbitrary standard which shall represent the poorest genuine M., and bear the same relation to good M. that our specific gravity 1.029 does to the 1.080, 1.031, or 1.034 of M. of average quality. The Eng. Society of Public Analysts have fixed the following minimum quality for unadulterated M.:

Fat .....	2.5
Caseine .....	9.0
Sugar .....	
Salts .....	
Water .....	88.5
	100.

M. of average quality can be watered and skimmed very seriously before it falls below this standard.

(4) *Optical methods* have been proposed for the examination of M., but are rarely used. Inspectors acquire great skill in distinguishing skimmed and watered M. by the eye.

**II. HUMAN MILK.**—Human M. is more bluish than cow's M., and has a sweeter taste. It is strongly alkaline, and is remarkable for the difficulty with which it coagulates. It is less easily and completely coagulated by rennet; the coagulum is not so gelatinous nor so firm and solid as that of cow's M.; it is also more digestible. Its specific gravity varies from 1.02561 to 1.04648. The M. of women confined for the first time contains more water than the M. of women who have had several children. According to Vernois and Becquerel, the percentage of fat varies with age: the M. of women from 15–20 contains 3.738 per cent.; 20–25, 2.821 per cent.; 25–30, 2.348 per cent.; 30–35, 2.864 per cent.; and from 35–40, 2.233 per cent. It increases by nearly 0.3 per cent. during the period of menstruation. The percentage of butter varies inversely as the quantity of M. produced. It decreases with imperfect nutrition. The following analyses have been published by different chemists:

#### WOMAN'S MILK.

	Vernois and Becquerel, 89 analyses.	Stimon, 14 analyses from one woman.	Clermont, 3 analyses from one woman.	Chevallier and Henry.	D'Heritiers.	Jag'elski.
Fat .....	2.67	2.53	3.71	3.55	5.20	2.90
Caseine .....	3.92	3.43	3.26	1.52	0.95	2.90
Sugar .....	4.36	4.82	3.54	6.50	6.34	4.80
Salts .....	0.14	0.23	0.19	0.45	0.45	0.20
Water .....	88.91	88.37	89.00	87.98	87.06	89.20
Total .....	100.	99.38	100.	100.	100.	100.
Solids .....	11.09	11.63	11.00	12.02	12.94	10.80

According to Vernois and Becquerel, the amount of fat in human M. increases during the first 2 months after delivery, but decreases between the fifth and 6th, as well as between the tenth and eleventh month.

**III. MILK OF OTHER ANIMALS.**—*Mare's M.* is rich in sugar and poor in fat and caseine. It readily ferments (see article KOUMISS); specific gravity, 1.034 to 1.045. *Ass's M.* resembles mare's M., being rich in sugar and poor in the other constituents; specific gravity, 1.028 to 1.035. It readily sours, and easily undergoes fermentation. *Camel's M.* is rich in sugar; specific gravity, 1.035. *Elephant's M.* is rich in fat and sugar, has a sweet taste, neutral reaction; specific gravity, 1.03132. The analysis in the table was made by Edward W. Martin of New York. *Ewe's M.* is thickish, white, of agreeable taste and smell, and very rich in fat and caseine; specific gravity, 1.032 to 1.044. *Goat's M.* is white, of insipid sweetness, and peculiar odor; specific gravity, 1.034 to 1.036. On coagulation its caseine forms thick clots. It is very similar to cow's M. in composition. The M. of *sows* is thickish and stringy. The taste is cool and rich, but not sweet; it is alkaline; specific gravity, 1.0298 to 1.041. Few analyses have been made, as the sows generally refuse to yield a drop to even the most skillful dairymaids. *Canine M.* is rather thick, and becomes thicker on warming, when it does not coagulate; specific gravity, 1.033 to 1.036.

The following table shows the composition of the M. of various animals:



MILK OF DIFFERENT ANIMALS.

	Fat.	Caseine and albumen.	Sugar.	Salts.	Water.
Mare's.....	1.06	1.95	6.28	0.40	90.31
Ass's.....	1.07	2.24	5.72	0.41	90.56
Camel's.....	2.90	3.67	5.78	0.66	86.99
Elephant's.....	9.10	2.51	8.59	0.50	79.30
Ewe's.....	5.83	7.05	4.50	0.65	82.97
Goat's.....	4.88	4.07	4.40	0.74	86.41
Sow's.....	4.71	7.69	3.12	0.92	83.52
Bitch's.....	9.87	8.58	2.89	0.43	78.23

C. F. CHANDLER.

**Milk Quartz**, a quartz of milk-white color, occurring chiefly in Greenland.

**Milk Sugar**. See MILK and SUGAR. By PROF. C. F. CHANDLER, LL.D.

**Milk Tree**, applied to trees whose trunks yield a milky fluid fit for food when incised. Such are the cow tree, found in the Caraccas Islands; the *kirigama*, or *Gymnema lactiferum*, of Ceylon, used for domestic purposes; and the *tabayba* dolce, or *Euphorbia balsamifera* (see EUPHORBIA) of the Canary Islands, yielding a wholesome juice resembling sweet milk.

**Milky Way**. See GALAXY.

**Mill**. See GRINDING and CRUSHING MACHINERY.

**Mill (JAMES)**, b. at Logie Pert, Forfarshire, Scot., Apr. 6, 1773; ed. at the Univ. of Edinburgh, licensed as a preacher in the Scot. National Ch. 1798, but abandoned that career in consequence of a change of religious opinions; became a tutor in the family of Sir John Stuart, whom he accompanied to Lond. in 1800, and settled in that cap. as an author. He edited the *Literary Journal*; wrote a *Hist. of Brit. India* (8 vols. 1817-18), which procured him a post in the office of the E. I. Co.; was contributor to the *Westminster Review* (1824); pub. a treatise on *Political Economy* (1821-22); wrote for the *Encyclopædia Britannica* on political and social subjects, and was author of *An Analysis of the Phenomena of the Human Mind*. D. June 3, 1836.

**Mill (JOHN STUART)**, son of James Mill, b. in Lond. May 20, 1806. A precocious child, ed. peculiarly by his father, he grew up a sceptic in religion. All his associations identified him with Bentham's school of philos., to which he claims to have given the title "utilitarian." When 17 yrs. old his father secured for him an appointment from the E. I. Co., in whose service he remained 35 yrs., rising steadily from the lowest grade of clerk to the highest post in his dept., that of examiner of India correspondence. Meantime he was much engaged in literary work. From 1835 to 1840 he was the prin. conductor of the *Westminster Review*. With the bringing out of his *System of Logic, Ratiocinative and Inductive*, in 1843, he became prominent as a strong, bold radical writer on philosophical subjects. He pub. in 1848 his full treatise, entitled *Principles of Political Economy, with some of their Applications to Social Philos.* This work has passed through several editions in Eng. and Amer., and has a place among the standard works on the subject. On the dissolution of the E. I. Co. in 1856, M., thrown out of his office, turned his attention altogether to literary labors. His most notable later writings are a work on *Liberty, Thoughts on Parliamentary Reform, an Examination of Sir William Hamilton's Philosophy, Eng. and Ire., and The Subjection of Women*, in which he advocates woman suffrage. D. at Avignon May 8, 1873.

A. L. CHAPIN.

**Millais, mil-lä' (JOHN EVERETT)**, b. at Southampton June 8, 1829. He is of Fr. extraction, and spent his early yrs. in Fr. and Jersey; was sent to Lond. to study art at the Royal Acad. Before he was 18 he had gained prizes for drawing and had borne off medals of silver and gold. His first exhibition was in 1846. But in 1849 M., in concert with William Holman Hunt and D. G. Rossetti, threw off the academic tradition, and, starting with the purpose to paint nature and life as they really appeared, inaugurated what soon became celebrated as the "pre-Raphaelite school" of art. The doctrines of the new school were set forth in a short-lived periodical, called *The Germ*, the few numbers of which appeared in 1850. Mr. M. was chosen a member of the Royal Acad. in 1863.

O. B. FROTHINGHAM.

**Mil'ard (DAVID)**, b. in Ballston, N. Y., Nov. 24, 1794; became a minister of the "Christian" denomination 1815; was pastor of a ch. at W. Bloomfield, N. Y., 1818-32, and at Portsmouth, N. H., 1837-40; wrote *The True Messiah in Script. Light*; edited for several yrs. a monthly magazine called *The Gospel Luminary*; visited Pal. in 1841; wrote *Travels in Egypt, Arabia Petraea, and the Holy Land*; settled again at Bloomfield; was prof. of biblical antiquities and sacred geog. at Meadville Theological Sem. 1845-67. D. Aug. 3, 1873.

**Milbank, Dak.** See APPENDIX.

**Milbury, R. R. junc.**, Worcester co., Mass., has cotton, woollen, and other manufactures, with water-power from Blackstone River. Pop. pt. 1870, 4397; 1880, 4741.

**Milledge (JOHN)**, b. at Savannah, Ga., in 1757; became a lawyer; served in the Revolutionary war; atty.-gen. of Ga. 1780, gov. 1802-06; was in Cong. nearly 10 yrs., 1792-1802; U. S. Senator 1806-09, and was the prin. founder of the Univ. of Ga. D. Feb. 9, 1818.

**Milledgeville**, city and R. R. centre, cap. of Baldwin co., Ga., 32 m. N. E. of Macon; has State lunatic asylum and State penitentiary. It has water-power, and is centre of a cotton-growing region. Pop. 1870, 2750; 1880, 3800.

**Milennarians**, believers in the millennium [Lat. *milie*, "thousand," and *annus*, "year"]—4. e. the thousand years' reign of the Messiah at the end of time. There are numerous theories of the millennium, but they all may be reduced to two, the literal and the spiritual.

**Millepede**. See MYRIAPOD and JULIDÆ.

**Millepora (Millepora)**, a genus of coral-producing aculeaphs of the order Hydroïdæ and the sub-order Tabulatæ.

There are at least 5 genera of tabulate corals whose cells have horizontal partitions extending from wall to wall. The cells do not have vertical partitions running through the floors. The M. make a hard, stony coral, smooth, branching, and with very small cells.

**Miller, Dak.** See APPENDIX.

**Miller (ANDREW JACKSON)**, b. in Camden co., Ga., Mar. 21, 1806; studied law and settled in Augusta about 1827; in 1836 was elected to the State legislature, and was continuously returned to the house or senate as long as he lived; for more than 10 yrs. was pres. of the senate, and thereby lieutenant-gov. of the State. Ga. is greatly indebted to him, with a few others, for her present magnificent system of internal improvements. D. Feb. 3, 1856.

A. H. STEPHENS.

**Miller (EDWARD)**, M. D., b. at Dover, Del., May 9, 1760, studied med. at the Univ. of Pa.; was surgeon's mate at the military hospital at Baskingridge, N. J., 1780-81; went to Fr. as surgeon on an armed ship 1782; practised for some yrs. in Md. and Del.; removed to New York in 1796, and with Drs. Mitchell and Smith founded in Aug. 1797 the *Med. Repository*, the first Amer. journal of its kind. He became chief phys. of New York 1803, prof. of the theory and practice of phys. in the Coll. of Phys. and Surgeons 1807, and clinical lecturer in the New York Hospital 1809. He aided his brother Samuel in the composition of his *Brief Retrospect*; wrote a *Report on the Yellow Fever in New York* in 1805, maintaining that the disease is not contagious; was one of the most distinguished phys. of his day. His med. writings were edited by his brother, with a biographical sketch. D. Mar. 17, 1812.

**Miller (HOMER V. M.)**, M. D., b. in Pendleton dist., S. C., Apr. 23, 1814; moved to Rabun co., Ga., where he was ed.; was matriculated in the Med. Coll. of S. C. in 1833, graduating with the highest honors in 1835, and completed his med. studies in Paris in 1838; returned to the U. S., and practised at Cassville, Ga. Became connected with the M. E. Ch.; licensed to preach without joining the itinerancy; took an active part on the hustings in the Presidential canvasses of 1840-44. In 1846 was prof. in the med. coll. of Memphis, Tenn., and 3 yrs. after became prof. in a med. coll. in Augusta, Ga.; was surgeon in the Confed. States army, rose to be division surgeon, and finally med. inspector of the military dept. of Ga.; became prof. in the med. coll. of Atlanta, Ga.; was an active member of the constitutional State convention under the reconstruction acts of Cong.; in 1869 was elected U. S. Senator from Ga. to fill an unexpired term in 41st Cong.

A. H. STEPHENS.

**Miller (HUGH)**, b. Oct. 10, 1802, at Cromarty, on the N. E. coast of Scot., in humble circumstances; acquired an extensive knowledge of Eng. lang., hist., and lit. In 1819 he was apprenticed to a stone-mason, and he worked at this trade steadily till 1836. In 1829 he pub. a vol. of *Poems written in the Leisure Hours of a Journeyman Mason*. In 1836 he received a second accountship in a branch bank at Cromarty, married, pub. his *Scenes and Legends of the N. of Scot.*, and his *Letters to Lord Brougham on the Auchtermarder case*. In 1840 he went to Edinburgh as ed. of *The Witness*, a Free Ch. organ, and in the columns of this paper he pub. *The Old Red Sandstone, or New Walks in an Old Field*. He also pub. many other works, but at last shot himself at Portobello, near Edinburgh, Dec. 26, 1856.

**Miller (JAMES)**, b. at Peterboro', N. H., Apr. 25, 1776; became a lawyer; major 4th U. S. Inf. 1808, lieutenant-col. 5th Inf. 1810, brevet col. 1812, col. 21st Inf. 1814, brevet brig.-gen. in 1814, when Cong. presented him a gold medal for gallantry on the Canadian frontier; was gov. of Ark. Terr. 1819-25; collector of Salem, Mass., 1825-49. D. July 7, 1851.

**Miller (CINCINNATUS HEINE)**, known in lit. as JOAQUIN, b. in Cin., O., in 1841; in 1854 ran away from home and went to the Cal. mining regions; was taken prisoner by the Modoc Indians, and lived with them 5 yrs., learning their lang. and fighting their wars with them; left them in 1858 and went to San Francisco; in 1860, after studying law a short time, was admitted to the bar in Or.; in 1862 edited a newspaper for a short time; in 1866 was elected dist. judge of Or.; settled in N. Y. about 1874. Wrote *Pacific Poems, Songs of the Sierras, Songs of the Sun-Lands*, and several successful dramas.

**Miller (JOHN)**, served 1812-18 as lieutenant-col., and then col. of U. S. inf., and was especially distinguished at Ft. Mells 1813; was register of public lands in Mo., then a journalist at Steubenville, O.; gov. of Mo. 1836-32, and M. C. 1837-43. D. Mar. 18, 1846.

**Miller (PATRICK)**, one of the numerous inventors of steam navigation, b. at Dalwinston, Dumfriesshire, Scot., about 1730; began in 1758 some experiments in ship construction and propulsion, and pub. in 1786 a pamphlet giving an account of a vessel he had invented. In 1788 he propelled a boat 5 m. an hour by a steam-engine. The experiment was abandoned, but after the experience of Fulton his claims to the invention were put forward. D. Dec. 9, 1815.

**Miller (SAMUEL)**, D. D., b. near Dover, Del., Oct. 31, 1769, grad. at the Univ. of Pa. 1789; became associate pastor of the First Presb. ch. in New York 1793, and prof. of ecclesiastical hist. in the Theological Sem. at Princeton 1813, holding that office until May 1849. He was prominent in the councils of his denomination, and was author of numerous theological treatises. Among his works were *A Brief Retrospect of the Eighteenth Century and the Life of Jonathan Edwards*. D. Jan. 7, 1850.

**Miller (SAMUEL F.)**, b. at Richmond, Ky., Apr. 5, 1816, ed. at Transylvania Univ.; became a phys. and afterward a lawyer. Adopting emancipationist views in 1848, removed in 1850 to Ia.; became successful as a lawyer; declined all public offices until 1862, when he was appointed one of the justices of the U. S. supreme court.

**Miller (STEPHEN D.)**, b. at Waxhaw Settlement, N. C., May 1877, grad. at S. C. Coll. 1808; became a lawyer; was M. C. 1819-20, in the S. C. senate 1822, gov. 1823-30; U. S. Senator 1831-33; removed in 1835 to Miss. D. Mar. 8, 1838.



**Miller** (WILLIAM), b. at Pittsfield, Mass., Feb. 15, 1782, settled in Poughkeepsie, N. Y., 1804; served as a capt. of volunteers on Canadian frontier during the war of 1812; moved in 1815 to Low Hampton, N. Y., and in 1833 began to announce the speedy second coming of Christ, which, by his interpretation of the biblical prophecies, he fixed for the yr. 1843, at which time the world would be destroyed. In a few yrs. his converts in the U. S., Canada, and G. Brit. numbered many thousands, and were popularly known as Millerites, though they styled themselves Second Adventists. On the failure of the original prediction M. and his followers claimed that the error in calculation could not be great, and continued to assign dates for the end of all things, but the sect rapidly decreased in numbers. D. Dec. 20, 1849.

**Miller** (WILLIAM HOLLOWES), F. R. S., b. in Eng. about 1803, grad. at Cambridge in 1826; became fellow and tutor of St. John's Coll.; succeeded Dr. Whewell as prof. of mineralogy 1832; was appointed in 1843 on a royal committee to superintend the construction of parliamentary standards of length and weight, in place of those destroyed by fire in 1834, and undertook the standard of weight, which he finished in Mar. 1854. He served in 1867 on a commission to inquire into the condition of the exchequer standards, and in 1870 on the international commission upon metric system; pub. many important papers on mineralogy and crystallography. D. May 21, 1880.

**Millerites**. See ADVENTISTS and MILLER (WILLIAM).  
**Millersburg**, on R. R., cap. of Holmes co., O., 82 m. N. E. of Columbus. Pop. 1870, 1457; 1880, 1814.

**Millersburg**, Pa. See APPENDIX.  
**Miller's Thumb**, or **River Bullhead**, the *Uranidea gobia*, a small fish of European seas and streams. It is of the family Cottidae. It is sometimes eaten.

**Milleton**, N. Y. See APPENDIX.  
**Millet** [It. *miglietto*, from Lat. *mille*, "a thousand," in reference to its yielding 1000 to 1], a name applied to grasses of several distinct genera and species. The *Milium effusum*, or true M. of the botanists, found throughout Europe and N. Asia and in the N. U. S., is a slender grass 4 to 6 ft. high, which has never been cultivated. The cultivated M. of anc. and modern times, *Panicum miliaceum*, is sown chiefly for forage, though the seeds yield a very nutritious flour, as do also those of the Hungarian, Ger., and It. M.

**Millet**, me-yâ' (JEAN FRANÇOIS), b. at Greville (Manche), formerly part of the province of Normandy) in 1815. M. studied in Paris under Delacroix, and exhibited at the Salon of 1844. The subjects for his painting were scenes in agriculture and village life, all touched with pensive feeling, easily deepening into melancholy. Few of his pieces have been brought to Amer. D. Jan. 18, 1875.

**Mil'm** [Fr. abbreviation of *milleième*, "thousandth"], a prefix used in the Fr. metric system to denote a thousandth part of the measure indicated by the word to which it is prefixed; as *miligramme*, *millilitre*, *millimètre*, etc.

**Millington**, N. J. See APPENDIX.

**Mills** (CLARK), b. in Onondaga co., N. Y., Dec. 1, 1815. His first trade was that of a millwright, his second that of a plasterer. From this he proceeded to sculpture, which he began to practise in Charleston, S. C. He was self-taught, had never been in Europe or seen the works of the masters in his art, but made his way by perseverance and ambition. In overcoming the mechanical difficulties incidental to the execution of his ponderous works Mr. M. showed extraordinary ingenuity. D. Jan. 12, 1883.

**Mills** (SAMUEL JOHN), b. at Torrington, Conn., Apr. 21, 1783; entered Williams Coll. in 1806, and in Sept. 1808 was the prin. organizer of a society of undergraduates who contemplated becoming missionaries; grad. in 1809; spent some months at Yale studying theol. and seeking adherents to his missionary project; entered Andover Theological Sem. in 1810, and associated himself with Judson, Nott, and Newell in memorializing the "General Association of Mass." upon the subject of missions, which step resulted in the formation of the Amer. Board of Coms. for Foreign Missions. He was licensed to preach in 1812, and ordained in 1815; spent 3 yrs. in missionary labors in the S. States, and 2 yrs. in New York and other great cities engaged in promoting the formation of the Amer. Bible Society and the Amer. Colonization Society, as well as other missionary organizations, and was sent by the Colonization Society, along with Rev. Ebenezer Burgess, to W. Afr. to select a site for a colony. They proceeded first to Eng. to confer with Brit. philanthropists (1817), and accomplished their object in Afr. in the following yr., but on the return voyage M. d. at sea, June 16, 1818. He fully earned the title of "father of foreign missions in America." (See his *Memoir*, by Rev. GARDNER SPRAY.)

**Mill Springs**, Wayne co., Ky., on the Cumberland River. On Jan. 19, 1862, the U. troops under Gen. Thomas and the Confed. troops under Gen. Crittenden met in battle about 5 m. from this place. The latter were defeated with a loss of 190 killed, 60 wounded, and 89 prisoners. The U. loss was 38 killed and 194 wounded.

**Millville**, on R. R., Cumberland co., N. J., 40 m. S. of Phila. Pop. 1870, 6101; 1880, 7660.

**Mil'man** (HENRY HART), D. D., b. in Lond. Feb. 10, 1791, ed. at Eton and Brasenose Ox.; became a fellow 1815, M. A., and took priests' orders 1816; was Hampton lecturer 1827, prof. of poetry at Ox. 1821-31, rector of St. Margaret's, Westminster, and canon 1835, dean of St. Paul's 1849. Wrote *Apollon Belvedere*, a poem; *Fazio*, a tragedy; *Samos*, a poem; *Bampton Lectures*, *Hist. of the Jews*, etc. D. Sept. 24, 1868.

**Mil'more** (MARTIN), b. at Boston, Mass., in 1845, entered the studio of Mr. Ball in 1860; modelled an alto-relief of an ideal subject entitled *Phosphor*, which was much admired; made busts of Sumner, Longfellow, Ticknor, etc.; received in 1864 a commission to execute granite statues of Ceres, Flora, and Pomona for the Horticultural Hall at Boston; designed a bronze statue for the soldiers' monument at Forest Hill Cemetery, Roxbury, and was subsequently em-

ploied by the city of Boston to execute a similar monument which was placed on Boston Common.

**Milne-Edwards** (HENRI), M. D., b. at Bruges, Belg., Oct. 23, 1800, was the son of an Englishman; took his med. degree at Paris 1823; became prof. of nat. hist. at the Lycée Henri IV., prof. of nat. hist. at the Musée 1841, prof. of zoology 1862, dean of the Faculty of Sciences, etc. Author of *Anatomical Researches concerning Crustaceans*, *Handbook of Materia Medica*, *Elements of Zoology*, etc.

**Mil'nor** (JAMES), D. D., b. in Phila. June 20, 1773, studied at the Univ. of Pa.; was admitted to the bar in 1794; practised at Norristown 1794-97, and at Phila. 1797-1814; was M. C. 1811-13, and opposed the war with Eng.; took orders in the P. E. Ch. 1814, and was rector of St. George's ch., New York, until his death, Apr. 8, 1844.

**Mi'lo** [anc. *Melos*], a Gr. island, the most westerly of the Cyclades, 14 m. from E. to W., 8 from N. to S., about 65 m. E. of Peloponnesus. It is volcanic and very fertile, producing wine, oil, fruit, and grain, and rich in sulphur, vitriol, and alum. But its water is brackish and its climate malarious. The anc. city of M., near whose ruins stands the modern v. of Kastorn, was on N. side of island, and had an excellent harbor. The statue of Venus, found here in 1820, is now in the Louvre, Paris. Pop. nearly 3000.

**Milrea'**, or **Milree'** [Port. *mil*, a "thousand," and *real* (pl. *reals*), a "real"], called also *cordo*, or *crown*, a Port. and Brazilian coin and money of account. The Port. M. is worth about \$1 U. S.; the Brazilian is 514 cents of our money.

**Miltiades**, mil-ti'a-dêz, b. at Athens, son of Cimon, succeeded his brother Stesagoras as tyrant of Chersonesus, and joined Darius Hystaspis in his campaign against the Scythians. Together with the other Grs. he was left in charge of the bridge over the Danube, and when Darius did not return at the appointed time he recommended the destruction of the bridge, while the Ionians, on the advice of Histæus, insisted on its preservation. Afterward he conquered Lemnos, which was a Per. possession, and when the Per. fleet, after the capture of Miletus, approached Chersonesus, he fled and repaired to Athens. Here he was chosen commander against the Per. force, which under Datis and Artaphernes threatened Athens, and defeated it in the battle of Marathon (490 B. C.). A new armament which the Athenians placed under his command he used for an expedition against Paros for private purposes. He was arraigned, and condemned to defray the whole cost of the armament, and as he could not pay this enormous fine he was thrown into prison, where he d. from a wound he had received during the campaign. His son Cimon paid the fine, and a monument was raised in honor of him on plain of Marathon.

**Mil'ton**, on R. R., Norfolk co., Mass., 9 m. S. of Boston. The tp. contains the Blue Hills, which gave name to the State, the word *Massachusetts* probably signifying Great Hills. Pop. tp. 1870, 2683; 1880, 3206.

**Milton**, R. R. junc., Northumberland co., Pa., on the Pa. Canal. Pop. 1870, 1909; 1880, 2102.

**Milton** (JOHN), b. in Bread st., Lond., Dec. 9, 1608; was originally destined for the Ch., and entered Christ's Coll., Cambridge, Feb. 12, 1625; in 1632 he left Cambridge and returned to his father's house in Horton, where he studied classical lit. and philos. with great energy, cultivated music, and composed the *Sonnet to the Nightingale*, *L'Allegro*, and *Il Penseroso*, the elegy *Lycidas*, and the two masques, *Comus* and *Arcades*; the first collected edition of his poems was not pub., however, until 1645. After his mother's death in 1637 he went abroad, visited Leyden, Paris, and Rome, and settled, on his return, in Lond., where he soon became engaged as a most violent and intolerant, though candid and eloquent, controversialist. His first polemical onset was an attack on the Epis. Ch. (1641-42). Five treatises belong to this contest—viz. *Of Reformation*, *Of Prelatical Episcopacy*, *The Reason of Ch. Govt.*, *Animadversions*, and *Apology for Smectynymus*. In 1643 he married Mary Powell, but she left him after one month on account of the "spare diet and hard study" she found in his house. Four tracts on divorce followed (1644-45)—viz., *The Doctrine and Discipline of Divorce*, *The Judgment of Martin Bucer*, *Tetrachordon*, and *Colasterion*, in which he maintained that moral incompatibilities justify divorce. The couple became reconciled afterward, and lived together until the death of the wife in 1653; she bore him 3 girls. In 1644 he also pub. 2 other essays, *On Education* and *Areopagitica*, a *Speech for the Liberty of Unlicensed Printing*, which latter treatise is his most eloquent piece of prose writing. After the execution of Charles I. (Jan. 30, 1649) he wrote 3 powerful pamphlets (1649-50) in order to defend the acts of the Eng. people in its struggle with its king—viz., *The Tenure of Kings and Magistrates*, *Eikonoclastes*, and *Pro Populo Anglicano Defensio contra Salmasii Defensionem Regiam*; and to this group of writings belongs also his controversy with Duncuillon (1654-55), comprising 3 pamphlets, among which was *Defensio Secunda*. The attack on Salmasius made a great sensation in Europe. It was written at the demand of Parl., as in 1649 M. had been appointed sec. in the ministry of foreign affairs by Cromwell. This position he held till the Restoration in 1660, though he became entirely blind in 1654, and could work only by the aid of a reader and a scribe. After the Restoration he was compelled to keep himself concealed for some time, and even after the Act of Oblivion he continued to live very secluded. *Paradise Lost* was pub. in 1667, *Hist. of Brit.* in 1670, *Paradise Regained* and *Samson Agonistes* in 1671, *Of True Religion* in 1673. A Lat. MS. *De Doctrina Christiana*, which shows his very heterodox conceptions of different points of Christianity, was not pub. till 1825. He d. Nov. 8, 1674. At its first appearance *Paradise Lost* made no great impression, but in the 18th century it was raised to the most conspicuous place in Eng. lit. CLEMENS PETERSEN.

**Milton College**, at Milton, Rock co., Wis., was chartered in 1867. It is connected with the Seventh-Day Bap. denomination. Both sexes recite in the same classes and compete for the same honors in all the depts.



**Milwaukee**, city and important R. R. and commercial centre, a port of entry and cap. of Milwaukee co., Wis., on the bay and river of the same name on the W. shore of Lake Mich., 84 m. from Madison and 85 m. from Chicago by rail. The harbor at the mouth of the Milwaukee River is one of the best upon the upper lakes. The river is navigable for vessels of the largest lake tonnage for 3 m. from its mouth, directly through the business part of the city. At this point there is a dam which raises the water 12 ft. above high water, allowing slack-water navigation some 2 m. farther up the stream. A canal  $\frac{1}{4}$  m. in length from this dam on the W. side of the river creates abundant water-power. The Menomonee and Kinnickinnic rivers empty into the Milwaukee about 1 m. from its mouth, and are navigable for nearly 2 m. Several limestone-quarries are worked along the banks of the Menomonee, which furnish an excellent stone for building. The bay is a beautiful expanse of water, running inland about 3 m., and measuring about 6 m. across from its extreme point. Wheat is the great commercial staple, and the amount received constitutes this one of the largest primary wheat-markets of the world.

The co. c.-h. is a large and elegant structure, built of Lake Superior sandstone. The P. O. is a substantial building, erected by the gen. govt. of Ill. marble; it is also used for U. S. courts and custom-house. The Immanuel Presb. ch. is a beautiful stone edifice of mediæval Gothic style, completed in 1874. There are 2 cathedrals, R. Cath. and Epis. A Capuchin monastery and a Franciscan coll. are just out of the city. The Convent de Notre Dame, the mother-house in the U. S., occupies an entire square. The National Asylum for Invalid Soldiers is about 3 m. distant. A park adorns the lake bluff for half a mile.

M. is mentioned in 1817 as "a Pottawatomie village lying on the right bank of the Milwaukee River at the confluence with the lake." The first white settler was Solomon Juneau, a Fr. fur-trader, who came to M. about 1825. He entered a claim to a part of the land now occupied by the city, and lived to be its mayor after it had become one of the most prosperous towns upon the lakes. M. was laid out as a v. in 1835. It has the Wis. Industrial School for Girls, a fine Industrial Exposition building, Marquette Coll. and a Jesuit Sem. A harbor of refuge is being constructed here by the U. S. which will be the best on the lakes. Pop. 1870, 71,440; 1880, 115,587; 1884, about 169,000. [From orig. art. in *J.'s Univ. Cyc.*, by Hon. W. P. Lynde.]

**Mime** [Gr. *μῖμος*, Lat. *mimus*], a rude form of the drama which prevailed in anc. Gr. and Rome. The Gr. M. was of Sic. origin, and Sophron, the greatest of the mimographers, mingled ethical teachings with buffoonery. The Gr. M. was written in prose. The Rom. M. was a sort of modern pantomime, but it was sometimes in part dialogue. It had a generally coarse and indecent character. The actors themselves were called *mimi*, whence our word "mimic."

**Mimosa** [Gr. *μῖμος*, a "mime," referring to the movements of the leaves], a genus of leguminous plants, of which the most familiar species is *M. pudica*, the common sensitive plant; gives name to the sub-order *Mimosæ*.

**Mina** [Gr. *μῖνα*; Heb. *maneh*], in Gr. money and weights, containing 100 drachme and forming the sixtieth part of a talent. The value varied according to the talent used. The Attic M. is generally stated to have been worth \$17.61 U. S. money; it was a money of account, and was not coined.

**Mina**, mee'nah (XAVIER), b. in Upper Navarre, Sp., in 1789; was studying for the priesthood when the Fr. invasion of 1808 impelled him to place himself at the head of a band of guerrillas. Taken prisoner in 1810, he employed his time in studies. Returning to Sp. in 1814, he took up arms against the absolutism of Ferdinand VII., and was forced to cross the border into Fr. (Oct. 1814). He proceeded to Eng. and formed the plan of an expedition to Mex. in aid of the patriots who were there struggling for independence. He succeeded in interesting some distinguished Englishmen in his plans, chartered a vessel, and proceeded to Baltimore; conferred with many prominent Amers., enlisted 300 volunteers, with whom he landed at Galveston, Tex., Nov. 24, but being unable to effect a junction with the Mex. patriots, he proceeded to New Orleans. Here he met with assistance and reorganized his expedition; landed at Soto la Marina, Tamaulipas, Apr. 1817; was joined by a few Mex., and at the head of less than 500 men forced his way to the centre of Mex. and arrived June 24 at the fort of Sombbrero, near Leon, held by the insurgents. After numerous engagements, M. was surprised at night at the rancho of Venadito, near Irapuato, Guanajuato, Oct. 10, and after a trial was executed, Oct. 27, 1816.

**Minaret**. See APPENDIX.

**Mind** [Gr. *νους*; Lat. *mens, mentis*], contradistinguished from *matter*, is free, self-determined being, and hence exists in the form of atomic individuals, and not, as is the case with matter, in that of mere mechanical or quantitative aggregates. Wherever we observe activity which is in conformity to an end or purpose, we attribute it to M. Taken generally, material things are limited or constrained from without—conditioned through others—while spiritual beings are always free and self-conditioned, at least formally, originating their own limitations, first as ideas or purposes theoretically, and then realizing them as practical activity or will. Pure matter, devoid of all self-determination, is perhaps mere empty space—pure chaos; pure M. or absolute self-determined being is God. Between these ultimates lie the world of nature and that of man. In opposition to the theory of the speculative philos. and theologians, the materialists repudiate the co-ordination of M. with matter, or the subordination of matter to M., and explain M. as a function of matter. Psychology with them, accordingly, falls into a dept. of physiology. An outline of the entire philos. of M. includes the following depts.: A. Subjective Mind falls under 3 heads—I. Anthropology, or the science of those phases of M. beginning with its enthrallment in nature and its struggle for individuality. II. Phenomenology of M. is the science

of the process by which M. comes to recognize free self-determining intelligence as the presupposition and logical explanation of the objective world. III. Psychology, considered as a special dept., is the science of M. as subject; it considers the subjective factor of knowledge and investigates its forms. It treats (a) of theoretical M. as sense-perception, representation and pure thought; (b) of the emotional activity of M.; (c) of the practical activity, or the will. B. Objective Mind includes the world of human hist. and the organized insts. of man—(a) the family, (b) civil society, (c) the state. C. Absolute Mind (*νοῦς ποιητικός*) includes (a) the phase of manifestation of the divine M. to sense-perception in the form of the beautiful in art; (b) the revelation of the divine to the will in the form of the good as set forth in religion; (c) the systematic exposition of the divine M. as the ultimate truth in the form of science, culminating in theol. or philos.

WM. T. HARRIS.  
**Mine**. See MINES, MILITARY, and MINING ENGINEERING.

**Mincola**, Tex. See APPENDIX.

**Miner** (ALONZO ARES), D. D., b. at Lempster, N. H., Aug. 17, 1814; was brought up on a farm, and received an academic education; was pastor at Methuen, Lowell, and Boston, Mass.; filled many important offices in Mass. connected with educational interests, and was pres. of Tufts Coll. 1862-74.

**Miner** (CHARLES), b. at Norwich, Conn., Feb. 1, 1780; emigrated in 1799 to the Wyoming Valley, Pa., where, with an elder brother, he established the *Luzerne Federalist*, and afterward the *Gleaner*, in which he wrote a series of humorous essays; became assistant ed. of the *Political and Commercial Register* at Phila.; established at West Chester, Pa., the *Village Record*, in which his sketches were very popular. He was M. C. 1825-29; was a friend to the agricultural and silk-growing interests, which latter industry he was the first to introduce and popularize in the U. S. by his writings; declined a re-election on account of deafness; returned to the Wyoming Valley in 1832, and wrote in 1845 a *History of Wyoming*. D. Oct. 26, 1865.

**Miner** (THOMAS), M. D., b. at Middletown, Conn., Oct. 15, 1777, grad. at Yale 1796; taught school several yrs. and studied law, but ultimately became a phys., practising for some yrs. at Middletown. He was one of the founders of the Yale Med. Inst. and of the Conn. Retreat for the Insane; became a high authority upon fevers; wrote *Essays upon Fevers and other Med. Subjects*, a treatise on *Typhus Synopalis*, etc. D. Apr. 23, 1841.

**Mineralogy** [from *mineral*, and Gr. *λόγος*, "discourse"]. This science treats of the chemical and phys. properties, relations, occurrence, and classification of minerals; the word *mineral* denoting any homogeneous, inorganic, natural product, not gaseous, and not the immediate result of organic processes. Minerals are distinguished by their chemical properties, their form, structure, lustre, color, hardness, specific gravity, etc.

**Chemistry**.—Like any other chemical compounds, minerals are to be regarded as combinations of atoms and molecules, and in writing the formulas for these the ratios of the elements present are calculated in 3 ways: The *atomic ratio* is the ratio between the number of atoms. The *oxygen ratio* is the ratio between the number of atoms of oxygen in the different oxygen compounds present. The *percentage ratio* is the number of parts in 100, and is deduced from the ratio between the atomic weight of the compound and that of each constituent.

**Form and Structure**.—Some minerals occur only in an amorphous state, but the majority are at times well crystallized, or distinctly crystalline. Any crystal can be referred to one of 6 systems, in which the crystal faces are determined by their position in regard to a set of assumed axes intersecting within the crystal. In the *first (isometric)* system there are 3 axes, all equal, and intersecting at right angles. In the *second (tetragonal)* there are 2 equal horizontal axes at right angles, and a third of different length, vertical to their plane. In the *third (orthorhombic)* are 3 unequal axes at right angles. In the *fourth (monoclinic)* are 3 unequal axes, 1 horizontal, 1 vertical, and a third inclined to the vertical and making a right angle with the horizontal axis. In the *fifth (triclinic)* the axes are all unequal and inclined to one another, one being assumed as the vertical axis. In the *sixth (hexagonal)* which is in some respects analogous to the *tetragonal* are 3 equal horizontal axes, making angles of 60° with each other, and a fourth of different length, vertical to their plane. The crystalline form is very useful in distinguishing minerals, because it is an established fact that the angle between any two faces of a crystal will, under similar conditions, always be the same for the same minerals, subject to slight variations corresponding to changes in the composition of the varieties of the mineral.

**Isomorphism**, or the property of similar substances to crystallize in very similar forms, admits of their mutual replacement in crystallized minerals, this replacement being often accompanied by a slight change in the angles of the crystals. **Dimorphism** is the property of the same substance to crystallize in two different systems, or two different types of the same system. **Trimorphism** and **polymorphism** refer to crystallization in more than two forms. **Pseudomorphism** is the assumption by one mineral of the peculiar form of another, but the second mineral always retains its own internal structure and phys. characteristics. In *amorphous* minerals there is no trace of crystalline form or special characteristic of structure due to individual crystals. The majority of the solid amorphous minerals are the result of a gradual change from a gelatinous state, or of rapid cooling from a melted condition, but many of them are the result of the alteration of pre-existing minerals.

**Cleavage**, or the tendency to split in certain directions, is characteristic of most crystallizable minerals, and is of great use in determining minerals, the cleavage planes being always the same for the same mineral, no matter what the



modifications of the crystal. Some minerals are devoid of cleavage, especially the amorphous minerals and native malleable metals, while the cleavage of others, like mica and gypsum, is so perfect that they can be easily split into very fine laminae.

**Hardness.**—Minerals vary in hardness, from the liquid hydrocarbons and water to the diamond. Hardness does not usually vary much for the same mineral, and is therefore a valuable aid in determining minerals.

**Optical Properties.**—All transparent crystals not belonging to the isometric system (anisometric) possess *double refraction*, or divide into 2 rays a ray of light passing through them. One of these rays follows the ordinary law of refraction, and is called the *ordinary ray*, while the other is called the *extraordinary ray*. Sections of doubly refracting crystals of proper dimensions exhibit colored rings when examined by convergent polarized light, owing to the interference of the rays. Some crystals transmit light of different colors and intensity in different directions. Colorless crystals cause only variation in the intensity of the light; colored crystals in the color also.

**Lustre, Color, and Translucency.**—Minerals are divided according to their *lustre*, or appearance in reflected light, into 2 grand classes, *metallic* and *non-metallic*. *Color* is always the same, and characteristic in the case of some minerals, as metals, pyrites, etc.; others are white or colorless and transparent, like ice, quartz, etc., but these may be colored by mechanical admixture or isomorphous combination of colored constituents. The colors of minerals vary greatly, and so does their translucency. The *taste, smell, and feel* of minerals are additional means of distinguishing them.

**Classification.**—For a long time M. as a systematized science was in a very confused state, minerals and rocks were confounded together, and widely different minerals were placed in the same classes. In the early part of this century Berzelius introduced chem. in classifying minerals, and at the present day chem., combined with crystallography, forms the basis of the generally accepted systems of M. Dana's system of M., an unexcelled example of research and judgment, may be cited in illustration of the chemical grouping of minerals combined with crystallography. He first arranges the elements into 3 series, beginning with the more basic, then the more negative, and finally the eminently negative: **SERIES I.** *Gold group*, gold, silver; *iron group*, platinum and allied metals, mercury, amalgams, copper, iron, zinc, lead; *tin group*, tin. **SERIES II.** *Arsenic group*, arsenic, antimony, bismuth; *sulphur group*, tellurium, sulphur, selenosulphur; *carbon-silicon group*, diamond, graphite. **SERIES III.** Chlorine, bromine, iodine, fluorine, oxygen. The gold group also includes hydrogen and the alkali metals; the arsenic group, phosphorus, nitrogen, and probably boron; the iron group, calcium, magnesium, aluminium, cobalt, nickel, zinc (chromium, manganese, lead, in part, etc.); the tin group, titanium and zirconium, there being many subdivisions. [From orig. art. in *J. s. Univ. Cyc.*, by PROF. H. B. CORNWALL.]

**Mineral Oil.** See PETROLEUM.

**Mineral Pitch, Resin, etc.** See BITUMEN.

**Mineral Point,** on R. R., Iowa co., Wis., 175 m. N. W. of Chicago, has a sem. Pop. 1870, 3275; 1880, 2915.

**Mineral Tallow, or Hatchettine,** a fossil hydrocarbon, found in iron-stone nodules and in coal. It seems to be a fossil resin.

**Mineral Waters.** See WATER.

**Mineral Wax.** See PARAFFINE.

**Minersville,** R. R. June, Schuylkill co., Pa., on the W. Branch of the Schuylkill River. Prin. occupation, coal-mining. Pop. 1870, 3699; 1880, 3249.

**Mineral Wool.** See APPENDIX.

**Minerva,** a great Rom. divinity, the virgin daughter of Jove, early identified with the Gr. Athena, whom she much resembled. She was the patron of the arts and of all crafts requiring skill and tact, and the frequent guide of men in battle. She ranked third among the gods of the Capitol.

**Mines, Coal, and Mining.** See MINING ENGINEERING.

**Mines, Military.** I. *General Definitions.*—The term military mine originally signified a subterranean passage. In modern warfare the object of such a passage is to deposit a quantity of powder for subsequent explosion. This subterranean passage is called a shaft when it is vertical, a gallery when it is horizontal or inclined and exceeds in dimensions 3' x 4', and a branch when it is under these dimensions. When a gallery or branch is inclined it is called ascending or descending. M. used in defence are called countermines. In the latter the prin. communications are lined with masonry; in the former wood is used for lining.

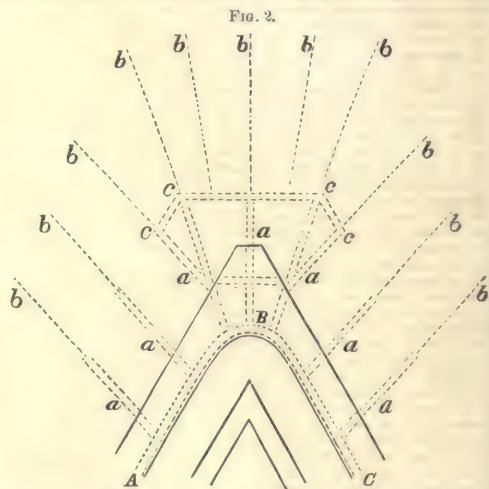
II. *Communications for Mines of Attack.*—The names of the galleries employed in the attack are great gallery, principal gallery, common gallery, branch. The wooden linings are of 2 kinds—viz. frames and sheeting, and cases. A mining case consists of 4 pieces of plank arranged with mortises and tenons (Fig. 1). The cases being fitted together, are placed touching each other, so as to form a continuous lining.

III. *Loading and Firing Mines.*—The cavity excavated to receive the powder is called the chamber. The powder, having been deposited, is connected with the surface by a fuse in the shape of the ordinary safety-fuze, powder-hose, or electric wires, generally the latter. To prevent the force of the explosion acting in the direction of the gallery, it is necessary to fill the latter up for a certain distance with solid materials. This operation is called tamping. The materials used

for tamping may be the earth just excavated or sand-bags. M. may be fired (or, as it is technically termed, sprung) by electricity, by the ordinary safety-fuze, or by powder-hose. Powder-hose is a long cylinder of linen or calico, about an inch in diameter, filled with powder.

IV. *Charges and Nomenclature.*—The explosive used in military M. is generally gunpowder—nitro-glycerine, gun-cotton, and other violent explosives being too sudden in their action to have the lifting effect required. The effects caused by an explosion underground depend upon the quantity of powder, upon its depth below the surface, and upon the nature of the soil. Beside the disturbance at the surface, there is a violent internal commotion which extends in all directions. The distances to which this commotion extends are called the radii of rupture. The radius of the circular opening on the ground is called the radius of the crater. The shortest line drawn from the centre of the charge to the surface of the ground is called the line of least resistance. The line drawn from the centre of the charge to the edge of the crater is called the radius of explosion. A crater of which the diameter is equal to the line of least resistance is called a one-lined crater; when the diameter is double the line of least resistance, a two-lined crater, and so on. M. charged so as to produce two-lined craters are known as common M. If more heavily charged, they are called globes of compression or overcharged M. Those with smaller charges are called undercharged M. Those with charges so small as not to produce any crater are called camouflets. A small M. with a line of least resistance not greater than 10', formed by sinking a shaft from the surface of the ground and placing the charge at the bottom of it, is termed a fougasse. A stone fougasse consists of an excavation in the form of a frustum of a cone, with its axis inclined toward the enemy, at the bottom of which is placed a charge of powder. Charges are said to be at 1, 2, 3, etc. lined intervals when the distances between their centres are respectively one half, two halves, three halves, etc. of the sum of their lines of least resistance.

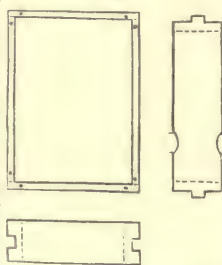
V. *Countermines.*—A system of countermines consists of 2 parts—viz. that exterior to the main ditch, and that under and within the main ditch. The 2 leading principles to be observed in its arrangement are—1st, to make each group of chambers and branches independent of the others, by giving it a separate communication with the main gallery in rear, so that the destruction of one group may not paralyze another; and, 2d, to present the ends of galleries to the blows of the enemy, rather than the flanks, since the effects of his globes of compression are thus much diminished. Fig. 2 shows an arrangement of the most important galleries in a system of countermines. The continuous gallery A B C



is placed behind the counterscarp, and is the base of the first part of the system; it is called the counterscarp gallery. The galleries *a a a* are called galleries of communication. The galleries *b b b*, of which the function is to reconnoitre the enemy's mine, are called listening galleries. The galleries *c c c* are called transversals; their object is to facilitate ventilation and the service of the mines. In the second part of the system—not shown in the diagram—the M. under the ditch, having for their main object to disperse the debris from the breaches, are placed in front of the foot of the scarp. Their branches debouch from a gallery behind the scarp and about 20 yards from it, called the scarp gallery. This gallery serves as base to all M. within scarp.

VI. *Subterranean Warfare.*—In the attack the miner should advance by several galleries, the flank ones being guarded by branches as listeners, and should push his advance with great vigor, at the same time taking all precautions to discover the enemy and to conceal his own approach. Upon discovering the enemy's presence, he must at once establish globes of compression, to destroy the countermines. But before springing them he must prepare for the following operations—viz. 1st, to occupy and intrench himself in the craters; 2d, to construct shelters for the troops ordered to protect them from sorties; and, 3d, to establish surface communication between them and his trenches. The latter is done by means of the sap, and by intermediate small M. which are sprung at the same time as the globes. As soon as he has occupied the craters, the besieger should sink a shaft and debouch with his galleries. These will

Fig. 1.





generally be directed straight to the front to continue the attack. Should the enemy open a crater by the explosion of a countermine, the besieger will occupy it and proceed to search for the gallery leading to it. Having taken possession of the gallery, he may convert it into a trench by the simultaneous explosion of heaps of powder deposited in it from distance to distance. The besieger should use large charges of powder, as a general rule employing globes of compression. In the defence the besieged should suspend his labors several times a day to listen. As soon as he hears the enemy, he should push forward a branch to meet him; or he may at once excavate a chamber and load it as a camouflet, and then wait until the enemy is near enough. The object of the besieged is to destroy as much of the enemy's galleries as possible, while at the same time he avoids producing deep craters at the surface in which his enemy can make a lodgment. Hence, he should place his M. at such a depth that, even while he employs considerable charges, these shall not produce extensive craters, and he must not spring them until the distance of the enemy is less than the line of least resistance. Under favorable circumstances he should himself occupy a crater. After the enemy has sprung his globes of compression, the besieged, beside keeping up a heavy artill. fire on the craters, should at once advance with numerous branches close up to them, in front and on both flanks. If he succeeds in preventing the enemy from debouching with a gallery, he proceeds to drive him out of the crater by further explosions. He opposes the sinking of shafts of attack over his countermines by countershafts, made by boring a hole upward, loading, and firing it. He repels the storming of his galleries by barricading his loopholed doors, and firing a smoke-ball on the enemy's side; the latter being thus driven away, he has time to effect an explosion which shall destroy a portion of his gallery, and thus raise an effective barrier. [From orig. art. in *J.'s Univ. Cyc.*, by CAPT. O. H. ENNST.]

**Minghetti** (MARCO), b. in Bologna, It., in 1818; studied phys. and social science, and travelled in It., Fr., and Ger. In 1846 he pronounced a discourse at Bologna on the corn-law reform in Eng., declaring himself in favor of free trade. His next work was a *Dialogue on the Philos. of Hist.* In 1854 he pub. an essay on the *Decay of the Fine Arts*, in 1859 a treatise entitled *Della Economia pubblica, delle sue attinenze con la morale e col diritto*. Meanwhile he had established in 1846 a journal, *Il Felsineo*. In 1847 he was invited to Rome as member of the Consulta della Finanze. In 1848 he was named by Pius IX. minister of public instruction, but on the defection of the pope from the liberal cause M. left the ministry and hastened to the Lombard camp, where he was appointed capt. on the staff of Carlo Alberto. After the battle of Goltio he was created major, and after that of Custoza (1848) he was decorated. Rossi invited him to form a part of his constitutional ministry. M. arrived at Rome on the very day of the assassination of his friend, and at once pub. a protest against the crime. M. returned to the Piedmontese army. After the battle of Novara he gave himself up to his private studies. In 1858 he went to Egypt and Sinai; in 1859 he was appointed by Cavour sec.-gen. of foreign affairs. After the peace of Villafranca he became a member of the assembly of the Romagna, and upon the annexation he was elected M. P. from Bologna. In 1860 M. was named minister of the interior, in 1862 minister of finance, and at the same time pres. of the council; in 1864 he effected a loan of 700,000,000 francs, and brought about the Sept. convention which transferred the cap. of the kingdom of It. to Florence. In the Menabrea ministry M. was at the head of the agricultural and commercial dept.

**Miniature**, min'e-tür, a delicate style of painting, generally applied to very small portraits, whence a "miniature." M. painting may be divided into 2 kinds—that of the illuminated MSS., which was always executed on parchment, and the modern art so called, applicable to any material, but for which ivory plates almost invariably serve as the ground. The *miniatori* or illuminators of the Middle Ages were distinguished for great care, especially in the preparation of their colors, which are generally as fresh to-day as when first applied. After the invention of printing had superseded calligraphy and illumination, the demand for pictures, whether small portraits or reduced copies of larger works, in fact greatly increased, and the art assumed new characteristics. Though less modern in many respects than their It. contemporaries, Hemling, and especially Holbein (d. 1554), may be regarded as the fathers of the present M. The earlier painters used egg, gum, or glue as a vehicle. They always employed body-colors thickened with white; thus, the shades were not executed with a transparent medium, but with light colors which were opaque.

**Minie**, me-ne-ä' (CLAUDE ÉTIENNE), b. at Paris about 1805; entered early the army as a volunteer; fought in Algeria; was made capt. in 1849; became a teacher in gunnery at the school of Vincennes in 1852, and went in 1858 to Egypt as supt. of a factory of firearms. In 1849 he brought out his invention of the rifle-ball which is called after him. D. Dec. 15, 1879.

**Minims, or Minimi** (Lat. *minimus*, "the least"). **Order of the**, instituted by St. Francis de Paula about 1436, under the name of "Hermits of St. Francis;" confirmed in 1474 by Sixtus IV., and the name changed to Minims by Alexander II. Convents of nuns were established in 1495 in Sp., and in 1621 in Fr. Agreeably to their name, humility was the distinguishing feature, and with the usual vows of poverty, continence, and obedience, the most rigid abstinence was inculcated.

**Mining Engineering**. As an art, mining is an art of excavation, but as a science it may be considered as the science of avoiding excavation, since the aim of the engineer is to reach and remove the valuable masses entirely if possible, and no more. The miner's method of excavating consists essentially in first undermining the face of rock

and then prying, wedging, or blowing it down. The tools and instruments for this are picks, wedges, hand-drills, power-drills, cutting-machines, and blasting-powders. Beside the undermining at the bottom of the face, it is often expedient to disengage the sides also with the pick.

Many mines have been begun by a simple quarrying on the outcrop of a mineral deposit, but the increasing difficulties invalidate this method so decidedly that at the depth of 100 ft. mostly the science of deep mining has to be invoked. It is impracticable to avoid making certain preparatory works before the attack or exploitation can be properly commenced. These works are tunnels, shafts, and adits. Supposing that a vertical shaft has been sunk, as deep down as various reasons will allow, it is next put into connection with the deposit by means of the adits, which are galleries sloping a little toward the shaft for drainage and rolling. From where the adits pierce the vein next are run gangways to right and left in the vein itself. These make the different levels. Finally, these levels being put into communication by slopes in the vein—200 ft. apart, for example—the mineral mass is seen to be subdivided into a set of parallelepipeds. This finishes the preparatory work.

Exploitation is the taking out of the parallelepipeds so prepared and exposed. If such a parallelepiped be attacked on an upper corner by miners, with pick, drill-bar, and shovel, it is called *underhand stoping*. Overhand stoping is where the workmen attack one of the lower angles of a parallelepiped. In this case the miners are, as it were, undermining the whole parallelepiped. In comparing these 2 methods it will be found that for various reasons underhand stoping is best for mining precious metal, and overhand for coal.

The exploitation of thick veins is effected by different dispositions. For example, when there is abundant filling they may be attacked from below upward; or again, where caving is allowable, they may be taken from above downward; and finally the method by pillars and galleries is applicable anywhere. That title ordinarily refers to an exploitation in which the pillars are used for support alone, and are supposed to be left and abandoned utterly. This relinquishes  $\frac{1}{2}$  to  $\frac{1}{3}$  the material in the earth, but in thick veins of cheap ore or coal is sometimes the only way possible. It is combined often, however, with a subsequent robbing of the pillars. The robbing involves caving, and when the creep of the caving can be commanded the method is as exhaustive as any.

Coal-mining differs from other mining principally because there is comparatively little refuse in ordinary coal-beds, and because the generation and blowing out of fire-damp in fiery mines exact peculiar lighting, particular ventilation, and beside a disposition of works in which the different portions, and even the different breasts, are isolated one from another, so that an accident in one may not compromise all. The perfection of an exploitation is to get out all the valuable material, and nothing else, with rapidity and with safety and comfort to the miners.

**Interior Transportation**.—From the fronts down to the gangways the matters are sent in barrows, sledges, shutes, or cars. In the main-ways there are always railroads. The cars may be iron or wood. The motors are men and boys, mules, small horses, stationary engines with endless chains, or locomotives.

**Hoisting**.—At the mouth of the shaft is a derrick, on top of which are 2 large sheaves or pulleys to bend the cables from the shaft to the winding-drums or reels. The cables are terminated with an end of chain, which is hooked on to the buckets, skips, or cages. The cages are simple elevators, which carry one or more cars; they are guided by vertical strips of timber fixed to the sides of the hoisting-way, and these also serve in connection with the parachutes, which ought to be attached to all cages, particularly if miners are hoisted in them.

**Pumping**.—The pumps of a deep mine are composed of a series of lifts, each more than 100 ft. high. All the pumps are force-pumps with plungers, except the lowest, which is a lift-pump, more convenient for following the sinking of the shaft or being moved about. If lift-pumps were used alone, the engine would have to lift rods and water at the same time, thereby doubling its work. The best pump engines undoubtedly are single-acting, with large cut-off.

**Ventilation** is either natural or artificial. Artificial ventilation is produced by pneumatic machines, by fans, by furnaces, and by jets of steam. It is found preferable to ventilate by drawing out the air, rather than by forcing it in. The amount of air required for any mine can hardly be told except by experiment. In coal-mines it is imperative to split the air without stint, in order to subserve the isolation of the works. The directing and modifying of the currents is effected by doors and air-shutes in the mine-ways.

**Milling** at coal-mines consists only in breaking, picking, screening, and washing the coal. The breakers are toothed cylinders; the screens are revolving trommels, with different-sized apertures for sorting the lumps as they pass through; the washing is done in large jigs or elsterns. Masses of metallic ore when first extracted and dumped are first broken by hammers or sledge-work in a pile-driver frame; then treated by jaw-crushers and cylinder rollers; then transmitted to the stamps. For the same purpose heavy wheels rolling in a circular trough are used, and in some respects to better effect, as they do not destroy the metal when native, like stamps.

**Mining Surveying**.—The main ways are surveyed with a transit, the narrower ones and the fronts of work with a compass and half circle suspended from a cord stretched at convenient points. The vertical and horizontal angles and linear measurements being referred to 3 co-ordinate planes, it is easy therefrom to make maps, sections, and elevations, or to solve any problem of underground projection, by the ordinary methods of geometry or trigonometry. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. F. L. VINTON.]



**Mink** [of uncertain etymology], a name given to the 2 small species of the weasel family (Mustelidae) and of the genus *Putorius*—viz. (1) *P. lutreola* of Europe and N. Asia, and (2) *P. vison* of N. Amer. The M. of N. Amer. yields fine



Minks.

and high-priced furs, especially northward. The M. frequent small streams and forests and mts. They are easily bred in a half-domesticated state, and several large "minkeries" have been established in the U. S. with good pecuniary results. M. are easily trapped.

**Minneapolis**, on R. R., cap. of Ottawa co., Kan., on N. bank of Solomon River. Pop. 1880, 1084.

**Minneapolis**, city and important R. R. centre, cap. of Hennepin co., Minn., on both sides of Miss. River, at Falls of St. Anthony, 8 m. N. W. of St. Paul. The site is on a broad esplanade which commands a fine view of the falls, and the surrounding country is noted for its beauty. Several picturesque lakes are in the immediate vicinity, and the Falls of Minnehaha ("laughing water") are but 5 m. distant. M. has a line of steamers which in summer ply on the upper Miss., above the falls to St. Cloud. The Falls of St. Anthony, having a descent of 75 ft. within a mile, supply an immense water-power. The Univ. of Minn. is located here, as well as the Augsburg (Lutheran) Theological Sem., established by the Scandinavians of the N. W., and Hamline Univ., by the Meths. There are an acad., 2 female sems., a medical coll., an atheneum, 3 opera-houses, and a spacious and beautiful cemetery. Lumber and flour are very extensively manufactured here. M. was first settled in 1849, incorporated 1867, annexed city of St. Anthony, on E. bank, 1873. Pop. 1870, 13,066; 1880, 46,887; 1885, about 120,000.

**Minnehaha** ["laughing water," in the Dak. lang.], a waterfall in Hennepin co., Minn., celebrated for its beauty. Here the small river Minnehaha leaps 60 ft. down a limestone precipice. It is  $\frac{1}{2}$  m. from the Miss. and near Minneapolis. The legend of an Indian maiden leaping this fall when thwarted in her love for an Indian brave has been finely treated by Longfellow in his *Minnehaha*.

**Minnesingers**, The [O. H. Ger. *Minni*, "love" and *singen*, "to sing"], the distinctive name of a peculiar class of poets who flourished in Ger. from the middle of the 12th to the close of the 13th century. Before their appearance lyric poetry and versification were virtually unknown in Ger.; and it is now placed beyond a doubt that the M. did not learn their art from the Provençal poets. It seems as if the religious fervor excited by the Crusades, together with the chivalric sentiments of the times, had suddenly inspired the whole knight-errantry of Ger. with a poetic frenzy; and one of the most remarkable features of their productions is, that while those knights were mostly uneducated men, many of them not able to read and write, their poems are distinguished by a surprising elaboration of poetical form. This poetic outbreak was at first confined exclusively to the knightly class. When subsequently the peasants and citizens began also to practise poetical composition, the Minnesong became changed into the Meistersong. None of the early knight-minstrels, and only few of the later, wrote down their songs. They improvised the poetry and the music at the same time. Generally, the song was composed for the knight's lady-love, to whom it was sent, not on paper, but through the agency of the knight's Sancho Panza, a young *Singerlein* of good voice and quick memory, to whom the knight sang his song till the young man had it by heart. Then he was despatched to the lady-love in question to sing her his master's song. The Minnesongs were passed from mouth to mouth, until toward the close of the 13th century one of the later M. was instructed by a Swiss knight to collect and have written down all discoverable Minnesongs. The M. sang only lyrics. In course of time they became didactic, censorious, and critical. Some of the M. put into metrical form the romances of the knights of King Arthur and of Charlemagne. Most prominent among these writers of Minne-romances are Wolfram von Eschenbach, who wrote *Parzival*; Gottfried von Strassburg, the author of *Tristan and Isolde*; and Hartmann von der Aue, known by *Golden Legend of Poor Henry*. By far the most prominent among the purely lyrical M. ranks Walther von der Vogelweide. Ulrich von Lichtenstein exhibits the Quixotic side of that knight-errant period in all its absurdity. Emp. Henry VI. and his son, young Conrad, the last of the Hohenstaufens, were also among the M. (See VAN DER HAGEN, *Minnesinger*.)

**Minneso'ta**, one of the N. W. States, at the head



of the Miss. Valley, lying between 43° 30' and 49° N. lat., and 89° 29' and 97° 5' W. lon. It is bounded N. by British Amer., E. by Lake Superior and the State of Wis., S. by Ia., and W. by Dak. The extreme length of the State from N. to S. is about 380 m.; its breadth is from 337 to 262 m.; area estimated at 83,965 sq. m.

or 53,353,600 acres. Its name is derived from that of the prin. tributary of the Miss. within its boundaries, and is said to signify in the Dak. or Sioux lang. "sky-tinted water."

**Face of the Country.**—The gen. surface of the country is undulating, and is the actual watershed of all that part of the N. Amer. continent lying E. of the Rocky Mts. Accordingly, we find a range of drift-hills crossing the upper portion of the State nearly from E. to W., mostly with flat tops and nowhere exceeding 100 ft. of elevation above the adjacent country, in or near which are the sources of the Miss. River, of the Red River of the N., of the feeders and tributaries of the Lake of the Woods, and the sources also of the St. Louis River. There are, then, 3 distinct slopes, differing in soil, vegetation, and geological character in the State—the N. slope, including not only the Red River Valley, but the valleys and lakes of the streams draining into Rainy Lake and the Lake of the Woods; the E. slope, occupying the valley of the St. Louis River and its tributaries, and declining gently toward Lake Superior; and the S. slope, drained by the Miss. and its affluents, comprising about  $\frac{2}{3}$  of the State, and extending into and forming part of the great Miss. Valley. Three fourths of the State may be generally described as rolling prairie, interspersed with frequent groves, oak-openings, and belts of hard-wood timber, dotted with numberless small lakes and drained by numerous clear and limpid streams. The remaining fourth includes the hills which form the divide, the extensive mineral tract extending toward Lake Superior, and the heavy timbered region lying around the sources of the Miss. and Red River of the N.

**Rivers, Lakes, Etc.**—The State is mostly drained by the Miss., the Red River of the N., the St. Louis, and their numerous tributaries. Of the affluents of the Miss., the Minnesota is the principal on the S. W. side; the other tributaries on the S. W. side are the Root, Zumbrota, Cannon, Sauk, Crow Wing, and Willow rivers; on the N. and N. E. its largest affluent is the St. Croix; and Rum River, the outlet of Mille Lacs Lake, is the only other considerable stream; the Red River has several branches of but moderate size, known as Buffalo, Wild Rice, Red Lake, and Reed Grass rivers; the St. Louis has several streams, such as the Ushkabwahka, Big White Face, Stone, Floodwood, and Savanah rivers. There are also numerous small streams flowing into Lake Superior, and several of larger size, such as the Vermilion, Little Fork, Big Fork, and Bandette, discharging into Rainy Lake River and the chain of lakes which form a part of the N. boundary of the State. M. is emphatically the land of lakes (about 7000). A few of these lakes, such as Leech, Red Lake, Mille Lacs, Vermilion, Winnebogishish, Big Stone, Traverse, Cass, and Otter Tail lakes are of considerable size. Lake Itasca, the ultimate source of the Miss., is of horseshoe shape, and its longest diameter is only 10 or 12 m.; Lake Traverse, the source of the Red River of the N., is long but narrow; Dead Fish Lake, source of the St. Louis, is small; Lakes Pepin and St. Croix are only enlargements of river-beds of Miss. and St. Croix rivers.

**Mineralogy.**—Iron of excellent quality exists in large quantities in the Lake Superior region, and also in the S. and S. W. portions of the State. Copper of equal purity with that in the upper peninsula of Mich. has been found in the Lake Superior region. Gold and silver exist in moderately paying quantities in the vicinity of Vermilion Lake. The other prin. minerals of the State are slate, lime, salt, white sand for glass-making, building-stone, peat, tripoli, marl, etc. The red pipestone of which the Indians make their pipes is found abundantly in the S. W., and is quarried and used for many purposes.

**Soil and Vegetation.**—The 3 slopes specified above have each a different soil and vegetable growths. The N. is a rich alluvial deposit admirably adapted to wheat-culture and to grazing. This region has forests of oak, beech, elm, and maple. The E. slope is a better mineral than agricultural region, though the soil yields fair crops; much of this slope, as well as the highlands or divides, is covered with a heavy growth of pine, spruce, and other coniferous trees, valuable as lumber, but the soil beneath them, when cleared, is comparatively sterile. The S. slope, which comprises all of the State below the highlands, is composed of alternate rolling prairie and woodland, and is unsurpassed in fertility and productiveness. About  $\frac{1}{2}$  of the land-surface of M. is timbered land. In this S. slope there are detached groves and copses of great beauty sprinkled everywhere among the prairies and around the numerous rivers and lakes, while growths of dwarfed oaks skirt the borders of the







97 A B 96 C 95 D Longitude 94 W. from E. Greenwich 93 F 92 G 91 H

BRITISH TERRITORIES

MAP OF  
**MINNESOTA**  
Drawn and Engraved on Copper-Plate  
EXPRESSLY  
FOR  
**JOHNSON'S CYCLOPEDIA**

Scale of Miles  
2 4 6 10 20 40 60













prairies and are known as oak-openings. There is also a tract on both sides of the Minnesota River, over 100 m. in length and with an average width exceeding 40 m., comprising an area of 5000 sq. m., which is covered with a dense growth of magnificent hard-wood timber. It is known as the Big Woods. In this, as well as the smaller groves, are found almost every species of deciduous trees known in the N. States. More than 20,000,000 forest trees have been planted on the treeless prairies of the State. Owing to the great number of small lakes, streams, and marshes in the N. E. the aquatic plants of the sub-alpine flora predominate—wild rice, reeds, callas, and water-loving plants generally. In the N. E. part of the State it is estimated that there are 256,000 acres of cranberry marsh, which yield abundantly. Among fruits, apples, Siberian crab-apples, pears, cherries, plums, grapes (the more N. varieties), strawberries, raspberries, currants, blackberries, whortleberries, and gooseberries are abundantly cultivated, and yield immense quantities of excellent fruit.

**Zoology.**—The prairies and forests abound in a great variety of wild animals, especially wolves (2 species, the gray and the prairie wolf), bears, wild-cats, raccoons, foxes, deer, rabbits, squirrels, gophers, and woodchucks. Otter, mink, beaver, and muskrats are the prin. aquatic animals. Pigeons, grouse, wild-turkeys, and partridges are among the feathered game, as well as ducks, brant, and wild-geese in their season, and multitudes of smaller birds, distinguished for their gay plumage or melodious song, make the woods, lakes, and rivers vocal with their music or brilliant with their beautiful and varied hues. The numerous lakes are plentifully supplied with pickerel, bass, pike, sunfish, and smaller fish, and the present fish commissioner is introducing into them in large numbers lake and brook trout, the lake white-fish, black bass, etc.

**Climate.**—The climate of M. is remarkably healthful and bracing, and is largely sought by invalids for its dry and tonic character. The mean average temperature of the State for the yr. is 44.60°; the mean winter temperature, 16.10°; the summer temperature averages about 70.50°; the spring has a mean temperature of 46°, and the autumn about 38°. The largest amount of rainfall is in the spring and summer months, the winter being usually dry and the snowfall much lighter than in States farther S.

**Agricultural Products.**—The census of 1880 showed M. to be the fifth great wheat-growing State in the U., producing 34,601,080 bushels; corn, 14,831,741 bushels; oats, 23,382,158 bushels; barley, 2,972,965 bushels; wool, 1,352,124 lbs.

**Farm Animals.**—M. had, in 1880, 257,282 horses, 659,050 cattle, 267,598 sheep, 381,415 swine.

**Manufactures.**—With the exception of the lumber trade, M. is not a heavy manufacturing State. There were, in 1880, 3493 manufacturing establishments, employing 21,247 hands, paying \$8,613,094 wages, with capital of \$31,004,811; value of products, \$76,065,198. Of lumber there were 472,280,000 ft. sawed in 1880. The milling business at Minneapolis and elsewhere is enormous.

**Railroads.**—M. had, Jan. 1, 1882, 3391 m. of railway, costing \$207,040,999, with net earnings of \$4,794,447, paying dividends and int. of \$3,797,954. Several of these are great trunk lines, like the Chicago, Milwaukee and St. Paul; Chicago and N. W.; St. Paul, Minneapolis and Manitoba, and Chicago, St. Paul and Minneapolis. The N. Pacific railway also runs for 290 m. through M.

**Finances.**—The assessed valuation of property in 1880 was—real estate, \$208,446,781; personal, \$54,581,906; total, \$253,028,687; State tax, 1½ mills on \$1, producing \$383,905. The whole taxation, however, State and local, was \$7,713,707; State debt, 1880, \$2,565,000; total indebtedness, State and local, \$3,476,064.

**Commerce.**—The internal trade of M. consists mainly of grain and other food-supplies, transported (chiefly by rail) to E. markets. The great rivers—the Miss., the St. Croix, and the Red River of the N., with the Minnesota—furnish no less than 2800 m. of navigable waters. The State had, in 1881, 67 registered vessels, carrying 8346 tons; value of exports from the 2 customs districts, Duluth and Minnesota, in 1881, \$2,275,168; imports, \$783,294.

**Banks, Etc.**—In Oct. 1881 M. had 27 national banks, capital, \$4,900,000; circulation, \$1,845,294; bonds to secure circulation, \$2,073,500; deposits, \$13,010,427. There were also 20 State banks and trust cos., having deposits of \$4,475,837; 3 savings banks, deposits, \$566,510, and 89 private bankers, deposits, \$2,772,567. Fire insurance cos. in 1880 had risks of \$105,803,134; received for premiums, \$1,311,330; losses paid, \$1,374,149.

**Education.**—Number of children of school age (5-21 yrs.) in 1873, 271,428, of whom 180,248 were enrolled in public schools. In 1880, children attending school were 186,544; total expenditure for public schools, 1880, \$1,622,919, of which teachers' salaries required \$956,571. Total permanent school fund of the State, \$4,050,729; value of school buildings, \$3,382,352. M. has 6 univs. and colls., with 63 instructors, 822 students, paying \$7265 tuition fees. Newspapers and periodicals in 1882, 219, of which 13 were daily journals.

**Churches.**—M. has about 1600 chs., the Lutheran denomination leading, with 418 chs. and 55,000 members; Meth. Epis., 242 chs., 30,355 members; R. Cath., 212 chs.; Bap., 140 chs., 7026 members; Congregationalist, 137 chs., 6702 members; Presb., 116 chs., 6717 members; Prot. Epis., 56 chs., 4584 members.

**Population.**—In 1860, 172,023; 1870, 439,706; 1880, 780,773 (whites 776,884, colored 3889, including 2300 Indians, 24 Chl., and 1 Japanese).

**Principal Cities and Towns.**Pop. 1880.—Minneapolis, 46,887; St. Paul (cap.), 41,473; Winona, 10,208; Stillwater, 9055; Red Wing, 5876; Mankato, 5550; Faribault, 5415; Rochester, 5103; Hastings, 3809; St. Peter, 3436; Owatonna, 3161; Duluth, 2645; Lake City, 2596; New Ulm, 2471; St. Cloud, 2462; Northfield, 2296.

COUNTIES.	*Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
Aitkin.....	6-E	178	366	Aitkin.....	196
Anoka.....	9-F	3,949	7,108	Anoka.....	2,706
Becker.....	5-B	304	5,218	Detroit City.....	554
Beltrami.....	3-C	89	10	Sauk Rapids.....	598
Benton.....	8-D	1,558	3,012	Ortonville.....	tp. 709
Big Stone.....	8-A	24	3,688	Mankato.....	5,550
Blue Earth.....	11-D	17,302	22,889	New Ulm.....	2,471
Brown.....	10-D	6,396	12,018	Thomson.....	265
Carlton.....	6-F	286	1,320	Chaska.....	1,899
Carver.....	9-E	11,586	14,140	Montevideo.....	862
Cass.....	5-D	380	496	Centre City.....	33
Chippewa.....	9-B	1,467	5,408	Moorehead.....	55
Chigo.....	9-F	4,358	7,982	Grand Marais.....	443
Clay.....	5-A	92	5,887	Windom.....	1,885
Cook.....	8-H	534	5,338	Hastings.....	3,809
Cottonwood.....	11-C	534	2,319	Alexandria.....	1,355
Crow Wing.....	6-D	200	17,391	Blue Earth City.....	1,086
Dakota.....	10-F	16,212	11,244	Preston.....	939
Dodge.....	11-F	8,598	10,678	Albert Lea.....	1,966
Douglas.....	7-B	4,239	29,651	Red Wing.....	5,266
Faribault.....	11-E	9,940	3,004	Elbow Lake.....	tp. 75
Fillmore.....	11-G	34,887	67,013	Minneapolis.....	46,887
Goodhue.....	10-F	10,378	16,332	Caledonia.....	894
Grant.....	7-B	340	5,083	Park Rapids.....	136
Hennepin.....	9-E	31,566	96	Cambria.....	501
Houston.....	11-H	14,936	1,825	Mora.....	1,099
Hubbard.....	5-E	2,035	1,825	Hallock.....	108
Isanti.....	9-F	96	106	Lac-qui-Parle.....	tp. 108
Itasca.....	11-A	1,825	16,103	Beaver Bay.....	tp. 108
Jackson.....	11-C	93	106	Le Sueur Centre.....	73
Kandiyohi.....	7-E	1,769	2,945	Marshall.....	tp. 170
Kittson.....	2-A	64	6,257	Warren.....	961
Lac-qui-Parle.....	9-A	145	992	Fairmont.....	1,041
Lake.....	3-H	135	5,643	Glenox.....	578
Le Sueur.....	10-E	11,607	6,990	Litchfield.....	1,250
Lincoln.....	10-A	2,945	1,501	Little Falls.....	587
Lyon.....	10-B	992	5,875	Austin.....	2,305
Marshall.....	2-A	992	3,604	Currie.....	76
Martin.....	11-D	3,867	19,232	Worthington.....	524
McLeod.....	9-D	5,643	21,543	Ada.....	5,103
Meeker.....	9-D	6,990	18,676	Rochester.....	1,635
Miller.....	7-E	1,109	1,356	Fergus Falls.....	tp. 600
Mille Lacs.....	7-E	1,109	2,092	Pipe Stone.....	272
Morrison.....	7-D	1,681	11,433	Crookston.....	1,227
Mower.....	11-F	10,447	5,874	Glenwood.....	tp. 464
Murray.....	11-B	209	45,990	St. Paul.....	41,473
Nicollet.....	10-D	8,612	5,375	Redwood Falls.....	981
Nobles.....	11-B	117	10,791	Beaver Falls.....	185
Norman.....	4-A	117	22,481	Faribault.....	5,415
Olmsted.....	11-G	19,793	3,669	Luverne.....	679
Otter Tail.....	5-B	1,968	4,504	Duluth.....	2,645
Pope.....	7-F	948	15,516	Shakopee.....	911
Pipestone.....	11-A	2,092	3,855	Elk River.....	635
Polk.....	3-A	11,433	10,637	Henderson.....	964
Pope.....	8-B	2,691	21,956	St. Cloud.....	2,462
Ramsey.....	10-F	22,085	8,271	Owatonna.....	1,161
Redwood.....	10-C	1,899	3,911	Morris.....	443
Renville.....	10-C	3,219	7,473	Benson.....	456
Rice.....	10-F	16,083	6,133	Long Prairie.....	290
Rock.....	11-A	138	1,507	Maudsels.....	2,068
Saint Louis.....	4-F	4,561	2,080	Wadena.....	307
Saint Peter.....	10-E	11,082	12,385	Stillwater.....	1,708
Sherburne.....	8-E	2,080	19,563	St. James.....	444
Sibley.....	10-D	6,725	295	Breckenridge.....	tp. 636
Stearns.....	8-C	14,206	29,197	Winona.....	10,928
Steele.....	11-F	8,271	18,104	Buffalo.....	141
Stevens.....	8-B	174	5,884	Granite Falls.....	578
Swift.....	9-B	2,036			
Todd.....	7-C	2,036			
Traverse.....	7-A	13			
Wabasha.....	10-G	15,889			
Wadena.....	6-E	2,080			
Waseca.....	11-E	7,854			
Washington.....	9-F	11,809			
Watwan.....	11-D	2,496			
Wilkin.....	11-A	295			
Winona.....	21-H	29,319			
Wright.....	9-E	9,457			
Yellow Medicine.....	10-B				
Total.....		439,706	780,773		

\* Reference for location of counties. See map of Minnesota.

† Organized since census of 1880.

**History.**—The first European who set foot on the terr. of M. was Louis Hennepin, a Franciscan priest, who in 1680 ascended the Miss. to the Falls of St. Anthony, to which he gave their name. In 1763 this region was ceded to G. Brit., and in 1766 it was explored by Capt. Jonathan Carver. In 1783 it was transferred to the U. S. as a part of the N. W. Terr. In 1805 a tract of land was purchased from the Indians. In 1820 Ft. Snelling was built, and in 1822 the first mill was erected in what is now Minneapolis. In 1823 the first steamboat visited M. Between this time and 1830 a small colony of Swiss settled near St. Paul. In 1838 the Indian title to lands E. of the Miss. was extinguished. In 1843 a settlement was commenced at Stillwater, on Mar. 3, 1849, Cong. passed an act organizing the Terr. of M. At this time the pop. of the Terr. was between 4000 and 5000. In 1851 the Indian title to the lands between the Miss. and the Red River of the N. was extinguished. Immigration at once commenced in earnest, and on Feb. 26, 1857, Cong. passed an enabling act for its admission as a State, and on May 11, 1858, M. was admitted to the U. as a State. Her growth has been one of wonderful rapidity. In 1862 the Sioux suddenly made an irruption upon the new settlements. Nearly 1000 persons perished from this outbreak; but the Sioux were defeated and conquered, the most guilty executed, and the whole tribe removed from the State.

#### Governors.

TERRITORIAL.		Wm. R. Marshall . . . . .	1866-70
Alexander Ramsey . . . . .	1849-53	Horace Austin . . . . .	1870-74
Willis A. Gorman . . . . .	1853-57	Cushman K. Davis . . . . .	1874-76
Samuel Medary . . . . .	1857-58	John S. Pillsbury . . . . .	1876-82
STATE.		Lucius F. Hubbard . . . . .	1882-87
Henry H. Sibley . . . . .	1858-60		

REVISED BY A. R. SPOFFORD.

**Minnesota River** rises in Big Stone Lake, on the boundary between Minn. and Dak., traverses the State of Minn., flowing first S. E. and then N. E., reaching the Miss.



5 m. above St. Paul. It flows through "the Big Woods," a great forest of deciduous trees, and is navigable 300 m. in high and 45 m. in low water. Total length, 470 m.

**Minnesota, University of**, in Minneapolis, Minn., established by virtue of the State const. The present charter dates from 1868. The govt. is vested in a board of regents, consisting (1) of 7 members appointed by the gov., and (2) 3 members *ex-officio*—the gov., the supt. of public instruction, and the pres. of the univ. The endowment consists of 202,083 acres of public lands, much of which has been sold. Tuition free in all depts. Both sexes are admitted. There is no dormitory system. No honorary degrees are conferred. The geological survey of the State was intrusted to the univ. in 1872. The permanent plan of organization was adopted in 1870. The studies usually included in the first 2 coll. yrs. are thrown out of the univ. proper, and are merged with a remainder of "preparatory" work to form the dept. of elementary instruction required by the charter. The following distinct but federated colls. are in operation: (1) A coll. of science, lit., and the arts, having 3 courses of gen. studies, classical, scientific, and modern; (2) a coll. of agriculture, having a course of proper professional studies; (3) a coll. of mechanic arts, having courses in civil and mechanical engineering; (4) medical college.

**Minnow** [Fr. *menu*, "small"], a name applied to many small fresh-water fishes of the family Cyprinidae. They are used as live bait in pike and pickerel fishing, and are important as affording food to larger and better fishes.

**Mino Bird**, the *Gracula musica*, called also *Eulabee Javanicus*, a remarkable bird of the starling family, found wild in the Malay Islands. It is very lively and intelligent, and when trained is considered the best talker among the birds, far surpassing any parrot. It is also a good singer. It is almost entirely black, with orange wattles and yellow bill and feet. There is a white spot on the wing, and the bird is about a foot long.

**Minonk**, city and R. R. junc., Woodford co., Ill., 118 m. S. W. of Chicago. Prin. employment, coal-mining and agriculture. Pop. 1870, 1122; 1880, 1913.

**Minor**. See INFANT.

**Minor** (WILLIAM THOMAS), LL.D., b. at Woodbury, Conn., Oct. 3, 1815, grad. at Yale in 1834; was 8 yrs. in the Conn. legislature; gov. of Conn. 1856-58; consul-gen. at Havana 1864-67; became in 1868 a judge of Conn. superior court.

**Minorca**, the second largest of the Balearic Islands, situated in the Mediterranean, and belonging to Sp. Area, 335 sq. m. Pop. 39,005. It is high and mountainous, its highest point, Mt. Toro, rising 4793 ft. It produces oil, wine, hemp, and fruits; lead, copper, and iron are found. Chief town, Pt. Mahon.

**Minories** [Lat. *Frates minores*], the name given by St. Francis of Assisi to his original order.

**Minos**, a king of Crete to whom the Cretans traced their laws and political insts., a son of Zeus and Europa, a brother of Rhadamanthus, and, after his death, one of the judges of the Shades in Hades.

**Minotaur**, in Gr. mythology, a monster, half bull, half man, the offspring of Pasiphaë, the wife of Minos, and Poseidon's bull. Minos shut the monster up in the Cnossian labyrinth, where a number of youths and maidens, paid as a tribute by Athens, were sacrificed annually to it until it was killed by Theseus.

**Minstrels** [Fr. *ménéstral*, probably from Lat. *ministrelus*, dim. of *minister*], the name applied during the Middle Ages in Eng., Scot., Fr., and Normandy to strolling musicians who sang to the harp verses composed by themselves or others, and usually accompanied their songs with dancing, mimicry, and other devices to *minister* to the amusement of royal or noble patrons. They were successors of the skalds of earlier Scandinavian and Teutonic antiquity, and connected with the "bards" of the Celtic and Gothic tribes. They had begun to degenerate into jesters. The last representative of the earlier type of warrior-minstrels was Taillefer, who at the battle of Hastings rode before Duke William, tossing up and catching his sword and singing the song of Roland. In the 39th yr. of Elizabeth a statute was passed classing M. and "jugglers, bearwards, fencers, common players of interludes, tinkers, and peddlers" as "rogues, vagabonds, and sturdy beggars." In modern times the comic singers of negro and other melodies are known as "minstrels."

**Mint** [Gr. *μήθη*], a name of various fragrant aromatic labiate plants, especially of the genus *Mentha*. Of these, the peppermint and spearmint are the most important.

**Mint** [A.-S. *mynet*, "money"], a factory of coin conducted under the sanction of public authority. A brief reference can only be made to the organization of the M. of the U. S., and the prin. operations to which bullion is subjected in the manufacture of coin. The M. and assay-offices are under the supervision of the director of the M., whose headquarters are in the treas. dept. at Wash., and who is subject to the gen. direction of the sec. of the treas. The M. at which coinage is executed are located at Phila., San Francisco, and Carson. Assay-offices are located at New York, at Denver, Col., at Boise, Id., and at Charlotte, N. C. The officers of the coinage M. are a supt., assayer, melter and refiner, and coiner; and for the M. at Phila. an engraver. The assay-office at New York has a supt., assayer, and melter and refiner. The other assay-offices have an assayer in charge, and a melter. The various operations and processes to which bullion is subjected after being received at one of the coinage M. are as follows:

(1) *The preparatory melting*; (2) *the assay*, which determines the precise proportion of fine gold or fine silver in each case, and also whether both metals are present and require parting; (3) *the parting process*, often called *refining*; (4) *the alloying of the metal*, so as to make ingots of standard fineness; (5) *the assay of ingots*; (6) the various manipulations by which such standard ingots are converted into coin.

As a gen. rule, all bullion when received is subjected to

preparatory melting, for the purpose of freeing it from all earthy matter and adhering substances. Samples for assay are taken while the bullion is in a fused condition, and before being cast into bars. The bullion, if not of sufficient fineness and otherwise in condition to admit of being brought to the legal standard for coinage—9 parts pure metal and 1 of copper—is subjected to purification by melting and the use of protective and refining fluxes. If gold bullion contains silver, or silver bullion contains gold, in quantities sufficient to defray the expense of separating the two metals, it is subjected to the parting operation, which is based on the fact that silver is soluble in both nitric and sulphuric acid, while gold is not affected by either. The bullion, having been freed from all foreign substances and base metals, or separated where gold and silver are associated in the same bullion, is alloyed with copper and brought to the legal standard for coinage. It is then cast into ingots and assayed, and if found to be sufficiently within the deviation from standard or "tolerance" allowed by law, is transferred to the coiner, who converts it into coin.

From each delivery of coins by the coiner to the supt. a certain number of pieces are indiscriminately taken, sealed up, and placed in the pyx, for the annual trial or test of the coinage, which is made in Feb. of each yr. by a commission constituted by law for that purpose; and if it appears by such examination and test that the reserved coins do not differ from the standard fineness and weight by a greater quantity than is allowed by law, the trial is considered and reported as satisfactory; but if any greater deviation from the legal standard or weight appears, the fact is certified to the Pres. of the U. S., and if on a view of the circumstance he shall so decide, the officer or officers implicated in the error are thenceforward disqualified from holding their respective offices. In the various processes to which bullion is subjected at the M. more or less loss occurs, particularly by volatilization in melting and refining, and is accounted for under the term "wastage." The operative officers are charged and credited with all bullion delivered to and returned by them, and are allowed a credit for actual "wastage." Great care is taken to recover from time to time all the minute particles of bullion remaining in the residuum fluxes, fines, etc. A voucher is required for and a record kept of all transfers of bullion and coin and every transaction involving the receipt or disbursement of money.

Gold is valued in the coinage at the rate of  $25\frac{1}{10}$  grains troy,  $\frac{9}{10}$  fine, or  $232\frac{1}{100}$  grains of pure metal to the dollar. For silver the valuation in the trade dollar is at the rate of 430 grains troy,  $\frac{9}{10}$  fine, or 378 grains of pure metal to the dollar. In the subsidiary silver coins it is valued at the rate of  $385\frac{1}{10}$  grains troy,  $\frac{9}{10}$  fine, or  $347\frac{1}{100}$  grains of pure metal to the dollar. Charges which are estimated to equal but not exceed the average expense of each operation required to bring gold and silver bullion into a condition for coinage are fixed from time to time by the director of the M., with the approval of the sec. of the treas.

The subsidiary silver, as well as the minor or token coins (bronze 1 cent and copper-nickel 3 and 5 cent pieces), are manufactured on govt. account only, the public treas. purchasing the bullion and metals required therefor, defraying the expense of manufacture, wastage, and transfer to the various treasury-offices, and realizing the seigniorage or gain on such coinage. Gold coins are receivable at the treas. of the U. S. at their denominational value, when not reduced in weight by natural abrasion, after a circulation of 20 yrs. as shown by the date of coinage, more than  $\frac{1}{4}$  of 1 per centum, and at a ratable proportion for any period less than 20 yrs. For the silver coins no legal limit of abrasion or wear is provided. [From *orig. art. in J.'s Univ. Cyc.*, by H. R. LINDERMAN, Director of U. S. Mint.]

**Minting, the Mechanical Operations of**. The principal operations and processes to which ingots of standard fineness are subjected in their manufacture into coin may be classified as follows:

(1) *The rolling*, which reduces the ingots to strips or fillets of nearly a proper thickness for the denominated coins; (2) *the annealing*, which is rendered necessary to preserve the ductility of the metal during the rolling operation; (3) *the drawing*, whereby any want of uniformity in the thickness of the strips is corrected; (4) *the cutting*, or forcing from the strips "planets" or blanks of the size and shape of the coin; (5) *the adjusting*, or weighing separately of each blank, and bringing those above standard within the working limit of deviation by filing; (6) *the milling*, which presses up the edge of the blank in order to protect the surface of the coin; (7) *the cleaning*, whereby all oxidation is removed from the face of the blank; (8) *the coining*, or impressing upon the blanks the devices and inscriptions prescribed.

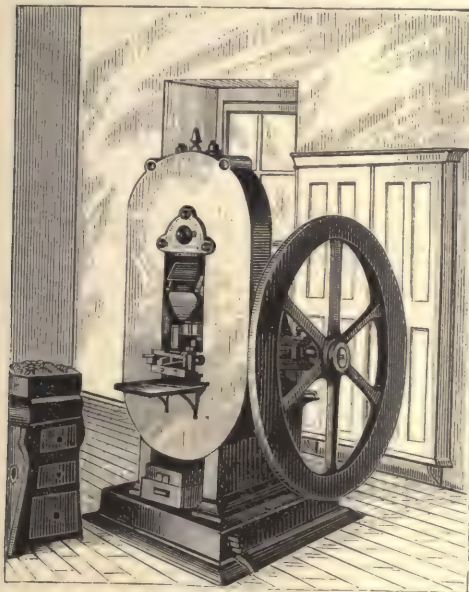
When ingots are received by the coiner from the melter and refiner, and the weight noted, they are taken to the rolling-room, and passed through heavy iron or steel rolls, each melt being kept and passed through separately. At each successive rolling the rolls are brought together by means of a screw, their adjustment or proximity to each other being indicated upon a dial which is regulated by the workman in charge. Successive rolling hardens or renders brittle the strips, and necessitates annealing in order to preserve their ductility. The length of time required to anneal gold is from 1 to  $1\frac{1}{2}$  hours, and for silver about 15 minutes. The first annealing having been completed, the strips are passed a few times through the finishing-rolls, and after a second annealing are ready for the drawbench. The pointed ends of the strips are inserted between the drawplates, and drawn through a small pair of perpendicular steel rolls by means of a treadle and an endless chain. Two drawings are necessary for each strip. In the first a slight reduction is made, and in the last the drawplates are carefully adjusted to the thickness of the coin. A few strips are then passed through, from both ends of which blanks are cut and weighed, and if the weight is found to conform to the working tolerance, the drawing of the entire lot is proceeded



with. The strips are then taken to the cutting-press and planchets out therefrom. This operation consists in passing the strip across a conical steel bed, while a punch just fitting the bed operates on the upper side of the fillet and forces a piece of the exact size and shape of the punch through the sharp bed beneath. The punch, operated by steam, moves with great rapidity, and cuts from 150 to 240 pieces a minute. The perforated strips, denominated "clippings," and the blanks, are sent to the cleaning-room for the purpose of removing all dirt and grease adhering to them from previous operations. The clippings are returned to the melter and refiner, and remelted, and the planchets or blanks delivered to the adjusters.

A blank, or counterweight, adjusted to a small fraction exceeding the legal weight of the coin, is furnished to each adjuster, with which the weight of all the blanks is tested, those heavier than the counterweight being carefully filed upon the edge until they are adjusted to a perfect counterpoise. The adjusted planchets are then returned to the forewoman, and under her supervision 5 of the most experienced adjusters prove the work, and if any planchet is found outside of the prescribed limit, it is readjusted. Those of less weight than the counterweight are kept in separate pans and tested by a second counterweight, which is a slight fraction below the standard weight of the coin. All gold coins and the silver trade dollar are adjusted by hand. The subsidiary silver coins, half dollar, quarter dollar, and dime, are weighed separately, and all above or below the legal tolerance rejected.

The adjusted blanks are now ready for the milling operation, which is done by a machine containing a circular plate, the outer edge being of steel, and which revolves within a strong band of the same material. The revolution of the inner disk carries the blank through the intermediate space between the working disk and fixed band, and which, being somewhat less than the diameter of the piece, presses up the edge of the planchet as it revolves. One revolution carries the piece through the mill and completes the operation.



View of coining-press in position for work.

The milled planchets, more or less oxidized, before being brought to the proper condition for blanching must be entirely coated with oxide of copper. To insure this, they are annealed to a cherry-red heat, and when removed from the furnaces are placed in a colander, dipped for a few moments into a diluted solution of sulphuric acid, and from thence into pure water in order to rinse off the acid. This leaves the blanks thoroughly cleaned, and after being dried by shaking in a large iron sieve or revolving riddle filled with sawdust, they are ready for the stamping operation.

This last, and most important operation is performed by the coining-press. As each blank descends to the bottom of the tube, a pair of steel fingers seize it and carry it forward between the dies. While the dies are closing upon it, and stamping both the obverse and reverse inscriptions, the steel fingers return for another planchet, convey it to the dies, seize the coined piece, and force it into a box beneath the press. The coined pieces are collected from the presses and taken to the weigh-room, where they are made up in drafts for delivery to the supt. The speed of the coining-presses is from 70 to 100 pieces a minute, and the pressure exerted in stamping the coins ranges, according to their denomination, from 40 to 200 tons. [From orig. art. in *J.'s Univ. Cyc.*, by H. R. LINDERMANN, Director of U. S. Mint.]

**Minto** (GILBERT ELLIOT), FIRST EARL OF, eldest son of Sir Gilbert Elliot of Minto, b. at Edinburgh, Scot., Apr. 23, 1751; entered Parl. 1774 as an adherent of Mr. Fox; succeeded to the baronetcy 1777; was ambassador at Copenhagen 1788-94, made a privy councillor June 1793, acted as gov. of Corsica during the Eng. occupancy of that island, June 1794 to Oct. 1796; created Baron Minto 1797, appointed ambassador to Vienna 1799, pres. of the board of control for Indian affairs 1806-07, gov.-gen. of India 1807-13, directed

the conquest of the isles of Fr. and Bourbon 1810, participated in the expedition which resulted in the occupation of Java 1811, made earl of Minto and Viscount Melgund Feb. 1813, and d. at Stevenage shortly after his return to Eng., June 21, 1814.—His son, GILBERT ELLIOT MURRAY KENYON-MOND, second earl, b. Nov. 16, 1782, became ambassador to Berlin 1832-34, first lord of the admiralty 1835-41, and lord privy seal 1846-52, in the cabinet of his son-in-law, Lord John Russell. He was sent to It. upon a special mission 1847, and d. in Lond., July 31, 1859.

**Min'uit**, or **Minnewit** (PETER), born in Wesel, Rhenish Pruss., about 1580, belonged to a distinguished family, and had been deacon in the Walloon ch. at Wesel, but had resided some yrs. in Hol. when he was appointed by the Dut. W. I. Co. first gov. and director-gen. of New Netherlands. He landed on Manhattan Island May 4, 1624, purchased the island from the Indians for 60 guilders; built Ft. Amsterdam, and governed the colony until Aug. 1631, when he was recalled. Having put into the port of Plymouth, Eng., through stress of weather, on his homeward voyage, Apr. 1632, his ship was attacked at the suit of the N. Eng. Council on an accusation of illegal trading, but was released in May. M. had lost favor with the W. I. Co. through a charge of having countenanced land monopoly, and after unsuccessful efforts to regain his position offered his services to the Swe. gov't. to found a colony in Amer. The great chancellor Oxenstiern having patronized the project, a Swe. W. I. Co. was formed, and M. sailed from Gothenburg, Swe., in 1637, with a body of Swedes and Finns; ascended Chesapeake Bay, and in Mar. 1638 began to build Ft. Christiana, 2 m. from the confluence of Minqua's Kill with the South River, near the present city of Wilmington, and called the country New Sweden. This was the first permanent European settlement on the Del., and the colony remained in the hands of Swe. until captured by the Dut. in 1655. Peter Minuit was thus the founder of the metropolis of the New World. He d. at Ft. Christiana, New Sweden (Del.), in 1641.

**Min'ute** [Lat. *minutus*, "small," "diminished"], the sixtieth part of an hour, and the sixtieth of a degree. Both kinds of minutes are divided into 60 seconds.

**Miocene** (Gr. *μειων*, "less," and *καινος*, "recent"), the strata of the Middle Tertiary period in geol. The M. deposits abound in animal and vegetable remains. Those of the Atlantic and Gulf coasts are marine in their origin; those of the far West are fresh-water strata. The first contain remains of large cetaceans, the latter of Carnivora and Ungulata. Some M. species still exist.

**Mirabeau**, me-rah-bo' (HONORÉ GABRIEL RIQUETTI), COUNT, b. at Bignon, near Nemours, in Provence, Mar. 9, 1749; received a military education at Paris, and was a lieut. of cav. in his 17th yr. After serving for some time in Corsica, he left the military career altogether, and led a very adventurous and rather reckless life. On the convocation of the States-General he first tried to be elected by the nobility, but being rejected because he possessed no fief himself, he bought a clothier's shop in Aix and entered the Assembly as a member of the third estate. From this moment and up to his death he was actually the ruler of the destinies of Fr. It was he who established the third estate as the dominant power in the States-General, and it was he who established the States-General as the dominant power in the govt. of Fr. The activity which he developed as leader of the Assembly and pres. of the Jacobin Club was enormous, but the exertion, in connection with his reckless life, suddenly broke his strength. D. Apr. 2, 1791.

**Miracle-Plays.** See MYSTERIES.

**Miracles.** I. *Meaning of the Term.*—A miracle is a sensible event wrought by God in attestation of the truth. It is not simply an extraordinary event, which, however unfrequent, occurs through the regular action of the same forces that produce the ordinary events in nature, and which might be foreknown by one acquainted with its cause; but it is an event which nature by its own action never would have brought forth, and for which the power of God alone is adequate. It shows a new force introduced into nature, by which nature is checked and changed. A M. may be defined, therefore, as a counteraction of nature by the Author of nature.

II. *The Occasion for Miracles.*—Nature furnishes no revelation of God's mercy to sinners. And yet without this revelation the sense of sin—the strongest and saddest sense ever felt by the soul—finds nothing to dispel its terrors. If, therefore, God can pardon sin and purify the sinner, nothing can be so important to man as the communication of this truth, and nothing so probable as that the revelation will come through a M.

III. *Proof that the Miracles of the Bible actually occurred.*—If these M. did occur, no evidence of the fact could be better than that which we actually possess. They were of such a nature that they must actually have occurred as reported, or their reporters have fabricated the stories, knowing them to be false. But to suppose this would be only to suppose something much more difficult to believe than the M. But more than this: the M. of the N. T. were believed on the very spot where they were declared to have taken place, and by thousands who could have at once disproved the story if it had not been true. The story of the apostles was believed by their enemies. It does not appear that the M. were ever denied at the time when they were held up as the reason why all the world should believe that Jesus is the Christ. They were actually admitted as facts by the opposers of Christianity. No historical events could be established with a greater certainty than these possess, by any amount of testimony.

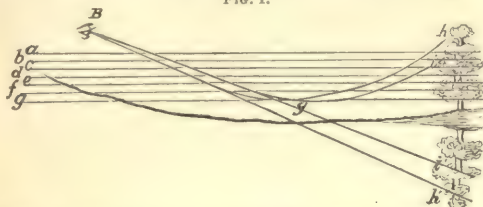
J. H. SEELYE.

**Mirage**, me-rah' [from *miror*, to "wonder"]. Under this head are included those reflections known as mirage, looming, and Fata Morgana. These are—(1) M. of the desert; (2) M. at sea; (3) looming; (4) a combination of ordinary M. at sea and looming; (5) Fata Morgana. The first is due to the refraction of the rays of irregularly reflected



light, sent back to the eye from the object. The heated sand of the desert rarefies the lower strata of air, while the upper strata are condensed by the chilling due to the radiation of its heat. The strata of different densities mingle slowly in consequence of the stillness of the air. Fig. 1, *a*,

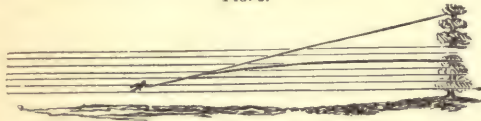
FIG. 1.



Mirage of desert: *a, b, c, d, e, f*, reflecting surfaces where strata of air touch; *g*, angle of total reflection; *B*, eye of observer; *h, i, j*, pencils of rays from object; *h', i', j'*, pencils' focus in reflection.

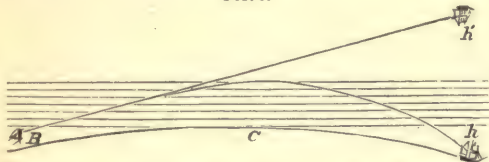
*b, c, d, e, f, g*, represents the boundaries of strata of air, which decrease in density from above downward. Every point of the tree sends out divergent rays of irregularly reflected light, by means of which it is visible. The direct rays from the tree to *B* make it visible to the eye at *B*. The ray *h*, which under ordinary circumstances would never reach the point *B*, meets in its downward course strata of continually decreasing density, and becomes less and less inclined to the parallel layers of air, till at *g* the angle of total reflection is reached and the rays are bent upward, and enter the eye in the direction *h'B*; and so with *i* and all other rays. An object is always seen in the direction by which the rays sent from it enter the eye; an inverted image is therefore formed by the portion of each pencil of rays proceeding from the tree, which is bent back to the eye as by a mirror. Second, *M*, at sea is explained in exactly the same way, except that the conditions are reversed. The lower strata of air are chilled by the waters of the ocean, and increase in density from above downward; the rays which produce the image curve convexly or in the opposite direction. (Fig. 2.) Third, looming is due to refrac-

FIG. 2.



tion alone; a portion of the pencil of rays which proceed from the point *h* (Fig. 3) reaches the eye direct, and produces the image of the real object, while another portion is refracted, and produces an erect image above the real one. Fourth, a real, inverted, and erect picture of the same object is sometimes projected upon the retina of the eye at the same time a portion of each pencil of rays proceeding from the body reaches the eye direct, producing the image of the real object; another portion is simply refracted, as

FIG. 3.



Mirage at sea: object *h* below horizon at *B*; *C*, earth's curved surface.

in Fig. 3, producing an erect image; while a third portion is first refracted, and then totally reflected, forming an inverted image. [From orig. art. in *J's Univ. Cyc.*, by S. B. HERRICK.]

**Miramichi** (mir-a-me-shee) **River**, of N. B., discharges its waters by a deep estuary into Miramichi Bay, an arm of the Gulf of St. Lawrence. It is navigable to Newcastle by large ships, and higher up by smaller vessels. Many salmon and other valuable fish are taken here.

**Miramón**, me-rah-món' (MIGUEL), b. in the city of Mex. Sept. 20, 1838; entered the military acad. of Chapultepec in 1846; fought in the defence of Molino del Rey and Chapultepec against the army of Gen. Scott, and was taken prisoner Sept. 13, 1847; was engaged in suppressing several local revolts against Santa Anna, by whom he was sent with the rank of capt., in Oct. 1854, in an expedition against Alvarez in S. Mex.; was made col. July 1855. The revolution having triumphed, the regular army was naturally disloyal to the administrations of Alvarez and Comonfort. When *M.* was sent against the rebels of Zacapoaxtla, he seized the opportunity to imprison his superior (Dec. 1855), placed himself at the head of the force, joined the rebels, led them rapidly to Puebla, and occupied that city; captured Toluca in Jan. 1857; captured the city of Cuernavaca; hastened to Mex., took by storm the Hospicio and the Acordada; was sent against the formidable combination which supported the cause of Juarez in the central states; *M.* gained the battle of Salamanca, and forced Juarez to withdraw temporarily from the country; found himself at the age of 26 the chief military leader in Mex.; was chosen pres. by the electoral junta Jan. 2, 1859. He then undertook the siege of Vera Cruz, where Juarez had established his govt., but was unsuccessful, and after a prolonged struggle of 3 yrs. the "war of reform" terminated in favor of Juarez by the battle of Colupalamp, Dec. 22, 1860, and *M.* was forced

to flee from the country. He proceeded to Europe, and took part in the plans of Nap. III. for founding a monarchy in Mex. On the accession of Maximilian to the nominal throne of Mex., *M.* was honored with the appointment of grand marshal Sept. 1863, and with the embassy to Berlin 1864. At the crisis of the Mex. monarchy *M.* arrived with Marquez in Mex. After several conferences at Orizaba (Dec. 1866), Maximilian resolved to make a last effort to maintain his throne, and placed the army in the hands of the 2 gens. *M.* undertook the defence of Querétaro, which terminated by the capture of that city May 15, 1867. Along with Maximilian and Gen. Tomas Mejia, *M.* was shot on the Cerro de las Campanas, near Querétaro, June 19, 1867.

**Miranda**, me-rah'n'dah (FRANCISCO), b. at Caracas, Venezuela, in 1750; entered the Sp. army, and served in Guatemala, where he attained the rank of capt. at 17; accompanied the Fr. forces in their campaign in aid of Amer. independence, and conceived a project for the emancipation of the Sp. Amer. colonies; went to Europe, and received encouragement from Catharine II. of Rus., from William Pitt, and from the Fr. revolutionary leaders; was appointed gen. of division in the Fr. armies, and in Sept. 1793 was made commander-in-chief of the army of Flanders. He commanded the left wing at the battle of Neerwinden (Mar. 18, 1793), the loss of which led to his imprisonment, trial, and acquittal. He went to New York and fitted out an expedition; landed Aug. 2, 1806, near Caracas; was forced to retreat to Trinidad. At the outbreak of the revolution of 1810 he reappeared in Venezuela; was accepted by the insurgents as their head 1811; drove the Spaniards from nearly the whole of New Granada. The earthquake of Mar. 26, 1812, enabled the Sp. forces to occupy several of the ruined cities. Aug. 26, 1812, he was arrested in violation of the capitulation, and taken to Puerto Rico, whence he was soon removed to Cadiz and confined in a cell of the Inquisition, where he d. in Jan. 1816.

**Mir'iam**, the sister of Moses, was, according to Josephus, the wife of Hur and the grandmother of Bezaleel, who built the tabernacle. *M.* is the Heb. form of Mary.

**Mirrors** [Lat. *mirari*, to "admire," Fr. *miroir*]. Solids, usually in the form of plates having a smooth surface capable of reflecting light, have been a part of the furniture of the toilet from a period of very high antiquity. The earliest *M.* were formed of polished mineral substances or of metals, but after the invention of glass that substance naturally superseded most others in the construction of *M.* It appears that the backs of glass *M.* were sometimes coated with lead, but about 3 centuries ago the process of covering glass with an amalgam of tin came into use in Venice, and has been since employed down to the present time. The process consists in spreading out upon a solid horizontal table a sheet of tin-foil, which is covered with mercury, so that the superior surface may remain liquid. After having been scrupulously cleaned on its lower surface the glass to be coated is advanced horizontally along the layer of mercury, its lower edge being depressed below the surface, so as to exclude air and to remove impurities. When in proper position it is left resting on the mercury, and by tilting the table the superfluous fluid is allowed to flow off, being caught in a trough provided for the purpose at the margin of the table. A uniform pressure is then applied to the glass, and it is allowed to remain for some time in this condition, after which it is carefully lifted, the amalgam adhering to it, and is placed with the amalgamated surface uppermost. Some weeks' rest is required to allow the amalgam to harden, though it occasionally occurs that a *M.* will not "dry" for months.

**Silvered Glass.**—Liebig in 1836 noticed that aldehyde would reduce silver from ammoniacal solutions, depositing it upon glass or porcelain in a continuous film. The first application of the process on a large scale was made by Drayton in 1843. He used different essential oils as reducing agents. But his glasses soon became spotted. The next attempt was made by Petitjean in 1855; this seems to have been more successful, his process with slight modifications being still in use. The materials and proportions required by one of the various modifications of Petitjean's process, used on large plates, are as follows: (1) 1 lb. crystallized nitrate of silver to be treated, while stirring, with 12 liquid ounces of ammonia 26° B. After cooling and crystallization, 6½ pints distilled water are to be added, and the solution filtered. This solution will keep for any length of time. (2) The reducing solution is to consist of pure crystallized tartaric acid dissolved in 4 parts of water; and this is said to improve with age. The advantages claimed for the silver over the quicksilver process are: (1) Harmlessness to the workmen; (2) facility and expedition, the whole operation being completed in a few hours; (3) possibility of repairing damaged parts; and (4) superior power of reflection. But the durability of silver mirrors is still an open question. They are all liable to become spotted.

C. F. CHANDLER.

**Mirzapoor**, town of Brit. India, the cap. of a dist. of the same name, on the right bank of the Ganges. The dist. of *M.*, comprising an area of 5235 sq. m., with 1,104,315 inhab., extends along the Ganges and the Sone between lat. 23° 50' and 25° 30' N., and between lon. 82° 11' and 83° 39' E., and belongs to the presidency of Agra. The city of *M.* is the most important cotton-market of India, with an extensive industry in cottons, woolens, and silks. Pop. 67,274.

**Misere're** [Lat. "have mercy"], the name applied in the R. Cath. Ch. to Ps. li., from the first word of the Vulgate translation.

**Mishawaka**, R. R. June, St. Joseph co., Ind., 4 m. E. of S. Bend, has fine water-power. Pop. 1870, 2617; 1880, 2640.

**Mishna**. See TALMUD.

**Mispick'el** [Ger.], a mineral crystallizing in the trimetric system, and composed of iron 33.54 per cent., arsenic 33.42 per cent., sulphur 21.08 per cent. In color it is silver-white to steel-gray, with a grayish-black streak; hardness, 5.5 to 6. It occurs principally in crystalline



rocks, especially associated with ores of silver, tin, lead, and zinc. It frequently forms a troublesome impurity, but has been largely used in Cornwall, Eng., for the manufacture of white arsenic.

EDWARD C. H. DAY.

**Misrepresentation**, a false or erroneous statement or representation, whether made from ignorance, carelessness, mistake, or with an intention to deceive or defraud. The subject of fraudulent M. is of great importance in law, it being a gen. principle that fraud has the effect to render voidable every contract and transaction into which it enters as a constituent element. But the legal rules upon this subject have been sufficiently stated under the topic FRAUD (which see). Mere innocent M., also, made without knowledge of the falsity of the statement, may afford ground for the rescission of a contract when it has caused one or both of the parties to enter into the agreement under a mistake of fact which is subsequently discovered. When the mistake or misapprehension relates to the substance of the whole consideration, as if there is a complete difference in substance between the thing bargained for and that obtained, so as to constitute a failure of consideration, the promise resting upon it is not obligatory, and will not be enforceable, or if it has been carried out may under appropriate circumstances be rescinded by a court of equity. But no innocent misstatement will afford a cause of action in tort and entitle the party injured to recover damages for the loss he has sustained. This form of remedy is only available when the representation resulting in damage has been fraudulently made.

GEORGE CHASE.

**Missions**, mish'unz [Lat. *missio*, from *mittere*, to "send"]. Chr. M. are founded on the command of Christ to publish the gospel in all the world. The Ref. of the 16th century is the grand epoch for both R. Cath. and Prot. M. The most remarkable period of the R. Cath. M. was the 16th and 17th centuries. Rome had a M. in India for the space of 2½ centuries, another in Chi. for 144 yrs., another in Japan for nearly 100 yrs., another in the Afr. Kingdom of Congo for more than 200 yrs., another in Paraguay for 117 yrs., and she has maintained her present ascendancy in the Philippine Islands for more than 2 centuries. The Jesuit M. among the native tribes of the Amer. continent, both N. and S., have had a wide extension. The R. Caths. have a distinct organization for M., a dept. by itself. The Propaganda is a missionary society, and has charge of everything relating to the preservation of the Catholic faith in the different parts of the world.

The earliest of the modern Prot. M. was sent to Lapland in 1559 by Gustavus Vasa, king of Swe. The Dut. M. in Ceylon and the Indian Archipelago grew out of the Dut. conquests early in the 17th century. The charter granted by Charles I. in 1628 to the Mass. colony expressed the hope that the colony would "win the natives of the country to the knowledge and obedience of the true God and Saviour of mankind." John Eliot began his labors among the Indians of Mass. in Oct. 1646, and continued them until his death in 1690 at the age of 85. Thomas Mayhew was really the first missionary to the Indians, having begun his labors on Martha's Vineyard as early as 1643. Eliot had worthy collaborators and successors, and in 1675 there were 24 regular congregations of "praying Indians," and as many Indian preachers. The well-known M. of David Brainerd was commenced in 1743. The number of Indians in the U. S. territory at the opening of the present century is supposed to have exceeded 400,000. Divided and scattered over a vast wilderness, the aborigines were easily forgotten, and the spirit of Eliot, the Mayhews, and Brainerd slept for a long time. The Rev. Cyrus Kingsbury began his M. among the Cherokees in 1817. The Choctaws having expressed a desire for a M., Mr. Kingsbury was transferred to them in 1818, and called his first station Eliot. About the yr. 1825 a half-breed Cherokee, named George Guess, who could neither write nor speak Eng., but knew that a mark could be made to represent a sound, set himself to gather the number of distinct syllables in the Cherokee lang., and found them to be 86. With the Eng. letters he made out an alphabet for the lang. The whole was so simple that in 3 or 4 yrs. half the nation was able to read, and was actually reading a portion of the N. T. translated into their lang. and printed with this syllabic type. In 1860 the Cherokees and Choctaws had claims to be regarded as Chr. nations; so, also, had the Seneca nation in N. Y. The Dakotas (or Sioux) were among the most powerful tribes on the continent, numbering probably from 30,000 to 40,000, and traversing vast hunting-grounds. A M. was commenced among them in 1835, and there were early successes.

Passing into Brit. India, and down through the 120,000,000 in the valley of the Ganges, we find a large number of important dists. more or less occupied by different missionary societies, Eng., Ger., and Amer. The vast system of railways recently introduced into India has added immensely to the facility of evangelizing the country. Henceforward Bombay will be the great landing-place and point of departure for missionaries to India, saving immensely in travel, labor, time, expenditure, health, and life. The Prot. M. of India, Burmah, and Ceylon are carried on by 35 missionary societies, in addition to local agencies. Almost all the prin. towns of the empire have at least one missionary. The greatest apparent local successes have been among the peasantry S. of Calcutta, and among the Coles, Telugus, Shanars, and Karens.

The islands of the Pacific have been largely Christianized. It would be difficult to find a professed idolater in the islands of E. or Central Polynesia where Chr. missions have been established. The Sandwich Islanders have been recognized as a Chr. nation since 1863. Still more recently, tens of thousands in Madagascar have surprised the world by embracing the Chr. faith after a persecution of 25 yrs., not exceeded in severity by any of the persecutions in primitive ages. [From orig. art. in *J's Univ. Cyc.*, by RUFUS ANDERSON, D. D., LL. D.]

Mississipp'i, a S. W. State of the Amer. U., lying in the



Miss. Valley, bounded W. by Ark. and La., E. by Ala., N. by Tenn., and for 108 m. the 31st degree of N. lat. forms the boundary on the S., separating it from E. La., leaving to the eastward a strip of terr. 78 m. broad, stretching down to the Gulf and Miss. Sound, and including all islands within

6 leagues of shore-line; area, 46,810 sq. m. or 29,958,400 acres. **Topographical Features and Soil.**—From the N. E. corner, where there is a marked limestone formation with a rugged country, the surface slopes gradually toward the Miss. River and the Gulf of Mex., leaving a broad low ridge running nearly N. and S. through the centre of the State, which divides the waters which fall into the Miss. from the affluents of the Tombigbee, Pearl, and Pascagoula rivers. On the W. this ridge extends, at Vicksburg, to the Miss., terminating in bold high bluffs. To the E. of this watershed are broad tracts of gently rolling prairies of exceeding fertility, yielding large crops of cotton and corn, while to the W. the surface is broken by a system of valleys and low, narrow ridges that start at right angles from the spinal ridge, and drop off into the great basin of the Yazoo delta—a basin embracing some 4,000,000 acres, the very heart of the cotton-zone of M. On the central ridge there are large tracts of rolling arable land, either in cultivation or covered by heavy forests. About Pontotoc there is a considerable breadth of fair upland. In the S. stretches a rolling region of open pine woods down to the Gulf shore. Thus, the larger part of the State has a broken, rolling surface, but nowhere mountainous, or with ridges, at the highest, of greater elevation than 800 ft. The Yazoo basin is subject to overflow at times of extreme high water. The N. upland section is diversified by small valley-areas of highly productive soil. In the S. the soil is indifferent. Even the bottom-lands of the Big Black, Tallahatchie, and Yalabusha rivers, though covered by a luxuriant growth of trees and underbrush, are not productive under tillage; but on some of these streams there is found a bench or "second bottom" of exceeding richness. The prairie-region, on the other hand, found so productive in Lowndes and on the tributaries of the Tombigbee, prolonged S. and W. between the head-waters of Pearl and the Big Black rivers, loses its fertile character comparatively. Below the Yazoo delta, along the Miss., except where interrupted for short distances by bold bluffs, a broad belt of low, thickly-timbered land of extreme fertility lines the river, but, like the Yazoo basin, is subject to overflow.

**Rivers, Etc.**—The State is mainly drained by the Miss. River and its affluents, the Homochitto, Big Black, Yazoo, and its tributaries the Sunflower and Tallahatchie; the Pearl River, with its prin. branch the Bogue Chitto, and the Pascagoula, with the Chickasawha, and other tributaries, drain the S. E., and the Tombigbee and its affluents drain the E. In the extreme N. E. the Tenn. River forms the boundary for 15 m.

**Geological and Mineralogical Features.**—The small streams which fall into the Tenn. River in the N. E. corner of the State are bordered by massive walls of limestone. W. of this the Cretaceous formations crop out. W. of these Tertiary formations prevail. The bottom-lands on the Miss., the Sunflower, and the Yazoo, and the tributaries of the latter, as well as the Gulf coast for about 30 m. back, belong to the Quaternary or Alluvial era. To this era belongs the Orange sand, the most striking feature of the State's geol., for its presence on the surface is so gen. as to make its absence exceptional. It is chiefly made up of rounded, silicious sand, colored, and more or less indurated by the hydrated peroxide of iron. On the Pontotoc ridge it is either of a glaring deep red, as in Itawamba co., or of a dull iron-rust color; in the region of the long-leaf pine it is of a delicate rose tint, and sometimes of a bright yellow, crimson, or purple; elsewhere it becomes white, and even bluish. With a large increment of iron, in some places the tendency is to concrete into a ferruginous sandstone, occasionally in such masses and solidity as to afford good building material. These indurations are generally found capping hills and ridges, some of which rise in steep isolated hillocks from the level surrounding country as high as 150 ft., forming curious landmarks which indicate the former surface-level. In some places these conglomerates are tubular, of singular regularity of dimension and mould, with the appearance of newly-made iron castings, often 4 to 5 ft. in length, and with a bore from ¼ of an inch to 4 inches in diameter. Such hills are further crowned, generally with clumps of the short-leaved pine, not visible elsewhere in the same vicinity. The average thickness of this Orange sand-stratum varies from 40 to 60 feet, but 100 is not at all infrequent, and it has been found as thick as 300 ft. The useful materials of this formation are the ferruginous sandstone, much of which can be used in rough







Fr. commander of New Orleans pursued the Indians early in 1730, recaptured the prisoners, and after extensive slaughter brought 427 prisoners to New Orleans, where they were sold as slaves and sent to Santo Domingo. The prov. was soon after abandoned by the Co. of the Indies to the king of Fr., who sent Blenville back as gov. On his arrival he found the colonists again involved in war with the Chickasaws—a war which lasted with varying fortunes for several yrs. From 1743 to 1752 the Indians were peaceful, but in 1752 another Indian war commenced. An attempt was made by the Fr. commander to invade their country, but he accomplished little. In 1763 E. La., including most of the present States of M. and Ala., was ceded to G. Brit. by Fr., and soon after a considerable immigration commenced from the Eng. colonies on the Atlantic. In 1798 the U. S., having succeeded to the rights of the Eng. govt. in this region, established the Terr. of M., comprising all of Ala. and M. between the 31st and 35th parallels. In 1811 the portion of M. below the 31st parallel, being a part of the land ceded by Sp., was added to the Terr. In Mar. 1817 Ala. was set off from M. Terr. as a separate State, and in Dec. 1817 M. was admitted into the U. as an independent State under a const. previously formed. In 1822 a new const. was adopted. M. was one of the earliest of the S. States to proclaim her secession from the U. On the formation of the Confederacy she supplied its first and only Pres. She furnished with great promptness her quota of troops to the Confed. armies, and suffered severely from the ravages of war. The battle of Pittsburg Landing (or Shiloh) was fought near her border, and the pursuit was prolonged into her terr. The battles of Iuka and Corinth, the capture and recapture of Holly Springs, the several attacks on Vicksburg, the capture of Jackson, and the numerous raids which occurred, including the 2 which had Meridian for their objective, kept the State in a condition of apprehension throughout the war. At the close of the war, in Apr. 1865, measures were adopted by the legislature looking to the acceptance of the situation. The govt. appointed Hon. William L. Sharkey provisional gov., and a State convention was assembled which repealed the ordinance of secession and formally abolished slavery in the State. The State formed with Ark. the fourth military dist., placed under the command of Gen. E. O. C. Ord and others until 1869. A convention held in June 1868 adopted a new const. The State was restored to the U. in Feb. 1870.

## Governors.

TERRITORIAL.	John J. Guion (acting)	1851
Winthrop Sargent..... 1798-1802	James Whitfield.....	1851-52
Wm. C. C. Claiborne..... 1802-05	Henry S. Foote.....	1852-54
Robert Williams..... 1805-09	John J. MacRae.....	1854-58
David Holmes..... 1809-17	William McWillie.....	1858-60
STATE.	John J. Pettus.....	1860-62
David Holmes..... 1817-19	Jacob Thompson.....	1862-64
George Poindexter..... 1819-21	Charles Clarke.....	1864-65
Walter Leake..... 1821-25	W. L. Sharkey (prov'l).....	1865-66
David Holmes..... 1825-27	Benj. G. Humphreys.....	1866-70
Gerard C. Brandon..... 1827-31	James L. Alcorn.....	1870-71
Abraham M. Scott..... 1831-33	Ridgely C. Powers.....	1871-74
Hiram G. Runnels..... 1833-35	Adelbert Ames.....	1874-76
Charles Lynch..... 1835-37	John M. Stone.....	1876-82
Alexander G. McNutt..... 1837-41	Robert Lowry.....	1882-86
Tilghman M. Tucker..... 1841-43		
Albert G. Brown..... 1843-48		
Joseph W. Matthews..... 1848-50		
John A. Quitman..... 1850-51		

REVISED BY A. R. SPOFFORD.

**Mississippi River, The** [Algonkin, *Missi Sepe*, "Great River"], rises in the lakes in the central portion of the N. Amer. continent, S. of Lake Winnipeg and W. of Lake Superior. Its remotest springs, running 3 m. N. into Lake Itasca, rise in lat. 47° 34' N. and lon. 95° 2' W. The mouth is in the Gulf of Mex., lat. 28° 58.5' N. and lon. 89° 10' W. The elevation of the source is 1680 ft. above the sea; the length in a right line is 1164 m., and by its tortuous channel it is 2800 m.; the breadth between its natural banks below its lowest tributary, Red River, is 2800 ft. as a mean of 153 measurements, and the mean depth of its deepest channel at high water is 121 ft. It discharges annually 19,500,000,000 cubic ft., equal to 145.6 cubic m. of water, into the Gulf of Mex. The maximum rise and fall of water in the channel at Natchez, Vicksburg, and Cairo, severally 370, 480, 1097 m. above its mouth, is 52 ft. The area of its delta is much greater than that of any other river, having an extent estimated at 38,600 sq. m. At the junction with Leech River the falls 30 ft. in 300 yards occur, called Falls of Pecagama, which form the head of navigation. In 270 m. of estimated distance from the river's utmost source to these falls the rapids and currents have a descent of 324 ft., and thence to the mouth of Pine River, nearly 300 m. below, the falls or rapids amount to 165 ft. The Fall of St. Anthony makes a marked feature in the river-channels of St. Anthony, from below by a reef, over which the river plunges with a fall of about 18 ft. and a width of 1200 ft. Below Lake Pepin, which is an expansion of the river, it widens, and continues nearly 1 m. in width to the mouth of the Ill. Two great rapids or falls occur in this portion of the channel—the Rock Island Rapids, of 22 ft. fall, 350 m. below the Falls of St. Anthony, and the Des Moines Rapids, of 24 ft. fall, about 125 m. below Rock River. Below the mouth of the Mo. River the character of the M. is entirely changed. The waters mingle slowly, often seen unmingled in low-water season, below St. Louis for 30 m., the Mo. keeping the right bank and the M. the left. At the Grand Chain, near above Cape Girardeau, terminates the range of limestone cliffs and bluffs. From thence (for 1300 m.) to the sea the river rolls through a level alluvial bed; and though at many points it touches the upland bluffs on the left bank, its right is an unchanging alluvial bed.

**Alluvions.**—At many places above the head of this delta, and for distances of from 10 to 40 m., the Miss. proper is

flanked by alluvial tracts of land of great fertility. The Sny Island in Pike co., Ill., recently reclaimed by levees, reaches some 40 m. None of these approach the magnitude of the Amer. Bottom, which extends from nearly opposite the mouth of the Mo. to Chester, below the Kaskaskia, 90 m. below St. Louis, with a breadth of about 6 m. From a few m. below Cape Girardeau on the right bank, 90 m. above the O. River, in highest floods the waters of the M., prior to levees, passed over the banks and into the St. Francis Valley. This is the proper head of the delta alluvion, that extends thence to the Gulf of Mex. The body of the country, of about 600 m. in length and a mean width of 40 m., is an alluvion, formed chiefly by the deposits from the M. It is this vast alluvion, as also the Yazoo basin of 360 m. long and 60 m. greatest breadth, that has been the subject of partial reclamation from floods by levees along the river's bank. For 25 yrs. the upper, for 40 yrs. the middle, and for 50 to 100 yrs. the lower, portion of this area have had the flood-waters greatly restrained by these levees. Yet, despite all the efforts of riparian proprietors—then of the cos. and parishes, and ultimately of the States—to protect the lands settled and cultivated by an enterprising people, the river's ravages have put to naught human skill and labor. It undermines the banks, caving away the levees and destroying the plantations by annual floods. Such have been the ravages, and so far back have levees been driven by continual caving, that the new levees required have such height and consequent cubic contents that the burden has become too great for State treasures. The cry, therefore, for national relief from the "levee burden" has become gen. and importunate. These levees have already cost the people of La., on their 780 m. of river-front, the building of 75,000,000 cubic yards of earthwork. By an estimate of U. S. engineers the construction of a complete levee-system for the entire alluvion, capable of controlling the river, would cost some \$36,000,000; and \$2,000,000 would be required for annual repairs. The total length of levees demanded for this purpose would be 1775 m. The River's Bed below the mouth of the O. furnishes testimony as to the great depth of the alluvial deposits. This depth cannot be less than 100 ft., while in some localities it is much greater. The river changes its location by rapid cavings, amounting to several m. in the memory of individuals living. In a few thousand yrs. this shifting of position must have amounted to a large portion of the delta's breadth. At least to the extent of these lateral movements the river has made an alluvion of more than 100 ft.—in places 150 to 180 ft. deep. The depth of the alluvion, by this testimony, increases toward the Gulf.

**The River-Mouths.**—The several passes diverge from an expansion in the river of treble its mean width, say 7500 ft. The first division was into 3 main passes, called the S., S. W., and N. E. Passes. Such is the softness of the material forming all the bars and lands about the river-mouths that vessels pass through the channels drawing 1 ft., often 2 ft., more than the soundings. The South Pass has been deepened from 8 ft. to about 35 ft. by means of jetties.

Beneath the Gulf waters the contributions of the M. have a wide distribution. While the heavier sandy materials are soon dropped or rolled into the depths near the mouths, the aluminous clays held in very fine comminution by the waters are spread out upon the Gulf by the lightness of the fresh water, and are only finally parted with many m. at sea. Accordingly, the soundings bring up the blue mud that so specifically marks this river's discharges for the whole front of its delta of 130 m., and not less than 300 m. both E. and W., and 50 to 100 m. from land. [From orig. art. in *J.'s Unit. Cyc.*, by Prof. C. G. FOSBERY.]

**Mississippi Scheme,** the title of a banking and commercial scheme which ended in a wild speculation and collapse. It was started in Paris in 1719 by John Law. Its primary object was to relieve the Fr. finances from the burdensome debt and disorder consequent on the expensive wars of Louis XIV. A royal bank was first established, of which Law was director-gen. Then a commercial co. was chartered entitled "The Company of the West," of which also Law was director-gen. To this co. the whole prov. of La. was watered by the Miss. and its branches, was granted. Subsequently it was intrusted with the collection of the taxes and of the king's revenues, and thus it had a monopoly of almost the entire commercial and financial operations of the nation. Meantime the bank issued its notes freely till the paper currency amounted to 2,700,000,000 livres. The speculations culminated at the close of the yr. 1719, when the co.'s shares sold for more than 10,000 livres each, and money was so abundant that the bank loaned at 2 per cent. The drain of specie consequent on the overissue of paper money soon caused a panic, and the bubble burst, producing universal bankruptcy and distress.

A. L. CHAPIN.

**Mississippi Sound** washes the Gulf coast of Miss. and part of that of Ala., extending from Mobile Bay nearly to the mouth of Pearl River. It is divided from the main waters of the Gulf by the chain of Dauphin, Petit Bois, Horn, Ship, and Cat islands—of sand and generally wooded. It has fine harbors under protection of Ship and Cat islands (the former fortified), and its waters afford a tranquil navigation to steamers and coasting vessels running between Mobile and New Orleans (*via* Lake Pontchartrain). Grant's Pass, a narrow and partly artificial channel between Dauphin Island and the mainland, forms the connection between the sound and Mobile Bay; Lake Borgne, toward the W., is entered at St. Joseph's Island.

**Missolonghi,** miss-so-long-gee, town of Gr., in the govt. of Aetolia, on the Gulf of Patras. Is well fortified, and famous for the valor with which it twice met the besieging Turks during the war of independence (1822 and 1826). Lord Byron d. here, Apr. 19, 1824. Pop. 6324.

**Missou'la,** cap. of Missoula co., Mont., on N. Pacific R. R., and one of the prin. forks of the Columbia River. There are extensive mines and good grazing advantages in the vicinity. Pop. not given in census of 1880.



**Missouri**, mis-soo're, one of the central States of the

Miss. Valley, lying wholly W. of the Miss. River, and including a small tract between the Miss. and the St. Francis rivers in the S. E., extending from the parallel of 36° to that of 40° 30', and from the meridian of 89° 2' to 95° 44' W. lon. from Greenwich; greatest length from N. to S., about 309 m.; greatest breadth from E. to W., 318 m.; average breadth, about 244 m. Bounded N. by Ia., E. by Ill., Ky., and Tenn., S. by Ark., W. by Indian Terr., Kan., and Neb.; area, 69,415 sq. m. or 44,425,600 acres.

**Face of the Country.**—The State is divided into 2 unequal portions by the Mo. River, which crosses it from W. to E., and forms also its N. W. boundary. The portion S. of the Mo. is of very varied surface, the S. E. portion being very low and swampy; above this, on the Miss., the highland bluffs commence and extend up to the mouth of the Mo. In the S. W. portion of the State the Ozark Mts. occupy the greater part of the country; these mts., or rather hills, render the whole region exceedingly broken and hilly, the isolated peaks sometimes rising from 500 to 1000 ft. above their bases, and then sinking into very beautiful and sometimes fertile valleys. The numerous river bottoms and valleys formed by the tributaries of the Osage and Mo. rivers are moderately fertile, but they are generally subject to overflow. Farther N., in the basin of the Osage and above it, the land is mostly rolling prairie, with occasional forests; the immediate valley of the Mo. has a rich alluvial soil and abounds in large forest-trees.

**Rivers, Lakes, Etc.**—The prin. rivers of the State are—the Miss., which bounds the State on the E., and has a shore line of 470 m.; and the Mo., which forms the W. boundary of the State for nearly 300 m., and turning eastward at the mouth of the Kan. River flows in an E. S. E. direction across the State, and turning N. E. enters the Miss. 15 m. N. of St. Louis. The Little River which crosses the S. boundary of the State before entering the Miss., and the Meramec, are the only considerable streams discharging their waters into the Miss. S. of the Mo. River. N. of that river Salt River is the largest of these tributaries, but the Osage or Copper River, Perruque Creek, Bardene Creek, Fabius, Wyconda, and Little Fork rivers are streams of moderate size. The Mo. receives numerous large affluents in the State; on the S. side are Lamine River, Osage River and its tributary the Little Osage, Sac River, Grand River, Pomme de Terre River, Big Nianqua, Auglaize, Maries Creek, and Gasconade River; on the N. side, the Nishnabotona, Nodaway, Platte, Grand, Chariton, Rocher, Percé, and Cedar rivers and Yellow Creek. There are few lakes in the State.

**Mineralogy.**—The coal-measures cover 23,100 sq. m. of the surface of the State, occupying in gen. the W., N. W., and N. portions of the State. These include not only the 4 subdivisions of the Upper Carboniferous formation—viz. Upper, Middle, and Lower coal and Clear Creek sandstone—but 6 successive deposits of the Lower Carboniferous, comprising an unclassified sandstone, and the St. Louis, Keokuk, and Chouteau groups of limestones and sandstones. In the richness and variety of its mineral productions M. is surpassed by no State. Gold is found only in the drift sands of N. M., and silver only in combination with lead in the galena and other ores; but iron is found in some form in every co.—bog ores in S. E. M.; limonite or brown hematite in most of the cos. of S. E. M.; goethite, a variety of the brown hematite, in Adair co.; red hematite throughout the coal-measures, red and yellow ochres in many cos.; spathic ores in the coal-measures and in Phelps co.; the specular oxide in vast masses, such as the Iron Mt., Shepherd Mt., Pilot Knob, Simon Mt., Meramec mines in Phelps co., and numerous other deposits in 8 or 10 other cos.; sulphurets (iron pyrites) throughout the coal-measures; and sulphate of iron (copperas) in the coal-measures and abandoned coal-mines. Zinc in the form of blende is abundant in S. W. and S. E. M., and the silicates and carbonates also in the same region, while zinc bloom sometimes occurs. The sulphate of cadmium (greenockite) is associated with the zinc blende. Copper in the form of blue and green carbonates (green malachite) and sulphurets is found in large quantities in Shannon, Crawford, Jefferson, Franklin, and Madison. and in smaller quantities in a dozen other cos. Nickel and cobalt are found in paying quantities at Mine La Motte in Madison co., and the St. Joseph mines, and the beautiful hair-like crystals of sulphuret of nickel (millierite) in the vicinity of St. Louis. After iron, lead is the greatest mineral product of M., the mines of that State producing a larger quantity of lead than all the rest of the U. S. There are 2 great lead fields—one in S. E. and the other in S. W. M., in the porphyry and magnesian limestones of the former and the Lower Carboniferous rocks and magnesian limestones of the latter. It is also found in smaller quantities in many other cos.; galena, or sulphuret of lead, and cerussite, or the carbonate, are the prin. ores, though the phosphate (pyromorphite) is sometimes found. Wolfram is found in



Madison co., and manganese and manganiferous iron in Iron and other cos. Of minerals not ores there are great numbers. Carbonate of lime (calcite), arragonite, pear-spar, fluor-spar, quartz in all forms; heavy-spar (sulphate of baryta), largely used in the adulteration of white lead; gypsum, mainly in the form of selenite; pickeringite, feldspar, mica, hornblende, asbestos (only in Madison co.), bitumen or mineral tar (throughout the coal-measures), fire-clays, potter's clay, and kaolin; an excellent glass-sand from the saccharoidal sandstone; lime of several qualities; hydraulic lime and cement; polishing-stone, saltpetre, building-stone, granite, sandstones, limestones and marbles, grindstones, millstones, slates, and numerous fine varieties of colored marbles, are the prin. of these. We have already spoken of the great extent of the M. coal-fields. The coal is of various qualities, some being common bituminous, some very rich in carbon, and developing excellent results under the coking process, while some will not coke; some is in quality equal to the Liverpool canal coal. There are many mineral springs in the State—sulphurous, saline, and chalybeate—and in Howard co. salt-springs containing from 1000 to 1200 grains of salt to the gal.

**Zoology.**—Bears, cougars or panthers, wild-cats, wolves, foxes, raccoons, and opossums are found in the mts. in considerable numbers. Deer of several species, rabbits, hares, squirrels, and perhaps also antelopes, are abundant, as well as gophers and other small rodents. Wild-turkeys, quails, pigeons, prairie-hens and other grouse abound; eagles, vultures, hawks, owls, etc. are found; song-birds and birds of beautiful plumage are very numerous, and wild-geese, ducks, brant, and teal, and herons, swans, and divers are found in their season on the Miss. and in the swampy regions. Snakes, lizards, toads, frogs, turtles, etc. are plentiful.

**Climate.**—The climate of M. is generally healthy, except in the river-bottoms and the swampy dists. of the S. E., but it is a climate of great extremes. The summers are long and hot, the winters cold and icy, with strong and piercing winds. Annual mean temperature—Jefferson Barracks (lat. 38° 28' N., lon. 90° 18' W., elevation 472 ft.), 55.46°; St. Louis (lat. 38° 37' 28" N., lon. 90° 15' 16" W., elevation 544 ft.), 54.5°. Total rainfall of year—Jefferson, 37.83 inches; St. Louis, 42.32 inches.

**Soil and Vegetation.**—The soil of the State may be divided into 5 classes or dists. The alluvial deposits of S. E. M. and of the first bottoms of Mo. River are exceedingly rich and fertile. Much of the S. E. region is covered with swamps, but where these are drained they will compete in productiveness with the richest lands in the world. The reclaimed lands of this section yield enormous crops of cotton and from 75 to 90 bushels of corn to the acre. The next class of lands in point of fertility are the black-soil prairies of N. W. M., which are underlaid by the upper coal-measures. After 30 yrs. of cultivation the lands yield quite as large crops as at first; corn-crops of from 50 to 75 bushels to the acre, and wheat of 25 bushels, are the usual yield of this region; blue grass, apples, and most of the small fruits do well here. E. M., N. of the Mo. River, may be considered as the next class. A part of this is prairie and a part rolling lands. The soil yields better crops of wheat, though not so well adapted to corn. Some of the best tobacco lands in the State are in this region; all kinds of fruit do well. A region somewhat less fertile is found in S. W. M. This is a good fruit-region, grapes, peaches, pears, and apples being especially successful. It yields also good crops of wheat and corn. The poorest land in the State is the extensive tract lying between S. W. M. and the swampy lands of the S. E. This region is not sterile, but most of the hills are heavily timbered, and some of the valleys are very rich. From 20 to 35 bushels of corn or 15 to 20 of wheat are produced on this soil, and near the S. boundary of the State cotton is raised successfully. Most of N. and N. W. M. is prairie, though with belts of timber along the streams. The prairies are decked with numerous flowers of great beauty during the spring and summer seasons. The Mo. bottoms are generally heavily timbered with cottonwood, hickory, black walnut, hackberry, burr, and red oak. W. of Howard co. the Mo. River cos. have heavy bodies of fine timber, but interspersed with prairies. E. of Howard co. there are belts of hard-wood timber from 10 to 20 m. wide, including ash, oak, walnut, sugar-maple, hackberry, hickory, elm, etc. A similar belt, 15 to 20 m. wide, runs parallel to the Miss. Along the Osage River and in all the S. cos. are heavy tracts of good timber, chiefly white, black, yellow, and post oak, black jack, black hickory, sassafras, dogwood, cedar, etc., and nearer the Ark. border extensive tracts of pine. Yellow poplar, sweet gum, cypress, oak, catalpa, tupelo, black gum, and black walnut are the principal forest trees of the S. E.

**Agricultural Productions.**—M. is one of the great grain-growing States, producing, by the census of 1880, of Indian corn, 202,414,413 bushels; wheat, 24,966,637 bushels; oats, 20,670,958 bushels; rye, 555,426 bushels; buckwheat, 57,640 bushels; barley, 123,051 bushels. The yield of tobacco was 12,015,637 lbs. The clip of wool was 7,313,924 lbs., standing 6th in yield of this staple in the U. S. Of cotton there was produced, in 1880, 20,318 bales.

**Farm Animals.**—By the census of 1880 M. had 637,776 horses, 192,027 mules and asses, 2,080,932 cattle, 1,411,298 sheep, and 4,553,123 hogs.

**Manufactures.**—M. is a heavy manufacturing State in certain commodities. In 1880 the number of manufacturing establishments was 17,806, employing 101,952 hands; amount of wages paid, \$49,688,712; capital invested, \$130,016,735; aggregate value of products manufactured, \$300,252,157. The value of glassware manufactured in M. in 1880 reached nearly \$1,000,000. In 1880 there were 22 iron and steel establishments; capital, \$9,152,472; total wages paid, \$734,575. Total value of products, \$4,660,530. Coal mined in 1881, 1,750,000 tons. Pig iron produced in 1880, 95,050 tons.

**Railroads.**—M. had in operation, in Jan. 1882, 4,211 m. of R. R., costing, for roads and equipment, \$239,530,162, with













MAP OF  
**MISSOURI**

Drawn and Engraved on Copper-Plate  
EXPRESSLY  
FOR  
**JOHNSON'S CYCLOPEDIA**

Scale of Miles  
0 10 20 30 40



MAP OF  
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Scale of Miles  
0 10 20 30 40







net earnings of \$13,499,373; interest paid on bonds, etc., \$7,335,625; dividends paid, \$2,299,977. Half a dozen of these are great trunk lines, embracing the Wabash, St. Louis and Pacific; Chicago, Rock Island and Pacific; Mo., Kansas and Texas; Mo. Pacific; St. Louis, Iron Mt. and Southern, etc. The S. and W. connections of these and other roads are most important, and they do an enormous business.

**Finances.**—The assessed valuation of M. in 1881 was—real estate, \$81,555,564; personal property, \$147,662,910; R. Rs. and telegraphs, \$29,143,999; total, \$558,361,443. Rate of State tax, 40 cents on \$100, producing \$2,129,512; total taxation, State and local, 1880, \$10,269,736; State debt, \$16,259,000, chiefly contracted in aid of R. Rs., against which the State holds in sinking fund \$3,031,000. Total indebtedness of M., State, co., and town, \$57,431,322.

**Commerce.**—M. has little direct foreign trade, but her interior commerce is enormous, including heavy shipments of all the cereal crops, pork, beef, live animals, manufactures, and merchandise, both by railway and rivers. St. Louis alone received in 1879, of wheat, 17,093,362 bushels, and shipped 7,302,076 bushels; receipts of corn, 13,360,636 bushels; shipments, 8,311,005; barrels of flour shipped, 3,045,085; number of hogs packed in M. in 1879-80, 926,931.

**Banks, Etc.**—In Oct. 1881 M. had 22 national banks, with a capital of \$4,050,000; circulation, \$2,317,340; U. S. bonds to secure circulation, \$2,630,000; aggregate deposits, \$10,371,055. There were 120 State banks and trust cos., with capital of \$5,747,582 and \$39,624,525 deposits; 3 savings banks, with deposits of \$506,510; 92 private bankers, with capital of \$1,381,546 and \$7,148,243 deposits. There were 17 Amer. fire and marine insurance cos. in M. in 1881; total fire losses in 1881, \$3,218,100. Life insurance cos., 2.

**Education.**—The number of children of school age (6-20 yrs.), in 1880 was 723,484, of whom 486,002 were enrolled in public schools, with an average attendance of 260,540. Total expenditure for public schools, \$3,092,332, of which teachers' salaries required \$2,361,058; number of school-houses, 10,329; value of school property, \$7,810,924; number of teachers, 10,802. There is a normal school at Kirksville, with over 500 pupils, and 2 others, beside 7 med. colls., 2 law schools, and 4 theological schools. M. has 14 univs. and colls., with 201 instructors and 2429 students, paying tuition in 1880, \$73,765. The State Univ. at Columbia includes an agricultural coll. and school of mines. In 1882 there were 509 newspapers and periodicals in M., of which 43 were daily.

**Churches.**—The Baps. are in the majority here as in most S. States, numbering 1381 chs., 823 ministers, and 88,491 members; Christians (Disciples of Christ), 565 chs., 395 ministers, 60,950 members; Meth. Epis. (South), 273 chs., 53,483 members; R. Caths., 246 chs., 286 priests, and a worshipping pop. of 163,572; Lutherans, 202 chs., 34,490 members; Meth. Epis., 222 chs., 257 ministers, 19,821 members; Cumberland Presbs., 371 chs., 16,129 members, and about 30 other denominations, having from 10,000 down to 30 members each.

**Population.**—In 1870, 1,721,295; 1880, 2,168,880 (white 2,022,826, colored 145,554, including 91 Ch. and 113 Indians).

**Principal Cities and Towns, Pop. 1880.**—St. Louis, 350,518; Kansas City, 55,735; St. Joseph, 32,431; Hannibal, 11,074; Sedalia, 9561; Joplin, 7088; Springfield, 6522; Moberly, 6070; Jefferson City (cap.), 5271; Carthage, 4167.

COUNTIES.	*Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
Adair.....	1-G	11,448	15,190	Kirksville.....	2,214
Andrew.....	2-D	15,137	16,318	Savannah.....	1,906
Atchison.....	1-C	8,440	14,656	Rockport.....	715
Audrain.....	3-H	12,307	19,732	Mexico.....	3,835
Barry.....	8-E	10,373	14,405	Cassville.....	...
Barton.....	5-D	6,087	10,328	Lamar.....	...
Bates.....	5-E	15,860	25,381	Butler.....	2,162
Benton.....	5-F	11,322	12,396	Warsaw.....	515
Bollinger.....	6-J	8,162	11,130	Marble Hill.....	265
Boone.....	4-G	20,765	25,429	Columbia.....	3,326
Buchanan.....	2-D	30,298	49,792	Jefferson City.....	32,431
Butler.....	8-J	4,298	6,011	Poplar Bluff.....	791
Caldwell.....	2-E	11,390	13,646	Kington.....	470
Callaway.....	4-H	19,202	23,670	Fulton.....	2,409
Camden.....	5-G	6,108	7,268	Linn Creek.....	...
Cape Girardeau.....	5-D	20,688	30,999	Washington.....	...
Carroll.....	3-F	17,446	23,274	Carrollton.....	2,313
Carter.....	7-I	1,455	2,168	Van Buren.....	...
Cass.....	4-D	19,296	29,431	Harrisonville.....	1,113
Cedar.....	6-E	9,474	10,741	Stockton.....	407
Chariton.....	9-F	19,136	26,234	Keytesville.....	737
Christian.....	7-F	6,707	9,628	Ozark.....	925
Clark.....	1-H	13,667	15,031	Kahoka.....	704
Clay.....	3-D	15,564	15,572	Liberty.....	1,476
Clinton.....	2-D	14,063	16,073	Platteburg.....	1,344
Cole.....	5-D	10,292	15,515	Jefferson City.....	32,431
Cooper.....	4-G	20,692	21,596	Bonville.....	3,584
Crawford.....	5-H	7,392	10,756	Steelville.....	410
Dade.....	6-E	8,683	12,557	Greenfield.....	712
Dallas.....	6-F	8,383	9,263	Buffalo.....	437
Daviess.....	2-E	14,410	19,145	Gallatin.....	1,141
De Kalb.....	2-D	9,558	13,334	Mayville.....	418
Dent.....	6-I	6,357	10,646	Salem.....	1,624
Douglas.....	7-G	3,915	7,753	Ava.....	134
Dunklin.....	8-J	5,992	9,694	Kennett.....	171
Dryden.....	3-E	30,098	36,534	Union.....	402
Gasconade.....	5-H	10,093	11,153	Hermann.....	1,314
Gentry.....	1-D	11,607	17,176	Albany.....	879
Greene.....	7-F	21,549	28,301	Springfield.....	6,522
Grundy.....	2-F	10,567	15,185	Trenton.....	3,312
Harrison.....	1-E	14,835	20,304	Betha.....	984
Henry.....	5-E	17,401	25,905	Clinton.....	2,885
Hickory.....	5-F	6,482	7,397	Hermitage.....	167
Holt.....	2-C	11,652	15,509	Oregon.....	862
Howard.....	3-G	17,233	18,429	Fayette.....	1,347
Howell.....	8-H	4,218	8,314	West Plains.....	351
Iron.....	6-I	6,278	8,183	Ironton.....	759
Jackson.....	3-E	55,041	89,325	Independence.....	3,146
Jasper.....	7-D	14,928	32,019	Carthage.....	4,167
Jefferson.....	5-J	15,380	18,736	Hillsborough.....	...
Jesse.....	4-E	12,648	28,172	Warrensburg.....	4,045
Knox.....	1-H	10,974	13,047	Edina.....	1,156
Laclede.....	6-G	9,380	11,534	Lebanon.....	1,419
Lafayette.....	3-E	29,623	25,710	Lexington.....	3,996
Lawrence.....	7-E	15,067	17,583	Mount Vernon.....	327
Lewis.....	1-H	16,114	15,925	Monticello.....	324

\* Reference for location of counties. See map of Missouri.

COUNTIES.	Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
Lincoln.....	3-I	15,969	17,428	Troy.....	839
Linn.....	5-F	15,906	20,016	Linness.....	280
Livingston.....	3-F	16,130	20,196	Chillicothe.....	4,028
Macon.....	3-E	25,239	26,222	Macon City.....	3,046
Madison.....	6-J	5,439	8,876	Fredericktown.....	127
Marion.....	5-H	5,916	7,304	Vienna.....	...
Marion.....	2-H	23,780	24,537	Palmyra.....	2,479
McDonald.....	6-D	5,226	7,816	Platteville.....	147
Mercer.....	1-F	14,673	15,457	Rhineston.....	1,340
Miller.....	5-G	6,616	9,805	Tussumba.....	157
Mississippi.....	7-K	4,982	9,270	Charleston.....	1,028
Moniteau.....	4-G	11,275	14,346	California.....	1,427
Monroe.....	2-H	17,149	19,671	Darwin.....	1,253
Montgomery.....	4-I	10,405	16,249	Bellair.....	328
Morgan.....	5-G	8,424	10,132	Versailles.....	578
New Madrid.....	7-K	6,357	7,694	New Madrid.....	719
Newton.....	7-D	12,821	18,947	Neosho.....	1,631
Nodaway.....	1-D	14,751	19,544	Marysville.....	3,485
Oregon.....	8-H	3,287	5,791	Alton.....	127
Osage.....	4-H	10,793	11,824	Linn.....	tp. 1,804
Ozark.....	6-G	3,263	5,618	Gainesville.....	165
Perry.....	8-K	3,059	4,299	Gayoso.....	148
Perry.....	9-T	11,866	15,481	Marysville.....	1,416
Pettis.....	4-F	18,706	27,271	Sedalia.....	9,561
Phelps.....	6-H	10,506	12,568	Rolla.....	1,582
Pike.....	3-I	23,076	26,715	Bowling Green.....	1,067
Platte.....	3-D	17,323	17,366	Platte City.....	670
Polk.....	6-F	17,445	15,734	Potosi.....	824
Pulaski.....	6-G	4,714	7,250	Waynesville.....	616
Putnam.....	1-F	11,217	13,555	Unionville.....	722
Ralls.....	3-H	10,510	11,838	New London.....	502
Randolph.....	3-G	15,908	22,751	Huntsville.....	1,527
Ray.....	3-E	18,700	20,400	Richmond.....	1,434
Reynolds.....	8-I	3,755	6,722	Centerville.....	...
Ripley.....	3-E	3,175	5,377	Doniphan.....	157
Saline.....	3-F	21,672	29,011	Marshall.....	2,701
Schuyler.....	1-G	5,820	10,470	Lancaster.....	528
Scotland.....	1-H	10,670	12,508	Memphis.....	1,416
Scott.....	7-K	7,317	8,587	Benton.....	109
Shannon.....	7-H	9,239	3,441	Eminence.....	91
Shelby.....	2-H	10,119	14,024	Shelbyville.....	619
St. Charles.....	4-I	21,304	23,665	St. Charles.....	5,014
St. Clair.....	5-F	6,742	14,125	Paris.....	373
St. Francois.....	5-J	9,749	13,822	Farmington.....	1,422
St. Genevieve.....	5-G	8,284	10,390	St. Genevieve.....	1,422
St. Louis (city).....	4-J	310,864	350,518	St. Louis.....	350,518
St. Louis (city).....	4-J	40,325	51,885	St. Olive.....	...
Stoddard.....	8-K	8,535	12,431	Bloomfield.....	...
Stone.....	8-F	3,253	4,404	Galesna.....	85
Sullivan.....	1-F	11,907	16,569	Millan.....	1,117
Taney.....	8-F	4,407	5,599	Forsyth.....	...
Texas.....	7-H	9,618	12,206	Houston.....	191
Vernon.....	5-E	11,247	19,369	Nevada.....	1,918
Warren.....	4-I	9,673	10,806	Warrenton.....	296
Washington.....	5-I	11,719	12,886	Pot. A.....	716
Wayne.....	7-F	6,068	9,096	Greenville.....	190
Webster.....	7-J	10,434	12,175	Harshfield.....	465
Worth.....	1-D	5,004	6,303	Grant City.....	463
Wright.....	7-G	5,684	9,712	Hartsville.....	248
Total.....		1,721,295	2,168,880		

**History.**—The present State of M. was known as Upper La. Under this name its lead-mines began to be known as early as 1720, and settlements were made not long after at St. Louis, Cape Girardeau, and (probably about 1755) at St. Genevieve. In 1763 it was ceded to Sp. with the rest of the La. or Miss. River country, while all E. of the river came into the possession of the Eng. In 1775 St. Louis had attained some reputation as a fur-depot and trading-station, and had about 800 inhabs., and St. Genevieve about half as many. New Madrid had been founded some time before. In 1800 Sp. ceded her provs. on the Miss. to Fr., and the Fr. govt. sold them to the U. S. in 1803. The U. S. govt. divided the purchased region into the Terr. of Orleans and the dist. of La., the latter including most of Ark., Mo., Ia., Minn., and Dak., and most of Kan. and Neb. In 1805 this region was erected into the Terr. of La. and St. Louis made the cap. In 1810 the pop. of the Terr. was 20,845, of which all but 1500 were in the present limits of M. In 1812 La. becoming a State, the name of the Terr. was changed to M. Terr. In 1817 the Territorial legislature applied to Cong. for liberty to prepare a State const. preliminary to admission into the U. This application led to a protracted struggle in Cong. on the question of the admission of M. as a slave State. It was finally settled by the Mo. Compromise, which provided that slavery should be allowed in M., and might be permitted in all terr. W. of it S. of the line of 36° 30', but not in any terr. N. of that line. This compromise was virtually repealed in 1854 by the act organizing the Terrs. of Kan. and Neb., and this repeal was among the causes which led to the c. war. A convention met at St. Louis June 12, 1820, and agreed upon a const.; the State was admitted to the U. by Presidential proclamation Aug. 10, 1821. Its subsequent progress was very rapid. At the commencement of the late c. war M. was almost equally divided. The people of the W. portion of the State had taken sides in the Kan. troubles, and armed bodies of men known as Missouri "border ruffians" had penetrated into Kan. and committed many outrages there. A convention was called on Feb. 28, 1861, which decided in favor of remaining in the U. Another constitutional convention met at St. Louis Jan. 6, 1865, and adopted a new const., providing for emancipation and the changes induced by it. This const. was further modified in 1870, and a still newer one adopted Oct. 30, 1875.

#### Governors of the State.

Alexander McNair.....	1820-24	Claiborne F. Jackson.	1861
Frederick Bates.....	1824-26	Hamilton R. Gamble.	1861-64
John Miller.....	1826-32	Thomas M. Fletcher.	1865-69
Daniel Dunklin.....	1832-36	Joseph W. McClurg.	1869-71
Liburn N. Boggs.....	1836-40	Benj. Gratz Brown.....	1871-73
Thomas Reynolds.....	1840-44	Silas Woodson.....	1873-75
John C. Edwards.....	1844-48	Charles H. Hardin.....	1875-77
Austin A. King.....	1848-53	John S. Phelps.....	1877-81
Stephen Price.....	1853-57	Thomas T. Crittenden.....	1881-85
Truett Polk.....	1857	John S. Marmaduke.....	1885-89
H. Johnson (acting).....	1857		
R. M. Stewart.....	1857-61		

REVISED BY A. R. SPOFFORD.



**Missouri Compromise**, kom'pro-miz, the name given to an act of Cong. passed in 1820 for the admission of Mo. into the U., about which great errors exist in the popular mind. (See STEPHENS'S *Compendium of the Hist. of James Monroe's Administration*.) ALEXANDER H. STEPHENS.

**Missouri River**, The, next to the Miss., is the great river of N. Amer. It has its source in the summits of the Rocky Mts., about 10,000 ft. above the ocean-level. Its total length from Lake Madison to its mouth, where it falls into the Miss., is 3047 m., draining an area computed at 557,918 sq. m. Below Ft. Benton, the present head of navigation, the river-valley is a mile in breadth. After passing the rapids 400 m. below Ft. Benton the valley has a mean width of about 10 m., and the river traverses it from side to side. The channel proper to Sioux City is always shifting. The amount of water discharged remains approximately the same, the channel-breadth increasing but little in 1000 m. of distance and after receiving the waters of a number of rivers draining hundreds of thousands of sq. m. Evaporation from its sandy beds explains this phenomenon. At Sioux City it receives the Big Sioux, and below, to the mouth of the Kansas in lat. 39°, a distance by channel of 500 m., the M. receives 12 small rivers from Ia. and Mo. From the mouth of the Kansas the river flows nearly E., receiving on both sides the waters of fertile and well-cultivated regions. The breadth is enlarged from 2500 to near 3000 ft., and its discharge of water is 120,000 ft. per second; the upper Miss. yields only 105,000 ft. at the junction. The valley of the M. abounds in mineral wealth. Even the regions of desert and shifting sands are in many portions underlaid by coal, and the Black Hills and Wind River Mts. are pervaded by the precious metals, while the Carboniferous beds abound in lead, iron, marble, and coal.

**Missouri Valley**, R. R. junct., Harrison co., Ia., 5 m. from the Mo. River. Pop. 1880, 1154.

**Mist**. See Fog, by PROF. JOSEPH HENRY, LL.D.

**Mistletoe**, miz'z'l-tō [A. S. *mistletoe*], a popular name of the European *Viscum album*, the true M. of tradition, which grows upon apple and other trees, but not very often upon the oak. This plant was revered by the anc. Teutons and Celts, and is still hung up at Christmas. The common N. Amer. M. is *Phoradendron flavescens*. The fruits contain a viscid substance from which bird-lime is made. This substance doubtless fixes the seeds to the bark of the tree upon which the future plant grows. The radicle pierces the bark, and draws nourishment from the sap of the tree. Belongs to the order *Loranthaceae*, all green parasites.

**Mistral** [Fr.; Provencal, *mistral*; It. *maestro*, the "master"], a violent, gusty, and very dry N. W. wind that blows in winter over the W. basin of the Mediterranean, often causing great damage by sea and land.

**Mitchell** (JOHN), b. at Dungiven, Ire., Nov. 3, 1815, grad. at Trinity Coll. in 1836; studied law and practised for several yrs.; contributed to newspapers; was ed. of the *Dublin Nation* for several yrs.; in 1847 started the *United Irishman* in the interests of the "Young Ireland party," and with the leaders was arrested in 1848, convicted of felony, and transported for 14 yrs., but escaped in 1853; went to New York, where he started the *Citizen*, advocating slavery, but gave it up, and started the *Southern Citizen* at Richmond, which failed; resided at Paris till the war broke out; returned to Richmond, edited the *Enquirer* in the interests of the South, and lost 2 sons in its forces; returned to New York and established the *Irish Citizen*, which soon failed; went to Ire. in 1874, where he was returned to Parl. from Tipperary; being declared ineligible, he was again returned to Parl., but further action was rendered unnecessary by his death. Wrote *Jail Journal* and *The Last Conquest of Ire.*—Perhaps. D. Mar. 20, 1875.

**Mitchell** (ORMSBY MCKNIGHT), LL.D., b. in Union co., Ky., Aug. 23, 1810; became clerk in a store at Miami, O., when 12 yrs. old; obtained an appointment to a cadetship at W. Pt., where he grad. 1829; was assistant prof. of math. at W. Pt. until 1831; studied law and practised in Cin. until 1834, when he was elected prof. of math., natural philos., and astron. at Cin. Coll. In the spring of 1842 he gave a course of public lectures on astron., which resulted in the formation of a society for the purpose of procuring a telescope and the erection of an observatory, and was commissioned to procure the necessary apparatus in Europe. The cornerstone of the observatory was laid by John Quincy Adams Nov. 10, 1843, on Mt. Adams, and the building was formally opened April 14, 1845. The building of Cin. Coll. having been destroyed by fire during the same yr., and M. receiving no salary as director of the observatory, was obliged to look elsewhere for means of support. He divided his energies between astronomical observations, the delivery of popular lectures on astron., and R. R. surveys. He served as adjutant-gen. of O. 1848-49, and made 2 voyages to Europe (1853 and 1854) as chief engineer and agent of the O. and Miss. R. R. The great work of his life was the stimulus given to astron. by his popular lectures. He established in July 1846 a scientific journal entitled *The Sidereal Messenger*, which was discontinued in 1848. In it, and in a school edition of Burritt's *Geog. of the Heavens* which he prepared in 1849, he pub. his observations upon double stars in so far as they have yet been given to the world. In 1848 he invented a chronograph for automatically measuring and recording right ascensions by electro-magnetic mechanism. In 1849 he devised a declinometer, or apparatus for the accurate measurement of large differences of declinations, which after successive improvements was in 1854 attached to the equatorial, the latter instrument having been firmly clamped to the meridian. During the ensuing 5 years (1854-59) many zones of faint stars were observed by its means, and nearly 50,000 observations were accumulated. Among his other achievements are his discovery of the duplicity of certain stars, notably Antares; his numerous unpublished observations of nebulae, solar spots, double stars, and comets (chiefly made in 1848-49); his determination of

the lon. of Cin. with reference to Wash. and St. Louis; the invention of an apparatus for personal equation, and the training of competent and enthusiastic astronomical observers. In Aug. 1859 he accepted the post of director of the Dudley Observatory at Albany, N. Y., which had been erected in accordance with plans furnished by him 5 yrs. before. In 1861 he tendered his military services to his country, was made brig.-gen. of volunteers Aug. 9, and ordered to the dept. of O. He distinguished himself by a forced march into N. Ala., seizing the R. R. between Corinth and Chattanooga; was made maj.-gen. Apr. 11, 1862, and given the command of the dept. of the S. in Sept. D. Oct. 30, 1862. His principal publications were *The Planetary and Stellar Worlds* and *The Orbs of Heaven*.

**Mitchell**, Dak. See APPENDIX.

**Mitchell**, Ind. See APPENDIX.

**Mitchell** (DAVID BRADIE), b. in Scot. Oct. 22, 1766; removed in 1783 to Savannah, Ga., where he had become heir to an estate; was chosen solicitor-gen. of Ga. 1795, maj.-gen. of militia 1804, gov. of Ga. 1809-13 and 1815-17; made a treaty with the Creeks 1818. D. Apr. 22, 1837.

**Mitchell** (DONALD GRANT), LL.D., "Ik Marvel," b. at Norwich, Conn., Apr. 1832; grad. at Yale in 1841; travelled in Europe; studied law in 1846 in New York; wrote *Fresh Gleanings*, *The Battle Summer*, a record of his observations in 1848 in Paris; *The Lorgnette*, *Reveries of a Bachelor*, *Dream Life*; was U. S. consul at Venice 1853-55.

**Mitchell** (ISIDORE H. M. L. R.). See APPENDIX.

**Mitchell** (JOHN), M. D., F. R. S., b. in Eng., settled at Urbana, Va., about 1700. Devoting himself to bot., his information was of value to Linnæus, who named for him the *Mitchella repens*; prepared a *Map of the Brit. and Fr. Dominions in N. Amer.*; wrote *Contest in Amer. between G. Brit. and Fr.*, etc., and *Present State of G. Brit. and N. Amer.*; returned to Eng. about 1767. His tracts on bot. were pub. in 1769 as *Dissertatio brevis de Principiis Botanicorum et Zoologorum*, etc. D. Mar. 1768.

**Mitchell** (MARIA), LL.D., b. at Nantucket, Mass., Aug. 1, 1818, of Quaker parentage; assisted her father in his astronomical studies; gave special attention to study of nebulae and of comets; received in 1847 a gold medal from the king of Den. for the discovery of a comet; was afterward employed upon the Coast Survey and the *Nautical Almanac*; became in 1865 prof. of astron. in Vassar Coll.

**Mitchell** (NAHUM), b. at E. Bridgewater, Mass., Feb. 12, 1769, grad. at Harvard 1789; was admitted to the bar 1792; was member of the Mass. legislature 1798-1812, except one term in Cong. 1803-05; State senator 1813-14, circuit judge 1811-19, chief-justice of common pleas 1819-21, treas. 1822-27, com. for settling boundaries between Mass. and R. I. and between Mass. and Conn. With Bartholomew Brown he edited the *Bridgewater Collection of Sacred Music*; wrote a *Hist. of Bridgewater*, with genealogical tables, for many yrs. the standard in N. Eng. D. Aug. 1, 1853.

**Mitchell** (ROBERT B.), b. in Richland co., O., 1823, ed. at Washington Coll., Pa.; became a lawyer; served as an officer of O. volunteers in the Mex. war; took an active part in the Kan. struggle, having gone thither in 1856; was treas. of Kan. 1858-61; adjutant-gen. 1860-61; in the U. S. volunteer service during the c. war, at first as col. and afterward as brig.-gen.; was badly wounded at Wilson's Creek, and was gov. of N. M. 1865-67. D. Jan. 26, 1882.

**Mitchell** (S. WEIR), M. D., b. in Phila. Feb. 15, 1829, a son of Dr. J. K. Mitchell, grad. in 1850 at the Jefferson Med. Coll.; known for his researches on serpent-poisons, nerve-physiology, respiration of tortoises, etc., pub. in *Smithsonian Contributions*, etc.; wrote *Cryptogamous Origin of Malarious and Epidemic Fevers*, etc.

**Mitchell** (STEPHEN MIX), LL.D., b. at Wethersfield, Conn., Dec. 20, 1743, grad. at Yale 1763; was tutor there 1766-69; became a lawyer of his native town 1772, associate judge of the Hartford co. court 1779, its presiding judge 1790; judge of the superior court of the State 1795, its chief-justice 1807-14; was in Cong. 1783 and 1785, U. S. Senator 1793-95. D. Sept. 30, 1835.

**Mitchell** (SIR THOMAS LIVINGSTONE), D. C. L., F. R. S., b. in Stirlingshire, Scot., in 1792; entered the army in 1817, at the age of 16; was aide-de-camp to the duke of Wellington; in 1827 was appointed deputy surveyor-gen. of New S. Wales, and ultimately became surveyor-gen., filling that post until his death; conducted 4 daring expeditions into the great deserts of Australia; discovered Mt. Byna, Australia Felix, the Red, Peel, Namoy, and Victoria rivers, explored the courses of the Darling and Glenelg rivers, and mapped out a practicable route between the colonies of Victoria and S. Australia. He pub. accounts of his expeditions. He was knighted in 1839, made a col. in 1854. D. Oct. 5, 1855.

**Mitchell** (WILLIAM L.), LL.D., b. Aug. 25, 1805, in Henry co., Va.; moved to Ga. when a boy; grad. at State Univ. 1825; studied law, was admitted to the bar, and in 1867, after the death of Judge Lumpkin, was put at the head of the Lumpkin Law School, of the State Univ., of which he became one of the trustees. D. Oct. 31, 1882.

**Mitchell** (SAMUEL LATHAM), M. D., LL.D., b. at N. Hempstead, N. Y., Aug. 20, 1764; took his med. degree at Edinburgh 1786; studied law, and was a com. to treat with the Six Nations 1788; became in 1792 prof. of chem., etc. in Columbia Coll.; was 1797-1813 ed. of the *Med. Repository*; was M. C. 1801-04 and 1810-13, U. S. Senator 1804-09; held professorships in the Coll. of Phys. and Surgeons, New York, 1808-26; v.-p. of the Rutgers Med. School 1826-30; was active in establishing learned societies and in scientific observation; author of several works, mostly upon natural and phys. science. D. Sept. 7, 1831.

**Mite**. See ACARUS.

**Mithra**, or **Mithras** [Sans. *Mitra*], one of the earliest divinities of the Aryan race, whose worship was modified by the Mazdeism of Zarathrestra, greatly extended in the later Per. empire, and even became a favorite at Rome and



the W. cities during the 2d and 3d centuries A. D. M. in the Zende religion was originally the highest of the 28 divinities of the 2d class in the Per. Pantheon, and of the 7 *amshaspands* subordinate to the Ized or ruler of the universe; but at a later day he became the equal, and ultimately the superior, of Ormuzd, and was identified with the Sun himself. Monuments of the M.-worship have been found in Rome, and even at Marseilles and Frankfort-on-the-Main. The "mysteries" of M. were a peculiar feature of this religion. The M.-worship was suppressed by law in the Rom. empire 378 A. D., but lingered for centuries in the E., until extinguished by Islam. (See LAJARD, *Le Culte de Mithra*.)

**Mithridates VI.**, king of Pontus, surnamed EUPATOR, or more generally the GREAT, b. at Sinope in 136 B. C.; succeeded his father in 124 B. C.; conquered the terts, along the N. coast of the Euxine as far as Chersonesus Taurica; incorporated the kingdom of Bosphorus farther to the W.; turned then to the countries S. of the Euxine, attacked Cappadocia and Bithynia, and met here with the Romans. Three wars ensued, known in the hist. of Rome as the Mithridatic wars—namely (1) 88-85 B. C.; (2) 83-82 B. C.; and (3) 74-66 B. C. They ended with the complete defeat of M., who retreated behind the Euxine, and killed himself at Panticapæum, where he was besieged by his own son, Pharnaces, in 63 B. C.

**Mit'la** [Aztec, *Mictlan*, "place of the dead"], a vast ruined city in Mex., 15 m. S. E. of Oaxaca, supposed to have been built by predecessors of the Zapoteco race, who now occupy that region. The monuments, consisting of immense palaces and temples, are adorned with a high degree of art, and are still in tolerable preservation.

**Mitrailleuse**, mē-tra-yūz', a gun in which several barrels are combined in order to produce a greater effect by the rapid succession of a number of shots. M. existed as early as the 14th century. The Scaligers at the end of the 14th century, the Prot. princes of Ger. in the Schmalkaldian war, and Aus. in the wars against Tur., used this kind of guns. A peculiar kind of M. was the *espingole*, each barrel being loaded with several shots, which, by a slowly burning charge, were discharged one after the other. It was used in the Middle Ages and by the Danes in 1848-50.

**Mitre**. See APPENDIX.

**Mitre** (BARTOLOMÉ), b. at Buenos Ayres June 26, 1821; early distinguished himself in lit.; resided at Montevideo during the earlier period of the 9 yrs.; siege of that city, and aided in the defence while engaged in historical researches; in 1846 went to Bolivia, where he became a journalist and instructor in a military coll., and was engaged as an officer of the Bolivian army in a war with Peru; afterward resided in Valparaiso, Chili, founded a newspaper, became known as a poet, and was once exiled to Peru for his supposed connection with a conspiracy; returned to Montevideo in time to take an active part as col. of art. in the overthrow of Rosas Feb. 3, 1852; was a leader in the movement at Buenos Ayres against Urquiza in the following Sept., resulting in the quasi independence of that prov. from the Argentine Confederation. He engaged in journalism, lit., and politics; wrote *Historia de Belgrano*; was minister of war under the administration of Obligado and Alsina; led the provincial forces in the campaign against Urquiza, which terminated in a defeat at Cepeda, Oct. 23, 1859, and resulted in the reunion of the seceded prov. to the Argentine Confederation. M. was chosen gov. of Buenos Ayres in May 1860; was made brig.-gen. in July, and new difficulties having arisen in 1861, he gained a victory over Urquiza at Pavon, Sept. 11. As a consequence Pres. Derqui was forced to resign, the "Confederation" was dissolved, M. became pres. *ad interim* in Oct., and called a cong. which met May 25, 1862, and formed a const. for the nation, which was thenceforth styled the "Argentine Republic." M. was elected pres. for 6 yrs. in Oct. During the war between Paraguay and the triple alliance he was for more than 2 yrs. commander-in-chief of the allied forces. During the administration of his successor, Sarmiento, M. was sent to the Brazilian court to conclude a treaty. In the electoral campaign of 1874 he presented himself as a candidate for the presidency, but being defeated by Avellaneda, he headed an unsuccessful rebellion which broke out Oct. 1; accepted the amnesty tendered him, and has since remained in obscurity. [From orig. art. in *J. N. Univ. Cyc.*, by HON. CHARLES A. WASHBURN.]

**Mitride**, a large family of gastropod mollusks of the group Rhachioglossa. There are 400 living and 100 extinct species. The Philippine Islands are their geographical centre and prin. habitat. The extra-tropical species are minute. The proboscis is long, and the animal emits an offensive, strong-smelling purple liquid. The bishop's mitre (*Mitra episcopalis*) is a fine shell from the Pacific Ocean.

**Mitylene**. See MYTLENE.

**Mixed Mathematics**, the application of mathematical principles to scientific investigations or to practical constructions in the arts. The term is used in contradistinction to the term *pure mathematics*, which is applied to the investigations of the purely scientific principles of math.

**Mixed Races**. The union of parents belonging to 2 distinct varieties of mankind gives rise to a mixed race, which usually blends in some measure the bodily characters of the 2 parent races. The intermediate complexion, hair, and features thus produced may be best traced in the descendants of whites and negroes, from the yellow-brown, crisp-haired mulattoes of the first generation, down to the children of whites and octoroons in the fourth generation, in whom negro blood may no longer be evident in the skin and hair, though a faint violet tinge of the finger-nails may remain. In crossing between races less different in complexion the absorption takes place sooner. Thus, there is considerable justification for the popular terms describing mixed races as "half-breed," "quarter-blood," "octoroon," etc., as if their constitutions were made up by arithmetical fractions of the constitutions of their parents. This mode of estimation, however, though useful for general guidance,

makes no approach to scientific accuracy. As in cross-breeds of other animals, so in man, some elements of parentage preponderate over others. One of the parent races may impress its type on the offspring more strongly than the other. Such preponderance may also depend in some measure on sex. Also, as is usual in crossed breeds of animals, reversion is apt to take place toward one or other of the parent types.

It may be laid down as a gen. rule that any 2 races of mankind are capable of producing offspring. This is in great measure actually proved by the existence of crossed races in endless variety of combination. Of these M. R., experience shows that some become permanent pops., such as would continue and increase indefinitely if left to themselves without further foreign admixture. It has, on the other hand, been argued that there are races between whom no permanent mongrel race can be formed, either because few children are born or because such children or their descendants are short-lived or sterile. This may to a certain extent be true, but in such arguments the effects of social causes have sometimes been mistaken for phys. failure. Apart from social causes, phys. failure of a M. R. seems oftenest due to unsuitability of one of the parent races to the climate.

The terms invented to denote the various race-combinations in Amer. are very numerous. The first cross between white and negro are *mulattoes*; the second cross, white with mulatto, are *quadroons*; the third class, white with quadroon, are *octoroons*; *tercerons* were mixed-bred of the third generation, and therefore the same as the above quadroons, and *quinteroons* were mixed-bred of the fifth generation, children of white and octoroon. The race sprung from Europeans and indigenous Amers. are usually known by the Sp. term *mestizos*; the next cross, of mestizos with whites, being called *castizos*. Among other well known terms are *zambo* or *sambo*, which is applied either to the negro-Amer. cross or to the quarter-bred offspring of negro with mulatto. To this last combination, or to the mulatto, the name of *griffin* especially belongs. The term *sallatras* is used for the quadroon-mulatto cross, as tending back toward the negro; but the similar word *turnatras* describes a mestizo cross returning toward the white. The epithets *lobos*, *coyotes*, and *cholos* are bestowed more or less indefinitely on mixed pops. of Sp. Amer. [From orig. art. in *J. N. Univ. Cyc.*, by E. B. TYLOR, LL.D., F. R. S.]

**Mixte'cas**, a nation of Indians in Mex., occupying the mts. in the W. of Oaxaca, the E. of Guerrero, and the S. of Puebla. According to their traditions, they came from the N. some centuries before the Sp. conquest. They were a brave and warlike people, and are now intelligent Mex. citizens. Their lang., which is of the Zapoteco family, is rich and melodious, and is still spoken in a considerable number of dialects.

**Mnemonics**, ne-mon'iks, or **Mnemotech'ny**, the art of assisting recollection by methods of association. The first to devise anything of this sort is said to have been Simonides, the Gr. poet (500 A. C.), of whose method both Cicero (*De Orat.*, li. 86-88) and Quintilian (*Inst.*, xl. 2) have spoken. In modern times we have various attempts to the same end, the most important of which are the *Memoria Technica* of Richard Grey (1730; new ed. Lond. 1851) and *The New Art of Memory* by Gregor von Fainagle (Lond. 1812), whose system was further carried out by Aimé Paris in his *Principes et Applications diverses de la Mnémotechnie* (Paris, 1853). The common aim in all these methods is to associate the thing to be remembered with something else which it is thought can be more easily recalled. J. H. SEELYE.

**Mnemotechnics**. See MNEMONICS.

**Mo'a**, the name given by the natives of New Zealand to a large bird, of the former existence of which they preserve a tradition, and which by that tradition is referred to the eagle tribe. The name is now accepted as belonging to species of the family Dinorthis: a gigantic extinct bird related to the family of the Struthionidae or ostriches. The *Dinorthis gigantea* was from 10 to 12 ft. in height.

**Mo'abites**, descendants of Moab, the son of Lot by his eldest daughter, hostile to the Israelites, in spite of the relationship between them. Their S. boundary was the brook Zered (the modern Wady el-Ahzy), which empties into the S. E. corner of the Dead Sea. Their terr. was about 30 m. from E. to W., and at one time extended as far N. (50 m.) as the mts. of Gilead. At the time of the Exodus they had lost about 30 m. of terr., having been driven S. of the Arnon by the Amorites. Subdued by David, they regained their independence after the dismemberment of the Heb. kingdom, and disappear from hist. after the conquests of Nebuchadnezzar (604-561 B. C.).

THE MOABITE STONE, which celebrates the achievements of one of their kings, Mesha (about 900 A. C.), was found Aug. 19, 1868. It proves that the Grs. added nothing to the alphabet brought to them from the E. (See GINSBURG'S *The Moabite Stone* and TRISTRAM'S *The Land of Moab*.)

**Mo beetle**, Tex. See APPENDIX.

**Mo'berly**, city and R. R. centre, Randolph co., Mo., 146 m. W. of St. Louis. Pop. 1870, 1514; 1880, 6070.

**Mobile**, mo-beel', city and important R. R. and commercial centre, cap. of Mobile co., Ala., on the river of the same name, near its entrance into Mobile Bay, 30 m. above the Gulf of Mexico, 140 m. E. of New Orleans, on a sandy plain gently rising from the river's bank. The suburbs embrace several beautiful hills. The harbor is shallow, affording anchorage only for vessels under 10 ft. draught, while larger vessels have to remain 25 m. distant in the bay. It has a Jesuit coll. at Spring Hill, an acad. conducted by the Sisters of the Visitation at Summerville, Barton Acad., the Ala. Med. Coll., 4 orphan asylums, a city hospital, a U. S. marine hospital, the Providence Infirmary, a spacious custom-house, and a fine market-house. M. was founded in 1703 by Lemoyne de Bienville as the cap. of La., which it continued to be until 1723. By the treaty of 1763 Eng. acquired N. E.



La., with M. as its cap., but the city was captured in 1780 by the Sp. gen. Galvez, was confirmed to Sp. by the treaty of 1783, and regarded as belonging to Fla. It was occupied, however, by Gen. Wilkinson Apr. 13, 1813, as belonging to La. (See FARRAGUT and FORT MORGAN.) In 1819 it was incorporated as a city. Pop. 1870, 32,034; 1880, 29,132.

**Mobile Bay** is 35 m. in length from its N. extremity to its outlet into the Gulf of Mexico, and 8 or 10 m. in width. The long, narrow sand-isthmus of Mobile Point, at the extremity of which is Ft. Morgan, is the barrier which divides it from the Gulf of Mexico. The entrance is between the point and Dauphin Island, 3 m. distant, on which is Ft. Gaines. The bar, over which 18 or 20 ft. of water can be carried, is 4 m. seaward. The depth of the bay generally is 12 to 14 ft., but a small area near the outlet having 20 to 21 ft. forms the anchorage. The Alabama River enters by numerous arms, separated by mud-flats, the head of the bay.

**Mobilier, Crédit.** See CRÉDIT MOBILIER.

**Moc'casin** [Indian], **Water-Mocassin, or Cotton-mouth**, the *Ancistrodon* (*Toxicophis*) *piscivorus*, a very venomous serpent of S. States, found in swamps and even in water. It is 2 ft. long, dark-brown above and gray beneath. The name mocassin is also given to the *Ancistrodon atrofasciatus* of the S. States and to the copperhead (*Ancistrodon contortrix*), both dangerous reptiles.

**Mocha**, mō'ka, town of Ar., prov. of Yemen, on the Red Sea, in lat. 13° 19' N. It has a good harbor, and is the most celebrated coffee-market in the world. Pop. about 7000.

**Mocha-Stone, or Moss-Agate**, a beautiful variety of chalcedonic quartz, remarkable for the dendritic ("tree-like") markings seen within it, which mimic mosses, foliage, and even landscapes. These appearances are due to an infiltration of oxide of manganese or of iron.

**Mock'ing-Bird**, the *Mimus polyglottus*, a singing-bird of the family Turridæ, found in the warmer parts of N. Amer. It is a rare summer visitant in the more N. States. The M.-B. is the best Amer. song-bird, and is one of the best singers in the world. Beside its own delightful song, it imitates the notes of most other birds.

**Modena**, mod'en-ah [anc. *Mutina*], a large town of N. It., cap. of the late duchy of Modena, which embraced the terr. between Venetian Lombardy, the Pontifical States, Tuscany, and the Mediterranean, and the duchy of Parma and the kingdom of Sard. The town itself, situated in lat. 44° 38' N., lon. 10° 56' E., lies in a low, moist, but healthy and fertile plain between the Secchia and the Panaro, with which rivers it is connected by canals. The city is well built. The Duomo was begun in 1099; adjoining it is the famous tower La Ghirlandina. The ducal palace, a vast and grand mediæval edifice, contains a picture-gallery, a library, a museum, and archives of the greatest interest. M. is conspicuous for her educational and charitable insts. The hist. of this town may be traced to 200 a. c. Its mediæval hist. is stormy and changeful. From 1391 the house of Este governed M. and its dependencies until 1859. Francis V. was driven out by his subjects in 1848, restored soon after by Aus., and obliged to fly a second time in 1859, soon after which M. by a popular vote was annexed to the kingdom of It. Pop. 58,058.

**Modes'to**, on R. R., cap. of Stanislaus co., Cal., 29 m. S. E. of Stockton, has some manufactures and considerable trade in agricultural products. Pop. 1880, 1693.

**Moso-Goths.** See UPLILA.

**Mos'fat** (ROBERT), b. at Inverkeithing, Scot., in 1795; went to S. Afr. as a missionary in 1817, and passed nearly 60 yrs. in successful labors among the Bechuanas and other barbarous tribes, into whose langs. he translated portions of the Bible and other religious books. He pub. a *Hist. of Missionary Labors in S. Afr.* The wife of Dr. Livingstone was a daughter of Mr. M. She d. Apr. 27, 1862.

**Mogul, or Great Mogul**, is a corruption of "Mongol," and is the name generally applied by Europeans to members of that Mohammedan dynasty of Mongolian descent which in the 16th century established itself in Hindostan under Baber, a descendant in a direct line from Timour or Tamerlane, and which here founded a great and powerful empire. The most remarkable of the rulers of this dynasty were Akbar (1556-1605), Jehan-Geer (1605-27), and Aurung-Zeb (1658-1707), during which period the empire comprised almost the whole of Hindostan. When the Eng. conquered India they gave the dynasty a pension, but after the rebellion of 1857, in which it was implicated, they sentenced the last G. M. to transportation to Rangoon, and put the 24 other members of the family to death.

**Mohacs**, town of S. Hungary, on the Danube, the centre of a considerable trade in cattle, grain, wine, and other agricultural products, which are shipped hence to Vienna. Pop. 12,140. It is famous as the place where 2 of the most momentous battles in Hungarian hist. were fought (Aug. 29, 1526, and Aug. 12, 1687). In the former, Louis II. attacked a Turkish army under Solymán the Magnificent. The Hungarian army was cut to pieces, the king drowned, and a large portion of the country fell into the hands of the Turks. In the latter battle Charles of Lorraine completely defeated the Turks and ended their dominion in Hungary.

**Mo'hair**, the wool of the Angora goat and the fabrics which are woven from it. This kind of goods, formerly made only in the E. in a small way, and imported sparingly into Europe by way of Venice, is of late yrs. extensively produced in G. Brit. and other parts of Europe, and much less extensively in the U. S.

**Mohammed, or Mahomet**, the founder of the Mohammedan creed, b. at Mecca April 30, 571. The tribe to which he belonged, the Koreish, was one of the most distinguished Ar. tribes. But his family, Hashem, was poor. His father, Abdallah, d. before he was born, and he lost his mother, Amena, when he was 6 yrs. old. Adopted by his uncle, Abu Taleb, he made a journey with him to Syria. With another uncle, Zubeir, he afterward travelled much in N. Ar. for mercantile purposes. In his 20th yr. he served

in the war against the Beni Kinanah. In his 25th yr. he was a shepherd on the pasture-fields in the vicinity of Mecca. At this time he received some employment from a linen-trader named Saib, and having been recommended as a smart and trustworthy man to a rich widow, Kadijah, he undertook the management of her business. She liked him so well that she married him, though she was 15 yrs. older than he; and M. now (595) devoted himself to religious meditations. From the 35th yr. of his age he often retired to a cave in Mt. Hara, near Mecca, and here he spent hours and days in solitary contemplations. In his 40th yr. he received the first revelation concerning the new truth, but afterward such revelations, accompanied by epileptic fits and spasmodic convulsions, continued to occur throughout his life; from them originated the Koran. He began to preach in 609, and entered upon his public ministry in 612. His first believers were his wife, Kadijah, some relatives and friends, among whom were Abubekr and Ali, but their number was small; and when he proclaimed himself publicly in Mecca as a prophet, he met with violent opposition. Of great importance was the conversion of a number of pilgrims from Medina, who carried the new faith back to their native town, where they preached it with decided success. Nevertheless, his position in Mecca was still very dangerous. Kadijah d. Oct. 23, 619, but he soon after married several other wives. The famous Hedjrah, or flight from Mecca to Medina (620 m. N.), occurred Sept. 20, 622, from which date the Mohammedan era begins. He now built a mosque, instituted religious rites, consolidated the congregation, and determined to propagate the new faith, not by preaching, but by fighting. In a contest with the Meccans at Badr in 623 he was victorious, and although he met with a heavy reverse at Ohod in 624, and was even besieged in Medina in 627, yet he made a favorable peace with the Meccans in the following yr. Meanwhile he had opened connections with different foreign courts—Abyssinia, Byzantium, and Per. The results of these missions and some campaigns which ensued were small, but when the Meccans broke the peace during a war between the prophet and Abyssinia, he conquered the city; and this event furthered more than any other the conversion of all the Ar. tribes and their consolidation into one people. In 632 he undertook his last great pilgrimage to Mecca at the head of 40,000 disciples, shortly after which he d. at Medina, June 8, 632.

CLEMENS PETERSEN.

**Mohammed**, the name of 4 Ottoman sultans: MOHAMMED I. (1413-21), b. in 1387, the youngest son of Bajazet I. When his father d., one yr. after the battle of Angora (1402), and Tamerlane retired behind the Oxus, the Ottoman empire was divided between the 4 sons of Bajazet, but M. put to death his 3 brothers, and became sole ruler in 1413. His reign was filled with wars against the Venetians, Bedreddin the Reformer, Mustapha the Pretender, Per., etc., but he showed great nobleness toward his allies and toward rebels. He built the mosque of Adrianople.—MOHAMMED II. (1451-81), b. at Adrianople in 1430, the son and successor of Amurath II., was valiant, sagacious, equally able in the camp and the council. On May 29, 1453, he took Constantinople by storm, and gave it up to plunder and massacre for three days. The city recovered very soon; he rebuilt it, made it his cap., and induced the Grs., in whose hands were the commerce and industry of the place, to return by proclaiming religious freedom. He conquered Serbia and Bosnia in 1458, Morea in 1460, Trebizond in 1461, Albania in 1467. In 1474 he took Caffa and Tana from the Genoese; in 1480 Negropont and Lemnos from Venice, and the Ionian Islands from Naples. D. in a campaign against Per. He conquered in all 12 independent empires and 200 cities.—MOHAMMED III. (1595-1603), b. in 1556, the son and successor of Amurath III.; conquered Erlan Sept. 21, 1596, and defeated the Grs. and Hungarians in the battle on the plains of Keresztes, Oct. 23 same yr. Under him the signs of decadence of the Tur. power began to show themselves.—MOHAMMED IV. (1648-87), b. in 1642, the son and successor of Ibrahim I., who was strangled by the Janizaries. Defeated at Chotyn in 1673, routed completely by Sobieski before the walls of Vienna (Sept. 12, 1683), beaten at Mohacs (Aug. 13, 1687), the army marched to Constantinople, deposed M., and raised his brother, Solymán III., to the throne. M. was kept in prison till his death in 1692.

**Mohammedanism.** See KORAN and MOHAMMED.

**Molra**, EARL OF. See RAWDON (LORD FRANCIS).

**Molre Antique**, mō'ar an-ték' [Fr. *moire* is the Eng. *mohair*], a name given to the best kinds of watered silk. Broad silks of good quality are first dampened, then carefully and smoothly folded, and lastly submitted to great pressure. On drying, the curious lines called watering appear in the fabric.

**Molas'es**

[Lat. *mellaceus*, from *mel*, "honey"], or **Treacle**, a thick, dark-colored syrup, produced during the manufacture of sugar, and consisting essentially of uncrystallizable sugar, water, coloring-matter, and various impurities. It is in part the product of sugar-plantations, known as W. I. and New Orleans molasses, and in part comes from sugar-refineries.

**Moldavia.** See ROMANIA.

**Mole** [Dut. *mol*], a name applied primarily to small insectivorous mammals of Europe (*Talpa Europea* and *T. occidentalis*), distinguished by their cylindrical or barrel-shaped body, little-defined neck, broad, flattened fore feet, and adaptation for digging and subterranean life. It is therefore popularly bestowed on (1) all the various species of Talpine Talpidæ, found in different parts of the N. hemisphere; (2) to the species of Chrysochloridæ or "golden moles" of Afr.; and (3) to certain rodents adapted for subterranean life; e. g. the "sand-moles" and "mole rats" of the family Muridæ.

**Mole-Cricket**, a name given to the burrowing crickets, and primarily to those of the genus *Gryllotalpa*. In the U. S. they are most common in the S. They are more common in wet ground, and some species are very destructive to crops.

**Molecule.** See CHEMISTRY.



**Mole-Rat**, a name given to certain remarkable rodents of the family Muridae, but differing from all other rats in their mole-like habits and appearance, and in their rudimentary eyes. They feed on the roots of plants, and inhabit Asia and Afr.

**Moleschott**, mo'les-skot (JACON), b. at Herzogenbusch, Hol., Aug. 9, 1822; studied med. at Heidelberg; began to practice at Utrecht; lectured on physiology at Heidelberg from 1847 to 1854, but was considered to endanger religion and morals by his views of the absolute relation between the lowest material conditions and the highest spiritual manifestations of human life; professor at Zurich in 1856; removed in 1861 to Turin. Wrote *Physiologie der Nahrungsmittel, Lehre der Nahrungsmittel, Ursache und Wirkung in der Lehre vom Leben*, etc.

**Molesworth** (Sir WILLIAM, BAERT), b. at Camberwell, a suburb of Lond., Eng., May 23, 1810; succeeded to the baronetcy in 1823; studied at the Univ. of Cambridge, but was obliged to leave on account of having challenged a tutor to fight a duel; finished his education at Edinburgh Univ. and in Ger.; travelled through Europe; became in 1831 an enthusiastic advocate of reform measures; was elected to Parl. for E. Cornwall Dec. 1832; was an intimate friend of Bentham and James Mill, of whose opinions he was a leading exponent in Parl.; founded the *Lond. Review* in 1835, which he merged in the *Westminster Review* in 1836. In 1853 he became first com. of public works in the cabinet of the earl of Aberdeen, and in 1855 sec. of state for the colonies in Lord Palmerston's first cabinet. D. Oct. 22, 1855.

**Molière**, mo-le-air' (JEAN BAPTISTE POQUELIN), b. in Paris Jan. 15, 1622, was ed. in the coll. at Clermont, and after finishing his coll. course (1642) he studied law for a couple of yrs. But he suddenly gave up his profession, left Paris (1645), assumed the name of Molière, and strolled around in the provs. for 12 yrs.—first as an actor, then also as an author, and at last even as a manager. In 1653 he brought his first original comedy, *L'Étourdi*, on the stage in Lyons. In 1657 he represented another original play, *Le Dépit amoureux*, in Nantes, and in 1658 he reached the goal of his exertions, to play in Paris for the court and the king. His troop received the title of "troupe de Monsieur." Next yr. he brought on the stage *Les Précieuses ridicules*. It was not only a success, but a victory. In 1661 M.'s troop removed, under the name of "troupe du roi," to the Palais Royal, and thus the foundation was laid of the Théâtre Français. In *Les Précieuses ridicules* he attacked the finery and pedantry of the Hôtel Rambouillet, the most solidly established and most generally acknowledged literary power of the time; and he repeated the attack with *Les Femmes savantes* (1671). In *Le Médecin malgré lui* and *Le Malade imaginaire* (1674) he attacked the phys. of his time. In *Tartuffe* (1667) he touched the most dangerous point in contemporary life in Fr.—viz. religious hypocrisy. *Tartuffe* is one of his greatest creations, and the hypocrites smarted under the blows it dealt. Of course such a man must have many enemies, and more than once the king himself, Louis XIV., had to support him against the chicaneries of his foes. And to the troubles of his public life were added domestic calamities. In 1661 he had married Armande Béjart, a younger sister of his former mistress. Armande proved a coquette, and M. was jealous. He suffered horribly. There is in *Le Misanthrope* a passion which excites the deepest sympathy. D. Feb. 17, 1673.

**Molina**, mo-lee'nah (LUIS), b. at Cuenca, in New Castile, in 1535; entered the order of the Jesuits in 1553; was prof. of theol. at the Univ. of Evora, Port., for 20 yrs., and d. at Madrid Oct. 12, 1601. In 1588 he pub. his *Liberi Arbitrii cum Gratia Donis, Divina Præscientia, Providentia, Prædestinatione et Reprobatione Concordia*, which attempted to harmonize the views of Augustine concerning grace with the Semi-Pelagian ideas of free-will. The Dominicans attacked the book with fury, and the Jesuits defended it. A contest between the Thomists and Molinists ensued, and grew very hot. The pope was asked to interfere, but he transferred the whole question to an assembly of cardinals, the celebrated *Congregatio de Auxiliis*, and forbade all controversy till the Congregatio had made its decision. This decision never came, but the question arose again in the strife between the Jansenists and the Jesuits, and still remains unsettled in the R. Cath. Ch.

**Molina** (PEDRO), b. in Guatemala in 1777; became a phys., poet, and politician; was noted for the liberality of his political views; was one of the members of the first national executive in 1823; went as ambassador to Colombia 1825, and signed a treaty of alliance; represented Central Amer. in the Cong. of Panama 1826; was gov. of Guatemala 1829, sec. of state for foreign affairs 1832-33; was exiled by Carrera, and resided some yrs. in Costa Rica; was deputy to the constitutional assembly 1848, and for many yrs. pres. of the med. faculty and chief director of the Univ. of Guatemala. D. about 1850.

**Moline**, mo-leen', city and R. R. centre, Rock Island co., Ill., on the E. bank of the Miss. River, 350 m. below St. Paul; has fine water-power. Pop. 1870, 4166; 1880, 7800.

**Molinism**, the theory proposed by Luis Molina (1588), and designed to harmonize the doctrine of predestination with that of human responsibility.

**Molino del Rey**, mo-lee'no del rã, a series of buildings  $\frac{1}{2}$  m. N. of the castle of Chapultepec, near the city of Mex., originally a flour-mill, afterward a foundry of arms, and occupied as a fortress by a portion of the Mex. army, was carried by storm, Sept. 8, 1847, by Gen. Winfield Scott.

**Mollinos**, mo-lee'nõs (MIGUEL), b. near Saragossa in 1627; studied at Pamplona and Coimbra, and settled, after being ordained priest, at Rome, where a great number of people chose him for their confessor. In 1675 he pub. his *Guido Spirituale*. It teaches that true godliness consists in uninterrupted communion with God, established by contemplation, and was the foundation of the so called Quietism. The Jesuits found that this view endangered the doc-

trine of good actions. Pope Innocent XI. condemned the book in 1687; M. recanted, and was imprisoned for the rest of his life in a Dominican monastery of Rome, where he d. Dec. 29, 1696.

**Mollusca**. See CONCHOLOGY.

**Moloch**, mo'lok, or **Molech** [Heb. מֹלֶךְ, "the king"], called also **Mileom** (1 Kings xi. 5) and **Malcham** (Zeph. i. 5), the fire-god of the Phœnicians (a modification or hypostasis of Baal, the sun-god), but spoken of in Script. as more especially "the abomination of the Ammonites." That children were sacrificed to this deity is not to be questioned, although "passing through the fire to Molech" may not always mean so much. Diodorus Siculus (xx. 14) describes a brazen image used among Carthaginians in sacrificing children to Cronus or Saturn.



**Moloch Horridus**, one of the most hideous of existing animals, a lizard of Australia, is completely covered with sharp spines and has large horn-like spines over the eyes. It is of a pale yellow, spotted with black, brown, and red. It belongs to the family Agamidae, and is of moderate size.

**Moltke**, molt'keh, von (HELMUTH CARL BERNHARD), COUNT, b. Oct. 26, 1800, at Parchim, in Mecklenburg, and ed. at the military acad. of Copenhagen; entered the Prus. service in 1822, and was appointed a member of the staff in 1822. He devoted himself with great energy to the scientific part of his office, and pub. in 1835 a work on the Russo-Rus. war of 1828-29. This war led M. to make a journey to Tur. in 1835. The sultan, Mahmood, procured for him a furlough of several yrs., during which time he aided the sultan by his advice, both in the reorganization of the Tur. army and in the improvement of the fortifications of Silistria, Shoomla, Varna, Roostchuk, and the Dardanelles; accompanied the Tur. army in the campaigns against the Koords and against Mehemet Ali, viceroy of Egypt; returned home and pub. in 1841 *Briefe über Zustände und Begebenheiten in der Türkei aus den Jahren 1835-39*, and a map of Constantinople and the Bosphorus. In 1846 he was appointed adjutant to Prince Henry of Prus., who lived in Rome, and the fruit of his residence in this city was a map of its surroundings. In 1847 he was attached to the gov. gen. on the Rhine, and became chief of a division of the staff in 1848, chief of the staff of the fourth army corps from 1849 to 1855, adjutant to Prince Friedrich Wilhelm in 1856, and chief of the staff of the whole army in 1858. In this position he has made his name immortal as a gen. In 1866 and 1870-71 the king led as commander-in-chief, and gave absolute authority to M.'s dispositions. On a minor field, in 1864 against Den., Prince Friedrich Karl having received the command in Apr., M. led the army for the first time in war, having drawn up beforehand the plan of the whole campaign. In 1866, in the war against Aus. and her allies, he entered a larger theatre. In June 1866 he was made a gen. of inf., and after the short campaign was finished the king gave him the highest Prus. order, that of the Black Eagle, and the Diet voted him a dotation. He was elected a deputy to the N. Ger. Diet in the next yr. Anticipating the Fr. attack, he planned a campaign against Fr. immediately after the Aus. war, which plan was laid before the king in 1868, and followed out in 1870. On the day of the capitulation of Metz the king created him a count; on the conclusion of the armistice he gave him one of the 5 grand crosses of the Iron Cross, and on the day of the return of the troops to Berlin he made him a field-marshal. He also received a dotation of 300,000 thalers, and the freedom of many cities was presented to him. Wrote *Der Italienische Feldzug von 1859, Ueber den Krieg vom Sommer 1866, und Deutsch-französische Krieg, 1870-71*. [From orig. art. in *J.'s Univ. Cyc.*, by AUGUST NIEMANN.]

**Moluccas**, or **Spice Islands**, are a group of islands of the Malay Archipelago, lying between Celebes and Papua, between lat. 3° S. and 6° N., and between lon. 126° and 135° E. They are all of volcanic origin, high, mountainous, and exceedingly fertile. The forests contain teak, ebony, sandal, iron, and satin wood, beside palms, bread-fruit trees, and many varieties of the finest fruit trees. Rice, sage, cotton, indigo, coffee, and sugar are grown; the Dut. have confined the cultivation of the clove to Amboyna and the Uliassers, and that of the nutmeg to the Banda Islands. The original inhabs. were Malays; Arabs, Hindoos, and many Chl. have since settled there, and one of the most prominent features of the pop. are the mestizoes, descendants of Europeans and natives. On the islands directly governed by the Dut. the inhabs. are Chrs.; the inhabs. of the islands which are only indirectly governed are Mohammedans, and are generally pirates. The N. division of the archipelago, comprising the islands of Ternate, Tidore, Batjan, Makian, Motir, and the Obi group, and forming the residency of Ternate, which contains 95,142 inhabs., is indirectly under Dut. govt., while the S. division, comprising Amboyna, the Banda Islands, and the Uliassers, and forming the 2 residencies of Amboyna and Banda, which together contain 296,737 inhabs., are governed directly.

**Moly** [Gr. μόλυβδος], a fabulous herb, a sovereign remedy for all diseases, which Mercury gave Ulysses as a countercharm against Circe. The anc. identified it with a species of garlic. The *Allium M.* is a showy plant, cultivated under the name of golden garlic for ornament.

**Molybdenite**, the natural sulphide, a mineral crystallizing in the hexagonal system, with eminent cleavage, and occurring commonly foliated or in highly flexible inelastic scales. In its crystallization, hardness, lead-gray color, and metallic lustre it much resembles graphite, but is distinguished from that mineral by its streak, which is lead-gray,



its specific gravity, and by emitting sulphurous fumes before the blowpipe. It is met with in gneissoid, granitic, and other crystalline rocks.

**Molybdenum** [Gr. μόλιβδος and μόλυβδος, "lead"], an elementary metal, occurring in a well known mineral which is so extremely similar to graphite or "black lead" that it was first discovered in 1778 by Scheele to yield the peculiar oxide known as *molybdic acid*. A few yrs. later, in 1782, Hjelms isolated its metal. *Molybdic acid* occurs native, as *molybdite* or *molybdic ochre*, of which there are several Amer. localities. Of the native sulphide, *molybdenite*, there are quite a number of localities on this continent. It is only distinguishable from graphite by a very practised eye, but on white glazed earthenware it gives a *greenish* trace, easily distinguishable from that of black lead. Its laminae are much more flexible and infrangible than those of graphite. On heating in an open glass tube beautiful crystals of *molybdic acid* sublime. The metal is not too well known. It is easily reduced from its oxide, even by hydrogen gas, but is fusible with difficulty. Debray fused it, and describes it as white, with silver-like lustre, very hard (almost equal in this respect to topaz), and of density = 8.6. It is unacted on by the air at normal temperatures, but when heated sufficiently burns to *molybdic acid*. Concentrated acids act upon it; diluted ones not readily or not at all. Its most important compound, practically, is the compound of *molybdic acid* with ammonia, used in chemical analysis for the detection and determination of phosphoric acid.

**Möniers**, mun'e-ers [Fr. "mummers"], the cant name given in 1818 to a body of evangelical Prot. of Switz. and the adjoining parts of Fr. and Ger., whose distinguishing characteristic was the fervency of their religious exercises. The M. accused the national Ch. of Switz. of apostasy from Calvinism, especially in denying the divinity of Christ. They were subjected to repressive measures, and returned to the orthodox communion. The most distinguished of the M. was Rev. Caesar Malan.

**Momm'sen** (THEODOR), b. at Garding, Schleswig, Nov. 30, 1817; studied law and philology at Kiel; travelled 1844-47 in Fr. and It.; was appointed prof. of Rom. law at Leipzig in 1848, at Zurich in 1852, at Breslau in 1854, and at Berlin in 1858. His *Östliche Studien. Die unteritalienischen Dialekte, Corpus Inscriptionum Neapolitanarum. Geschichte des Römischen Münzwesens, Corpus Inscriptionum Latinarum*, etc. opened new roads for the study of the anc. It. lang. and hist.; and his *Römische Geschichte* is one of the most original productions of modern historical art.

**Momus**, in Gr. mythology, was a son of Night, and the personification of mockery and censure. Aphrodite was the only being whom he found blameless.

**Monachism**, mon'a-kizm [Gr. μόνος, "alone"], a life of religious seclusion, asceticism, and devotion. Traces of such a life appear in remote antiquity—among the Hindus about 1400; in Buddhism, which rose about 600 b. c.; in the time of Darius and Alexander in the Gymnosophists or naked and solitary devotees; among the Hebs. and among the Grs. (the Pythagoreans), about 500 b. c. Chr. M. differs from its Brahmanic prototypes in that, while the latter were developed from the dogma of an eternal dualism and conflict of good and evil, the former roots in the idea of an eternal divine monarchy, and the apostasy but final subjugation and recovery to it of lapsed souls. It regards a solitary, ascetic, and contemplative life as a means to this result, by liberating the soul from the dominion of sense and exalting it to the realms of pure truth and communion with Deity. The idea of expiation has also been engrafted upon it. Chr. monasticism in its development embraced 4 stages—the ascetic, the anchoritic, the cenobitic or conventual, and the confederation of monasteries in orders or congregations. Tendencies to a monastic asceticism appear in the apostolic age. An ascetic life, at first purely voluntary, came to be regarded by the middle of the 2d century as a superior morality and merit, for the attainment of which men gave up their property and addicted themselves to self-denial and mortifications of the flesh, but without vows and within the chs. Subsequently asceticism developed into anchoritism or the eremitic life. Men sought the desert first as a refuge from the persecutions of the Empire, afterward in flight from the blandishments of the world. About the middle of the 3d century Egypt especially became the theatre of the anchorite life.

In 325 Pachomius established on Tabennæ, an island in the Upper Nile, a society of monks, organized into priories and convents, under the superintendency of abbots (fathers), with common regulations for spiritual exercises, but with no vows. Similar communities of women (nunneries) were organized about the same time by the sister of Pachomius. Other similar insts. soon grew up around the establishments at Tabennæ, numbering, in 348, 50,000 monks. Soon the inst. spread through the E. Monasteries were founded in Syria, in Mesopotamia, in Armenia, in Cappadocia and Pontus. Monastic institutes spread along the coasts, cliffs, and isles of the E. Mediterranean to It. and W. Europe. M. was first brought to Rome by Athanasius in his flight from the persecutions of the E. empire, and was stimulated there especially by the panegyrics and example of Jerome and Ambrose, and by Augustine in Africa and Martin of Tours in Gaul. In time monastic establishments, at first isolated and independent, combined into larger communities, having a common rule and a common head. These confederacies were termed orders, and appear most fully organized and powerful in the W. in the mediæval period under the govt. of congregations and chapters.

As regards the relations of M. to the hierarchy, at first as a lay inst., it presented an anomaly for which no provision had been made in the hierarchical system, and was regarded with solicitude because of its great influence with the multitude. Soon the hierarchy converted it into an instrument for strengthening its own power. Monasteries were first brought under episcopal control, and the monks became a

standing army or force of minute-men for the bps. From early times (about 400) monasteries became training-schools for the clergy and nurseries for missions. Selections were made from them for papal coms. and legates and for ecclesiastical preferments. The main body of the clergy became monks. Superior sanctity was attached to the regular compared with the secular orders, and to a great extent monks became the preachers and confessors of Chr. nations.

With the fall of the Rom. empire in the W. the monasteries almost perished in the migration and confusion of nations. They were reorganized and restored to a superior system and unity of govt. and discipline by Benedict of Nursia, whose order, the Benedictine, ruled the W. for centuries, and who is regarded as the organizer of mediæval M. He founded (529) the cloister of Monte Casino. Affiliated convents were diffused through S. and Central Europe from the 6th to the 9th century. They extended also their establishments to Brit. and Ire., and amid the Slavonian and Scandinavian tribes. But in the troublous times toward the close of the Merovingian rule, decay of discipline, with luxury, idleness, and corruption, entered the monasteries. The court meantime bestowed the offices and revenues of monasteries on its favorites, not only among the clergy, but among the nobles and military chiefs, and often on the wives and mistresses of monarchs. The convents were often occupied as residences by the families of lay abbots, and often used as rendezvous for banquets, hunts, and military games. Charlemagne attempted to correct these abuses and restore discipline, and to connect schools and literary enterprises with conventual life. Under the commission of William, duke of Aquitaine, Berno, a Burgundian count, founded (910) the monastery of Cluny, under the immediate supervision of the pope. In imitation of Cluny a large number (1000) of monasteries were reformed or newly organized, and formed themselves into a confederation, with Cluny as its head. The congregation of the Cistercians, founded at or near Dijon in 1098, rivalled that of Cluny, differing from it in simplicity of ritual and in submission to episcopal jurisdiction. Celebrated and powerful in It. was the Camaldole order, founded in 1018, and the Vallombrosan, established in 1088. Various other orders originated in the 11th and 12th centuries, as the Carthusians and the Carmelites.

The Franciscans originated from Francis of Assisi (b. 1182), who went forth, after the example of the apostles, without scrip or purse, preaching the gospel to the multitudes, subsisting upon alms, and drawing with him a band of enthusiastic youth as followers. His order was sanctioned by Honorius III. (1223), with the right of preaching and the care of souls in any dist. or country. The order of the Dominicans was founded by Dominic Guzman (b. 1170), a Castilian of high family, whose zeal was especially aroused for the conversion of heretics, and led him to the S. of Fr. (1208) to preach to the Albigensians. His order, like that of the Franciscans, was empowered to preach and hear confessions everywhere; in 1220 it adopted the rule of St. Francis, and became a mendicant preaching fraternity, differing from the Franciscans in superior literary and theologic culture, which was pursued by them with an especial view to the confutation of heretics. The Augustine order, founded 1256, also subsequently rose to importance, and was distinguished for eminent names, especially for that of the great Reformer. Especially to be noted also are the military orders, which appeared in the times of the Crusades in the 11th and 12th centuries—spiritual knights who added to monastic vows that of perpetual war with the infidel. Various other orders, representing various types of religious sentiment, temperament, and enterprise, sprang up in the latter part of the Middle and the earlier of Modern Ages. Especially to be noted among these is that one which has been the most potent arm of the papacy in its conflict with Protestantism during the last 3 centuries—the order of the Jesuits. In relation to the Ref. of the 16th century, from the monasteries came some of its earliest heralds and some of its most effective leaders, as Luther and Bucer. But the monastic orders, true to the genius of their system, soon presented the most hostile and effective resistance to it. But the rise of great Prot. powers in Europe greatly diminished their numbers, wealth, and influence. The tendency to liberalism in European thought in the age preceding the Fr. Revolution was disastrous to M. in Catholic countries. It was regarded as hostile to the progress of ideas, and as adverse to economical interests, because discouraging marriage, withdrawing multitudes from productive vocations, and holding vast properties in a dead hand.

M. at present subsists with little of its former importance. Amid a world no longer presenting the conditions that gave it its birth, it is no longer the *potent factor* of former times in hist. and civilization, while its work in hospitals, schools, and asylums is brought into competition with insts. which gen. society, now more enlightened, more scientific, more humane, and more free, is erecting for itself. [From orig. art. in *J.'s Univ. Cyc.*, by T. M. Post, D. D.]

**Mon'aco**, a small city, with 2863 inhabs., situated on a promontory in the Gulf of Genoa, forms, together with a surrounding terr. comprising an area of 6 sq. m., with 7049 inhabs., an independent principality of Europe. It is a legalized gambling-place, and has lately acquired reputation as a watering-place and a resort for consumptives.

**Monad** [Gr. μονάς, *évás*] does not seem to have been used with any technical philosophical meaning by the anc. It obtained such first in the writings of Giordano Bruno (1548-1600), who used it to designate the primal elements of all existence, spiritual as well as material. The M., which are minute spheres, contain the potency of all the forms of life. It was probably the doctrine of Giordano Bruno that gave Leibnitz the fundamental thought of his *Monadology*. The profundity of the *Monadology* has seldom been recognized. Kant suggested, in his *Critique of Pure Reason*, a doctrine somewhat similar. At the present day Hermann



Lotze (*Medicinische Psychologie*) propounds a doctrine of spiritual M. or simple unextended beings, each of which is a modification of the Absolute.

**Monarchy**, mon'ar-ke [*Fr. monarchie*; *It. monarchia*; *Sp. monarquía*—from *Gr. monárchos*, from *mónos*, "alone," and *archē*, "to rule"], gov't. of a state by one chief only. The word in its original sense can hardly be applied to the constitutional sovereignties of the present day. The govts. of Eng. and others resembling it are therefore called "limited" or "mixed" M., and thus distinguished from those to which the term *absolute* is given. Absolute M., which as the world advances toward freedom are becoming rarer, are now found in perfection only in the E.

**Monastery**. See MONACHISM.

**Monasticism**. See MONACHISM.

**Monck**, munk (CHARLES STANLEY), fourth viscount, G. C. M. G., b. at Templemore, Ire., Oct. 10, 1819, ed. at Dublin Univ., and called to the bar in 1841; succeeded his father in 1849; entered the House of Commons 1852; was a lord of the treas. 1855-57; was gov.-gen. of Canada 1861-68; became a baron in the House of Lords 1866; became in 1867 a com. of the Irish Ch. temporalities. During his service in Canada the Dominion was established.

**Monck'ton** (ROBERT), a son of the Viscount Galway; entered the Brit. army in 1742; served with distinction in Flanders; also at Dettingen, Louisburg, C. B. (1758), Que. (1759), where he was second in command and badly wounded; was lieut.-gov. of N. S. 1756, gov. of N. Y. 1762; captured Martinique 1762; became lieut.-gen. 1770; served afterward in G. Brit., sat in Parl., and d. May 3, 1782.

**Monday** [Ger. *Montag*; *Fr. Lundi*—signifying "moon-day"], the second day of the week. Dion Cassius (xxxviii. 18), who wrote about 220 A. D., says that "the practice of referring the days of the week to the 7 planets began among the Egyptians," and had been but recently adopted by the Rom. world.

**Mondovì**, mon-do-vee' [*Monsvici*, *Monsregalis*, *Vicedunum*], town of N. It., in the prov. of Cuneo, about 42 m. S. of Turin and 1600 ft. above the sea-level. It is surrounded by anc. walls, with a citadel on the S. side, and the torrent of Ellero flows by it on the W. The episcopal palace, the cathedral, and other chs. are of interest. About 2 m. from M. is the great sanctuary of the Madonna di Vico. M. is not very old, and its mediæval hist. resembles that of other Piedmontese towns. In 1796 occurred the battle of M., in which Bonaparte defeated the Piedmontese army, and thus prepared the conquest of all Upper It. In 1799, the inhabs. of M. having revolted against the Fr., the town was sacked by them. Pop. 16,543.

**Money**, mun'ne, a standard by which wealth is measured, and an instrument by which one kind of wealth can be exchanged for another. It differs from wealth, in that while wealth is any object of common desire which costs labor, M. is that kind of wealth by which it has been agreed that the value of wealth shall be estimated, and for which all other kinds of wealth can be exchanged. Its 2 qualities are that it is a standard of value and an instrument of exchange. M. differs also from currency. While currency is anything with which commodities can be bought and debts canceled, it does not always have an intrinsic value, but may be, as in the case of bank-bills or gov't. notes, merely a voucher or representative of value, in which case it is not M. M. is that kind of currency which has an intrinsic value, and which thus, if not used as currency, would still be wealth. M. also differs from capital. Capital is that portion of wealth set aside and used for the reproduction of wealth. It may have been M., but the M. ceases to be such when it becomes capital.

In order that M. may be a standard of value as well as an instrument of exchange, its own value must be invariably a condition to which gold and silver better conform than any other commodity, but in which any currency not convertible into these necessarily fails. When bank-notes or gov't. notes become currency without a corresponding basis of M., nothing has ever been able to prevent their fluctuation in value and the consequent effect upon all other values. A poor currency inevitably causes a good one to disappear whenever put by its side. Inconvertible paper will always drive out gold and silver from circulation when brought into competition with these. The paper, being cheaper, will of course be used in preference to the dearer commodity, and gold and silver coin not only cease to circulate, but leave the country where the inconvertible paper abounds. In such a case nothing can bring the gold and silver back and put them into circulation again except the removal of the currency which has driven them out. When the poorer currency is withdrawn, that which is better flows back as naturally as the air rushes into a vacuum, while any other attempt to restore specie payments where they have been discontinued is as futile as the effort to put two mutually repellent bodies into the same place at the same time. (See COINAGE.) J. H. SEELYE.

**Mongolia**, mon-go'le-a. [the land of the *Mongol* or *Moghols*, for the name is spelled variously even by the native pop.], is still a vast dist. in Central Asia, extending fully 1000 m. E. and W., and in some parts as much as 600 m. from N. to S. Its present boundaries E. and N. are Manchouria and Siberia, and on the S. and W. Thibet and Toorkistan. The whole of what is now usually recognized as M. is considered to belong to the Chi. empire. A large portion of M. is occupied by the Great Gobi Desert, a tract as hopelessly desolate and sterile as can be found on the face of the earth. The Alashan country to the S. is mountainous and well wooded. On the W. side the great river Hoang-Ho runs for nearly 400 m., and some peaks, beyond where the Hoang-Ho forces its way eastward, are covered with perpetual snow, and are probably not less than 10,000 to 12,000 ft. high. These mts. bear the name of Inchin or Kinghan. Beyond this range, to the N. E., M. and Manchouria, with pops. almost identical, extend to the shores of the Yellow Sea; and

though some attempts have been made at cultivation, the interior is still for the most part wild and desolate. To the N. and N. W. chains of high mts. separate M. from Siberia, the range of Altai being the most famous. This, which is the richest portion of M., is chiefly in the hands of the Buddhist priesthood, the high priest himself residing at Ourga. This place is the seat of a special Chi. Mantchoo gov., with a supreme court of justice, and serves as a prin. depot for the trade passing into Siberia at Kiakhta. Though better watered than other parts of M., and the source of some considerable rivers, such as the Amoor and the Orkhon (which flows into the Siberian lake Baikal), the intense winter cold renders the rearing of vegetables almost impossible. The Mongolians are, as they have ever been, essentially nomadic. Their 2 largest branches are the E. or Mongols proper, and the W., who are usually called Kalmuks. Their military service extends from the age of 16 to 60; and the Chi. tribunal of foreign affairs, with 1 civil and 2 military govts., is the ultimate seat of appeal. A considerable trade passes through M. to Chi. on the one side and Rus. on the other, with frontier marts at Kiakhta in Siberia and Maimaitchin in M. The caravans perform their journeys between Oct. and the end of the winter, bringing furs, woollen stuffs, and leather from the W., and conveying thither teas, silks, cotton, rhubarb, and sugar-candy. The Mongolians belong to the great group now often called Turanian, and are thus allied to the Chi., Thibetans, and the Japanese, and more remotely to the Esquimaux, Samoyedes, Lapps, Turks, and Magyars. In anc. history we find their ancestors under the generic title of Scythians or Cimmerians; in later times they appear as the Huns, and still later as the warriors of Genghis Khan and Timour. Not long afterward the Kalkhas, under their khan, Kublai, conquered all Chi. and held the chief power there for about a century. Lastly, in the yr. 1519, Baber, a lineal descendant of Timour, founded by conquest a monarchy in Hindostan popularly called the "Mogul" dynasty. To the invasion of W. Asia by the Mongolian tribes we owe the establishment of many dynasties which became notable in hist., owing to their conflict with the Franks during the Crusades. Among the dynasties which owe their origin to the Mongolian conquests may be mentioned that of the Moguls of Per. and Syria (A. D. 1157-1355); the Kara-koumbu (Toorkomans of the Black Sheep), (A. D. 1357-1496); those of the White Sheep (A. D. 1406-1502); and the khans of Kapchak, of the Crimea, and of Kasan, with the Oozbeks of Bokhara, Samarcand, and Balkh. In Egypt we find Thoulonides and Ikshidites, and the powerful kingdom of the Mamelukes; in S. Central Asia, the Samanians and Bouides, and the earlier Ghaznavides of Ghazna. Then comes the great dynasty of the Seljooks, first in Per. from A. D. 1029-1194, and then at Iconium, Aleppo, and Damascus from A. D. 1081 to 1154. Lastly, we may name the important dynasties of the Ortokides of Syria (A. D. 1082-1220), of the Atabeks of Syria and Per. (1084-1250), who numbered among their greatest leaders the famous Salah-ed-din (Saladin). [From orig. art. in *J.'s Univ. Cyc.*, by W. S. W. VAUX, F. R. S.]

**Mon'tor** [so called because it was believed to give warning of the approach of the crocodile], a genus of large Old-World lizards, some of which approach the size of the alligators. *M. niloticus*, the M. of the Nile, is the typical species. It devours a large part of the eggs of the crocodile. It is some 6 ft. long. The *M. dracena* of India and *M. Gouldii* of Australia are also well-known M. The great lizards of the S. Amer. family Teiidae are also often called M., and closely resemble the true M.

**Monitor**, the designation of a special class of armored vessels, invented by John Ericsson, who on Sept. 23, 1854, submitted to Nap. III. the plan and specification of a nearly submerged vessel, the prin. features of which consisted of a revolving cupola of wrought iron for protecting a single gun of large calibre, inclined sides, and an overhang deck for protecting the propeller and rudder.

At the commencement of the c. war the Pres. proclaimed a blockade; and as the S. harbors were in possession of the Confeds., light-draught iron-clads became a necessity. On Oct. 4, 1861, the sec. of the navy contracted with Ericsson for the construction of "an iron-clad, shot-proof steam battery of iron and wood combined;" and the "Monitor" was launched at Greenpoint, L. I., on Jan. 30, 1862, and went to sea Mar. 6 in command of Lieut. John L. Worden, U. S. N., with a crew of 43 men and 12 officers, exclusive of Chief Engineer A. C. Stimers, who went as a volunteer. The vessel was an iron hull with wooden deck-beams and side projection; its extreme length was 172 ft.; breadth, 41 ft. 6 in.; depth of hold, 11 ft. 4 in.; draught of water 10 ft. 6 in.; displacement, 1255 tons. The turret was 9 ft. high; inside diameter, 30 ft.; thickness, 8 in. The thickness of the side-armor was 5 in.; of the deck-plating, 1 in. Diameter of propeller, 9 ft.; of the 2 steam-cylinders, 36 in.; length of stroke, 2 ft. 2 in. Armament, 2 11-in. shell-guns, each 15,668 lbs. This structure put into practical operation the invention of 1854—a sea-going raft carrying a fort.

At Norfolk, Va., the steam frigate Merrimack, of 4700 tons displacement, had been converted into a casemated iron-clad (and renamed the Virginia), with submerged ends, protected by 4 inches of iron, and armed with two 7-inch rifles, two of 6½ inches, and six 9-inch, smooth-bore shell guns. Her crew consisted of 320 men and 30 officers, and she drew 22 ft. of water. On Mar. 8, 1862, the sailing frigate Congress and the razeed frigate Cumberland were lying at anchor off Newport News, Va. The sailing frigate St. Lawrence and the steam frigates Minnesota and Roanoke (the latter with a broken shaft) were under the guns of Ft. Monroe. The construction of the Merrimack, her near completion, and her probable advent were known, and she came down Elizabeth River a little after meridian with 2 gun-boats in company.

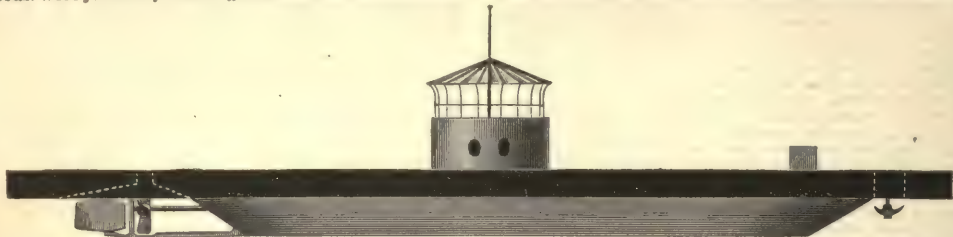
About 1 o'clock all 3 vessels opened fire upon the Congress and Cumberland, to which they replied ineffectually. It



was "full sea" at 1.56 p. m., and while the Cumberland was riding to the last of the flood the Merrimack ran into her, striking just abaft the starboard fore-chains; the blow was fatal, and the ship immediately began to sink. Lieut. Morris, her commander, fired his last broadside as the ship made her final plunge, and the living and the dying and the dead went down together, the Amer. flag flying at the peak. The Confeds. were joined by 3 more gunboats from James River,

and the Congress, having been set on fire by shells, slipped her cable, ran on shore, surrendered, and was abandoned, being on fire in several places. By 5 o'clock the battle was over. No hostile gunboat was disabled; the Merrimack had none of her plates penetrated or knocked off; only 2 of her crew were killed and 19 wounded.

When the U. squadron observed that the Confed. vessels were steering for the Congress and Cumberland, an effort



Ericsson's Monitor of 1861.

was made to go to their succor. The Minnesota was the only one adequate for offensive operations, and she steamed up for Newport News, 7 m. distant, but grounded before reaching there, and remained immovable during the battle. The Roanoke and the St. Lawrence, while being towed to the scene of the conflict, met with the same misfortune, but were relieved, and returned to their anchorage. At 9 p. m. the Monitor arrived, and was ordered to proceed immediately to the protection of the Minnesota.

Mar. 9 was a cloudless Sabbath morn. At 8 a. m. the Merrimack, supported by 3 gunboats, stood out to attack the Minnesota, which was lying aground about  $1\frac{1}{2}$  m. E. S. E. from Newport News. The M. advanced to cover the Minnesota, and when within  $\frac{1}{2}$  m. discharged both of her guns at the Merrimack, and received a broadside in return. The advantages were apparently in favor of the Merrimack. As the 2 iron-clads closed, all other combatants withdrew or were silent. The firing was not rapid on either side; the commanders fired only in close contact. In manoeuvring they were sometimes considerably apart, and once, while the vessels were thus separated, the Merrimack fired 3 shells at the Minnesota, one of which exploded the boiler of a tug alongside. The attempt to run down the M. was futile, owing to her light draught, solid deck, and overhang. The stroke of the Merrimack, hitting at an angle, simply pushed away her lighter antagonist. For more than 3 hours these mailed warriors interchanged indecisive blows, when near noon the M. hauled off. This movement laid open the Minnesota to another attack from the Merrimack, but her commander did not avail himself of it, but steamed over to Sewall's Point, passed the bar and the obstructions in Elizabeth River, and so on to the navy-yard at meridian.

The M. fired 41 solid cast-iron shot at the Merrimack, each weighing 163 lbs., with a charge of 15 lbs. of cannon-powder. She was hit 22 times without harm, except the fracture of one of the wrought-iron logs of the pilot-house. Her commander only was wounded. The Merrimack fired 46 shells at the M. and 4 at the Minnesota. The M.'s shot did not strike the Merrimack at the water-line, where the protection was only one inch of iron, but hit the sloping casemate, which was covered with 4 inches of iron in 2 plates. These were always broken by the blow, and sometimes the wooden backing was bulged, but the plates remained in their places, not having been hit twice in the same spot. The pounding given to the Merrimack during these 2 days was without precedent in the hist. of any vessel, and she was becoming leaky and shaky, beside lightening one inch for every consumption of 24 tons. She had exhausted her powers against the M., both in battering and ramming, and a wise consultation caused her withdrawal to the dry dock at Norfolk, where she remained under repairs for more than a month behind the obstructions of Elizabeth River. The M. continued in the roads, in conjunction with 3 large steamers fitted as rams, as the chief reliance in preventing the Merrimack from passing out to destroy the transportation of the Army of the Potomac, which covered the waters between Old Point and Yorktown. To this vital duty she was limited by imperative orders. [From orig. art. in *J.'s Univ. Cyc.*, by Hon. G. V. Fox.]

**Monk** (Gen. GEORGE). See ALBEMARLE, DUKE OF.

**Monkey**, *mung'ke* [generally supposed to be corrupted from the old It. *monicheo*, the diminutive of *monna*, "ape," but more likely from *monkin* or *monkin*, a "little man"], a name vaguely applied to representatives of the order Primates and sub-order Anthropoidea; generally understood to allude to the small-tailed, active species of the several families, in contradistinction to the larger species called apes and baboons; but also often used as a group-name for all representatives of the sub-order exclusive of man.

**Monks'hood**, the common name of the European acornite (*Aconitum napellus*), also called wolfsbane. This, the most important species of the genus, is a perennial herbaceous plant growing in the mountainous regions of Europe, and cultivated somewhat in our own gardens as an ornamental flower. The root is tapering or spindle-shaped, and is sometimes mistaken for horse-radish. The stem is erect, simple, rising several feet. The leaves are dark green on the upper surface, shiny, and are deeply divided. The flowers are large and of a violet-blue color. The fruit is of 8 small pods. All parts of the acornite are highly poisonous, but the root and leaves only are used in med.

**Monmouth**, mon'muth, R. R. centre, cap. of Warren co., Ill., 182 m. S. W. of Chicago, is the seat of Monmouth Coll. and Preparatory School. Deposits of bituminous coal exist. Pop. 1870, 4662; 1880, 5000.

**Monmouth** (JAMES FITZROY), DUKE OF, also duke of Buccleugh, earl of Doncaster and of Dalketh, Baron Tynedale, Ashdale, and Whitecheter, was the reputed son of Charles II. of Eng. by Lucy Walters. He took part in the Whig conspiracies of 1683, was exiled to the Low Countries, but after his father's death landed at Lyme Regis with a small force and claimed the crown; was defeated at Sedgemoor July 6, 1685, taken prisoner, and executed at Lond. July 15, 1685.

**Monmouth, Battle of**, fought (June 28, 1778) between the Amer. forces under Washington and those of the Brit. under Sir Henry Clinton. Intelligence of the treaty with Fr. recognizing Amer. independence reaching Clinton, he at once evacuated Phila. and began a retreat across N. J. to New York. The Amer. army, which had wintered at Valley Forge, immediately set out in pursuit, the advance being given to Gen. Charles Lee, whose orders were to harass the enemy and impede his march as much as possible. By the 28th the Brit. occupied the elevated land about Monmouth C. H., where, on the morning of that day, the Amer. advance became engaged with the rear of the enemy on the plain below; upon the reinforcement of the Brit. line the Amers. gave way in some confusion, and Lee now ordered a retreat. Meanwhile Washington, in ignorance of this disaster, had ordered up the main army, and peremptorily ordered Lee to rally his forces and hold his position, which he was only partially able to do, when the arrival of the left wing under Lord Stirling checked the further advance, and Greene, now coming up with the right wing, forced the enemy to retire. Preparations were made for an advance movement, but darkness put an end to the fight, and during the night Clinton silently withdrew, the intense heat securing him against pursuit.

**Monod** (FRÉDÉRIC JOËL JEAN GÉRARD), son of Jean Monod (1765-1836), a Prot. Swiss minister, long a pastor in Paris. Frédéric was b. at Monnaz, Switz., May 17, 1794, and ed. at Geneva; succeeded his father in the pastorate of the National Prot. ch. of the Oratoire, Paris, and in 1848 was, with De Gasparin, leader of the Free Evangelical secession. D. Dec. 30, 1863.

**Monogram** [Gr. *μόνος*, "single," and *γράμμα*, "character"], a figure or cipher combining all or the more prominent letters of a person's name, or the name of a place or thing. Artists, printers, publishers, and engravers, and in mediaeval times magnates have made use of M.

**Mo'no Lake**, in Mono co., Cal., E. of the Sierra Nevada. It is some 14 m. long and 8 broad, and has no outlet; its waters are intensely salt, highly alkaline, containing also borax and lime. It contains several islands, some having active fumeroles or boiling springs.

**Monomania**. See INSANITY.

**Monongahela City**, on R. R., Washington co., Pa., 21 m. S. of Pittsburg, was incorporated in 1873. Has coal-mines in its vicinity. Pop. 1870, 1078; 1880, 2904.

**Monophysites**, adherents to the doctrine of monophysitism (Gr. *one-natureism*, antithetical to diophysitism, two-natureism). I. The M. were an Oriental sect originating in the 5th century in the views of Eutyches. They held that though Christ is of two natures, which became conjoined at the incarnation, he does not subsist in two natures. There is in this sense but *one nature* after the union, though that nature involves and embraces two parts. The human is not annihilated, but is virtually lost, or virtually, though not essentially, absorbed in the divine. The Nestorians virtually argued there are two natures, therefore there must be two persons; the M. there is but one person, therefore there can be but one nature.

II. The spirit of the M. was that of their era, fierce and bloody. Only internal harmony was needed to make them very formidable. But a system which originated in extravagance and confusion of thought ran out of necessity into a number of sects.

III. The most important councils associated with the hist. of the M. are—(1) the Council of Constantinople (448-449); (2) the "Robber Synod" at Ephesus, which restored Eutyches (449); (3) the Council of Chalcedon, the 4th oecumenical (451). It decided that the two natures are united without fusion, without mutation, indivisibly and inseparably—one Christ in two natures.

IV. The struggle was violent and protracted between the parties. (1) In *Palestine* the diophysite bps. were expelled, and Theodosius was made patriarch of Jerusalem. (2) In *Egypt*, under the presbyter *Ælurus* and the deacon Mongus, the M. separated themselves. (3) In *Antioch*, Peter the Fuller attempted to introduce into the Trisagion the



formula, "Thou (God) wert crucified for us." (4) The emp. Zeno (482) put forth the *Henoticon*, which was designed to harmonize the contending parties. It used gen. expressions, avoided equally the phrases "one nature" and "two natures," condemned both Eutyches and Nestorius, and made an allusion to the Council of Chalcedon which was far from respectful. (5) Pope Felix III. (483-492) pronounced against the *Henoticon*, and excommunicated Acacius, the patriarch of Constantinople (484). This led to a suspension of communion between the W. and E. chs. for 34 yrs. (6) The emp. Anastasius I. (491-518) held fast to the *Henoticon*, with an evident leaning to the M. (7) In addition to the doctrinal interests there was a struggle between Rome and Constantinople for supremacy. Rome and orthodoxy came forth triumphant. (8) The M. were now branded as heretics both by the state and the dominant Ch. (9) The strength of the M. in Egypt was so great that they were able to find in it a refuge in the time of the terrible storm which had broken on them. The sphere of the M. was the E., where local and political jealousies intensified the disputes which arose with the Ch. of the W.

CHARLES P. KRAUTH.

**Monopoly** [Gr. *μόνος*, "alone," and *πωλείν*, to "sell"], an exclusive right to carry on some branch of trade, manufacture, or transportation. M. rules out competition, and secures to the party having this advantage a profit above the ordinary profit of business. Copyright and patent-right are forms of M., designed to give authors and inventors some reward for their brain-work, and are entirely legitimate. Sometimes a party buys up the entire supply of an article in the market, and withholds all sales until people are compelled to buy at whatever price the holder may choose to demand. This is little better than downright robbery. Nature often gives one country a M. of a particular product. Thus, Chi. and Japan have a M. of tea, our S. States of cotton, and Pa. of coal. The most mischievous M. are those which are created by special legislation, as in the charters of great moneyed corporations. The plea for such legislation is that great enterprises must be encouraged by special privileges. The mischief of it is that the creature of the state grows into a power to control it and oppress the public. Statutes granting special favors should be regarded with suspicion, and the popular mind should ever be reasonably jealous of all M.

A. L. CHAPIN.

**Monothelism** [Gr. *μόνος*, "one," and *θεός*, "God"], the doctrine or belief that there exists but one God, as distinguished from polytheism, which teaches the existence of more than one divinity. Judaism, Christianity, and Mohammedanism are the prin. monotheistic religions.

**Monothelites**, adherents of monotheism (Gr. one-will-ism), the doctrine that there is but one Will in the person of Christ; opposed to diolothelism (two-will-ism), the doctrine that each nature of Christ possesses a distinct will.

I. Monotheism is an offshoot of the monophysite influence on the ch. policy of the Byzantine court. The monophysite struggles of the 5th and 6th centuries had been the sources of uproar throughout the empire. These at last assumed such a shape as to threaten its unity. Heraclius (610-641) sought to remove the schism which divided the Ch. In his interview with Paul, the monophysite patriarch of Armenia, the expression "the one energy of Christ" had been used, and the impression it made on both sides suggested that it might be made the basis of a compromise between the Catholics and the Monophysites. With the Catholics the two natures were to be asserted, and yet with the doctrine of one theandric energy, one volition, implying one will, virtual provision would be made for the sort of unification for which the Monophysites contended. Protracted conferences followed with the monophysite patriarchs and with the orthodox patriarchs. These men were willing to concur in the doctrine propounded by the emp. as one which would preserve the truth. The first fruit of the compromise was that the Severians of Egypt were brought back to the orthodox Ch. (633). The Monophysites, who were not satisfied, were yet forced into compliance.

II. (1) Sophronius, a Palestinian monk, maintained that the doctrine was in conflict with orthodoxy. When (634) he became patriarch of Jerusalem, he caused it to be condemned by a synod. (2) Pope Honorius I. (625-638) advised that the whole question should be dropped as involving fruitless speculation, but decided in favor of the monothelite view (638). (3) On this declaration the emp. felt himself authorized to put forth a new creed, under the title *Echthesis pistole*, "exposition of faith" (638). (4) The Mohammedan invasion of Pal. and Egypt (637-640) cut off Sophronius from connection with the rest of the Chr. world, but his adherents, Stephen in the E. and the abbot Maximus in the W., worked in his spirit. (5) Pyrrhus of Constantinople (639) approved of the *Echthesis*, but was led by Maximus (645) to renounce it. An Afr. gen. synod (646) condemned monothelism. Pope Severinus declared against the *Echthesis*. Pope John IV. (640-642) condemned it, and urged Constantine III. to withdraw it (641). Pope Theodore I. (642-649) made the same demand of emp. Constans II. (630-668). He constituted at the same time Stephen apostolic vicar, with orders to depose all monothelite bps. and clergy. The Byzantine court yielded; Constans withdrew the *Echthesis* (648).

III. (1) In place of the *Echthesis* the emp. set forth the "Type of the Faith"—the *Tupos tes pisteos*. The Type forbade anew all contention on the will or wills of Christ; matters were to be put back to the point at which they stood before the strife. (2) The reply of the pope was anathema against Paul, patriarch of Constantinople, supposed author of the *Tupos*. At the First Lateran Synod (649) diolothelism was established as the Ch. doctrine. The course of the pope was treated by the emp. as treasonable. He was seized (653) by Kalliopas, imperial deputy, and sent into exile, where he died of his sufferings, firm to the end. (3) Pope Adeodatus (677) excommunicated the Gr. patriarchs; the Gr. Ch. excommunicated the pope. But the growth of the Mohammedan power made the healing of

this breach of the most urgent importance. Constantine IV. Pogonatus (668-688) entered into negotiations which led to the convening of the 6th general council. The council anathematized all M. It was decided that there is in Christ two natural wills and two natural operations, unseparated, immutable, undivided, unmingled. (4) The emp. Philipippus (Bardanes) brought about a temporary triumph of the M. at a council at Constantinople (711), which reversed the decisions of the 6th gen. council, but at his downfall (713) monotheism vanishes out of hist. CHARLES P. KRAUTH.

**Monreale**, mon-ra-ah'la, town of Sic., prov. of Palermo; its cathedral is one of the most splendid temples in the world. Adjoining the cathedral is the great monastery of the Benedictines, one of the most superb convents existing. The terrible massacre known as the Sicilian Vespers (1282) began on the road from Palermo to M. Pop. 16,211.

**Monroe**, mun-roo', city, on R. R., cap. of Ouachita parish, La. Pop. 1870, 1949; 1880, 3070.

**Monroe**, city and R. R. centre, cap. of Monroe co., Mich., has 2 female sems. Pop. 1880, 4990; 1884, 5316.

**Monroe**, on R. R., cap. of Green co., Wis. Pop. 1870, 3408; 1880, 3293.

**Monroe** (JAMES), 5th Pres. of the U. S., b. in Westmoreland co., Va., Apr. 28, 1758, was a descendant of a Scot. Cavalier family; ed. at William and Mary Coll.; entered the Revolutionary army in 1776; served in the prin. engagements of 1777-78; was wounded at Trenton; studied law under Jefferson; served again in the latter part of the war; was delegate to Cong. 1783-86; opposed the adoption of the U. S. const. 1788; was U. S. Senator 1790-94, minister to Fr. 1794-96, gov. of Va. 1799-1802 and again 1811, envoy to Fr. 1802 and to Sp. 1805, minister to Eng. 1808-08, sec. of state 1811-17, and also sec. of war 1814-15; was pres. of the U. S. 1817-25, elected the first time over Rufus King, the Federalist candidate, and re-elected in 1820 with little opposition. The chief events of this prosperous administration, "the era of good feeling," were the acquisition of Fla. from Sp., the inauguration of a system of internal improvements, the enunciation of the Monroe Doctrine, the Missouri Compromise of 1820, and the recognition of the independence of the Sp. Amer. states. D. July 4, 1831.

**Monroe City**, Mo. See APPENDIX.

**Monroe Doctrine**. This was a declaration of policy, made by Pres. Monroe in his message to Cong. in 1823, against the absolutist principle then prevailing in Europe of interference on the part of outside govts. against internal popular movements on behalf of free institutions. It was feared that the Sp. revolutionary govt. would be overthrown, and that efforts to overthrow the popular govts. in the Sp. Amer. colonies might follow. The declaration so called had the approval of the Eng. statesman, Mr. Canning. The Pres. says in his message that "we should consider any attempt on the part [of the allied powers] to extend their system to any portion of this hemisphere as dangerous to our peace and safety." . . . and that "we could not view any interposition for the purpose of oppressing [governments on this side of the water], whose independence we had acknowledged . . . in any other light than as a manifestation of an unfriendly disposition toward the U. S." If there was any such design, this declaration nipped it in the bud. Another passage of the message denounced colonization by any European power on Amer. continents. The principle of the doctrine in its essence is just, and a measure of self-defense; but it has been stretched more than once to measures to which it did not apply. T. D. WOOLSEY.

**Mon'son**, on R. R., Hampden co., Mass., 80 m. W. S. W. of Boston, has valuable quarries of gneiss, and an acad. Pop. tp. 1870, 3204; 1880, 3758.

**Monsoon** [Port. *monção*, from Arabic *mausim*, "season"], a tropical wind which in the Indian Ocean blows half the year from one point of the compass, and for the remaining half in the opposite direction. M. rarely coincide with the cardinal points of the compass, their most usual directions being N. W., S. W., N. E., and S. E.

**Monstrosity** [Lat. *hist.* See TERATOLOGY.

**Montagnards** [Fr. "mountaineers"], or simply **The Mountain**, in the first Fr. Revolution a name given to the ultra-democratic members of the National Convention, because they sat in the highest seats of the hall.

**Montague**, mon-ta-gu, Muskegon co., Mich., on R. R. and White Lake. Pop. 1880, 1297.

**Montaigne**, mon-tân, de (MICHEL EQUEM), b. Feb. 28, 1533, at the château Montaigne, near Bergerac, in the dept. of Dordogne; studied law at Bordeaux, and was appointed councillor in the Parl. of that city in 1554. He early obtained a great reputation, but after his father's death in 1569 retired and occupied himself with philosophical studies and meditations. In 1580 he pub. the first 2 books of his *Essais*, and in the same yr. he undertook a journey through Ger. and Switz. to It. In 1581 the citizens of Bordeaux chose him mayor of the city, and he kept peace in the place, although the feuds between Prots. and R. Caths. raged all around. He had also some influence at court, and acted several times as a mediator between the leaders of the different political and religious parties. The third book of his *Essais* he pub. in 1588. D. at Montaigne Sept. 13, 1592.

**Montalembert** (CHARLES F. R.). See APPENDIX.

**Montalembert**, mon-tah-lon-bair', de (MARC RENÉ), MARQUIS, b. at Angoulême, Fr., July 15, 1714; entered the army at 18; engaged in the manufacture of cannon for the Fr. navy. At the age of 62 he began to publish his great work, *La Fortification perpendiculaire, ou l'Art de défendre supérieurement l'offensif*. The use of the casemate in some of its forms goes back to the early part of the 16th century, and it was resorted to by Vauban in his second and third systems, of which the tower-bastions are casemated throughout. But it was reserved for M. in the latter part of the 18th century, to give it an extraordinary development, and to make the casemate the essential element of a system of fortification. D. 1800.



**Montana** (mon-tah'na) **Territory** is bounded on the N. by the Brit. possessions, E. by Dak., S. by Wyo. and Id., and W. by Id.; it lies between 44° 6' and 49° N. lat. and 104° and 116° W. lon. Area, 146,080 sq. m. or 93,491,300 acres.

**Face of the Country, Mountains, Rivers, Lakes, Etc.**—As its name indicates, it is a mountainous country, in which there are some fine valleys, and has an abundance of timber, such as pine, spruce, cottonwood, and aspen. The streams are skirted with dense thickets, in which at the proper season there is found plenty of serviceberries, currants, and gooseberries. In the Terr. is the main range of the Rocky Mts., with many detached spurs, the Bitter Root Range, the Judith, and the Belt Mts. S. of the Great Falls of the Mo. River. The prin. streams are the Gallatin, Jefferson, and Madison rivers, here called the "Three Forks," which unite and form the Mo. Beside these are the Yellowstone, Musselshell, Milk, Teton, Sun, and Maria's rivers, and many other smaller streams. Flathead Lake is the only considerable lake. The Yellowstone National Park is partly within M.

**Minerals.**—Gold has been found in every portion of the Terr. Silver ore, iron, and coal are also found. Lignite, copper, and petroleum are among the mineral products.

**Soil and Vegetation.**—The mts. of M. are usually well covered with forests, but the trees are, if deciduous, almost exclusively willow, poplar, and cottonwood; if evergreen, pine, spruce, fir, cedar, and balsam. There is very little hard-wood timber in the Terr. Grass and flowers of great beauty abound in the valleys. As a grazing country this will always maintain a high rank, the "bunch-grass," so excellent for cattle, covering all the hillsides and plains.

**Zoology.**—Great herds of deer, elk, mt.-sheep, and antelope exist and thrive in the mts. and on the plains and foothills of the mt.-ranges. The moose is often found in the mt.-gorges. Beaver, otter, marten, gray wolves, badgers, bears, and mink are found in the forests and streams. Herds of buffalo roam through the N. portion of the Terr. and S. of the Yellowstone River. In the mt.-streams are salmon and brook-trout and graylings.

The climate of M. is milder than that of States farther E. in the same lat. The annual mean temperature ranges from 44° to 48°. The climate is very dry. The annual rainfall at Ft. Benton is but 12.17 inches, and it is much the same over most of the Terr. Irrigation is practicable and easy in most of the arable lands.

**Agricultural Products.**—The soil of M. appears to be best suited to wheat and oats among cereals. Of wheat (census 1880), 469,688 bushels were produced; oats, 900,915 bushels; corn, only 5649 bushels. Wool clip of 1880 yielded 995,484 lbs. The area of wheat culture was largely increased in 1882.

**Farm Animals.**—By the census of 1880 M. had 35,114 horses, 172,887 cattle, 184,277 sheep, and 10,278 swine.

**Manufactures.**—The production of the various manufacturing industries of M. was as follows (1880): Establishments, 196; hands employed, 578; capital invested, \$899,390; wages paid, \$318,759; aggregate product, \$1,835,867.

**Railroads.**—In Jan. 1882 there were in operation in M. 232 m. of railway, mostly the N. Pacific, which runs through the Terr.

**Finances.**—The amount of taxable property as assessed in 1880 was—real estate, \$5,077,162; personal, \$13,532,640; total, \$18,609,802. Rate of tax, 10 cents on \$100, producing \$54,000 for Territorial expenditure proper; total raised by taxation, Territorial and local, \$388,947; Territorial debt, Nov. 1881, \$70,000; total indebtedness, including local debts, \$759,925.

**Banks, Etc.**—In Oct. 1881 there were 3 national banks in M., with capital of \$200,000; circulation, \$157,800; U. S. bonds to secure circulation, \$160,000; deposits, \$1,387,056. There were 13 private bankers, with capital of \$512,706 and deposits of \$904,498.

**Education.**—The number of children of school age (4-21 yrs.) in M. in 1880 was 7070, of whom 4667 were enrolled in public schools, with average attendance of 2986. Total expenditure for public schools, \$68,002.

**Churches.**—The M. E. Ch. has 8 chs., 6 ministers, and 675 members; M. E. South, 9 ministers, 232 members; Christians (Disciples of Christ), 6 chs., 4 ministers, 675 members; R. Caths., 10 chs., 13 priests; Presbys., 6 chs., 7 ministers, 194 members; Prot. Epis., 8 chs., 300 members.

**Population.**—In 1870, 30,585; 1880, 39,159 (white 35,385, colored 3774, including 1763 Chl. and 1663 Indians).

**Principal Cities and Towns.** Pop. 1880.—Helena (cap.), 3624; Butte City, 3363; Ft. Benton, 1618; Deer Lodge City, 941; Bozeman, 894; Glendale, 678; Miles City, 629; Va. City, 624.

COUNTIES.	*Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
Beaver Head.....	4-C	722	2,712	Dillon.....	.....
Choteau.....	2-D	517	3,058	Port Benton.....	1,818
Custer.....	3-F	38	2,510	Miles City.....	629
Dawson.....	2-F	177	180	Glendive.....	.....
Deer Lodge.....	3-C	4,367	8,876	Deer Lodge City.....	941
Gallatin.....	4-D	1,578	3,643	Bozeman.....	894
Jefferson.....	3-C	1,531	2,464	Radersburg.....	169
Lewis and Clarke.....	3-C	5,040	6,521	Helena.....	3,624
Madison.....	4-C	2,684	3,915	Virginia City.....	624
Meagher.....	3-D	1,367	2,743	White Sulphur Sp.....	.....
Missoula.....	2-E	2,554	7,537	Missoula.....	3,363
*Silver Bow.....	3-C	.....	.....	Butte City.....	.....
†Yellowstone.....	3-E	.....	.....	Billings.....	.....
Total.....		30,585	39,159		

\* Reference for location of counties. See map of Montana, in IDAHO.

† Organized since census of 1880.

**History.**—M. had had a few settlers, mostly trappers and hunters and some missionaries, for many yrs. before its organization as a Terr., but its growth dates from the discovery of gold there in 1861. It was a part of Id. Terr. till May 26, 1864, when it was organized as a separate Terr. After the discovery of gold people flocked in from all quarters. In the earlier days there was of course a very mixed pop., among which were a number of noted robbers and desperadoes, who at one time seemed to have complete possession

of the Terr. This state of things continued until the respectable portion of the community could endure it no longer, when they formed themselves into an organization known as the "Vigilantes," who administered the law without partiality or favor, and many a miscreant was hanged by them. It was once a favorite hunting-ground for hunters and trappers, and Ft. Benton, on Mo. River, at head of navigation, is an old fur-trading post, now occupied by U. S. troops.

Governors.

Sidney Egerton..... 1864-65 Benjamin F. Potts... 1870-82  
Francis Meagher (act.) 1865-66 J. Schuyler Crosby... 1882-84  
Green Clay Smith..... 1866-69 B. Platt Carpenter... 1884-88  
James M. Ashley..... 1869-70

REVISED BY A. R. SPOFFORD.

**Montanelli**, mon-tah-nel'le (GIUSEPPE), b. at Fucecchio, in Tuscany, in 1813, d. in 1862; ed. at the Univ. of Pisa and in 1838 pub. a vol. of poetry; from 1837 to 1839 practised as an advocate, and in 1845 was appointed prof. of civil and commercial law in the Univ. of Pisa. Even before 1848 he excited much attention by his proposed liberal reforms, by the political association known as *Fratelli Italiani*, and by the *Italia*, a journal edited by him at Pisa in 1847 with the motto "Riforma e Nazionalità." On the breaking out of the revolution in 1848 he volunteered. On his return to Tuscany he became a member of the constitutional ministry, and on the flight of the grand duke in 1849 he was chosen triumvir with Guerrazzi and Mazzini. At this time he exerted himself for the union of Tuscany with Rome. While he was on a mission to Paris the restoration took place, and M. remained an exile until 1859. Among his poems are *La Tentazione*, and a tragedy, *Camma*. In 1859 he declared himself for the autonomy of Tuscany. *La Nuova Europa*, a journal founded by him, ceased at his death.

**Montanists**, an early Chr. sect, the followers of Montanus of Pepuza in Phrygia. He appears to have been a priest of Cybele, was converted about 150 A. D., and soon after began to fall into fits of ecstasy and utter prophecies. Orthodox in respect to the cardinal doctrines, his teaching, in substance, was that the Mosaic and Chr. dispensations having failed to save the world, a new revelation had been made through him and his 2 prophetesses (Maximilla and Priscilla). This revelation pertained not to doctrine, but to discipline. The system was received at first with some favor, but finally it was treated everywhere as a heresy. Its strongholds were in Asia Minor and N. Afr.; Tertullian was its ablest champion. Several laws against the sect were enacted as late as 530 and 532 A. D.

R. D. HITCHCOCK.

**Montanus**. See MONTANISTS.

**Mont Blanc** [Fr. "White Mountain"], the highest mt. in Europe, except Mt. Elbruz in the Caucasus, is a part of the Graian Alps, in the dept. of Haute-Savoie, Fr. It covers an area of 98 sq. m., and rises into a plateau 11,500 ft. high, whence it splits into 3 peaks, of which the highest, La Bosse du Dromedaire, is 15,781 ft. high. The snow-line descends to the height of 8000 ft., and from its 36 glaciers the waters are carried E. through the Dora Baltea to the Po, and W. through the Arve to the Rhone.

**Montcalm**, mont-kahm' de (LOUIS JOSEPH SAINT VERAN), MARQUIS, b. near Nismes, Fr., in 1712; received a careful education, and at 14 entered the army, and was distinguished in It., Bohemia, and Ger., attaining the rank of col. In 1756 he was appointed to the chief command of the Fr. troops in Canada, and 3 months after his arrival captured Ft. Ontario (Oswego), and a yr. later Ft. William Henry (Lake George); in July 1758 he occupied Ft. Ticonderoga, where he successfully repulsed a quadruple Brit. force under Abercrombie. To protect Que., threatened by the forces of Gen. Wolfe, M. assembled the main body of his troops on the Montmorency, where (July 31, 1759) he repulsed Wolfe, who, retiring, secretly reached (Sept. 13) the Heights of Abraham, in rear of the army of M. With numbers nearly equal, M. gave battle to the Brit., but was entirely routed. Wolfe fell rejoicing in his victory, while M., who had received a fatal wound, d. the following day.

**Mont Cenis**, a mt.-pass on the boundary between the It. prov. of Turin and the Fr. dept. of Savoie, at the junction of the Graian and Cottian Alps. The tunnel was begun in Aug. 1857, and opened for traffic in Sept. 1871. It is nearly 8 m. long. Its N. end is 3942 ft. above the sea, its S. end 4380, and the middle about 15 ft. higher than the S. end. The cost was £3,000,000. Trains run through in about 30 minutes.

**Montclair**, R. R. Junc., Essex co. N. J. Pop. tp. 1870, 2853; 1880, 5147.

**Mont de Piété** [Fr. for "mount of piety,"] *It. Monte di Pietà*, an inst. for the loaning of money at a low interest to the poor, pledges being taken for security. The earliest seems to have been that of Padua, founded in 1491. The *Monti di Pietà* at Rome are among the best managed in the world. The M. de P. is a public system of pawnbrokerage. A similar system has prevailed in Chi. for ages.

**Montebello**, a v. of N. It., where the Aus. were defeated by Nap. I. June 8, 1800, and by Nap. III. May 20, 1859.

**Montecuccoli**, mon-ta-kook'ko-le (RAMONDO), COUNT, b. near Modena in 1608; entered the Aus. army in 1627; distinguished himself in the Thirty Years' war, and afterward in the Polish war against the Swedes, and received in 1660 the command of the allied Aus. and Fr. army in Transylvania, with which he defeated the Turks in the great battle of St. Gothard, on the Raab, Aug. 1, 1664. In the war between Fr. and Hol. he again commanded the Aus. army, and distinguished himself in campaigns of 1672-76. In 1679 the emp. made him a prince of the empire. D. Oct. 16, 1681.

**Montefiore** (Sir Moses). See APPENDIX.

**Montenegro**, mon-ta-ni'gro, a small independent principality of Europe, lying between the provinces of Bosnia and Albania, the Aus. prov. of Dalmatia, and the Adriatic. Area, 3550 sq. m. Pop. 236,000, including the town and dist. of Dubligno on the Adriatic. The surface is everywhere mountainous, the highest peaks, Kutsh-Kom in the E. and Mt. Dormitor in the N., rising 9300 and 8500 ft. The mts. are



covered with dense forests of oak, beech, poplar, and fir, which yield excellent timber; the sumach tree grows here. The inhabs. are a tribe of the Serbian race, and belong to the Gr. Ch. They lead a rough life. Agriculture, fishing, and hunting are their occupations; all their industry is carried on in a primitive way.

**Monterey**, mon-ta-rá', city of Mex., cap. of the State of Nuevo Leon, on a small river of the same name, 450 m. N. N. W. of Mex., situated on a fertile table-land inclosed within the N. cordillera of the Sierra Madre, 1686 ft. above the sea, is well built, chiefly of stone, has a handsome public square, numerous and commodious public edifices, and a considerable manufacturing industry. The commerce with the U. S. is prosperous and rapidly increasing, especially in machinery. The climate is equable, and the vicinity abounds in gardens and orchards. Founded in 1590, M. is the oldest and most important city of N. Mex. Pop. 33,811. The Amer. army under Gen. Taylor, having been reinforced, left Matamoros Aug. 5, 1846, some 6500 strong, and Sept. 9 appeared before M., strongly fortified and held by some 10,000 Mex. under Gen. Ampudia. W. of the town, and on a hill, was the bp.'s palace, also fortified. Gen. Taylor opened his attack on the 21st; the next morning the bp.'s palace was carried by Gen. Worth, and by the close of the 23d the whole city was occupied. The next day Ampudia surrendered the city and garrison.

**Monterey**, on R. R., Monterey co., Cal., and formerly cap. of Cal. It is on Monterey Bay, 80 m. by sea from San Francisco, with which it is connected by a line of steamers. Its harbor is safe and capacious. M. is beautifully situated, and is the seat of a R. Cath. bp. It is an old Mex. town, with many of its houses built of adobe, and with tiled roofs. Among the interesting localities near are the old fort and the ruined Carmelite mission. Pop. 1870, 1112; 1880, 1396.

**Mon'te Ro'sa**, next to Mont Blanc the highest mt. in Europe, is on the boundary between the Swiss canton of Valais and It., at the junction between the Pennine and Lepontic Alps. It rises in 9 peaks, the 4 central ones of which are more than 14,000 ft. high, the highest 15,200 ft. It is rich in metals. Gold, copper, and iron mines are worked. The highest of these mines is situated at an elevation of 10,500 ft., in the region of perpetual snow.

**Montesquieu**, mon-t'es-ku', de (CHARLES DE SECONDAT), BARON, b. at the château de Brède, near Bordeaux, Jan. 18, 1689; studied jurisprudence; was appointed councillor in the Parl. of Bordeaux in 1714, and pres. in 1716, but occupied himself more with philosophical studies than with parliamentary business, and pub. in 1721 his *Lettres Persanes*. In 1726 he resigned his office in the Parl., and travelled through It., Aus., Ger., and Eng., where he resided for 2 yrs. On his return he settled at Brède, and only occasionally visited Paris. In 1734 appeared his *Considérations sur les Causes de la Grandeur et de la Décadence des Romains*. At last, in 1748, his *Esprit des Loix* followed. D. Feb. 10, 1755.

**Montevideo**, mon-te-vid'e-o, cap. of the republic of Uruguay, is on the N. shore of the mouth of the Rio de la Plata, where it enters the Atlantic. The *cerro* or mount from which the city derives its name is the distinguishing mark of the port. It rises on the W. side of the bay 463 ft. The prin. building is the cathedral. The Plaza de la Constitución, the gathering-place of the elegant world, extends in front of the cathedral, and is planted with fine trees. The most noteworthy among the other public buildings are the opera-house, several theatres, and the hospital, the best in S. Amer. There are a small public library, several schools, and a coll. The pop. is distinguished for politeness. The commerce is considerable. The prin. articles of export are wool, skins, dried fish, tallow, oil, bones, meat-extract, and living animals (to Brazil); of imports, dry goods, jewelry, wine, spirits, flour, tobacco, furniture, etc. The city was founded by families from the Canary Islands, which settled here in 1717. Pop. 110,106.

**Montevideo**, MIND. See APPENDIX.

**Montezuma**, or **Moteczuma** [Mex. *Moteczuhzoma*, "the sad or severe one"], the name of 2 Aztec rulers, who were dignified by the Spaniards with the title of emps. of Mex. — MONTÉZUMA I. ILHUICOMINA, b. about 1390, was a valiant gen.; succeeded to the throne about 1436; extended his dominions to the Gulf of Mex., and d. in 1464. — MONTÉZUMA II. XOCOTOTZIN, b. about 1490, succeeded his uncle, Ahuizotl, 1502; distinguished both as a soldier and as a priest; ruled with splendor and military success until 1519, when Cortés arrived in Mex.; the monarch was imprisoned in his own cap., gave his allegiance to the king of Sp., and was killed by his own subjects during a tumult, June 30, 1520. His descendants were ennobled in Sp.

**Montezuma**, la. See APPENDIX.

**Montgomery**, mont-gum'er-o, city and R. R. centre, cap. of Montgomery co., and also of State of Ala. Neighboring soil is very productive, cotton being the staple. The capitol buildings are on high ground overlooking city and vicinity. Pop. 1870, 10,588; 1880, 16,718; 1885, about 18,000.

**Montgomery** (JAMES), b. at Irvine, Ayrshire, Scot., Nov. 4, 1771. Was ed. at the Fulneck School, Yorkshire, and apprenticed to a grocer, but ran away in 1789, and in 1792 became clerk to a journalist of Sheffield. Founded *The Sheffield Iris*, which he edited 31 yrs.; began in early youth to write poetry. In 1835 he received a pension. D. Apr. 30, 1854. Wrote *Prison Amusements*, *The West Indies*, an anti-slavery poem, etc.; is best known as a hymn-writer.

**Montgomery** (JOHN B.), b. at Allentown, N. J., about 1796; entered the navy as mdpn. 1812; was a mdpn. on board the flagship Niagara at Perry's victory on Lake Erie, Sept. 10, 1813, receiving a sword and the thanks of Cong.; was with Decatur in the naval campaign against Algiers 1815; commanded the sloop-of-war Portsmouth on the Pacific coast 1845-48, during which cruise he took possession of Lower Cal., occupied Guaymas, and blockaded Mazatlan for some months; was commissioned capt. 1853; was in command of the Pacific squadron 1860-61; made com. July 16,

1862, and rear-admiral July 25, 1866; commanded the naval station at Sackett's Harbor 1867-69, when he was placed on the retired list. D. Mar. 25, 1873.

**Montgomery** (RICHARD) b. near Raphoe, Ire., Dec. 2, 1736, ed. at Dublin Univ.; entered the Brit. army in 1754, and served in N. Amer. and the W. I. Retiring from the army in 1772, he came to Amer.; settled at Rhinebeck, N. Y., and married a daughter of R. R. Livingston; was a member of the first provincial cong. in 1775, and the same yr. was appointed a brig.-gen. in the Continental army. In the expedition for the invasion of Canada M. was second in command to Schuyler, until, owing to the illness of the latter, he succeeded to the chief command, capturing Ft. Chambly, St. John's, and Montreal in rapid succession. After tollsome marches the forces of M. and Arnold united near Que. Dec. 4, 1775. On the 9th he was made a maj.-gen. Advancing upon Que., the demand for a surrender of the city was refused, and a *coup de main* seemed to be the only hope of obtaining Que. A favorable moment occurred on the morning of Dec. 31, 1775. During a blinding snow-storm M., with his little band, started at 2 A. M., and had passed the first barrier when a discharge from the enemy's battery instantly killed him and others, and the troops fell back in confusion. A monument was erected over his remains by Cong. in front of St. Paul's ch., New York.

**Montgomery City**, Mo. See APPENDIX.

**Month** [Sax. *mona*, "month"], a period of time corresponding in length to one revolution of the moon around the earth, employed almost universally in the infancy of civilization to measure intervals in chronology. The length of a mean lunation from new moon to new moon again is 29 days 12 hours 44 minutes 2.84 seconds, exceeding thus 29½ days by about ¼ of an hour. It was early ascertained that this period corresponded very nearly to 29½ days, but as for chronological purposes fractions of days cannot well be counted, the M. were made alternately 29 and 30 days, the slight outstanding error being unknown or disregarded. Twelve lunar m. of 29½ days amount to only 354 days, or fall short of the length of a yr. by about 11¼ days. By the employment of a yr. of twelve lunar M., without any allowance for the discrepancy between this and the solar yr., the places of the successive M. in the seasons go backward, so as in about 32 or 33 yrs. to occupy every possible position in the natural yr. To avoid the inconvenience arising from this cause, the Egyptians made all their M. 30 days each, and added 5 uncalendered days at the end to complete the deficiency. The Jews, who employed alternate M. of 30 and 29 days, added a M. of 30 days, called an embolismic M., every three yrs. The anc. Grs. used a similar M., without such allowance. The Rom. M., before the reformation of the calendar by Julius Cæsar, were somewhat irregular, 4 of them being 31 days, 7 of 29 days, and one of 28 days. The Arabic and Tur. M. were alternately 30 and 29 days. The uncalendered days being added at the end of the yr. The Ch., both E. and W., has always continued to employ the lunar year of 30 and 29 days alternately, and in this respect has been followed by the P. E. Ch. of Eng. and of the U. S., embolismic M. being added as often as the error thus introduced exceeds 30 days. The Fr., under the First Republic, divided the year into 12 M. of 30 days each, with 5 uncalendered days at the end, called complementary days and also *sans cultottes*, which were made holidays. In the reformation of the calendar by Julius Cæsar, which took place about 46 yrs. before the Chr. era, the yr., which began on the first of Mar., was divided into 12 M. of 30 and 31 days each, with the exception of Feb., which had but 29. The entire yr. thus consisted of 365 days, to which every 5 yrs. an intercalary day was added immediately after the 23d day of Feb., so that the 24th, which in the Rom. calendar was called the 6th calends of Mar., was twice counted, and hence the yr. received the name of bissextile. In this yr. the M. of July was called Quintilis, the fifth, but the Rom. senate gave it the name of Julius, which it continues to bear. In imitation of this action the senate under Augustus gave to the M. Sextilis the name of the emp., which name is also still preserved. The Rom. M. to the end of the yr. bear the same names which they bore in the Rom. calendar, but by the change of the beginning of the yr. from the first of Mar. to the first of Jan., the numbers have ceased to indicate their place in the series. In our calendar Jan., Mar., May, July, Aug., Oct., and Dec. have each 31 days; Apr., June, Sept., and Nov. have 30, and Feb. 28 days in a common yr. and 29 in leap-yr. As for business purposes it is necessary that a calendar should be definitely fixed, this distribution of days has received the sanction of law. It is greatly to be desired that there should be a reform which should make the division of the yr. more systematic. The most suitable distribution would seem to be to give to all the odd M. 30 days, and all the even M. 31, except the last, which in a common yr. would have 30, and in leap-year 31. (See CAL-endar, EASTER, and EPOCH.)

**Monthon**, mon-to-lon', de (CHARLES TRISTAN), COUNT, b. at Paris July 21, 1783; entered the army in 1798; was distinguished himself in the battle of Wagram 1809; was attached to the personal staff of Nap.; acted as his aide-de-camp during the Hundred Days; followed him to St. Helena, and was appointed one of his executors. After 1830 he re-entered the Fr. army; took part in the attempt of Prince Louis Nap. at Boulogne; was imprisoned together with him at Ham, but afterward pardoned; became a member of the Legislative Assembly after 1848. Pub. *Mémoires pour servir à l'Histoire de Fr. sous Napoléon*, écrits à St. Hélène sous la dictée et Révisés de la Captivité de l'Empereur Napoléon à St. Hélène. D. Aug. 31, 1858.

**Month**, mon'te (VINCENTO), b. at Fusignano, It., Feb. 19, 1754; studied lit. with the poet Onofrio Minzoni in Ferrara, and imitated Varano and Dante; at Rome obtained the position of sec. to Duke Luigi Braschi, himself sec. of Pope Pius VI.; became a tragic poet, and wrote *Galeotto, Manfredi, Aristodemo*, and *Cato Gracco*. On the triumph of Bonaparte



M. sought the protection of the rising genius, and obtained at Milan the post of sec. of the executive directory. From thence he was sent to Bologna as com. of the Cisalpine republic. He was appointed prof. in the Brera at Milan, and of It. rhetoric in the Univ. of Pisa. In 1805 Nap. named him historian of the kingdom of It. Then followed certain adulatory poems, a translation of Persius, and one of the *Iliad* of Homer. D. Oct. 13, 1828.

**Monticello**, city and R. R. junc., cap. of Piatt co., Ill., 60 m. N. E. of Springfield. Pop. 1870, 871; 1880, 1337.

**Monticello**, R. R. junc., cap. of White co., Ind., 21 m. W. of Logansport. Pop. 1870, 887; 1880, 1193.

**Monticello**, city and R. R. junc., Jones co., Ia. Pop. 1870, 1337; 1880, 1877.

**Monticello**, N. Y. See APPENDIX.

**Monticello**, in Albemarle co., Va., 3 m. W. of Charlottesville, once the home of Thomas Jefferson, author of the Dec. of Ind. In a family cemetery near the mansion lie the remains of the Pres., over which rises a granite obelisk.

**Montmorency**, a river in Canada, rises in Snow Lake, Montmorency co., and flows S. into the St. Lawrence, 8 m. below Que. Near its mouth it falls nearly perpendicularly 250 ft., with a width of 50 ft., forming a beautiful cataract. A cone of ice is formed every winter below the falls, and sometimes attains a height of 200 ft.

**Montmorency, de (ANNE)**, FIRST DUKE, grand constable of Fr., b. at Chantilly Mar. 15, 1492; was one of the leading gens. in the wars of Francis I., and distinguished for cruel hostility to the Huguenots. He was mortally wounded in the battle of St. Denis, and d. at Paris Nov. 12, 1567.—**HENRY**, fourth duc de M., a grandson of the preceding, b. at Chantilly Apr. 30, 1595, was godson of Henry IV., and when 16 became admiral of Fr. and viceroy of Canada; served with distinction in It. and against the Huguenots; took part in the rebellion of Gaston of Orleans, and was executed by command of Richelieu, Oct. 30, 1632.

**Montpellier**, mont-peel'yer, R. R. centre, cap. of Washington co. and of the State of Vt., 305 m. N. N. W. from Boston. It has the Washington Co. Grammar School and



State Capitol (Montpelier, Vt.).

the Vt. Meth. Sem. and Female Coll. The State capitol is one of the finest buildings in the U. S. Pop. tp. 1870, 3023; 1880, 3219, including 1847 in v.

**Montpellier**, mont-peel'yer, city of Fr., cap. of the dept. of Hérault, on the Lézé, 6 m. N. of the Mediterranean; its promenades afford splendid views of the Mediterranean, the Pyrenees, and the Alps; and as its climate is salubrious, its vicinity is covered with villas and cottages. Remarkable among its buildings are the cathedral and the aqueduct; and among its insts., its med. school, founded in the Middle Ages by Ar. phys.; a botanical garden, the first established in Fr., and many excellent collections, are connected with the school. M. has large distilleries and manufactures of woollens and cottons, and it carries on an important trade in wine, olive oil, fruits, and grain. Pop. 56,005.

**Montpensier**, mōn-pōn-se-ā', de (ANTOINE MARIE PHILIPPE LOUIS D'ORLÉANS), DUKE, the fifth and youngest son of Louis Philippe, b. at Neuilly July 31, 1824; ed. at the Collège Henri IV., and in 1842 was appointed *sous-lieutenant* of artill.; capt. in 1843. He served in Afr. in 1844, and somewhat later, as chief of artill. under the duc d'Aumale, he directed it upon an Arab fort, leading an assaulting column, receiving a wound in the face, and exhibiting great bravery, for which he was named chevalier of the Legion of Honor. In 1845 he so distinguished himself at the battle with the Kabyles as to attain the rank of lieutenant-col. A tour through the E. followed, on his return from which he received the grand cross of the Legion of Honor, and was promoted to the colonelcy of the 5th regiment of artill., and in 1846 appointed to the command at Vincennes, with the rank of *maréchal de camp* (brig.-gen.). At this period the negotiations took place by which the duke was betrothed to the sister of the queen of Sp. These alliances and the famous "Spanish marriages" produced a great sensation in Fr. and dissatisfaction elsewhere, especially in Eng. After his marriage (Oct. 10, 1846) he took up his residence at the palace of the Tuileries, from whence in 1847 the revolution which dethroned the king made him, with the rest of the royal family, an exile. He finally fixed his residence in the palace of San Telmo at Seville. Here he passed many yrs., exhibiting his taste and

love of art in the embellishment of his grounds and in making his palace a rich collection of works of art. Agriculture, the fine arts, and the study of the politics and events of his adopted country and Fr. engaged his time. Beside honorary appointments, he was made by Queen Isabella, in 1858, captain of the Sp. army, and in 1859 she conceded to him the honors due to "infants" of Sp. This cordiality was disturbed by political troubles accumulating about the queen's govt. In 1859 he was exiled to the Balearic Islands. The dethronement of the Queen (Sept. 1869) only changed the character of the embarrassments which have beset him and the duchess. The most marked event of this period is the death of Duc Henrique, brother of Don Francisco, the husband of Isabella II., who, affecting to regard M. as a "pretender," repeatedly insulted him. A duel ensued, in which the duke, after twice receiving his adversary's fire and twice firing in the air, forced to a third exchange, aimed, and with fatal effect. The duke subsequently resided in Paris.

J. G. BARNARD.

**Montreal**, mon-tre-awl', city and important R. R. and commercial centre of the Dominion of Canada, in the prov. of Que., on the left bank of the St. Lawrence, 600 m. from its mouth, 180 above Que., 200 below Lake Ontario, 395 from New York, on an island formed by the 2 arms through which the Ottawa enters the St. Lawrence. It derives its name from Mont Réal (or Royal), which rises immediately behind it to a height of 750 ft. The largest public square is the Champ de Mars, a military parade-ground. Of the public buildings, the most remarkable are the R. Cath. parish ch. of Notre Dame, a parallelogram 241 ft. long, 135 wide, flanked with 6 towers, of which the 2 on the main front rise 213 ft.; and the Eng. cathedral, a cruciform structure in Gothic style, 112 ft. long, 70 ft. wide, the transept 100 by 25 ft., and the spire 224 ft. McGill Coll., founded as a coll. in 1811, erected a Univ. in 1821, reorganized and enlarged in 1852, comprises an excellent med. school and a fine museum. The harbor extends for nearly 3 m. from the v. of Hochelaga to the Victoria Bridge, which, about 2 m. long, crosses the St. Lawrence on 24 piers. It has a line of wharves more than 1 m. long, of solid masonry, is open generally from the end of Apr. to the beginning of Dec., and is accessible for vessels of 1800 tons burden. On the other side, toward Lake Ontario, costly locks and canals have been constructed. When Jacques Cartier arrived here in 1535, he found an Indian v. named Hochelaga. In 1642 the town was founded, in 1758 it was fortified, and in 1779 it contained 1200 houses. It was, however, merely an outpost of Que., both under Fr. and Brit. rule, until 1832, when it was made an independent port. Its growth has since been rapid. Pop. 1881, 140,863.

**Montrose**, on R. R., cap. of Susquehanna co., Pa. Pop. 1870, 1463; 1880, 1732.

**Montrose** (JAMES GRAHAM), FIRST MARQUIS OF, b. at the family estate of Montrose, Scot., in 1612; ed. at the Univ. of St. Andrew's; travelled in It. and Fr.; returned home in 1637, and joined the Covenanters. In 1639 M. left the Covenanters and became one of the king's partisans. He was created a marquis, and in 1644 he gathered an army of about 5000. With this army he defeated the Covenanters several times, and took several towns. On Sept. 13, 1645, he was defeated at Philiphaugh by David Lesley; in July 1646 he capitulated at Middleton, and soon after left Scot. for the Continent. Having been authorized by Charles I. and afterward by Charles II. to invade Scot., he landed in Mar. 1650 at the Orkneys with a small force, but having proceeded to the border of Ross-shire, his army was scattered and he himself taken prisoner, and hanged May 21, 1650.

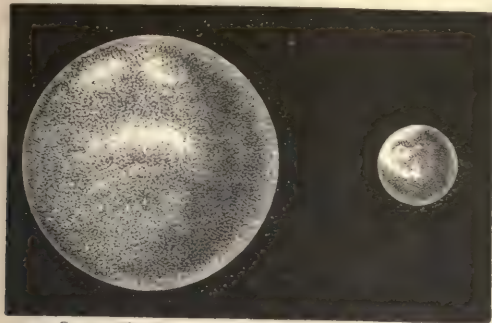
**Monts, de (PIERRE DU GUAIST)**, SIEUR, b. in Saintonge, Fr., about 1560, of an It. Catholic family; became a Prot., and attached himself to the fortunes of Henry IV. He had already made a voyage to Canada with Chauvin when in 1603 the king appointed him director of the Canadian Co. De M. fitted out a considerable expedition; sailed from Havre Mar. 7, 1604; explored the Bay of Fundy; discovered Annapolis harbor and the river St. John, which he ascended visited the St. Lawrence, and returned to Fr. in Oct., while his colony established itself at Pt. Royal (now Annapolis) under Poutincourt. On his arrival at court De M. found his monopoly ended; various other grants were made to different individuals, and he failed to obtain indemnification. He despatched a vessel in command of Lescarbot to the relief of Poutincourt Mar. 1606; despatched Champlain and Pontgravy on a new voyage to the St. Lawrence 1607; sent them other vessels 1608, by the aid of which Que. was founded. On the death of Henry (1610) De M. lost favor at court, and d. in 1611.

**Monza**, town of N. It., prov. of Milan, situated on the Lambro, about 10 m. N. E. of the city of Milan. It is a favorite summer and autumn retreat. M. is best known as the cap. of the old Lombard kings, and especially as the favored seat of the renowned Theodelinda. Very interesting memorials of this queen are still preserved in the cathedral; also the famous Iron Crown, so long used for the coronation of the kings of Lombardy. Pop. 28,012.

**Moody** (DWIGHT LYMAN), b. in Northfield, Mass., Feb. 5, 1837; worked on a farm till 17, when he became a clerk in Boston; joined the Congl. Ch. soon after, and in 1856 went to Chicago, where he engaged zealously in missionary-work among the poor classes; was in the service of the Chr. Commission during the c. war, and subsequently became city missionary of the Young Men's Chr. Association of Chicago; a ch. was built for his converts, and he became its unordained pastor; in the Chicago fire of 1871 the ch. and M.'s house and furniture were destroyed; a new ch., with sittings for 2500 persons, now stands in the place of the old ch. In 1873, with Ira D. Sankey, M. went to Europe and excited great religious awakenings at Edinburgh, Glasgow, Dublin, Lond., and other cities of G. Brit.; in 1875 they returned to the U. S., and have since held large meetings in various cities. He afterward, with Mr. Sankey, went again to G. Brit., and engaged in the same work.



**Moon** [Sax. *mona*], the conspicuous luminary of the night. She revolves about the earth in an elliptical orbit, and at the same time accompanies the latter body in its annual journey around the sun; she is therefore a satellite of the earth. Her diameter is a little more than  $\frac{1}{4}$  that of the earth, being 2160 m.; her volume is about  $\frac{1}{50}$  that of the earth, and her mass is about  $\frac{1}{81}$  of the earth's mass. Her mean distance, which is nearly 239,000 m., is about 60 times the earth's equatorial radius.



Comparative dimensions of the Earth and the Moon.

The relative sizes of the 2 bodies is shown in the figure; on the same scale, the mean distance from the earth to the M. would be 4 ft. 11 inches.

**Periods and Phases.**—From the time the M. lies in the direction of any star till she again has the same direction is about 27 $\frac{1}{4}$  days; this is her *sidereal* period. From the time the M. is in conjunction with the sun till she again returns to conjunction is about 29 $\frac{1}{2}$  days; this is her *synodical* period, and is also a *lunar month* or a *lunation*. The M. is globular, and shines by light reflected from the sun; consequently her illuminated hemisphere is always turned toward the sun. A greater or less portion of her bright surface will be visible to us according to the relative positions of the sun, M., and earth; these different aspects are called *phases*. When the M. is in conjunction her illuminated hemisphere is turned away from the earth, and is entirely invisible; in a day or two a portion of the bright surface becomes visible in the shape of a thin crescent, which continues to grow broader until the end of a quarter of a lunation, when the crescent becomes a semicircle; from this time the M. assumes a *gibbous* phase, the visible portion continuing to increase till the end of a half lunation, when the entire illuminated hemisphere is turned toward the earth, and is therefore completely visible; during the next half lunation the same changes take place, but in an inverse order.

**Rotation and Librations.**—The M. turns around an axis which makes an angle of about 6° with that of the ecliptic in the same time that she revolves about the earth; consequently she always presents to us nearly the same phase. In consequence, however, of the fact that her motion of rotation is uniform while her angular motion of revolution around the earth is variable, we see sometimes a little more on her E. and sometimes a little more on her W. limb than we should if her angular motion of revolution were uniform; in consequence of the inclination of her axis to the ecliptic we sometimes see a little beyond her N. pole, and sometimes a little beyond her S. pole. These alternate changes backward and forward are called *librations*, the former being libration in lon. and the latter libration in lat. In consequence of these librations we see at one time or another about  $\frac{2}{3}$  of the entire surface of the M., the remaining  $\frac{1}{3}$  being forever hidden from view.

**Variations of Brightness.**—The M., even at full, is far from appearing everywhere equally bright. Dark spots are readily discernible even by the naked eye. The most simple ex-



The full Moon.

planation of this is, that some portions of the M. reflect light less copiously than do others. The gen. appearance of the spotted surface at the time of full M. is shown in the

annexed engraving. At this very time scarcely any shadows are discernible. For the sun then, as we may say, looks upon the M. very nearly in the same direction in which we view the M. ourselves: so that what is hidden from him (*i. e.* is in shade) is concealed from us. The appearance of the dark portion is, in its conformation as well as its extent in lat. and lon., not wholly unlike our E. hemisphere.

**Lunar Mountains.**—The visible hemisphere is variegated with mt.-masses, some of which are like those on the earth, arranged in chains or ridges, but by far the greater portions are isolated or mixed in confused masses. The gen. appearance of these is similar to volcanic craters, being circular in shape, and often having a small central peak in the interior. With telescopes of high powers numerous cracks and fissures are observable, and from many of the prin. craters bright streaks are seen radiating in all directions, and extending to great distances.

It is pretty clearly established that the M. has no atmosphere, nor is there any perceptible trace of water on its visible hemisphere. [From orig. art. in *J. S. Univ. Cyc.*, by Prof. S. ALEXANDER, LL.D.]

**Moonstone,** a variety of adularia, or transparent potash-feldspar (*orthoclase*), so called because when polished it presents an opalescent appearance due to its internal chatoyant or pearly reflections. A variety of oligoclase occasionally presents a similar appearance.

**Moore** (ALFRED), b. in Brunswick co., N. C., May 21, 1755, ed. in Boston; served in the Revolutionary war with much credit; was chosen atty.-gen. of N. C. in 1790, and, though he had never read law, he soon mastered its principles; became a judge in 1798, and was, 1799-1805, an associate justice of the U. S. supreme court. D. Oct. 15, 1810.

**Moore** (ANDREW), b. in S. C., became a lawyer of Perry co., Ala.; was often in the legislature, and was speaker 1843-45; was a judge in the State circuit court 1851-57; gov. of Ala. 1857-61; called the convention which passed the ordinance of secession, and also sent troops to seize the U. S. forts at Pensacola.

**Moore** (BENJAMIN), D. D., b. at Newtown, L. I., Oct. 16, 1748, grad. in 1768 at King's Coll., N. Y.; took holy orders in 1774 in Eng.; was assistant minister of Trinity ch., N. Y., 1774-1800; became rector in 1800; P. E. bp. of New York 1801; prof. of logic and rhetoric in Columbia Coll., and its pres. 1800-11. D. Feb. 27, 1816.

**Moore** (CHARLES WHITLOCK), b. at Boston Mar. 29, 1801, was for 34 yrs. recording sec. of the grand lodge of Mass.; edited the *Masonic Mirror* 1825, the *Amaranth* 1828, and commenced in 1841 the publication of the *Freemason's Monthly Magazine*; founded *Zion's Herald* in 1823, and prepared several Masonic manuals.

**Moore** (CLEMENT CLARKE), LL.D., son of Bp. Benjamin Moore, b. in New York July 15, 1779, grad. at Columbia Coll. in 1796; in 1821 became prof. of biblical learning in the P. E. Sem., afterward prof. of Heb. and Gr., and then of Oriental and Gr. lit. Author of a Heb. and Gr. lexicon, a vol. of *Poems*, *George Catcott*, and of the ballad *The Night Before Christmas*, etc. D. July 10, 1863.

**Moore** (FRANK), b. at Concord, N. H., Dec. 17, 1828; pub. *Songs and Ballads of the Amer. Revolution*, *Cyc. of Amer. Eloquence*, *The Rebellion Record*, etc.; was for a time sec. of legation at Paris.

**Moore** (GABRIEL), b. in Stokes co., N. C.; M. C. from Ala. 1822-29, gov. of Ala. 1829-31, U. S. Senator 1831-37. D. 1844.

**Moore** (GEORGE H.), LL.D., b. at Concord, N. H., Apr. 20, 1823, grad. at New York Univ. 1843; assistant librarian of the New York Historical Society 1841-49; became librarian in 1849. Author of *Treason of Charles Lee*, *Employment of Negroes in the Revolutionary Army*, *Hist. of Slavery in Mass.*, etc. He is supt. of the Lenox Library.

**Moore** (Sir HENRY), BART., b. in Jamaica in 1713, became gov. of Jamaica in 1756; received a baronetcy for suppressing a slave insurrection; was gov. of N. Y. 1764-69.

**Moore** (HENRY RATON), b. at Andover, N. H., July 21, 1803; was apprenticed as a printer to his brother, the antiquarian writer; edited a newspaper at Plymouth, N. H., 1825-26; became a teacher of musical science; prepared a *Musical Catechism*, the *Merrimack Collection of Instrumental Music*, the *N. H. Collection of Ch. Music*, the *Northern Harp*, and other popular collections. D. Oct. 23, 1841.—His brother, JOHN WEEKS MOORE, b. at Andover Apr. 11, 1807, also became a printer; edited the *Bellows Falls Gazette* for several yrs.; wrote *A Complete Encyc. of Music*.

**Moore** (JACOB BAILEY, JR.), b. at Andover, N. H., Oct. 31, 1797, brother of the preceding; became a partner and brother-in-law of Hon. Isaac Hill; was long a printer and journalist of N. H.; librarian of the New York Historical Society 1845-48; P. M. of San Francisco, Cal., 1848-52; was one of the eds. of the *Historical Collections of N. H.*, author of *Memoirs of Amer. Govs.*, *Gazetteer of N. H.*, and valuable works of local hist. D. Sept. 1, 1853.

**Moore** (JESSE HAILE), b. near Lebanon, Ill., Apr. 22, 1817, grad. at McKendree Coll. Aug. 1842; was teacher 2 yrs. at Nashville, Ill., when he was appointed prin. of Georgetown Sem.; licensed to preach in 1846, he accepted in 1848 the pastorate of the M. E. ch. at Shelbyville; was prin. of Paris Sem. 1848-54, and pres. of Quincy Coll. 1854-56; then for 2 yrs. in charge of the M. E. ch. at Carlinville. At the outbreak of the war he was located at Decatur. Resigning his charge in 1862, he raised the 115th Ill. Volunteers, which he commanded at Chickamauga, Tunnel Hill, Resaca, etc., at Franklin, Nashville, and subsequent pursuit of Hood; brevet brig.-gen. 1865; was presiding elder of Decatur dist., Ill. conference, in 1868, when he was elected to Cong.; re-elected in 1870.

**Moore** (Sir JOHN), K. B., son of John Moore, M. D., b. at Glasgow, Scot., Nov. 13, 1761, entered the army in 1776; served in the Mediterranean, in Amer., and the W. I., and sat in Parl. for a time; was gov. of St. Lucia 1798-97; served in Ire. 1798; was badly wounded in the Netherlands 1799; served in Egypt, and became maj.-gen. and K. B. 1801;



served afterward in Swe. (1808) as envoy and commander of the Brit. contingent; took (Oct. 6, 1808) chief command of the Brit. troops in the Peninsula, numbering 28,000, managing the campaign against Nap., but the failure of the Sp. to co-operate with him compelled him to fall back upon Corunna. He conducted the retreat with masterly skill. He was killed at the battle of Corunna, Jan. 16, 1809.

**Moore** (MARTIN), b. at Sterling, Mass., Apr. 22, 1790, grad. at Brown Univ. 1810; was for 30 yrs. Congl. pastor at Natick, and afterward at Cohasset; edited Boston *Recorder* 20 yrs.; wrote *Hist. of Natick and Life of John Elliot*; was v.-p. of N. Eng. Genealogical Society 1861-66. D. Mar. 12, 1866.

**Moore** (NATHANIEL F.), LL.D., a nephew of Bp. Benjamin Moore, b. at Newtown, L. I., Dec. 25, 1782, grad. at Columbia Coll. 1802; admitted to the bar 1805; became in 1817 adjunct prof. and in 1835 prof. of Lat. and Gr. in Columbia Coll.; was its librarian 1837-42, and its pres. 1842-49; author of *Lectures on the Gr. Lang. and Lit.*, *Anc. Mineralogy*, an *Historical Sketch of Columbia Coll.*, etc. D. 1872.

**Moore** (RICHARD CHANNING), D. D., b. in New York Aug. 21, 1792, ed. at King's Coll., N. Y.; went to sea; became a phys.; took orders in the P. E. Ch. 1787; was pastor at Rye, N. Y.; for 20 yrs. rector of St. Andrew's, Staten Island; rector of St. Stephen's, N. Y., 1809-14; consecrated bp. of Va. 1814. D. Nov. 11, 1841.

**Moore** (THOMAS), b. at Dublin, Ire., May 28, 1779, of R. Cath. parents; was in youth distinguished for his skill in lyric poetry; studied at the Dublin Univ. and at the Middle Temple, Lond. His first vol. of poems, the *Anacreon*, was a success; the *Poetical Works of Thomas Moore* was vastly more popular. He was in the civil service in the Bermudas 1803-04; made the tour of the U. S. and Canada. His subsequent works of permanent value are the *Irish Melodies*, *Lalla Rookh*, *Loves of the Angels*, *Life of Sheridan*, *The Epicurean*, a romance; *Life of Byron*, and the *Hist. of Ire.* D. Feb. 23, 1852.

**Moore** (ZEPHANIAH SWIFT), D. D., b. in Palmer, Mass., Nov. 20, 1770, grad. at Dartmouth in 1793; became pastor of the Congl. ch. in Leicester, Mass., in 1800, and in 1811 prof. of langs. in Dartmouth Coll.; in 1815 was pres. of Williams Coll., and in 1821 of Amherst Coll. D. June 30, 1823.

**Moorestown**, N. J. See APPENDIX.

**Moore-Powl**, incorrectly called **Red Grouse**, a ptarmigan of the Brit. Islands (*Lagopus Scotticus*), which is one of the most highly prized of Brit. game-birds. It is bred in confinement for food. It is about 16 inches long, mostly of a red-brown color, and feathered to the toes.

**Moorehead**, R. R. junc., cap. of Clay co., Minn., on the Red River. Pop. not given in census of 1880.

**Moore-Hen**, the *Gallinula chloropus*, a European, Afr., and Asiatic wading bird of the rail family (Rallidae). It is some 13 inches long, and of a brown and gray color. It is bred extensively in a half-domesticated state in Eng.

**Moors**, the name generally given to the Mohammedan race who invaded the S. part of Sp. in the early part of the 8th century A. D., though by no means accurately expressing either the character or the genealogy of these conquerors. There can be no doubt that all the leaders of this famous invasion were Arabs, just as much as those who had previously overthrown Egypt on the W. and Per. on the E.; but as their forces were largely recruited from the Afr. pop. of the neighborhood, the old *Mauri* of *Mauritania*, the whole of the invaders were called by the popular name of Moors; so, too, in early Eng. writers Mohammedans are constantly thus designated. In like manner, when Vasco da Gama sacked the sea-coast cities of India, his chronicler, Correa, calls the unoffending objects of his cruelties Moors. Other names given to them were Saraceni, from Al-Sherki, the Easterns; Hagareni, or the children of Hagar; and Ishmaelites. They were a very mixed race, of different Afr. tribes, though principally the people of Barbary, but comprising also Numidians, Phœnicians, Romans, and Arabs. The invasion of Sp. took place A. D. 711. For the next 45 yrs. all Sp., except the Asturias, submitted to the rule of successive warriors with the title of emirs, the deputies of the viceroys of Afr. The subsequent hist. of the M. in Sp. is the hist. of certain dynasties they founded there, which maintained for more than 7 centuries a strong or a weak sway over the whole or parts of that country, according as they were or were not supported by the bulk of their own people; internal treachery in the end accomplishing what all the arms or valor of the Christians had failed to achieve. Indeed, the first efforts of Ferdinand the Catholic were crowned with glory chiefly because the Arabs, divided among themselves, were unable to oppose a steady front to enemies far more merciless than themselves.

After the taking of Granada, the M. who desired to remain still in Sp. were required to accept the outward forms of Christianity and to be baptized, and those who did so were called by the *Moriscos* (or adherents to the anc. faith of Islam) *Christianos Moriscos*, or *Moriscos* alone, in derision. The atrocious cruelty with which these poor people were treated after every solemn promise had been broken by the Catholic party is a grievous blot on the memory of Ferdinand and of his successors. The Inquisition had nowhere more victims for its abominable tribunal. [From orig. art. in *J's Univ. Cyc.*, by W. S. W. VAUX, F. R. S.]

**Moorkuk** ("the swift"), an ostrich-like bird of the cassowary genus, but differing from the cassowary of N. Australia and related species in having the helmet-shaped crest of its head much less elevated and flattened behind, and the absence of cervical wattles. Compared with its newest allies, it is distinguished by the blue color of the throat as well as the back of the neck. It is an inhab. of the Australasian island of New Britain.

**Moose**, See ELK.

**Moosehead Lake**, the source of the Kennebec River, lies in Somerset and Piscataquis cos., Me. It is 36 m. long, from 3 to 10 m. wide, and is surrounded by a picturesque forest-region sparsely inhabited. Its waters abound in fine trout and are navigated by steamers.

**Moradabad**, town of Brit. India, cap. of a dist. of the same name, is ill built, but contains a large state prison and extensive barracks; has an active trade. Pop. about 60,000.

**Moral Philosophy** is the science which treats of duty or of duties. *Mos*, Lat., *ἦθος*, Gr., each signifies a way or manner of acting, and therefore of choosing or desiring to act; hence the appellations morality, moral philosophy, and ethics. Action in this connection signifies a right action, and right action signifies obligatory action, which is duty. The science which treats of duty must treat of the faculties and the conditions which are requisite for the performance of duty. It must therefore include a knowledge of the nature of man as a moral being, and so far must involve psychological analyses as fundamental to its special inquiries. It must also rest upon certain *a priori* intuitions, commonly called metaphysical, otherwise it cannot be truly scientific. It must assume that man has an ascertained place in the system of nature, in order to deduce the modes of action which are appropriate to his position and the ends for which he exists. From these principles conclusions are derived by the processes of deduction. A series of such conclusions, properly arranged and connected, becomes a moral or ethical system. Such a system, when designed for instruction, is called moral science proper. When these principles are stated in such a form as to be directive of the actions of men, they are called rules. A system of practical rules, when so arranged as to provide for and enforce the various duties of man, is called *theoretical morality*, sometimes *ethics*. The term *ethics*, however, when used in a broad sense, is a synonym for M. P.

**Casuistry** is the branch of M. P. which treats of questions concerning duties which appear to conflict with one another. These are called cases of conscience.

**Christian ethics** is a name for those principles and rules of duty which are formally sanctioned by Christianity.

**Theological ethics** is a term peculiar to Ger. theologians, who designate by it the theory of those characteristically spiritual exercises which are to be referred to the motives of Chr. theol. for their origin.

It is obvious that M. P. is somewhat peculiar as a science, in that it is directly applied not to actions as they are, but as they *ought to be*. Every other science concerns itself with the actual phenomena of matter or spirit, and endeavors to ascertain the forces which originate them and the conditions or laws by which they are produced. This science is limited to phenomena which are largely ideal and unreal. The actualities with which it concerns itself are man's capacities for these actions, and the motives or impulses which impel to them. M. P. may be considered as speculative and practical. As speculative it is concerned with 2 classes of questions: (1) with those which respect the capacities or endowments which qualify man to act morally; (2) with those which relate to the correct definition and ultimate analysis of ethical conceptions and the accurate statement of ethical principles. Practical M. P. is occupied with the determination of those rules or principles which are required for the guidance of the conduct and the formation of the character. Men owe certain duties to themselves growing out of their natural or acquired capacities, their position and prospects in life, and the ends and aims for which they exist. They also owe manifold duties to their fellow-men, which are determined by those permanent or changing relations in which they are connected with them. Supreme above all, and in a sense controlling all other relations, are those in which they stand to the Creator. To define and classify and enforce the duties which grow out of these relations are the functions of practical ethics.

M. P., both in its speculative and practical forms, is capable of progress. It has actually made progress with the advancement of reflective or scientific thought. In this dept. of knowledge and of thought, as truly as in every other, man can observe and discriminate facts unobserved before. He can discern in these facts relations before unnoticed; he can form more exact definitions and devise more fundamental and comprehensive principles. The science of duty has made as conspicuous progress as any other science, and the hist. of the successive steps of its advancement is marked by the changes which attend all science. The beginnings of moral science are found in those proverbs or practical sayings which embody the sagacious observations of the wise men of their time, who are interested in the improvement of their fellow-men and of society. The sayings of the wise men of Gr., the proverbs of Solomon, the moral teachings of Confucius and of other Oriental prophets and reformers, represent the beginnings of speculative and practical ethics. The sayings of the wise men of Gr. have a special interest, because in Gr. only were they followed by the beginnings of ethical science. Socrates, in originating that movement of scientific thought which has never been arrested, taught that moral excellence rests on true knowledge as its ground, and that wickedness proceeds from ignorance. The immediate followers of Socrates were—*first*, Antisthenes and the Cynics, who emphasized the doctrine that virtues elevate man above dependence upon any special desires. *Second*, Aristippus and the Cyrenaic school, who carried the Socratic doctrine that virtue and happiness must coincide to the one-sided extreme that pleasure is the supreme good. *Third*, Euclid and the Megarics emphasized the doctrine that good of every species is self-identical and one. Plato's ethics is founded on his metaphysics and psychology. Metaphysically, it is the attainment of the supreme good. Virtue in gen. involves the domination of the higher or governing power, the reason over the sensuous or animal, intermediate between which is the impulse of courage, the virtue of the heart; the virtue of reason is wisdom, of the heart is courage, of the senses is temperance. The virtue which regulates these three is justice. The prin. sphere for the exercise of morality is the state. The ethics of Aristotle is characteristic of the man and his philos. He finds the



*summum bonum* in the highest end of which man is capable. This end is happiness—i. e. rational happiness, at once a well-being and a well-doing, a perfect activity in a perfect life. All virtues are either ethical or dianoetic. Ethical virtue is the permanent direction of the will, which guards the mean between two opposite excesses, as this is determined by the intelligence. Dianoetic virtue is the correct ordering of the theoretical reason, either in itself or in reference to the other psychical functions. Man is by nature a political being. The state exists not only for the life, but for the higher ends of man. Its basis is the family, and therefore the rights of the family, and in turn of the individual, must be regarded by the state. With Aristotle the ethical science of the ancients may be said to have reached its culmination. The first Aristotelian schools, especially the Stoics, the Epicureans, and the neo-Platonists, introduced new practical teachings, but in principle brought no essential modifications of the doctrines of the leaders of the Socratic school.

Christianity in its forms and claims was not a system of ethics, but a religion. And yet in setting forth Christ as a perfect example of moral excellence and the founder and head of a new moral or spiritual kingdom, it had an important significance in the science of morals. We find in the N. T. and in the teachings and practice of the Chr. Ch. not only a purer practical morality, but we find that this morality implied a profounder principle concerning the moral nature of man and the end of his existence than any of the ante-Chr. systems had recognized. As fast as ethics, as such, became the field of special inquiry the new Chr. material was viewed after the Aristotelian or Platonic method, and was assimilated, so far as was possible, with the ethical systems already received in the schools. The doctrines of grace, of free-will, and of original sin could not be explained or defined without more or less distinctly implying an ethical system. After philo.—i. e. the philo. of Plato and Aristotle—was recognized in the schools as supplementary to the teachings of the Ch., the greatest of the Scholastics, Thomas Aquinas, produced an elaborate treatise on speculative and practical ethics. Thomas Aquinas follows Aristotle in his definition of virtue and the division of the virtues into ethical and dianoetic, the latter being ranked as the higher. To the philosophical—chief among which he reckoned the 4 cardinal virtues—he adds the theological virtues of faith, love, and hope, the first class being natural and the last being supernatural. The moral faculty is not destroyed by the fall of man, and is both a habit of certain principles and the act by which we apply them. Perfect happiness is the supernatural gift of God.

After the Prot. Ref. the distinction between 2 sorts of truth—viz. philosophical and theological—was gradually abandoned; the relation of the truth of reason and the truth of revelation was more clearly discerned. Natural was separated from revealed theol., and ethical truth as discerned by the moral nature of man was gradually recognized as the necessary assumption and foundation of supernatural religion. The writings of Grotius and Puffendorf are important in the early hist. of modern ethics.

Modern ethics began with the discussions which were occasioned by Thomas Hobbes. Hobbes wrote primarily in the interest of his political theory of despotism. In consistency with this theory he taught that man as an individual is naturally hostile to his fellow, and is incapable of sympathetic or benevolent affections. He is also incapable of voluntary action or freedom in any proper ethical signification of the term. As against Hobbes, Cumberland taught that nature manifests and enforces ethical laws. The laws of right or practical reason are certain propositions of unchangeable truth which direct our voluntary actions, and impose an obligation to external actions without civil law. The gen. law which is thus imposed is that "the greatest benevolence of every rational agent toward all forms the happiest state of every and of all the benevolent, so far as is in their power; and it is necessarily requisite to the happiest which they can attain; and therefore the common good is the supreme law." The law of nature is immutable because it cannot be changed while the nature of things remains unchanged. But the nature of things depends on the Divine will. Locke taught that moral good and evil signify conformity or disagreement with some law; and of laws there are divine law, the civil law, and the law of opinion. The divine law may be either promulgated by the light of nature or the voice of revelation; and the civil law comprehends all those positive statutes that are framed by civil rulers; and the law of opinion is that unwritten and changing law which is commonly called public sentiment. Bp. Butler rendered special service to ethical philo. by insisting that man is capable of benevolent or disinterested affection for his kind. He also contended against the licentious doctrines of his time that the true interpretation of the Stoic precept, "to live according to nature," requires man to recognize the natural supremacy of the moral over all other impulses. In respect to the nature of conscience he is not explicit, but asserts that it is probably neither exclusively rational nor emotional, but includes both these elements. Butler's contributions to moral science have exerted a powerful influence in Eng. and Amer. A special application of this theory was made by Adam Smith in his *Theory of Moral Sentiments*. He derived our moral judgments and feelings from the principle of sympathy operating upon man in society. The original sources of our ethical judgments and feelings are the grateful and hostile feelings of our fellow-men. With these feelings we have so intimate and sensitive a sympathy that we insensibly and by ready association connect them with our actions, and these with our intentions and dispositions; and we do this so rapidly that they often seem to be independent in their origin and authority of the root from which they sprang. Jeremy Bentham was the reputed father of the utilitarian school of morals, which founded all virtue in the tendency

of actions to promote happiness. The theory, as expounded by Bentham and Mill, the father and the son, was a theory of external conduct in social and public relations, rather than a theory of ethics proper. Its cardinal principle is identical with that of Cumberland, but its denial of human freedom as the ground of human responsibility, its neglect to recognize the permanent and internal springs of action, and its generally irreligious tendency have exposed it to the charge of being unscientific and superficial. Alexander Bain adopts the extreme views of those who derive the moral judgments from the influence of society under the laws of association. Herbert Spencer teaches the same theory, but modifies and fortifies it by his material physical doctrines of evolution and the law of differentiation. This is blended with the physiological doctrine of heredity to which Charles Darwin and his followers have given extensive currency.

The Kantian ethics have had no little influence upon Amer. and Eng. writers within the last 30 yrs., originally through the school of Coleridge, and subsequently through an original study of Ger. philo. The theory of Kant has had great significance in modern speculation. After Kant, as the result of his criticism of the speculative reason, had limited its functions to phenomena, denying it the power to know things in themselves, and especially had tested and set aside its authority to accord anything more than regulative validity to the ideas of God, the soul, and the material universe, he resorts to the practical reason to furnish reality and validity first to ethical relations, and by means of these to that speculative truth which the speculative reason is unable to affirm. The practical reason commands the will by its categorical imperative to believe in duty. In order that duty may be disinterested, this must be enjoined and obeyed irrespective of any possible relations to the sensibility—i. e. to happiness—simply because it is right. But in order that duty may be performed, the will must be free; therefore it must be free in fact, and it should be believed to be free. Moreover, although duty should be performed at the simple command of the practical reason, yet it is fit and necessary that it should be rewarded; and in order that it may be rewarded there must needs be a moral ruler; therefore, the practical reason commands the speculative to believe there is a God. The moral law in its content must be a rule that is fit to be universal, because only a universal rule can be accepted by the reason. Hence, the fundamental axiom of morals is, Act in such a way as is fit and possible for you in all conceivable circumstances. Of the Ger. philo. since Kant, the ethical system of each is usually a subordinate appendage to his metaphysical theory. Schleiermacher has perhaps been the most significant next to Kant, especially for his threefold doctrine of duties, virtues, and goods. J. G. Fichte, Schelling, Hegel, Herbart, Trendelenburg, Rothe, Schopenhauer, Chalybæus, J. H. Fichte, Lotze, are all able writers upon ethics. (See HENRY SIDGWICK, *The Methods of Ethics*.) [From orig. art. in *J.'s Univ. Cyc.*, by PRES. N. PORTER, D. D., LL.D.]

**Moran** (BENJAMIN), b. in Lancaster co., Pa., in 1830, became a printer in Phila.; went to Europe about 1850; travelled over Eng. on foot, and wrote *The Footpath and the Highway*; became clerk to the Amer. legation in Lond. and private sec. to Mr. Buchanan, then minister (1854); received the appointment of sec. of legation Nov. 1855, and remained in that post for nearly 30 yrs., occasionally acting as *chargé d'affaires*. He became noted for his thorough knowledge of the archives of the legation and of the annals of Amer. diplomacy; was popular with Amer. visitors to Eng. and with the political circles of Eng. society; was appointed *chargé d'affaires* in Port. Aug. 16, 1876, and still holds that position (1882). He has been a frequent contributor to Eng. and Amer. periodicals.

**Moran** (THOMAS), b. in Bolton, Eng., Jan. 12, 1837, brought in childhood to Phila.; apprenticed to an engraver in 1853; commenced painting landscapes in 1856; visited Europe in 1861, and again in 1866, paying special attention to the paintings of Turner; achieved success as an illustrator of books and in the execution of landscapes; settled at Newark in 1871, and in the same yr. accompanied Prof. Hayden's expedition to the Yellowstone River. The result was his painting, *The Grand Cañon of the Yellowstone*, which, and *The Chasm of the Colorado*, produced 2 yrs. later, after a similar expedition to Ut. and Ariz., were purchased by Cong. for \$20,000.

**Moravia**, mo-ra-ve-a (Ger. *Mähren*), prov. of Austria, bounded W. by Bohemia, N. by Silesia, E. by Hungary and Galicia, and S. by the duchy of Aus. Area, 8584 sq. m. Pop. 2,153,496. It is almost entirely encircled by mts.—W. by the Moravian, N. by the Sudetic, and E. by the Carpathian—whose branches and spurs cover the whole country with exception of the S. part, which forms an elevated plain. Generally, the surface slopes toward the S., traversed by the Morava and a number of minor streams, which all send their waters to the Danube. The more elevated portions of M. are not fertile; the mts. yield some coal, alum, saltpetre, and metals, especially copper and lead. But the valleys and the S. plains are very fertile, and produce not only grain, flax, hemp, hops, and excellent pastures, but also wine, chestnuts, and other varieties of fine fruits. Cattle, fine horses, geese, fowls, and bees are reared, and extensive manufactures of cloths, flannels, and other woollen fabrics are carried on. In the 12th century M. was made a margravate and declared a fief of the Bohemian crown, to be held by the younger sons; in 1526, on the death of Louis II. at the battle of Mohacs, it, with Bohemia, fell to Aus.

**Moravia**, on R. K., Cayuga co., N. Y., 15 m. S. E. from Auburn, is the centre of a large grain-growing and dairying dist., and has good water-power. Pop. 1880, 1540.

**Moravian Brethren**. See MORAVIAN CHURCH.

**Moravian Church, The**, is so called because in the 15th and 16th centuries Moravia constituted one of its prin. seats, and because it was renewed in the 18th by refugees



from that country. Its official name is "The Church of the United Brethren." The blood of the martyr John Huss was its seed. It was founded by some of his followers in 1457 on the barony of Lititz, in Bohemia. The basis of their union was the following 3 principles: The Bible is the only source of Chr. doctrine; public worship is to be conducted in accordance with the teaching of the Scriptures, and on the model of the apostolic Ch.; the Lord's Supper is to be received in faith, to be doctrinally defined in the lang. of the Bible, and every human explanation of that lang. is to be avoided. Lititz soon became the rallying-point for awakened persons throughout Bohemia and Moravia, so that the new Ch. rapidly increased. Religious liberty having been proclaimed in Bohemia and Moravia in 1609, the Brethren became one of the legally acknowledged chs. of these lands. In the early part of the Thirty Years' war, however, Ferdinand II. inaugurated the so called Anti-Reformation, which crushed evangelical religion out of Bohemia and Moravia. Only a hidden seed of the Ch. of the Brethren remained. The majority of its members were driven into exile (1627). A new centre was now established at Lissa in Poland, and many parishes of refugees were formed. But Lissa was destroyed in 1656. For more than half a century the Church of the United Brethren ceased to exist as a visible organization. On June 17, 1722, a few descendants of the Brethren, who had fled from their native land to Sax., began to build the town of Herrnhut on an estate of Count Zinzendorf, where an asylum had been provided for them. Count Zinzendorf himself became the leading bp. of the resuscitated Ch., and he strove to build it up in such a way as not to interfere with the rights and privileges of the state Ch., in the communion of which he had been born, and to which he was sincerely attached. [From orig. art. in *J's Univ. Cyc.*, by PRES. EDMUND DE SCHWEINITZ.]

**Mora-Wood**, the timber of *Mora excelsa*, or *Dimorphandra Mora*, a noble forest tree of Guiana. It is of the order Leguminosae. The wood resembles the best oak, but is dark, like mahogany. It is used in ship-building.

**Morazan** (FRANCISCO), b. in Honduras, Central Amer., in 1790, was sec.-gen. of Honduras 1824; was soon afterward elected gov.; distinguished himself in frequent contests with the conservative or "reactionary" party, which he drove from the city of Guatemala in 1829, on which occasion the national cong. decreed him the title of "saviour of the republic." He effected a radical reform in ecclesiastical affairs, suppressing the convents, expelling rebellious priests, and confiscating the Ch. property to educational and other public uses. In 1832, after suppressing another insurrection, M. was chosen pres., but was opposed by the conservatives, and after several yrs. of disturbances the republic was broken into 5 independent states. M. took refuge in Chili in 1840; settled in Costa Rica in 1842, where he was chosen pres. of the state, but after a short time a counter-revolution broke out, to which M. fell a prisoner, and was executed Sept. 15, 1842.

**Mordants** [Fr. from Lat. *mordeo*, to "bite;" Ger. *beizen*], substances used in dyeing and calico-printing to fix colors which have no affinity for the tissues; in gilding, any viscous or sticky matter employed in making gold-leaf adhere. M. are indispensable to the dyer; they serve as a bond of union between the fibre and the color, and many of them modify the tint of the color, thus enabling the dyer to produce many shades of color with the same dye. Animal fibres, as silk and wool, generally attract coloring-matters. Few colors can, however, be made to adhere to vegetable fibres, cotton or linen, without the aid of a M. Colors which require M. are called adjective; those which do not, substantive. The M. has a positive affinity for both color and fibre, and binds the two together. The most important M. are alumina, oxide of iron, and oxide of tin. If cotton is immersed in a solution of acetate of alumina, a basic acetate of alumina will be fixed on the fibres so firmly as to resist removal by washing; if the cotton be now treated with water and ground madder, the red coloring-matters of the madder, alizarine, and purpurine will unite with the alumina, and thus each fibre will become covered with the red madder lakes, or salts of alizarine and purpurine, with alumina. Astringents, such as sumach, nutgalls, etc. are employed as M., and act by virtue of the tannic acid they contain. When M. are printed on cotton cloth in stripes and figures, and the cloth thus mordanted is subjected to the action of the dyestuff, the color is fixed in similar stripes and figures, leaving other portions of the cloth white; this is calico. On subjecting the cloth to action of steam, the acid of the M., generally acetic, is expelled, and the base and color become fixed on the cloth. C. F. CHANDLER.

**More** (HANNAH), b. at Stapleton, Gloucestershire, Eng., Feb. 2, 1745, ed. at a seminary kept by her two elder sisters at Bristol, in which she afterward became a teacher; began writing poems and tragedies at an early age; made the acquaintance of Garrick, by whom her tragedies of *Percy* and *The Fatal Falsehood* were produced; obtained the warm friendship and admiration of Dr. Johnson, Burke, and the literary circle swayed by them; abandoned writing for the stage from religious scruples, and devoted her pen to the advancement of religion and education; settled at Wrington 1786; produced *Sacred Dramas*, *Florida*, etc.; established at Bath the *Cheap Repository* (1795), a monthly periodical, in which she pub. the *Shepherd of Salisbury Plain*; removed to Barley Wood, near Cheddard (1802), where she founded several charitable schools; pub. *Strictures on the Modern System of Female Education*. Wrote in 1809 *Catechism in Search of a Wife*, *Practical Piety*, etc. D. Sept. 7, 1833.

**More** (Sir THOMAS), b. in Lond., Eng., in 1480, son of Sir John More, judge of the king's bench; studied Lat. under Nicholas Hart; became at 15 a member of the family of Cardinal John Morton, abp. of Canterbury, for whom he probably acted as sec. in preparing *The Historie of the Pittiful Life and Unfortunate Death of King Edward V. and the Duke of York, his Brother, with the Troublesome and Tyrannical*

*Gort. of the Usurpation of Richard III., and his Miserable End*, which has been called the first specimen of classical Eng. prose; entered Canterbury Coll., Ox., 1497, where he learned Gr. under William Grocyn, the first prof. of that lang. in Eng.; became an intimate friend of Erasmus; studied law at New Inn and Lincoln's Inn; lectured on jurisprudence at Furnival's Inn, and on St. Augustine's *De Civitate Dei* at St. Lawrence's ch.; resided for some yrs. in a Grey Friars monastery, partaking of the manual labors and spiritual exercises of the monks while pursuing classical studies and learning Fr. and music; married Miss Jane Colt 1505; engaged in the practice of law; soon rose to great eminence; was elected to a magistracy of criminal causes and M. P. for Middlesex; opposed the exactions of Henry VII. both before the courts and in Parl., thereby incurring the wrath of that monarch, visited upon his father in the form of malicious prosecution, fine, and imprisonment. Soon after the accession of Henry VIII. Cardinal Wolsey was charged to secure for the Crown the services of the brilliant young advocate, and M. was successively made master of requests and confidential envoy to the Netherlands (1514 and 1515) to negotiate for the enlargement of commercial privileges. About this time he composed in Lat. his *Utopia*, or account of an imaginary commonwealth, of which the manners, laws, and state of society were depicted as a model worthy of Eng. imitation. M. was made privy councillor and treas. of the exchequer; was knighted 1521; repeatedly sent by Wolsey on special commissions to Fr.; became a favorite of the king; was chosen speaker of the House of Commons 1523, made chancellor of the duchy of Lancaster 1525, accompanied Wolsey on his famous embassy to Fr. 1527, and became lord chancellor 1529. The Ref. had then recently begun, and M. attacked the new doctrines upon their weakest points. However ready the chancellor might be to aid Henry VIII. as "defender of the faith," he could not be expected to acquiesce in the royal vagaries in dealing with the rights of Queen Catharine of Aragon, and his refusal to countenance the proceedings for divorce led to his retirement from the chancellorship in May 1532, and in Apr. 1534 was committed to the Tower for refusing to swear allegiance to the "act of succession," which excluded the daughter of Queen Catharine from the throne in favor of the offspring of Anne Boleyn; refused to take the oath of submission to the king in his newly assumed character of head of the Ch.; was condemned to death, and executed within the Tower July 6, 1535.

PORTER C. BLISS.

**Morea**, mo-ree'a (the ancient *Peloponnesus* [island of Pelops]), is the large S. peninsula of Gr., separated from the mainland by the Gulfs of Patras, Corinth, and Egina, and connected with it by the narrow isthmus of Corinth. Area, 8263 sq. m. Pop. 743,494. It is an elevated table-land encircled with high mts., intersected by fertile valleys.

**Moreau**, mo-ro' [JEAN VICTOR], b. at Morlaix, in Bretagne, Aug. 11, 1763; studied first law, but joined in 1792 the army of the north as commander of a battalion of volunteers from Rennes, and evinced under Pichegru such a military talent that in 1794 he was made a gen. of division. In 1796 he commanded the army of the Rhine and Moselle, and penetrated into the centre of Bavaria, driving the Aus. under Archduke Charles before him; but after Jourdan's defeat at Würzburg (Sept. 3) he was compelled to retreat in order not to be cut off from Fr., and this retreat along the valley of the Danube and through the Black Forest established his fame as one of the greatest living gens. Implicated in the conspiracy of Pichegru, he received no command for nearly 2 yrs., but in 1799 he commanded in It., first under Scherer and then under Jourbert. By those who wished to overthrow the Directory the dictatorship was offered him, but feeling himself unable to govern a state, he declined the offer and gave his services to Nap. Next yr. (Apr. 25, 1800) he crossed the Rhine at the head of an army of 100,000 men, and now followed the campaign through Bavaria and Aus. to the walls of Vienna, ending with the decisive victory at Hohenlinden (Dec. 3), which resulted in the Peace of Lunville (Feb. 9, 1801)—a campaign as brilliant as that Nap. made at the same time through N. It. But from this moment a rivalry sprang up between the 2 gens. M.'s wife succeeded in embittering his heart against the First Consul, and Nap. was determined to seize the first opportunity to crush him. He was arrested (Feb. 15, 1804) as an accomplice of the conspiracy of Pichegru and Cadoudal against the life of the First Consul, and was banished. He went to Amer. and settled at Morrisville, Pa., but on the invitation of Alexander I. of Rus. he returned to Europe in 1813, and was present at the emp.'s side in the battle of Dresden (Aug. 27, 1813), when a cannon-ball fractured both his legs. He d. Sept. 2, 1813.

**Morehead** (CHARLES S.), b. in 1802 in Nelson co., Ky., was ed. at Transylvania Univ.; became a lawyer; was often in the legislature, of which he was 3 times chosen speaker; atty.-gen. of Ky. 1832-37, M. C. 1847-51, gov. of Ky. 1855-59; became a secessionist, and was confined in Ft. Lafayette, near New York, for sedition for a long time in the c. war. D. Dec. 23, 1868.

**Morehead** (JAMES T.), b. at Covington, Ky., May 24, 1797, was ed. at Transylvania Univ. and the Univ. of N. C.; studied law and practised at Bowling Green, Frankfort, and Covington, Ky.; was often in the legislature; lieut.-gov. 1832, gov. 1834-36, pres. of the board of internal improvements 1838-41, U. S. Senator 1841-47; author of a work on *Practice and Proceedings at Law*, etc. D. Dec. 28, 1854.

**Morehead** (JOHN M.), b. about 1796 in N. C., grad. in 1817 at the Univ. of N. C.; was an able lawyer; pres. of the Whig national convention 1848, gov. of N. C. 1841-45. D. Aug. 28, 1866.

**Morel** (Fr. *morille*), the name given to the members of the genus *Morchella*, belonging to the ascomycetous groups of Fungi. The genus is characterized by an ovoid or pileate, deeply lobed, or pitted *pilius* raised upon a stalk, the pits



being covered by the spore-bearing surface, called the *hymenium*. The M. are best known for their esculent qualities, being among those fungi which were first used as articles of food. The most widely known species of the genus is *Morchella esculenta*, Pers., which is easily recognized by its large olive or smoky-gray colored pileus, 2 to 3 inches in diameter, covered by anastomosing ribs, which form large and deep pits, raised upon a short, thick, and hollow stalk, confluent with the contracted base of the pileus. It inhabits woody and bushy places on sandy soil, growing chiefly in the spring. The common M. is found in the U. S., as well as in most parts of Europe, but those in commerce come mostly from Ger. M. are largely used as a flavoring for sauces and soups, and in the production of the finest qualities of catchup. They are very palatable when stewed.

**Morelia**, cap. of the state of Michoacan, Mex., and seat of an archiepiscopal see. Founded by the Sp. as early as 1541, it was called Valladolid until 1828, when the present name was given in memory of the revolutionary chief Jose Maria Morelos, who was born there. It is solidly built, with well-paved streets embellished by handsome public structures, including the cathedral, with two lofty towers, erected in 1745. Water is supplied by a costly arched aqueduct, built in 1788 at the expense of the bp., Fray Antonio de San Miguel, to give employment to the poor during a famine. About 6350 ft. above the sea, the climate is genial. It has the coll. of San Nicolas de Hidalgo, and an ancient coll. devoted exclusively to the instruction of persons for the priesthood. Books were printed in M. (Valladolid) as early as 1559. Pop. about 30,000.

**Morell** (GEORGE), b. at Lenox, Mass., Mar. 22, 1786, grad. in 1807 at Williams Coll.; called to the bar in 1811; removed to Cooperstown, N. Y.; was first judge of the Otsego co. court 1827 and 1832, a U. S. judge in Mich. 1832-36, a judge of the Mich. supreme court 1836-43, its chief-justice 1843-45. D. Mar. 8, 1845.

**Morelos y Pa'von** (JOSE MARIA), b. at Valladolid (now named Morelia in his honor), state of Michoacan, Mex., Sept. 30, 1765; earned as a muleteer the means of education, and entering the priesthood became curate of Caracaro and Nocupetaro; joined in the revolt made by Hidalgo against the Sp. in 1810, and was intrusted with the duty of extending the movement on the S. W. coast, where he soon was at the head of 3000 men. On Feb. 19, 1812, he defeated a Sp. army at Cuautla Amilpas, where he was subsequently besieged by other Sp. forces, but effected his escape to win repeated victories in other quarters of Mex. In an expedition against Valladolid in Dec. 1813 he was beaten by Iturbide. He was taken prisoner Nov. 15, 1815, carried to Mex., tried, and shot Dec. 22, 1815.

**Morrell**, Mich. See APPENDIX.

**Morgan** (DANIEL), b. in Hunterdon co., N. J., 1736; removed to Va. in early life, and in 1755 joined Braddock's expedition as a wagoner; received 500 lashes in 1756 for an alleged insult to a Brit. officer. On the outbreak of the war for independence he raised a company of riflemen, with which he marched to Boston, and accompanied Arnold's expedition against Que., where he was made prisoner; being exchanged, he was appointed (Nov. 1776) col. of a Va. rifle regiment, which he commanded with great ability, and was conspicuous at Saratoga; promoted to be brig.-gen. in 1780, he was attached to the S. army, and Jan. 17, 1781, won the victory of Cowpens over Tarleton, avoiding Cornwallis's subsequent pursuit and rejoining Gen. Greene. For this service Cong. voted him a gold medal. Shortly after ill-health compelled him to retire, but in 1794 he was again actively employed in suppressing the "whiskey insurrection" in Pa.; was M. C. 1795-99. D. July 6, 1802.

**Morgan** (EDWIN DENNISON), LL.D., b. at Washington, Mass., Feb. 8, 1811; became in 1828 a clerk and in 1831 a partner in a wholesale grocery business in Hartford, Conn., and in 1836 established a successful mercantile business in New York; was State senator of N. Y. 1843-53; gov. of N. Y. 1859-62; ranked as maj.-gen. of U. S. volunteers 1861-62 (without pay); was U. S. Senator 1863-69; declined the secretaryship of U. S. treas. 1865, and 1881. D. Feb. 14, 1883.

**Morgan** (GEORGE WASHINGTON), b. in Washington co., Pa., Sept. 20, 1820; joined the Tex. army for independence, attaining the rank of capt.; appointed cadet at W. Pt. in 1841, but without graduating settled in Mt. Vernon, O. (1843), and became a lawyer; col. of the 2d O. Volunteers in Mex. war, and was appointed col. 15th U. S. Inf. Mar. 1847; brevet brig.-gen. for Contreras and Churubusco; U. S. consul at Marseilles 1855-58, in which latter yr. he was appointed minister to Port. In the c. war as brig.-gen. of volunteers, he commanded a division of the Army of the O.; of the Army of the Tenn. in the assault on Chickasaw Bluffs, Dec. 1862, and capture of Arkansas Post; M. C. 1871-75.

**Morgan** (Sir HENRY JOHN), the most celebrated of the early Eng. buccaneers, b. in Wales about 1637, was the son of a wealthy farmer; ran away from home in boyhood; shipped as a sailor to Barbadoes; went thence to Jamaica; soon joined a band of buccaneers, of which he became the leader; increased his numbers by admitting adventurers of all nationalities, and ultimately became possessed of a formidable fleet, with which he ravaged whole dists. of the "Spanish Main." M.'s earliest exploits were on the coasts of Campeche, where he made many prizes. With a well-equipped fleet of 12 vessels he ravaged Los Cayos and the S. coast of Cuba; marched inland; took and ravaged Puerto Principe after a formal battle; took Puerto Bello in New Granada 1668. The city was evacuated only on payment of a heavy ransom by the gov. of Panamá. Reinforced by a body of Fr. buccaneers under Pierre le Picard, M., with 960 men, attacked and took Maracaibo, which was freed from plunder by the payment of a ransom 1669; engaged and captured a formidable Sp. squadron, and returned to Jamaica with an immense booty. In the following yr. he assembled all the "brothers of the coast" for a raid upon Panamá; made rendezvous at Cape Tiburon, Santo Domingo, Dec. 16,

1670, with 37 vessels and 2200 men; appointed as second in command a Frenchman named Bradelet; took La Rancheria near Cartagena; captured the island of Santa Catalina a second time, obtaining stores of powder and guides, and took and destroyed the fort of San Lorenzo at the mouth of the Chagres River, killing over 300 of the garrison. The buccaneers then ascended the Chagres River in canoes with 1800 men, had to fight with concealed Indians, and suffered much from hunger, but succeeded in crossing the Isthmus, and appeared before Panamá Jan. 26, 1671, which was taken, sacked, and burned. M. then returned to civilized life, was knighted by Charles II., pub. his *Voyage to Panamá* (1683), and spent the last 20 yrs. of his life in opulence in Jamaica, where he d. in 1690.

**Morgan** (JOHN), M. D., F. R. S., b. in Phila. in 1735, grad. at Phila. Coll. 1757; M. D. at Edinburgh 1764, having previously studied under William Hunter and on the Continent; became in 1765 prof. of theory and practice in the Phila. Coll., and the prin. founder of the med. school; was 1775-77 director-gen. and phys.-in-chief of the army-gen. hospital at Phila. D. Oct. 15, 1789.

**Morgan** (JOHN H.), b. at Huntsville, Ala., June 1, 1826; served in the Mex. war. At Lexington, Ky., 1861, he organized the Lexington Rifles, with whom he joined Gen. Buckner in the Confed. service; commanded a squadron of cav. at Shiloh, and soon afterward began a series of raids through the portions of Ky. held by the Union forces, destroying R. Rs., bridges, and supplies. In 1863 he crossed the O. River upon a bold raid, but was captured with most of his command, and was confined in the O. penitentiary. He succeeded in escaping, and undertook a raid in Tenn., but was killed by Federal cav. Sept. 4, 1864.

**Morgan** (LEWIS HENRY), b. near Aurora, N. Y., Nov. 21, 1818, grad. at Union Coll. in 1840; practised law in Rochester 1844-64; in 1861 was a member of the N. Y. assembly, in 1868 of the State senate. Wrote *League of the Iroquois, Systems of Consanguinity and Affinity of the Human Family* (Smithsonian Contributions to Knowledge, vol. xvii.), etc. D. Dec. 17, 1881.

**Morganatic Marriage** [perhaps from the Gothic *morgan*, to "limit", or *Left-handed Marriage*, in Ger., Aus., and Den. the marriage of a prince, nobleman, or, in some regions, of any gentleman of rank, with a woman of inferior position. Such marriages do not necessarily prevent the contract of perfect marriage with a lady of full rank. Morganatic or inferior wives do not share the rank, titles, or estate of the husband, and the children, if not really illegitimate, are not regarded as of the rank of children of a full marriage, neither can they succeed to the property or the dignity of the father.

**Morgan City**, St. Mary's parish, La., on R. R. and the Atchafalaya River, 80 m. W. by S. of New Orleans. It is a port of entry, has a good harbor, and is connected with Tex., Havana, and Mex. ports by steamers. Pop. 1870, 776; 1880, 2015.

**Morgantown**, W. Va. See APPENDIX.

**Morgarten**, a mt. pass in the canton of Zug, Switz., between Morgarten Hills and Lake Egerl. On Dec. 6, 1315, the Swiss won here their first victory over the Aus.

**Morghen** (RAPHAEL SANZIO), b. in Florence, It., June 19, 1758; d. there in 1833. His father, an engraver, gave him early instruction in his art, and sent him to the school of Volpato in Rome. In 1790 M. visited Naples, but declined to stay there, preferring the offer of the grand duke of Tuscany, a salary of 400 scudi, and free apartments in the city of Florence, with the liberty of engraving such works as he pleased and the right of property in his own plates. The entire work of M. is estimated to comprise 254 pieces, 18 of which are from Raphael; 73 are portraits. Palmerini, the pupil of M., pub. in 1824 a *Life* and portrait of his master, with a catalogue of his works. O. B. FROTHINGHAM.

**Morgue, The**. See APPENDIX.

**Mor'ah** [the feminine of *Morah*], a dist. in Pal., on one of whose mts. Abraham attempted the sacrifice of Isaac (Gen. xxii. 2) and Solomon afterward built the temple (2 Chron. iii. 1). This identity has been denied by Dean Stanley and others, but was affirmed by Josephus (*Antiq.* i. 13. 2), and is accepted by a majority of the best scholars. (See also JERUSALEM.) R. D. HITCHCOCK.

**Mori Arinori**, b. in the prov. of Satsuma, Japan, about the yr. 1846; was among the first students sent to Eng. to be educated, and after remaining in Lond. 2 yrs. returned to Japan. He took part in public affairs after the late rebellion in his country, and was the first to receive a diplomatic mission from his govt., and in 1871 was accredited to the U. S. as *chargé d'affaires*. During his residence in Amer. he devoted special attention to educational matters. In 1873 he returned to Japan, and in 1875 was appointed first assistant minister of foreign affairs.

**Morier**, mor'ier (JAMES), b. in Eng. in 1780; early entered the diplomatic service; was private sec. of Lord Elgin in his embassy to Constantinople; accompanied the grand vizier in the campaign in Egypt against the Fr.; was taken prisoner by the Fr., and set at liberty with a threat to treat him as a spy should he return to Egypt. Having acquired a knowledge of several Oriental langs., he spent many yrs. as sec. of legation or as *chargé d'affaires* in Per., and attained celebrity through his novel descriptive of Per. manners and customs. Wrote several books of travel, and the novels *Adventures of Hajji Baba of Ispahan*, *Zohrab the Hostage*, *Ayesha*, the *Maid of Kars*, and *Mirza*. D. Mar. 30, 1849.

**Morin'din**, a yellow crystalline coloring-matter in the root of *Morinda citrifolia*, called *soranjee* in the E. I.

**Morindone**. See SORANJEE.

**Morison** (JOHN HOPKINS), D. D., b. in Peterborough, N. H., July 25, 1808, ed. at Exeter Acad. and Harvard Coll.; was first settled over the Unit. society in New Bedford, Mass., and afterward (1846) in Milton. Wrote *Life of Jeremiah Smith* and *Disquisition and Notes on the Gospel of Matthew*; ed. of the *Monthly Religious Magazine*.



**Morisonianism.** See EVANGELICAL UNION.

**Morlaks** [*Morlaci* or *Primorci*; "maritime people"], a rude S. Slavic race found in Dalmatia. They are mostly sailors and devout R. Caths. The M. of the interior make the best soldiers among the Dalmatian troops.

**Morley** (HENRY), b. in Lond. Sept. 15, 1822, ed. at King's Coll., Lond.; practised med. 1844-48; was for 2 yrs. a successful instructor; became in 1851 a Lond. journalist, and afterward edited the *Examiner*; lecturer on Eng. lit. at King's Coll., Lond., 1857-65, and in 1865 became prof. of Eng. lang. and lit. at Univ. Coll., Lond. Wrote *How to Make Home Unhealthy*, *Defence of Ignorance*, etc.

**Morley** (JOHN), b. at Blackburn, Eng., Dec. 24, 1838, ed. at Cheltenham and Lincoln Coll., Ox., graduating in 1859; is a liberal in politics; became in 1867 ed. of the *Fortnightly Review*; author of *Edmund Burke*, *Critical Miscellanies*, *Voltaire*, *Rousseau*, etc.

**Morley** (THOMAS), b. in Eng. about 1545, was a musical pupil of William Birde; studied at Ox.; imitated the It. style; was a skilful performer and a prolific composer of anthems, ch. services, etc. He pub. 4 books of *Madrigals*, a *Plaine* and *Easie Introduction to Practicall Musicke*, and *The Triumphs of Oriana*. D. at Lond. in 1604.

**Mormons**, or, as they call themselves, **The Church of Jesus Christ of Latter-Day Saints**, a religious sect founded in 1830 by Joseph Smith at Manchester, N. Y. The distinguishing peculiarities of the sect are, in religious respects, the belief in a continual divine revelation through the inspired medium of the prophet at the head of the Ch.; in moral respects, the practice of polygamy; and in social respects, a complete hierarchical organization. The govt. of the M. is a pure theocracy; its officers form a complete priesthood. The supreme power, spiritual and temporal, rests with the first presidency, elected by the whole body of the Ch. Then follows the office of the patriarch; then the council of the 12 apostles and of the 70 disciples; then the orders of high priests, bps., elders, priests, teachers, and deacons. But of the first presidency 2 members are only coadjutors; one alone is the real head of the whole organization—the prophet, the seer—and he alone has the "right" of working miracles and receiving revelations. This belief in a continual divine revelation through the medium of the prophet—a belief which enjoins absolute obedience to the commands of the revelation on the part of all persons who accept it—is the corner-stone of the social building of Mormonism, the only vital agency in its hist., the whole secret of its success; and the day it dies out Mormonism is nothing but a heap of nonsense. The M. accept both the Bible and the *Book of Mormon* as divine revelations, but they hold them both subject to the explanations and corrections of the prophet. The *Book of Mormon* was the legitimization by which Joseph Smith first introduced himself to the world—the guaranty he gave for the divine character of his mission. An angel from heaven appeared before him and told him where this book, the Bible of the W. continent, the supplement to the N. T., the fulness of the divine revelation, was hidden. On the spot designated by the angel Mr. Smith found in a stone box a volume 6 inches thick and composed of thin gold plates, 8 inches by 7, held together by 3 gold rings. These plates were covered with writing in the "reformed Egyptian" tongue—whatever that may be—but beside the volume Mr. Smith found the "Urim and Thummim," a sort of supernatural spectacles—for the puerilities of children's stories are not wanting—which enabled him to read and understand the characters. Sitting behind a curtain drawn across the room, he then dictated a translation—for he could not write himself—to his sec., Oliver Cowdery, and this translation was printed in 1830, accompanied by testimonials from 11 persons who had seen the golden plates before they unfortunately disappeared. It was soon proved beyond doubt that the *Book of Mormon* was simply a sort of historical romance written in 1812 by one Solomon Spaulding, who indulged in that kind of authorship, though he never succeeded in getting his productions pub., and that the MS. had become lost in a printing-office in Pittsburgh under the hands of an apprentice, Sidney Rigdon, who in 1829 became an associate of Joseph Smith. With this book as a basis for his teaching, and guided by divine revelations whenever such were needed, Joseph Smith began to preach, and in Jan. 1831 he led the first Mormon congregation, consisting of 30 members, from Manchester, N. Y., to Kirtland O., which place became the head-quarters of the sect for the following 7 yrs. All the prophet's business transactions in Kirtland, however, were of a more than doubtful character. The bank of which he had made himself pres. failed in 1838, and he had to flee in order to avoid being arrested for fraud. Meanwhile the great body of the sect had emigrated into Mo., and settled chiefly in and around Far West. But their conduct had now become so offensive to their neighbors that they lived in a state of actual warfare, and at the close of 1838 they were driven out of the State. Crossing the Miss., they retired into Ill. and settled in the vicinity of Commerce, where they founded the city of Nauvoo, and lived there for 7 yrs. Great advantages were given them here. A charter was granted to the city, which nearly made it independent of the State govt., and the M. had everything their own way. Nevertheless the whole association came near its dissolution. The dissipation of Joseph Smith provoked even his intimate friends, and the divine revelation concerning polygamy, with which his sins were to be covered, excited at first general indignation. A newspaper pub. by one of his former friends began to expose his outrages and crimes, and when, at the head of his personal party among the M., he razed the printing-office to the ground and expelled the publisher from the city, a warrant for his arrest was obtained by this man and served upon him. He refused to obey; the militia was called in to enforce the warrant. The M. armed at Nauvoo to resist it, and a war was on the eve of breaking out when the gov. succeeded in persuading the prophet to

surrender and take his trial. He was brought to the jail at Carthage, and on the evening of his arrival (June 27, 1844) he was shot here by a mob. In the following yr. the legislature of Ill. repealed the charter of Nauvoo, and the situation of the M. in the State had now become so precarious that a new emigration was deemed necessary. Preparations were immediately commenced under the leadership of Brigham Young, who was elected prophet after the death of Joseph Smith, and with admirable firmness and circumspection he led a host of about 16,000 persons across the prairie deserts to Salt Lake Valley—a movement which it took about 2 yrs. to perform. CLEMENS PETERSEN.

**Morning Glory.** See CONVULVULUS.

**Morny, de** (CHARLES AUGUSTE LOUIS JOSEPH), DUKE, b. in Paris Oct. 23, 1811, was believed to be a son of Queen Hortense and Count de Flahault; was adopted by Count de Morny, a resident of the island of Mauritius, but ed. by his grandmother in Paris; entered the army and fought with distinction in Algeria; but Queen Hortense having bequeathed to him an annuity of 40,000 francs, he left the service and engaged in commercial speculations; was a member of the Chamber of Deputies 1842-48; after the *coup d'état* minister of the interior for a short time; 1856-57 ambassador in St. Petersburg; from 1854 to his death pres. of the legislative body. D. at Paris Mar. 10, 1865.

**Morocco**, sultanate of N. W. Afr., situated between lat. 27° and 36° N., lon. 4° 30' E. and 11° 50' W., bounded by Algeria, the Mediterranean, the Strait of Gibraltar, the Atlantic, and Sahara. The coast along the Atlantic is generally low, flat, sandy, very dangerous to navigate, and affording only a few harbors; but from the Strait of Gibraltar eastward along the Mediterranean it is high, bold, and rocky. A beautiful and very fertile plain, containing all the large cities, Morocco, Fez, etc., extends between the coast-range and the Atlas Mts., which in several parallel lines traverse the country from N. E. to S. W. The climate in the plain is delicious, tempered by cool breezes from the Atlas, which keep off the scorching winds from Sahara; in the wet season, from Nov. to Mar., showers are frequent. In the mts. and on the S. slope extreme heat and cold alternate, and the changes are often very sudden. Excellent marbles of different kinds are found; gold, silver, copper, tin, nickel, rock-salt, and sulphur; iron is abundant and of good quality. The luxuriant forests which clothe the mts. contain oak, cedar of Lebanon, pine, and many kinds of valuable timber-trees. In the valleys and the plain all the cereals, fruits, and vegetables of the warm and temperate zones can be cultivated. But agriculture is generally in a very backward state, and the country sometimes does not produce sufficient wheat for its own demand. Area, 313,560 sq. m. The inhabs., numbering 6,370,000, are Berbers (generally agriculturists), Arabs (nomads), Moors (often employed in offices), Jews (merchants), and negroes (often slaves). The langs. spoken are dialects more or less corrupted of the Berber, Arabic, Sp., and negro tongues from the interior of Afr. The reigning religion is Islam. CLEMENS PETERSEN.

**Morocco**, one of the caps. of the sultanate of Morocco, situated in lat. 31° 38' N., lon. 7° 36' W., in a plain at the foot of the Atlas, 1500 ft. above the sea, is surrounded by a wall now generally in a dilapidated condition. The city was founded in 1072, and was in the 13th and 14th centuries a famous seat of learning, to which the Moors of Sp. sent their children to be ed., and said to have had 500,000 inhabs. It contains still many large mosques and a magnificent palace. Of its manufactures, that of red and yellow morocco is famous. Pop. estimated at 70,000.

**Morocco Leather** is the name given originally to leather made from goat skins tanned with smutch, but is now applied also to the inferior sort (roan) made from sheep skins. The name appears to be derived from the superior excellence of the leather formerly obtained from Morocco. Enamel oilcloth, made to look like M. L., is now extensively used. Real M. L. is considered to be the best material for bookbinding, and the estimation in which it is held has led to extensive counterfeiting, inferior sheep skins being dressed and dyed to resemble it as much as possible.

**Morpheus**, in Rom. mythology, the god of dreams, the son of Sleep (from Gr. *μωππειν*, the "moulder," the former of dreams), is represented as an old man with huge wings and a horn exhaling a somniferous odor.

**Morphia.** See OPIUM.

**Morphology**, in bot. as applied to the higher grade of plants, is an exemplification of the idea that the upwardly growing parts of a plant—all, indeed, but the roots and mere superficial growths, such as hairs and prickles—consist of joints of stem, developed one from another, and of leaves, each joint bearing at its summit one, two, or more leaves, or what answer to leaves. (See BOTANY and LEAF.) These ideas, now so fruitful, were vaguely conceived by Linnaeus, more distinctly developed by C. F. Wolf, made popular by Goethe in an independent way, and practically applied by N. Brown, De Candolle, A. St. Hilaire, etc. It now forms the basis of every treatise on morphological bot. The term is used in the study of the development and transformation of the cells of which the organs are composed. ASA GRAY.

**Morphy** (PAUL CHARLES), b. at New Orleans Aug. 22, 1837; exhibited from childhood surprising skill in chess, and at the age of 12 had defeated the best players of his native city; grad. at St. Joseph's Coll.; studied law, and was admitted to the bar in 1857; at the chess cong. in New York in 1857 was the victor, thereby becoming the champion player of the U. S.; in 1858 visited Europe; gained a victory over Löwenthal and others in Lond.; defeated the best Fr. and Ger. players, and gave exhibitions of his ability to play 8 games simultaneously without seeing the chess-boards. On his return to the U. S. he resumed the practice of law in New Orleans; became insane. D. July 10, 1884.

**Morrill** (ANSON P.), b. at Belgrade, Me., June 10, 1803, became a manufacturer and merchant; was gov. of Me. 1855-57, and M. C. 1861-63.



**Morrill** (DAVID LAWRENCE), M. D., LL.D., b. at Epping, N. H., June 10, 1772; became a phys. of Epsom, N. H., in 1793, pastor of the Congl. ch., Goffstown, N. H., 1802-11, a practitioner of med. 1807-90; was many yrs. in the N. H. legislature, and in 1816 its speaker; U. S. Senator 1817-23, pres. of the State senate 1823, gov. of N. H. 1824-27, and afterward ed. of the N. H. *Observer*. D. Jan. 28, 1849.

**Morrill** (JUSTIN S.), b. at Stratford, Vt., Apr. 14, 1810; engaged in mercantile business, and in 1848 became a successful agriculturist; M. C. from Vt. 1855-67; chairman of committee of ways and means and author of the Morrill tariff of 1861; U. S. Senator 1867-73, re-elected in 1873, and again in 1879.

**Morrill** (LOT M.), LL.D., b. at Belgrade, Me., May 3, 1813, ed. at Waterville Coll.; became a lawyer in 1839; entered legislature in 1854; pres. of State senate 1856, gov. of Me. 1858-60, U. S. Senator 1861-76; sec. of treas., 1876-77; afterward collector of Portland, Me., till his death, Jan. 10, 1883.

**Morris**, city, cap. of Grundy co., Ill., on R. R. and the Ill. and Mich. Canal, is one of the largest grain-markets in the W.; has a classical inst. and extensive mines of bituminous coal. Pop. 1870, 3198; 1880, 3486.

**Morris**, R. R. junc., cap. of Stevens co., Minn., 159 m. N. W. of St. Paul. Pop. 1880, 743.

**Morris** (CHARLES), b. at Woodstock, Conn., July 26, 1784; entered the navy July 1, 1799, and served during the war with Tripoli; promoted to be lieut. in 1807, and was distinguished in the war of 1812 as first lieut. of the frigate *Constitution*, being severely wounded in the engagement of that ship with the Brit. frigate *Guerrière*, Aug. 19; made capt., and took command of the *Adams*, which he was compelled to destroy in 1814, while lying in the Penobscot River in a disabled condition. Subsequently in command of the *Brandwinne*, he conveyed La Fayette back to Fr. in 1825, and later attained the rank of col. and commanded a squadron. For many yrs. he was in charge of various bureaus in the navy dept., being chief of the bureau of hydrography at the time of his death. D. Jan. 27, 1856.

**Morris** (GEORGE P.), b. at Phila. Oct. 10, 1802; removed in early life to New York, where he soon began to write for the press; pub. the *New York Mirror* 1823-42; was the associate of N. P. Willis in publishing the *New Mirror* (1843), the *Evening Mirror* (1844), the *National Press* (1845-46), and the *Home Journal* (1846-64); was one of the best of song-writers. D. July 6, 1864.

**Morris** (GEORGE SYLVESTER), A. M., b. at Norwich, Vt., Nov. 15, 1840, grad. at Dartmouth 1861; served in the army; was tutor at Dartmouth 1863-64; studied theol., and spent several yrs. in Ger., chiefly in philosophical studies; translated Ueberweg's *Hist. of Philos.*, with additions, and became prof. of modern langs. and lit. in the Univ. of Mich. 1870; has written on philosophical topics in reviews and in *Transactions of Victoria Inst.*

**Morris** (GOVERNOUR), b. at Morrisania, N. Y. (now in New York city), Jan. 31, 1752, grad. at King's Coll. 1768; was admitted to the bar in 1771; was in the provincial cong. of N. Y. 1775; assisted in drafting the State const. 1787; in Continental Cong. 1777-80; became 1781 assistant supt. of finance, and afterward was Robert Morris's partner in mercantile business; was one of the committee which drafted the Federal const. 1787; was engaged in business in Fr. 1788-91, U. S. agent in Lond. 1791, minister to Fr. 1792-94, U. S. Senator 1800-03; was one of the fathers of the N. Y. canal system, and pres. of the canal commission 1810-16; author of numerous essays, etc. D. Nov. 6, 1816.

**Morris** (JOHN G.), D. D., LL.D., b. at York, Pa., Nov. 14, 1803, grad. at Dickinson Coll. 1823, and in theol. at Princeton 1825; was pastor of the First Lutheran ch. in Baltimore 1826-59, and of another ch. in the same city 6 yrs.; was the first librarian of the Peabody Inst. at Baltimore, for which he drew up a catalogue; wrote a *Popular Exposition of the Gospels*; translated several works from the Ger.; made a *Catalogue and Synopsis of the described Lepidoptera of the U. S.*, both pub. by the Smithsonian Inst.; has written sketches of foreign travel, numerous scientific, religious, historical, and literary essays. He was the first ed. of the *Lutheran Observer*, and co-editor of the *Year-Book of the Ref.* He founded the v. of Lutherville, near Baltimore, and the female sem. at that place; was one of the founders of the *Record of the Linnean Society*; delivered scientific lectures at Pa. Coll., Gettysburg, and an annual course on *The Connection between Science and Revelation* in the Lutheran sem. at the same place. He has been pres. or v.-p. of numerous scientific, literary, and religious bodies.

**Morris** (LEWIS), b. at Morrisania, N. Y., in 1671, became a judge of the superior court of N. J. in 1692, and was prominent in public affairs; was for yrs. chief-justice of N. Y. and N. J.; acting gov. in 1731; active in separation of N. Y. and N. J. 1738; gov. of N. J. 1738-46. D. May 21, 1746.

**Morris** (LEWIS), one of the signers of the Dec. of Ind., was the eldest brother of Gouverneur Morris, b. in 1726 at Morrisania, N. Y.; grad. at Yale 1746; was in 1775 active in detaching the Indians from the service of G. Brit.; was in the Continental Cong. 1775-77, and afterward a maj.-gen. of militia. D. Jan. 22, 1798.

**Morris** (RICHARD), LL.D., b. at Bermondsey, Southwark, Eng., Sept. 8, 1833, was ed. at St. John's Coll., Battersea; appointed lecturer on the Eng. lang. and lit. in King's Coll. School in Apr. 1869, and was ordained curate of Christ Ch., Camberwell, 1871. Wrote *The Etymology of Local Names, Specimens of Early Eng., Historical Outlines of Eng. Accidence*, etc. Has edited numerous early texts.

**Morris** (ROBERT), b. in Eng. Jan. 20, 1734; came with his father to Amer. in 1747, and after serving in the counting-house of Charles Willing in Phila. until 1754, formed a partnership with that gentleman's son, which continued with great success until 1793. He strongly opposed the Stamp Act, and against his business interests signed the non-importation agreement of 1765. In 1776 he was a delegate to the Continental Cong., and, though once voting against the

Dec. of Ind., signed that paper on its adoption, and was twice (1775-78) re-elected to Cong. Throughout the war his services in aiding the gov. during its financial difficulties were of incalculable value; he freely pledged his personal credit for supplies for the army, at one time to the amount of \$1,400,000; he also established the Bank of N. Amer., and in 1781 was appointed supt. of finance, which post he held until 1784. He was subsequently a member of the Pa. legislature, of the convention which framed the Federal const., and from 1786 to 1795 was U. S. Senator, declining in the mean time the proffered post of sec. of the treas. After engaging in the China trade, he in his later yrs. became involved in land speculations which resulted ruinously, and his remaining days were passed in confinement for debt. D. May 8, 1806.

**Morris** (ROBERT HUNTER), a son of Gov. Lewis Morris of N. J., was a lawyer; for 26 yrs. a councillor of N. J., and for 20 yrs. its chief-justice, 1735-57; was deputy gov. of Pa. 1754-56. D. Feb. 20, 1764.

**Morris** (STAATS LONG), grandson of Gov. Lewis (1671-1746), and brother of Gouverneur, b. at Morrisania, N. Y., Aug. 27, 1728; entered the Brit. army; became capt. 1756; soon afterward lieut.-col. of the 89th Highlanders; served at the siege of the Fr. colony of Pondicherry, India, 1761; became brig.-gen. 1763; married the duchess of Gordon, who d. 1770; sat in Parl.; became maj.-gen. 1777 and full gen. 1786; was appointed gov. of Que. 1797. D. in 1800.

**Morris** (THOMAS), b. in Va. Jan. 3, 1776; removed in 1795 to Columbia, and in 1800 to Clermont co., O., where he studied law while employed as a farm-laborer; was admitted to the bar 1804, elected to the legislature 1806; was continuously a member of either the upper or the lower house for 24 yrs.; became eminent as a lawyer; was elected in 1809 a judge of the supreme court of the State, and in 1832 U. S. Senator as a Dem. He distinguished himself as an opponent of slavery and a defender of freedom of the press, free speech, and the right of petition. He was consequently not re-elected, but was in 1844 the candidate of the "Liberty party" for the Vice-Presidency. His *Life, Speeches, and Writings* were pub. by his son, Rev. B. F. Morris. D. Dec. 7, 1844.—Two other sons, ISAAC N. (b. Jan. 22, 1812) and JONATHAN D., have figured in public life, and have been members of Cong., the former for Ill. (1857-61), the latter for O. (1849-51).

**Morris** (THOMAS A.), D. D., b. in Kanawha co., W. Va., Apr. 28, 1794; joined the O. M. E. Conference in 1816; labored as an itinerant preacher in the N. W. down to 1834, when he was appointed the first ed. of the *W. Chr. Advocate* in Cin.; in 1836 was elected bp. He was author of a vol. of sermons and biographical sketches of his W. fellow-laborers in the ministry. D. Sept. 2, 1874.

**Morris** (Gen. WILLIAM WALTON), b. at Ballston Springs, N. Y., Aug. 31, 1801, grad. at W. Pt. 1820; served against the Arickaree Indians 1823; was major of mounted Creek volunteers in the Seminole war 1836-37; was engaged in the battles of Wahoo Swamp, Okeechobee, Hatchelulsee Creek, and many others, gaining two brevets, and during 9 yrs. garrison duty (1837-46) gained reputation as a military lawyer; was attached to the judge-advocate's dept. of Gen. Taylor's army on the Rio Grande 1846; was engaged in the battles of Palo Alto and Resaca de la Palma; was made military gov. of Tampico on the occupation of that port, military gov. of Puebla 1847-48; was commandant at Ft. Kearney, Neb., 1853-60, and at Ft. McHenry, Baltimore, 1860-61, where he promptly brought his guns to bear on the rioters in the affray of Apr. 19, 1861. He was promoted to a lieut.-colonelcy May 14, 1861, and shortly afterward refused to answer a writ of *habeas corpus* granted by a Md. judge, on the ground that it had become invalid by the outbreak of hostilities. He was made full col. of the 2d Artl. Nov. 1 of the same yr., brevet brig.-gen. in the regular army June 9, 1862, and brevet maj.-gen. Dec. 10, 1865. He commanded Ft. McHenry throughout the war. D. Dec. 11, 1865.

**Morris Island**, a low, narrow sand-island on the S. side of the entrance into Charleston harbor, S. C., a little more than  $\frac{3}{4}$  m. long. A Confed. battery on Cummings Point, at the extreme N. end of the island, aided in the capture of Ft. Sumter Apr. 1861. After this the Confeds. erected Ft. Wagner and other batteries on M. I. as part of the exterior line of defenses for Charleston. The S. end of the island was captured by the U. forces, July 10, 1863, and 2 unsuccessful assaults upon Ft. Wagner followed Ju'y 11 and 18, the object being to get within breaching distance of Ft. Sumter, about 2700 yards from Ft. Wagner. After the assault of the 18th it was determined to reduce Ft. Wagner by a regular siege, which was opened on the 19th. The final operations against the work were actively inaugurated on the morning of Sept. 5 by a heavy bombardment, which lasted 42 consecutive hours. Under this fire the trenches were pushed forward by the evening of Sept. 6 to the outer edge of the ditch, and orders were given to carry the place by assault on the following morning. During the night the enemy evacuated the fort, and the whole of M. I. came into possession of the U. forces. Long-range guns were subsequently placed upon its N. end and used against Charleston, 4 m. distant. One of the guns used was a 30-pounder Parrott rifle, which was fired 4606 times before it burst, and some of its projectiles attained a range of  $\frac{5}{8}$  statute m.

**Morrison**, city, on R. R., cap. of Whiteside co., Ill., 137 m. W. of Chicago. Pop. 1880, 1981.

**Morrison** (JOHN IRWIN). See APPENDIX.  
**Morrison** (ROBERT), D. D., F. R. S., b. at Morpeth, Northumberland, Eng., Jan. 3, 1782, ed. at Hoxton Acad. and the missionary coll. Gosport; went to Canton as a missionary of the Lond. Society; founded the Anglo-Chi. coll. at Malacca 1818; pub. a translation of the Bible in Chi., *Chi. Gram.*, and *Chi. Dict.* D. at Canton Aug. 1, 1834.

**Morristown**, on R. R., cap. of Morris co., N. J., 31 m. from New York, has a public park, and a lunatic asylum located about 2 m. distant. Pop. 1880, 5418.



**Morristown**, St. Lawrence co., N. Y., on R. R. and the St. Lawrence River, opposite Brockville, Canada. Pop. tp. 1870, 1954; 1880, 2186.

**Morristown**, Tenn. See APPENDIX.

**Mor'row** (JEREMIAH), b. at Gettysburg, Pa., Oct. 6, 1771; removed in 1795 to the N. W. Terr., and became one of the most prominent citizens of O.; was its first M. C. 1803-13, and again 1841-43; U. S. Senator 1813-19; gov. of O. 1822-26; often held State offices of responsibility. D. Mar. 22, 1852.

**Morse** (ABNER), b. at Medway, Mass., Sept. 5, 1793, grad. at Brown Univ. 1816 and at Andover Sem. 1819; became Congl. pastor at Nantucket 1819-22, and afterward at Bound Brook, N. J., and in Ind., where he procured the charter of a coll. and became a prof.; delivered courses of lectures on geol., and was author of *Genealogy of Several Anc. Puritans* and other genealogical works. D. May 16, 1865.

**Morse** (FREEMAN H.), b. in Bath, Me., Feb. 18, 1807; served in the legislature 1840-43; was M. C. 1843-45; mayor of Bath 3 terms; again in Cong. 1857-61; a member of the special committee of 33 on the rebellious States, and of the "Peace Congress" of 1861, and was consul at Lond. during Pres. Lincoln's administration.

**Morse** (ISAAC EDWARDS), b. at Attakapas, La., May 23, 1809, ed. at Middletown, Conn., and at the Military Acad. at Norwich, Vt.; entered the senior class at Harvard, graduating 1829; studied law at New Orleans and in Pa.; travelled in Europe; served as a member of the State senate; was com. to New Granada under Pres. Tyler 1841-43; M. C. 1843-51; subsequently atty.-gen. of La. D. Feb. 11, 1866.

**Morse** (JEDIDIAH), D. D., b. in Woodstock, Conn., Aug. 23, 1761, grad. at Yale in 1783; was a tutor there in 1786; minister of the First Congl. ch., Charlestown, Mass., 1789-1820; ed. of the *Panoplist* 1806-11; one of the founders of the Andover Theological Sem.; a prominent defender of the Trinitarian doctrine. Was author of a series of geogs. and gazetteers (beginning in 1784), also of a *Hist. of N. Eng., Annals of the Amer. Revolution*, etc. D. June 9, 1826. (See his *Life*, by WILLIAM B. SPRAGUE, 1874.)

**Morse** (RICHARD CARY), son of the preceding, b. at Charlestown, Mass., June 18, 1795, studied at Phillips Acad., Andover; grad. at Yale 1812, and at Andover Theological Sem., and was licensed to preach 1817; aided his father in the preparation of one of his geographical works; joined his brother Sidney in establishing the *New York Observer* 1833; was for 35 yrs associate ed. and proprietor of that paper, for which he executed many Fr. and Ger. translations; retired from active life in 1858. D. Sept. 22, 1863.

**Morse** (SAMUEL FINLEY BREESE), LL.D., b. in Charlestown, Mass., Apr. 27, 1791. He was the son of Jedidiah Morse, D. D.; was ed. at Yale, taking his bachelor's degree in 1810. He decided on becoming a painter, and went to Lond. in 1811 with Washington Allston, to study in the Royal Acad. under Benjamin West. In 1813 he received the gold medal for his first effort in sculpture, *The Dying Hercules*. Returning to Amer. in 1815, he followed his profession, at the same time prosecuting his scientific studies. He founded the National Acad. of Design in New York, and was its pres. for many yrs. In 1829 he again visited Europe and resided in Rome, Florence, Venice, and Paris for 3 yrs. On his voyage home in 1832 he conceived and made drawings of the recording telegraph which bears his name. From this time till his death he was occupied with this invention. He was one of the first profs. of the Univ. of the City of New York, filling the chair of fine arts. In 1835, in his rooms in the univ., he set up his rude telegraphic apparatus, but it was not till 1844 that he was able to bring his invention fully before the world. After repeated discouragements, by the aid of the Amer. govt. he established a telegraphic line between Wash. and Baltimore, a distance of 40 m. Over this line, on May 24, 1844, he put to the test the great experiment on which his mind had been laboring for yrs. From this time his triumph was complete. He passed at once into honors and riches. In 1846 the degree of LL.D. was conferred upon him by his alma mater. He became a member of many learned societies in Europe and Amer., and the recipient of the most flattering foreign distinctions. At a cong. of representatives of 10 of the govts. of Europe, specially convened for the purpose in Paris in 1858 at the suggestion of the emp. Nap., it was unanimously decided that the sum of 400,000 francs should be presented to him. On June 30, 1871, a bronze statue of M. was unveiled in Central Park, N. Y., he himself being present. The last time he appeared in public was at the inauguration of the statue of Benjamin Franklin in Printing-house Square in front of the City Hall, N. Y., Jan. 17, 1872, when he made the inauguration speech and unveiled the statue. D. Apr. 2, 1873. (See his *Life*, by SAMUEL IRENEUS PRIME.)

**Morse** (SIDNEY EDWARDS), brother of the preceding, b. at Charlestown, Mass., Feb. 7, 1794, grad. at Yale 1811; wrote for the *Columbian Sentinel* 1812-13; studied law at Litchfield, Conn.; established about 1815 the *Boston Recorder*; was associated with his brother in inventing and patenting the flexible piston pump 1817; prepared a school geog. 1820, and a larger geographical treatise 1822; founded in May 1823, with his younger brother, Richard C., the *New York Observer*, the first religious newspaper in New York; invented with Henry A. Munson the cerographic method of printing maps 1839; brought out the *N. Amer. Atlas*, the *Universal Atlas*, and a new school geog.; remained senior editor of the *Observer* until 1858; spent his later years in inventing and improving a "bathometer" for deep-sea soundings. D. Dec. 23, 1871.

**Morse, Sea-horse, or Walrus** [Rus. *morse*; Lapp. *mosk*; Norse, *hval-ros*, "whale-horse"], two species of *Rosmarus*, large seals of the Arctic regions, differing from the other seals in being chiefly molluscivorous, forming the family Rosmaridae. The walrus are hunted for the coarse flesh, for the excellent white ivory furnished by the great tusks, for the rather scanty but excellent oil, and latterly for the hide. The females are very fond of their young, and both

fight desperately when at bay. The largest males far exceed the ox in size.

**Mortars**, short cannon for throwing shells, usually fired at angles from 35° to 45° elevation, called "vertical fire," in contradistinction to the fire of long cannon, usually made at low angles. M. are believed to have been the first guns used, and, though changed from age to age frequently in form of chamber, size, and projectile, all ages have found them too useful in their special way to suppress or to essentially alter them.

**Mortier**, mor-te-é' (EDOUARD ADOLPHE CASIMIR JOSEPH), duke of Treviso, marshal of Fr., b. at Cateau-Cambrésis, Feb. 13, 1788; fought with distinction in Ger., Sp., and Rus.; made duke of Treviso after the battle of Friedland 1808, and a peer of Fr. during the first Restoration; went as ambassador to St. Petersburg in 1831; took charge of the ministry of war for a short time in 1834, and was killed by Fieschi's "infernal machine" July 28, 1835.

**Mortmain**. See APPENDIX.

**Morton** (HENRY), PH. D., b. in New York Dec. 11, 1836, grad. at the Univ. of Pa. 1857, about which time he prepared for the Philomathean Society of that inst. a translation of the hieroglyphic inscription of the Rosetta Stone, and executed on stone the drawings which accompanied its publication. He studied law nearly 2 yrs., when his predilection for physical and for chemical science induced him to give them his entire attention. In 1863 he was elected prof. of chem. at Phila. Dental Coll.; became in 1864 resident sec. of the Franklin Institute of Pa. and began in the Acad. of Music of Phila. a course of 16 lectures on light, which excited great attention, on account of the originality and brilliancy of their experimental illustrations. In 1867 he became ed. of the *Journal* of the Franklin Inst., and during the academic yr. 1867-68 filled temporarily the chair of chem. and natural philos. in the Univ. of Pa. In 1869 he organized the photographic parties sent to observe the solar eclipse of Aug. 7, under the auspices of the *Nautical Almanac* office, having under his direction the parties stationed at Burlington, Mt. Pleasant, and Ottumwa, Ia. In 1869 he was elected prof. of chem. in the Univ. of Pa., and in 1870 was appointed pres. of the Stevens Inst. of Technology at Hoboken, N. J., then just founded. He has put forth a number of scientific papers in the *Journal* of the Franklin Inst., the *Chemical News*, and the *Philosophical Magazine*. Among them are *On the Bright Line beyond the Moon's Edge in Partial Phase-Eclipse Photographs* and *On Thallene, a Solid Hydrocarbon produced in the Destructive Distillation of Heavy Petroleum Oils*.

**Morton** (JACKSON), b. in Va. about 1810, removed to Fla. a few yrs. after its annexation; became a manufacturer; was U. S. Senator 1849-55, and a member of the Cong. of the Confed. States.

**Morton** (JAMES DOUGLAS), FOURTH EARL OF, regent of Scot., b. at Dalkeith in 1530; became privy councillor 1561, lord high chancellor 1563; was an accomplice in the murder of Rizzio 1566; was cognizant of the plot against Darnley, but refused to join it, 1567; reappointed chancellor and made lord high admiral 1568; was one of the coms. at the conferences of York 1568; succeeded Lennox as regent Nov. 24, 1572; resigned and retired to Lochleven Castle Sept. 12, 1577; tried and convicted of participation in the murder of Darnley, and executed at Edinburgh June 8, 1581.

**Morton** (JAMES ST. CLAIR), b. in Phila. in 1829, grad. at W. Pt. in 1851; entered the engineer corps, and rose to be major of engineers in July 1863; served as assistant engineer on the defences of Charleston, S. C., and of Ft. Delaware; in 1855 was assistant prof. of engineering at W. Pt., then engineer of the third light-house dist., and engineer in charge of the Potomac aqueduct; led the Chiriqui expedition, Central Amer., in 1860; on his return resumed charge of the Potomac water-works, and subsequently superintended the fortifications on the Tortugas; in May 1862 reported to Gen. Buell as chief engineer of the Army of the Ohio; in Oct. 1862 was chief engineer of the Army of the Cumberland; commanded the pioneer bridge-brigade of that army, and became brig.-gen. of volunteers Nov. 29, 1862; constructed the intrenchments about Murfreesboro'; took part in the capture of Chattanooga; was wounded at Chickamauga, and superintended the engineering operations at Chattanooga under Gen. Rosecrans; in Nov. 1863 returned to the corps of engineers; in the Richmond campaign of 1864 served as chief engineer of the 9th army corps, and was engaged in the battles of North Anna, Tolopotomy, Bethesda Church, and assault of Petersburg, Va., where he was killed while leading the attack, June 17, 1864. Among his productions are *An Essay on Instruction in Engineering*, *An Essay on a New System of Fortifications*, and *A Memoir on Amer. Fortifications*. G. C. SIMMONS.

**Morton** (JOHN), b. at Ridley, Pa., in 1724, was many yrs. in public life; speaker of the general assembly of Pa. 1772-75; was sent in 1765 to the Stamp Act Cong.; was high sheriff 1760-70, and became a judge in the provincial courts; was an active member of the Continental Cong. 1774-76; signed the Dec. of Ind. D. Apr. 1777.

**Morton** (MARCUS), LL.D., b. at Freetown, Mass., Feb. 19, 1784, grad. at Brown Univ. 1804; became a lawyer; clerk of the Mass. senate 1811, M. C. 1817-21, a State councillor 1823, lieut.-gov. 1824, a judge of the State supreme court 1825-39, gov. of Mass. 1840 and 1843, collector of the port of Boston 1845-48. D. Feb. 5, 1864.

**Morton** (NATHANIEL), son of George, b. at Leyden, Hol., in 1613; was brought by his parents to Plymouth, Mass., July 1623; after his father's death was taken into the family of Gov. Bradford, whose wife was his mother's sister; early became assistant to his uncle in the management of public affairs, and by annual election was sec. of the colony from Dec. 7, 1647, until his death. In 1669 he put forth the first regular hist. of the colony, under the title *New England's Memoriall, or a Brief Relation of the most Memorable and Remarkable Passages of the Providence of God manifested to the*



*Planters of New England.* The work was compiled at the request of the coms. of the 4 united colonies. He also wrote a synopsis of the Ch. hist. of Plymouth. D. June 29, 1685.

**Morton** (OLIVER PERRY), b. in Wayne co., Ind., Aug. 4, 1823; attended the Wayne co. sem. 1837-43; entered in that yr. Miami Univ., Oxford, O., but left it 2 yrs. later; studied law, and was admitted to the bar in 1847. Elected judge in 1852 by the Dems., he separated from that party on the passage of the Kansas-Nebraska bill in 1854, and rose rapidly among the Reps. as one of their most prominent leaders. Elected gov. of Ind. in 1861, he was one of the most brilliant war-govs., and although by paralysis in 1865 prevented from moving about without artificial support, he vindicated as U. S. Senator, since 1867, his prominent political position, till his death. D. Nov. 1, 1877.

**Morton** (SAMUEL GEORGE), M. D., b. at Phila. Jan. 26, 1799; received his med. degree from the Univ. of Pa. 1820, and at Edinburgh 1823; became a practitioner of Phila. 1826; recording sec. of the Acad. of Natural Sciences 1825, its pres. 1840; prof. of anat. in Pa. Med. Coll. 1839-43; author of *Illustrations of Pulmonary Consumption, Human Anat., Crania Americana, Crania Egyptiaca*, and of a great number of papers upon ethnology, chem., zoology, geol., mineralogy, and other sciences. D. May 15, 1851.

**Morton** (WILLIAM THOMAS GREEN), M. D., b. at Charlton, Mass., Aug. 9, 1819; became in 1842 a dentist and manufacturer of artificial teeth in Boston, and while attending med. lectures there conceived the idea of using ether as an anæsthetic. (See ANÆSTHESIA.) D. July 15, 1868.

**Mosaic** (It. *mosaico*; Fr. *mosaïque*; Lat. *opus musivum*; Gr. post class. *μωσαϊκόν*), the art of producing geometrical figures or pictorial representations by means of small pieces of variously colored stone, glass, or other hard substance, arranged according to the design and cemented together on a solid background. At a very early period ornamental pavements made of black and white pebbles firmly imbedded, and so alternated as to exhibit geometrical forms, were common among the Oriental as well as the more W. nations. The anc. Egyptians, Pers., and Egyptians practised this art, and the house of Demetrius Phalereus of Athens (300 B. C.) was adorned in this way. It was from the Grs. (Pliny, book xxxvi. ch. 28) that the Romans derived their knowledge of M., to which they gave various names. The oldest Roman M. historically known to us was executed by order of Sulla in the temple of Fortune at Præneste. From this time it rose rapidly into favor. Cicero made use of it to embellish his porticoes and villas, and Caesar, it is said, even to floor his tents. Under Augustus and his immediate successors it was lavishly employed in the decoration of palaces and temples. The art declined in It. with the declining empire, and Byzantium became its chief seat. The new cap. soon rivalled Rome itself in the extent and splendor of her M., and in the ch. of Santa Sophia (erected in the 6th century) it was employed with a gorgeous profusion never before seen. This superiority, however, lasted but a short time, and the pupils soon surpassed their masters. The grotesque stiffness of the Byzantine school gradually disappeared, and the glorious cathedrals of S. Marco in Venice, of Monreale near Palermo in Sic., and of Orvieto, are proofs of the astonishing skill to which the It. mosaists attained in the 13th, 14th, and 15th centuries. In more recent times this art has been chiefly practised at Rome, and St. Peter's and St. Paul's without the Walls are indebted to it for much of the splendor of their interiors.

The so called Florentine M. (*Javoro commesso, pietre dure*), which dates from the time of the first Medici, instead of being composed of cubes of glass or marble, is made entirely of precious or semi-precious stones, such as the amethyst, lapis-lazuli, agate, onyx, jasper, etc., cut in forms best suited to produce the desired effects.

Much attention has lately been drawn to the famous monument of Taj Mahal at Agra in India, which is said to contain the whole Koran written in *pietre dure*, as well as to equally surprising works of the same kind at Delhi.

**Mosaic Gold.** Applied to an alloy of copper and zinc, called *or molu* (see ORMOLU); and to a bisulphide of tin, prepared by heating to low redness a mixture of 12 parts tin, 6 parts mercury, 6 parts sal-ammoniac, and 7 parts flowers of sulphur. It remains behind as brilliant gold-colored scales, and is employed to coat surfaces in imitation of gilding, etc.

HENRY WURTZ.

**Moschus**, mos'kus, a Gr. bucolic poet, b. at Syracuse; flourished in the middle of the 3d century B. C. Of his works, 4 entire Idyls, 3 small fragments, and an epigram are still extant, generally pub. with those of Bion.

**Moscow**, mos'kō, the second cap. of the Rus. empire, the manufacturing and commercial centre of the country, and one of the richest and most interesting cities in the world, is situated 400 m. by railway S. E. of St. Petersburg. Its circumference is 23 m., including numerous large gardens, ponds and lakes, and extensive pleasure-grounds, and it consists of 5 different parts: I. Kremlin, the central part of the city, occupies a hill on the N. bank of the Moskva, is surrounded by heavy stone walls surmounted with towers, and consists of chs., palaces, and public buildings. Beside the palaces of the czar, the patriarch, and the holy synod, the arsenal with its splendid trophy of 875 cannons abandoned by Nap. in 1812, the treas., and other public buildings, here are the cathedral of the Assumption, in which the czars are crowned, built in the 14th century, and gorgeously decorated with columns of porphyry and jasper; the cathedral of St. Michael, in which the czars before Peter the Great are buried; the tower of Ivan Veliki, 270 ft. high, surmounted with a gilded dome 37 ft. high, and containing 32 bells; the Kolokol, the largest bell in the world, weighing 448,000 lbs., is placed on a pedestal close by. II. Kitagorod, or the "Chinese city," to the E. of the Kremlin, also surrounded by a wall with towers and gates, is the seat of the trade of the city, and contains extensive bazaars crowded with buyers and sellers from Tartary, Per., Ger., and Fr.

III. Beloigorod, or the "white city," because it is surrounded by a wall of whitish stone, encircles the Kremlin and Kitagorod on 3 sides, and has many broad and elegant streets. Here are the palaces of the gov. and the nobility, the univ., several immense monasteries, the founding hospital, the theatres, the P. O. and other gov. houses, and the famous drill-house, 560 ft. long and 168 ft. wide, which affords ample room to drill for 2000 inf. or 1000 cav. IV. Zemlianoigorod, or the "earthen city," because it was formerly surrounded by an earthen wall, which now has been transformed into promenades. Lastly, V., the Slobodi, or suburbs. In these 2 parts of the city splendid mansions and magnificent monasteries, schools, hospitals, etc., surrounded with large and beautiful gardens, alternate with clusters of shanties, in which the working-people live, and with great bustling manufacturing establishments. Pop. 611,974.

CLEMENS PETERSEN.

**Moses**, mō'zez [Heb. מֹשֶׁה, *Mosheh*; Septuagint and Vulgate, *Moyse*; Egypt. *Messou*; Coptic, *Moushe*], signifies "he who has been drawn out of the water," and refers to the story of his birth as told in Ex. For the hist. of M. there are several other sources beside the Bible. There is an Egyptian tradition (Manetho), a Jewish tradition (Midrash), Philo, and Josephus, and a Mussulman tradition in the Koran. The tradition contains very little which is not elaboration and exaggeration of the account given in the Pentateuch, and it has generally a legendary character. The name of M. is one of the greatest in hist. He organized the Heb. people; he formed the Heb. character; and the influence which the Heb. nation has exercised on the civilization of mankind, by being through many centuries the bearer of the Monotheistic idea, can hardly be overestimated.

**Mosheim**, mos'hlm, von (JOHANN LORENZ), b. at Lübeck, Ger., Oct. 9, 1694, was theological prof. at Helmstädt 1722-47; became in 1747 prof. at Göttingen and chancellor of the univ. His works on ecclesiastical hist. are of great value. The chief are *Institutiones Historiæ Ecclesiasticæ* (translated into Eng. by Murdock) and *De rebus Christianis ante Constantinum*. D. Sept. 9, 1755.

**Moskwa, Battle of the.** See BORODINO.

**Mosque**, mosk [Ar. *mesjid*, the "place of bowing" in prayer], a Mohammedan temple of worship. It usually consists of a series of porticoes surrounding an open court, having in its centre trees and a fountain for ablutions; the dome, the minaret, and the arched gateway are usual peculiarities. Lamps, arabesques, and passages from the Koran take the place of paintings and statues. Mohammed himself built the first M. at Medina.

**Mosquera**, mos-ka'rah (RUY GARCÍA), b. in Sp. in 1501; accompanied Sebastian Cabot in his voyage in the Sp. service to the Rio de la Plata 1536; discovered Paraguay, from which he brought specimens of silver; was left by Cabot in charge of the colony of Espiritu Santo; narrowly escaped massacre by the Indians; established himself at Cape Santa Maria on the coast of Brazil, and subsequently on the island of Santa Catalina, after defeating the Port., and in 1535 joined Pedro de Mendoza in founding Buenos Ayres, where he d. about 1555.

**Mosquito**, mos-kē'to [Sp. dim. from Lat. *musca*, a "fly"], a name given to many biting and blood-sucking dipterous insects. The female insects alone bite, or rather thrust into the flesh their awl-like bristles, massed together into a tube, through which they draw the blood.

**Mosquito Coast, or Mosquitia**, a terr. of Central Amer. which lies between Costa Rica, Nicaragua, and Honduras, extending along the Caribbean Sea. Its inhabs., numbering about 10,000, are mostly aboriginal Indians, whose chief calls himself king of Mosquitia. The country is claimed by New Granada.

**Moss Agate.** See MOCHA STONE.

**Mosses** [Lat. *muscus* (or in the plural *musci*); Ger. *Moos* (pl. *Moose*)], a natural order of low, tufted acaerogenous plants arising from a filamentous prothallus, with a stem and distinct leaves, producing spore-cases, which usually open by a terminal lid and contain simple spores alone. Inflorescence synœcious, monœcious, dioecious, or polygamous. The male inflorescence consists of *antheridia, perigonia*—small, usually oblong-cylindrical bodies, opening at their apex at maturity for the emission of their contents, consisting of a mucous liquid filled with the very minute *sperm-cells*, which contain singly the *spermatozooids*. The antheridia are usually intermixed with hyaline articulated filaments, or *paraphyses*, and, with these, are commonly inclosed by *perigonal leaves* in a small bud-like (*gemmiform*) or disk-like (*disciform*) flower. The female inflorescence consists of *pietillidia, archegonia*—small, narrow, flask-shaped bodies, also variable in number, mixed with paraphyses and surrounded with leaves of peculiar form (*perichætal leaves*). The archegonium consists of an inner portion (*germen*), which after fertilization becomes the fruit, and an outer, at length, membranous portion, which ruptures early near the base; its upper part is almost always carried up on the apex of the growing fruit, and becomes the *calyptra*, while its lower part is the *vaginula*, which partly incloses and partly is coalescent with the base of the fruit. The calyptra is terminated by a long and narrow funnel-mouthed tube (*style*); if it splits on one side, it is *dimidiate* or  *cuculliform*; if not, *mitriform*. The fruit consists of a pedicel (*seta*), on its apex is borne the capsule (*theca*), which usually opens by a lid (*operculum*); within or beneath the operculum are commonly one or two rows of rigid processes (the *peristome*); those of the outer row are called *teeth*, those of the inner row, *clad or processes*, their intermediate processes, *cladæ*; an elastic ring of cells or *annulus* usually lies between the rim of the capsule and operculum; the theca contains the sac or *sporangium*, in which the seeds (*spores* or *sporules*) are included around a central *columnella*; the lower portion of the capsule is contracted into a *collum* or neck, when the sporangium does not reach to its base; when the pedicel is uniformly en-



larged under the capsule, it forms an *apophysis*; when protuberant on one side only, a *struma*. The spores consist of an outer coat (*exospore*) and an inner (*endospore*); in germination the inner coat bursts through the outer at a certain point; the protruding portion elongating, and at length ramifying, forms the *proembryonal thallus* (*protonema*, *prothallus*), from which the stems arise. The plants are also often propagated by *gemmae*, or buds, variously situated. Stems short and of a soft cellular structure, or most frequently more or less elongated, and then of a more solid and somewhat woody structure, radicle at the base, usually more or less (often much) branched; leafy, and beside sometimes clothed with lacinia-like scales (*paraphylla*). Leaves sessile, never lobed or parted, but often serrate or spinulose on the margin, usually furnished with a mid-nerve (*costa*); the blade (*lamina*) rarely composed of more than one thickness of cells; surface smooth or papillose; costa often parted, sometimes lamellated above, but oftener furrowed on the lower side. Rootlets jointed and branched, often roughened or papillose. Habitation on rocks, trees, rotten wood, dung of animals, and on the ground under extremely variable qualities and conditions of soil, in almost every lat. and climate. [From orig. art. in *J.'s Univ. Cyc.*, by COE F. AUSTIN.]

**Mos'tar** ("Old Bridge"), cap. of Herzegovina, on the Nereta, which here is crossed by a celebrated Roman bridge consisting of one arch of 95 feet (whence its name). Contains a fine palace, and manufactures knives, sword-blades, silks, etc. Pop. about 18,000.

**Most Precious Blood, Congregation of the**, an order of regular clerics (R. Cath.) founded by Caspar Bufalo (d. 1837); first introduced into the U. S. in 1844.

**Most Sacred Heart of Jesus, Congregation of**, a society of secular priests founded at Innsbruck in 1806; received the papal approbation in the same yr. Their superior for the U. S. resides at Milwaukee, Wis.

**Mosul**, town of Asiatic Tur., cap. of the eyalet of Mosul, on the right bank of the Tigris, opposite the remains of the anc. Nineveh. Formerly its fine cotton fabrics, called *muslins*, were exported to every European country. Now it has greatly declined. Pop. about 30,000.

**Motaz'illies** [from the Ar. for "sectaries"], called also **Kadarija**, "free-will men," and **Moattalites**, a former sect or body of sects among the Mohammedans. The sect originated in Mohammed's own days.

**Moth** [A.-S. *mogðe*], a perfect insect of the nocturnal Lepidoptera. They are distinguished from butterflies and sphinges by the antennae, which are filiform or pectinate in M., mostly knobbed in butterflies, and enlarged in the middle in the sphinges. M. are mostly nocturnal, sphinges mostly crepuscular, and butterflies diurnal. But the sphinges are frequently known as hawk-M. Among the best known M. are the silkworm M. and the clothes M. Their larvæ attack woollens, furs, feathers, etc., and more rarely cotton goods.

**Mother Carey's Chicken, or Stormy Petrel** (the *Procellaria pelagica*), the smallest of web-footed birds, some 6 inches long, and black. It nests in clefts of rocks and holes along the N. Atlantic coast. It emits much oil from the mouth when caught, doubtless from the fish with which its stomach is filled. It is often seen in the most stormy weather, and frequently rests upon the waves. The bird has a disagreeable smell. Mother Carey's goose is the giant fulmar (*Ossifraga gigantea*) of the Pacific.

**Mother-of-Pearl**, a substance chiefly afforded by the shells of the pearl oyster (*Meleagrina margaritifera*), which also yields the greater part of the pearls of commerce. The shells are obtained in the Gulf of Cal., at Panama, Cubagua, Ceylon, Madagascar, Swan River, Manila, the Society Islands, etc. The genera *Haliotis*, *Turbo*, etc. also furnish some mother-of-pearl.

**Motherwort**, a labiate herb, the *Leonurus cardiaca*, common in the U. S., though naturalized from Europe. It is used in domestic med., and prized for its sedative and diaphoretic powers, which are mild and safe in character. Its smell and taste are strong, and not pleasant.

**Motion** [Lat. *movere*, *motum*, "to move"] consists in a change of position or place of a point or of a body, the successive positions of the point or body forming its path or trajectory.

There can be no definite conception of the M. of a point or body without reference of its positions to some other point or body in relation to which the M. is estimated. On the earth's surface we are accustomed to refer nearly all ordinary phenomena of M. to some point which is fixed on the earth. The M. of a person walking is unconsciously referred to the points on the ground over which he passes; the M. of a projectile is referred to the point at which it receives the impulse which produces its M.; and the conception of the M. of the solar system is possible only by referring it to some point or direction in space toward which the system as a whole is supposed to move. The fundamental idea, therefore, of a simple movement is that it is relative—i. e. it must have reference to some point and some direction which may be supposed fixed. The study of the principles of M. unconnected with the forces which produce it constitutes a branch of the science of dynamics to which the name *kinematics* (from a Gr. word signifying "motion") has been given.

**Velocity** is a term which has reference to the *rate* of M. of a point or body. In popular lang. we speak of M. as being slow or swift, without attaching any very definite meaning to these terms, except such as belongs to the particular movement under consideration. A brook runs swiftly, and an arrow flies swiftly, but the swiftness of running water and the swiftness of an arrow represent two very different rates of M.; and although they convey quite definite ideas in one sense, yet something is still needed if we wish to compare these two M. definitely one with the other. The term *velocity* is used in such a comparison, and it may be

said that the water of the brook moves with a velocity of 5 ft. a second, and the arrow with a velocity of 300 ft. a second, both being referred to points on the earth. The term *velocity* is thus employed to denote a definite measure of the rate of M. according to some particular unit of measure. The 3 simple units of measure by which natural phenomena are investigated are the unit of force, the unit of time, and the unit of distance or space. The 2 latter are employed in the determination of velocity; and from these 2 the measure of velocity may be obtained—viz. the space measured in units of space, passed over by a body in a unit of time. If a second be taken as the unit of time, the velocity will be the space passed over by a point or body in one second. In this manner all velocities may be compared by their measures in the same units; assuming the same interval of time for the unit of time, the velocities of bodies in motion may be compared definitely by the spaces passed over in this unit of time. If the path or trajectory of a point is known, and its velocity given, the elements of its M. are thus completely determined. The M. is said to be *uniform* when equal portions of the path are passed over in equal times. It is *varied* when unequal portions of the path are described in equal times. It is *uniformly varied* when the successive changes of velocity, increasing or diminishing, take place by equal increments or decrements in the same time. The laws of M. require, therefore, not only that the path shall be known, but that the velocity at each point of its path, or the law by which the velocity changes, shall be known. W. P. TROWBRIDGE.

**Mot'ley** (JOHN LOTHROP), LL.D., D. C. L., b. at Dorchester, Mass., Apr. 15, 1814, grad. at Harvard in 1831; studied at Göttingen and Berlin; was admitted to the bar in 1836; became in 1841 sec. of legation at St. Petersburg, U. S. minister to Aus. 1866-67, to Eng. 1869-70. After long and exhaustive researches and manifold preparations he put forth in Lond. and New York in 1856 *The Rise of the Dut. Republic*, which immediately attracted great attention both in Amer. and Europe, and has been translated into Ger., Fr., Dut., and Dan. *The Hist. of the United Netherlands* followed from 1861 to 1868, and *The Life of John van Barneveld* in 1874. D. May 29, 1877.

**Mott** (LUCRETIA COFFIN), b. at Nantucket, Mass., Jan. 3, 1793, of Quaker parentage; removed in 1804 to Boston, and in 1809 to Phila., where in 1811 she was married to James Mott; became in 1817 a teacher, and soon after a preacher of the Society of Friends; adhered after 1827 to the Hicksite party; was one of the original founders of the Amer. Anti-slavery Society (1833); for many yrs. preached against slavery, war, and other evils, and finally became a leader in the woman-suffrage movement. D. Nov. 11, 1880.

**Mott** (VALENTINE), M. D., LL.D., b. at Glen Cove, L. I., Aug. 20, 1785, was ed. in New York, Lond., and Edinburgh; held professorships of surgery in Columbia Coll. and the Coll. of Phys. and Surgeons, New York, 1809-26 and 1830-40; in Rutgers Med. Coll. 1826-30, and was prof. of surgery and relative anat. in the New York Univ. Med. Coll. 1840-60. He was one of the most successful surgical operators of any age or country. Among his great operations were the successful tying of the primitive iliac artery for aneurism (its first performance); the successful removal of the right clavicle, with the application of 40 ligatures; the tying of the innominate artery for aneurism; the resection of 2 inches of the deep jugular vein; the tying (46 times) of the common carotid, etc. He was the inventor of valuable surgical implements; had wide fame as an *accoucheur*; was a brilliant and able lecturer; translated Velpeau's *Operative Surgery*, with large additions; wrote a vol. of travels in the East, a vol. of clinical lectures, and many professional papers and addresses. He was the recipient of many foreign distinctions and a member of numerous learned societies. D. Apr. 26, 1865.

**Motte (or Mothe) Cadillac, de la** (SIEUR ANTOINE), a Gascon nobleman, b. about 1660; served in the Fr. army in Acadia, and in 1680 was sent to Fr. by order of Louis XIV. with information regarding the colonies; was made in 1691 lord of Bonagat and Mt. Desert, including the shores of Frenchman's Bay, Me.; became in 1694 commandant of Michilimackinac; built in 1701 Ft. Pontchartrain, now Detroit; had long struggles with the Canadian authorities, the Jesuits, the Miamis, and the Natchez; became in 1711 gov. of La.; was one of the originators of the Miss. scheme; returned to Fr. in 1717; nothing further is known of him.

**Mould** [A.-S. *molde*], a term used in common lang. to denote any of the smaller filamentous fungi. The word is not susceptible of scientific definition, as the fungi popularly called M. belong to several different orders and differ widely from one another in structure.

**Moulding** [Lat. *modulus*, "small measure"]. The making of the pattern or model is the first step, and many contrivances are used for expediting the labor of pattern-making. The chief study in many patterns is to render the complex form of the design practicable at any reasonable cost, and in others to simplify the M. so that great numbers of the castings may be produced in a brief time.

In M. the plainer forms of castings the pattern is laid on a plane surface or follow-board, and a flask or frame of sufficient depth is placed around it. Into this flask moulding-sand is sifted. The sand is then rammed hard until the flask is filled, and a close board top is laid on it. The flask is then turned upside down, the follow-board is taken off, and a second, or cope-piece, of flask is laid on above what was at first the under side of the pattern. Coarse sand is then scattered over the surface which had lain on the follow-board, so that the mass of sand which is afterward rammed into the cope-flask may be perfectly separated from the first. The cope-flask, with the sand contained in it, is then lifted off, bringing in it in the sand the impression of the upper side of the pattern; and the pattern is carefully drawn out of the sand in the lower part of the flask. After a gate or passage-way, by which the metal may flow into



the mould, has been cut in the sand, the 2 parts of the flask are put together again accurately, and the mould is complete for the reception of the metal.

It is often needful to make openings into or through the casting; and when these are of moderate size they are made by placing cores in the cavity of the sand-mould. These are blocks or bars, which are made in suitable boxes from sand that has been moistened with a glutinous material. When the internal cavities are large, or the casting is of a box-shape, the interior is built up or moulded in a somewhat different way from that indicated, but always so that the sections of the mould may be detached from each other and the parts of the pattern withdrawn. A very large part of the work produced is that known as green-sand work, so called because the castings are made in sand that has been slightly dampened with water. It is invariably necessary to provide vents or outlets for the gases arising from the heating of the organic matter contained either in the material of the mould or of the cores.

In order to give the smoothest possible surface to the castings when made in iron, the surfaces of the sand-mould are dusted over with finely powdered coal, which is afterward smoothed down carefully. The effect of this facing is to prevent the fluid iron from burning into the sand, and thus causing an incrustation on the casting. In the management of large foundries it has been found expedient to adapt special contrivances to the work of M. For this purpose machines have been devised for moulding such things as shot and shell for ordnance, hinges and locks for builders' use, and especially for toothed wheels or gearing. [From orig. art. in *J. s. Univ. Cyc.*, by P. BARNES.]

**Moulting** (Old Eng. *mout*), or **Exuviation**, the periodical casting off of shell, skin, horns, feathers, or other parts of the integument, such as takes place once a yr. or oftener. Birds in many cases shed their feathers annually, and many quadrupeds also shed their coat of hair nearly all at once. Deer mostly renew their horns every yr.

**Moultrie**, moo'tree (WILLIAM), b. in S. C. in 1731; commanded a co. against the Cherokees 1761; was in 1775 appointed col. of the 2d S. C. regiment, and in that yr. represented St. Helena parish in the provincial cong. In June 1776, while engaged in constructing a defensive work of palmetto logs on Sullivan's Island, Charleston harbor, he was attacked by a Brit. fleet (June 28) under Sir Peter Parker; an engagement of nearly 10 hours ensued, resulting in victory for the little fort, which has since borne the name of its defender. In Sept. he was made a brig.-gen., and in Feb. 1779 defeated the Brit. near Beaufort. In May he successfully resisted Prevost's advance upon Charleston, which place he was able to hold until the arrival of Lincoln; but in 1780, upon the surrender of the place, he was made prisoner and held for nearly 2 yrs., refusing repeated offers of bribery to desert the cause of his country. After his exchange (Feb. 1782) he was made (Oct. 15) a maj.-gen.; was gov. of S. C. 1785, and again 1794-96. D. Sept. 27, 1805.

**Moultrie, Fort**. See FORT MOUTRIE.

**Mound Bird**. See MEGALOPTILIDE.

**Mound-Builders**. See AMERICAN ANTIQUITIES.

**Mound City**, Mo. See APPENDIX.

**Moundsville**, W. Va. See APPENDIX.

**Mountain Ash**, or **Rowan Tree**, the *Pyrus Aucuparia* of Europe, and the *P. Americana* and *sambucifolia* of N. Amer., both closely allied to the first and to each other. They are small trees, belonging to the order Rosaceæ, sub-order Pomaceæ. They have pinnate leaves, and in autumn clusters of small acid bright red fruit. The European tree is more common in cultivation than our own native species. The wood of all is hard and suitable for turnery. The peasantry of nearly all nations of Europe ascribe supernatural qualities to the wood of the rowan tree, which is used for divining rods and the like.

**Mountain Blue**, or **Chessylite**, is a carbonate of copper, composed of 25.43 per cent. of carbonic acid, 69.37 of oxide of copper, and 5.20 of water. When pure it contains 55.16 per cent. of copper. It occurs in the same localities as malachite, and results from the decomposition of other ores of copper. When crystallized it is of an azure blue, with a vitreous lustre varying from transparent to opaque. Chessylite is derived from Chessy, near Lyons, Fr., where it is found in blue crystals and also in a fibrous state.

**Mountain Cork**, a variety of asbestos, having the appearance of cork, and, owing to its structures of interlacing fibres, of so little density as to float on water. *Mountain leather* is an equally light variety of the same mineral, occurring in flexible sheets resembling leather.

**Mountain Limestone**, a name given in G. Brit. to the great sub-Carboniferous limestone strata. It is there metalliferous, lead being the most important ore. Soils resting on it are commonly very fertile.

**Mountains**. See EARTH, by PROF. A. GUYOT, LL.D.

**Mount Auburn**, on R. R., Middlesex co., Mass., contains M. A. Cemetery, area of 125 acres, laid out in 1831.

**Mount Ayr**, Ia. See APPENDIX.

**Mount Carmel**, Ill. See APPENDIX.

**Mount Carmel**, Pa. See APPENDIX.

**Mount Carroll**, on R. R., cap. of Carroll co., Ill., 131 m. W. of Chicago, has a female sem. and a public library. Pop. tp. 1870, 2815; 1880, 2878.

**Mount Clemens**, city, on R. R., cap. of Macomb co., Mich., 30 m. N. E. of Detroit, has a celebrated mineral and magnetic water-cure. Pop. 1870, 1788; 1880, 3057; 1884, 3827.

**Mount Desert Island**, in the Atlantic and in Hancock co., Me., is 14 m. long and 7 wide. Soames's Sound divides it nearly in two. It abounds in beautiful lakes. The highest point is Green Mt., 1335 ft. high. The Fr. settled M. D. in 1606, but were in 1616 driven out by the Eng., who settled it in 1761. Pop. 1870, 3093; 1880, 4657.

**Mount Desert Rock**, a small rocky islet, 30 m. S. E. of M. D. Island; lat. 43° 58' 7" N., lon. 68° 7' 22" W. It has a brick light-house with a fixed white dioptric light.

**Mountford** (WILLIAM), b. in Kidderminster, Eng., May 31, 1816, was ed. at Manchester Coll., York. Being unwilling to subscribe to the Thirty-nine Articles of the Ch. of Eng., he was forced to decline the pecuniary and social advantages of a scholarship in connection with one of the colls. of Ox.; came to the U. S. in 1849; was settled in Gloucester, Mass., 1850; retired from the active ministry. Wrote *Martyria*, *Euthanasia*, etc.

**Mount Gil'eard**, R. R. junc., cap. of Morrow co., O., 44 m. N. of Columbus. Pop. 1870, 1067; 1880, 1216.

**Mount Holly**, R. R. junc., cap. of Burlington co., N. J., 18 m. N. E. of Phila. There are also 3 R. Rs. to New York. Pop. Northampton tp. 1870, 4018; 1880, 4690.

**Mount Joy**, on R. R., Lancaster co., Pa., 12 m. N. W. of Lancaster, has a male and female sem. and a soldiers' orphan school. Pop. 1870, 1896; 1880, 2058.

**Mount Morris**, on R. R., Ogles co., Ill., 109 m. W. by N. of Chicago, is the seat of a M. E. sem. and collegiate inst. Pop. tp. 1870, 1455; 1880, 1969, including 855 in v.

**Mount Morris**, on R. R., Livingston co., N. Y., has an acad. and a sem. Pop. 1870, 1930; 1880, 1899.

**Mount Pleasant**, city and R. R. centre, cap. of Henry co., Ia., contains the Ia. Wesleyan Univ., an acad., and a female sem. The Ia. State hospital for the insane is about 1 m. from the town. Pop. 1870, 4245; 1880, 4410.

**Mount Pleasant**, Mich. See APPENDIX.

**Mount Pleasant**, on R. R., Westmoreland co., Pa., 40 m. S. E. of Pittsburgh, has an acad. Pop. 1870, 717; 1880, 1197.

**Mount Pulaski**, R. R. junc., Logan co., Ill., 21 m. N. E. of Springfield. Pop. 1870, 653; 1880, 1123.

**Mount Sterling**, on R. R., cap. Brown co., Ill. Pop. 1870, 1352; 1880, 1445.

**Mount Sterling**, city, on R. R., cap. of Montgomery co., Ky. Pop. 1870, 1040; 1880, 2067.

**Mount Vernon**, city and R. R. junc., cap. of Jefferson co., Ill. Pop. 1870, 1167; 1880, 2324.

**Mount Vernon**, R. R. centre, cap. of Posey co., Ind., on the O. River. Pop. 1870, 2880; 1880, 3730.

**Mount Vernon**, on R. R., Linn co., Ia., 65 m. W. of the Miss., is seat of Cornell Coll. Pop. 1870, 910; 1880, 977.

**Mount Vernon**, R. R. junc., Westchester co., N. Y. Pop. 1870, 2700; 1880, 1857.

**Mount Vernon**, city and R. R. centre, cap. of Knox co., O., has a fine c.-h. Kenyon Coll. is about 6 m. E. of this place. Pop. 1870, 4876; 1880, 5249.

**Mount Vernon**, Fairfax co., Va., contains MOUNT VERNON, the residence of Washington, on the Potomac, 9 m. below Alexandria. The mansion is a wooden building, erected by Lawrence Washington and enlarged by his brother and heir, the President. In 1858 it was purchased, with the tomb of Washington and 200 acres of land, by the Ladies' M. V. Association for \$300,000, from Mr. John A. Washington. Pop. dist. 1870, 2233; 1880, 2555.

**Mourning**, the official or conventional expression of grief, has varied much at different times and in different countries. The Hebs. tore the garment, cut the hair and beard, strewed ashes on the head, went bareheaded and barefooted, and lay down on the ground weeping and smiting the breast. The Grs. cut off the hair, put on a coarse black garment, retired into seclusion, and wailed. With the Roms. the M. was mostly done by the women; the men wore black clothes, but only for a few days. Public M. often occurred in the days of the republic on the occasion of some public calamity or on the death of some great man; during the empire, on the death of an emp. Then all business stopped; the temples, the forum, the schools, and the baths were closed. The M. rites among barbarians and half savages are often horrible. In the Feejee Islands the women burn their bodies when a chief dies, and fifty or a hundred fingers are amputated to be hung on his grave. Among civilized nations the M. customs have become very similar in modern times, and consist mostly in retirement within the house and avoidance of what is bright and noisy.

**Mouse**, pl. *Mice* [Lat. *mus*, *mures*], a name applied to the smaller rodents of the family Muridæ and of some allied families, the larger species being called rats, hamsters, etc. The house M. and rats are of the family Muridæ; group Mures. Of these, the *Mus musculus*, or common house M., is world-wide in its present range, though brought first from the Old World. The New-World M. are many of them of the group Sigmodontes. The number of species of M. is very great. The amount of damage done to agriculturists by M. alone is simply incalculable.

**Mousseline**, moo's'lin, a thin cloth made of cotton. Up to the beginning of the present century all muslin used in Europe came from India, and the Indian fabrics of this name were often of an astonishing fineness, justifying their poetical name of "woven wind;" but European manufactures have superseded Indian in the markets of the world.

**Mower**, mo'er (JOSEPH A.), b. in Vt.; at the outbreak of the Mex. war entered the army as a private in the co. of engineers; was commissioned second lieutenant in Feb. 1855, first lieutenant 1857, capt. 1861, and commanded his co. at the siege of New Madrid; appointed col. 11th Mo. Volunteers May 1862; took part in the Corinth campaign, and was conspicuous in the battle of Corinth, Oct. 4, 1862, where he was severely wounded. Promoted to be brigadier the following month, and maj.-gen. Aug. 1864. From that date to the close of the war he was engaged in every campaign in the W.—at Jackson, Vicksburg, Meridian, the Red River, in Mo., whence he was called personally to the aid of Sherman at Atlanta, rising through all the grades, until the end of the war, when he commanded the 20th corps. In 1866 he was appointed col. of inf., and placed in command in La., where he "stood at his post through pestilence and sickness" until his death, which occurred at New Orleans Jan. 8, 1870.

**Mowing-Machines**. See REAPING-MACHINES.

**Moxa** [Fr.], a form of the actual cautery. The down from the leaves of *Artemisia Moxa*, the pith of the sunflower, cotton or lint soaked in solution of saltpetre and



then dried, a pledge of spider's web, or a lump of amadou is rolled into a little cone and placed upon the part which it is desired to cauterize. It is then set on fire and held in place by an instrument called a porte-moxa. The neighboring parts are surrounded by wet lint. It is often useful in spinal disease, neuralgia, etc. After firing, the part may be dressed with ammonia or ice.

**Mozambique**, mo-zam-beek', terr. of the E. coast of Afr., extending along the Mozambique Channel from Cape Delgado to Delagoa Bay, between lat. 10° 41' and 26° S., and belonging to Port. The coast-land is low, with a rich, humid soil and a hot, moist climate, which make it extremely fertile. Large harvests of rice, maize, millet, and all varieties of tropical fruits are gathered wherever the ground is cultivated. Hippopotami, elephants, lions, crocodiles, and flamingoes abound. On the islands and shoals with which the coast is fringed turtles are caught in great numbers, and pearl-fishing is very remunerative; tortoise-shell is a staple article of export. The interior is higher, almost mountainous, and covered with forests yielding many varieties of excellent timber and dyewoods. The authority of the Port. is very slight. Area, 382,689 sq. m. Pop. 350,000.

**Mozambique**, cap. of the Port. terr. of the same name, is in lat. 15° 2' S., on a small island. It is defended by 3 forts, has a good harbor and some trade in rice, gum, gold-dust, ebony, tortoise-shell, and timber. Pop. 8522.

**Mozambique Channel**, the strait between the E. coast of Afr. and the island of Madagascar. It is about 1000 m. in length, with a breadth of between 500 and 600 m. at its entrances, and of nearly 300 m. in the middle. The Comoro Islands are at its N. outlet.

**Mozarabic Liturgy**. The Chr. subjects of the Saracens in Sp. were called *Mozarabes*, "Arabs by adoption." Their liturgy, Ephesine in its type if not in its origin, and not called Mozarabic till after the Mohammedan conquest in the 8th century, is, in its ground-work at least, coeval with the introduction of Christianity into Sp. But in the 11th century (in Aragon 1071, and in Castile 1074) it gave place, by royal authority, to the Rom. liturgy. Through the influence and example of Cardinal Ximenes (1493-1517) the use of it was revived in Toledo (after 1508), in Salamanca (1517), and in Valladolid (1567). By the concordat of 1842 provision was made for its continuance at Toledo, but nowhere else. It has been pronounced "the richest, the fullest, the most varied of all known liturgies." R. D. HIRSCOCK.

**Mozart** (WOLFGANG AMADEUS), b. at Salzburg Jan. 27, 1756, and d. at Vienna Dec. 1, 1791. When but an infant he absorbed a knowledge of music by listening to the lessons given his sister, Maria Anna. At 4 he played the piano with ease, and composed simple pieces, dictating them to his father. When the boy was 6 yrs. of age the father, Leopold M., visited Munich and Vienna with his 2 children, whose performances excited admiration. Leopold brought home with them a small violin for Wolfgang, who learned by himself to play it. In 1763 Leopold made a second tour with the children, visiting the most important cities of Europe, and although only 8 yrs. of age Wolfgang composed most of the symphonies which were played at his concerts, and which roused Lond. to enthusiasm in 1764. Home for a few months in 1766, Wolfgang pursued the study of composition under his father. In 1767 Leopold and the children went to Vienna, and remained there more than a yr., hoping to improve their fortunes, but they reaped only loss and disappointment. The emp. Joseph II., astonished at Wolfgang's genius, bantered him to compose an opera. Leopold mistook this jest for an order, and set the boy of 10 at work upon a libretto obtained after great difficulty. The It. court-musicians, piqued at this doubtful favor to the Ger. child, even then formed their mean clique against him. The opera, covering 558 pages of MS., was never allowed a representation. From all these fruitless miseries the Mozarts escaped at last, the father and son travelling through It. At Milan an opera by him, *Mitridate*, was brought on the stage and repeated 30 times. The whole tour was a success, and on his return he was appointed court-organist to the abp. of Salzburg. From 1777 to 1779 he resided in Paris, where the battle between Gluck and Piccini was then raging. In 1780 he was called to Munich by Prince Charles Theodore of Bavaria to write the opera *Idomeneo*. In this entirely new creation M. laid the corner-stone of dramatic composition. The possession of merit was delightful to the abp. of Salzburg, and the better to secure it he at once had M. return with his honors from Munich, and in 1781 move with him to Vienna as a member of his household. The abp. there lavished upon him the penury and ignominy with which he honored his menial servants. After a fruitless remonstrance, M. resigned, and unwillingly but needfully gave lessons for a living in Vienna, which thereafter was his home. In 1782 M. married Constance Weber, a pianist. Joseph II., fond of his It. masters, the enemies of M., was slow in granting him any privileges. Finally, *L'Enlèvement du Sérail* was ordered, and paid for with 50 ducats. The emp. gave him the office of composer to the court and a salary of 800 florins, but with indifference made his office a sinecure, for many yrs. not asking a note from his hand. To sustain his family he was obliged to give lessons, write waltzes and contredanses for balls, and give concerts in neighboring cities. It was not till his 28th yr. (1784) that these ephemeral labors were followed by uninterrupted industry in composition, when but 7 yrs. of life remained to him. The opportunity which wealth and royalty refused to give came unsought in the libretto of *Il Nozze di Figaro*, written for M. by Da Ponte in 1786. The people of Prague deserve mention for their warm and practical appreciation of M. They asked an opera, and *Don Giovanni*, the triumph of dramatic composition, was written for them in 1787. In 1788 he commenced to feel depressed by his disease of the lungs and the nerves. A mysterious messenger came to him and engaged him to write a *Requiem*, refusing any information as to its destination. In the single yr. of 1791 M.

wrote *Die Zauberflöte* for indifferent Vienna, *La Clemenza di Tito* for loving Prague, and the requiem for himself. On a dismal day of rain, unfollowed by a friend, the bodies of M. and 15 other dead were hurried through the streets of Vienna to the common burying-ground of the poor, and his grave is now unknown.

M. is considered the greatest composer of the world. In every kind of composition he produced works of the greatest excellence. He wrote, without showing the slightest weakness anywhere, operas, oratorios, symphonies, masses, quartets, solos for diverse instruments, sonatas, and dance-music. He was the best pianist of his time in Ger. Not less remarkable were his improvisations. His fecundity is perhaps without a parallel. His life was less than half the usual length; half of that short life was spent in long concert-tours, and his delicate health and his lessons and other ephemeral work sadly diminished his productivity. Yet he wrote 626 published works and 294 compositions either unfinished or unpublished. *Don Giovanni*, *Nozze di Figaro*, *Die Zauberflöte*, the requiem, the symphony in G minor, the quartets Nos. 10 and 18, are but a small fraction of the delights this most favored genius gave the world. [From orig. art. in *J's Univ. Cyc.*, by C. H. FARNHAM.]

**Mucilage** [Lat. *mucus*], a solution in water of any gummy matter. (See ARABIN, DEXTRINE, GLUE, GUM, STARCH, and TRAGACANT.)

**Mucorini** [Lat. *mucor*, "mould"], an order of saprophytic fungi in which the oöspores are solitary and produced by a process of conjugation, and whose conidia consist of sacs containing one to many spores. The species of this order are very widely distributed. They are found on nearly all decaying animal and vegetable matter. One species, *Phycomyces nitens*, grows on oily substances. As a rule, the members of this order are quite small, although *P. nitens* has been known to attain the height of a foot.

Inasmuch as the species of this order conform tolerably closely to the type, we may select *Mucor mucedo*, a common mould growing on dung and other substances, as an illustration of the whole order. If fresh horse-dung be placed in a moist place, it will soon be covered by a coating of white glistening fibres, which are the hyphæ or mycelial threads of *M. mucedo*. They soon cover the surface of the dung with a cotton-wool-like mass, from which mass project certain threads, whose tips at first white, afterward black, are the conidia or asexual fruit, consisting of sacs containing a large number of spores. The hyphæ or threads composing the mycelium, branch in all directions, and are occasionally divided by cross-partitions. The contents are colorless or slightly tinged with brown or gray. If submerged, the hyphæ live, at least for a certain length of time, but undergo certain changes; the cross-partitions become more numerous, and the cell-walls sometimes bulge a little. When the mycelium of *M. mucedo* is kept quite moist, it undergoes a modification, and we have the production of what is known to Ger. mycologists as *Brutzelten*. These are formed in the following way: The cross-partitions increase in number, and some of the cells thus formed swell until they become nearly spherical. The protoplasmic contents of the cells then roll themselves up into round masses resembling spores, which afterward are capable of germinating. The filaments, or hyphæ, which rise above the common mass of mycelium to bear the conidia, are generally from an eighth to half an inch high. The ends of the hyphæ swell into a globular-shaped sac. The contents of the sac are at first continuous with those of the rest of the filament, but are afterward cut off by an arched partition. The expanded tip of the mycelium, which projects into the spore-sac, is known as the *columnella*. The spores are formed by free-cell formation. Their color is grayish-brown, and when seen in mass they often appear black. The external wall of the sporangium is composed of 2 layers, the outer of which is beset with short hairs. Within the sporangium is an expansible elastic substance, whose presence can be demonstrated before the spores are ripe by bursting open the outer wall, when the elastic substance projects as a globular mass, in which the young spores are imbedded. When ripe the spores are discharged with some violence by means of the sudden swelling of the elastic substance; the whole outer wall breaks away and disappears, except a small portion which remains, forming a rim about the base. In *M. stolonifer* (bread-mould) it happens that not only is the outer wall of the sporangium destroyed, but the very large columnella splits and collapses, falling back over the fruit-stalk like an umbrella or small toadstool. The spores are often projected to a considerable distance. The spores placed on a moist surface swell to two, three, or even a greater number of times their original dimensions, but do not clearly show a division of their wall into two layers. Their germination takes place by the growth of one or more tubes, which soon assume all the appearance of the mycelium of *M. mucedo*, and in a short time, usually only a few hours, reproduce the conidia of the species.

When *M. mucedo* is cultivated on a decoction of horse-dung it only bears conidia. When growing spontaneously on horse-dung it not unfrequently produces oöspores as well. The oöspores are produced in the following manner: Two hyphæ which are lying near one another send out lateral shoots, which increase in size, gradually approaching one another until they meet. The two parts in contact are next cut off by partitions from the hyphæ from which they respectively arose. Finally, the cell-wall at the point of contact is absorbed, and the protoplasmic contents of the 2 cells unite into a globular mass, which afterward becomes enveloped in a coating of cellulose and grows into a spore. The oöspore remains attached for some time to the mycelium, but is finally set free. The oöspore germinates in the following manner: The thick outer coat opens, and from the contents of the spore there grows out a germinal tube, which soon assumes all the marks of the ordinary *Mucor* mycelium. This mycelium, arising directly from the



oöspore, produces conidia. [From orig. art. in *J.'s Univ. Cyc.*, by Prof. W. G. FARLOW, M. D.]

**Mudge** (Rev. ENOCH), b. in Lynn, Mass., June 21, 1776; joined the itinerant ministry at the second session of the N. Eng. conference in 1793. All the other Meth. preachers in the E. States down to that date had gone thither from the Middle or S. States. He travelled and preached through most of Mass., R. I., Conn., and Me. In the latter State, which was then a wilderness, he endured severe and romantic trials. He was a chief founder of its now prevalent Methodism. He was twice elected to the legislature of Mass. The latter yrs. of his life were spent in New Bedford, Mass., as chaplain to its mariners' chapel. He wrote a vol. of excellent *Sermons for Mariners* and many poetical pieces of some merit. D. in 1850.

**Muez'zin, or Mueddin** [Ar. from *uzn*, "ear"], an official, usually blind, who at certain hours of the day and night chants the call to prayer from the minarets of the mosque in Mohammedan towns. In the daytime the call *Adan* is used: "God is most great; there is no God but Allah, and I testify that Mohammed is Allah's prophet! Come to prayer! Come to security! Prayer is better than sleep!" The night-cry, *Ula*, is like the *Adan*, but ends in these words: "There is no God but Allah. He has no companion! he has no companion! To him belongs dominion; to him praise is due. He confers life and causes death; he is living and shall never die. In his hand is blessing and all power." The call *Ebed* is made an hour before day. Its first words are, "I praise the perfection of God, the Eternal One."

**Mufti** ("expounder"), or **Sheikh-ul-Islam** ("lord of the faith"), called also the **Grand Mufti**, the second in rank of the great ministers of the Porte, the head of the depts. of religion and law. At present he is but the supreme expounder of the law. The name mufti is also given to the jurisconsults who are attached to the govt. councils throughout the empire.

**Muggletonians**, the followers of Ludovic Muggleton (1607-97), a journeyman tailor of Lond., who was himself the follower of one John Reeve, a fanatic who professed to have prophetic gifts. His sect, though still in existence after 1890, is believed now to be extinct.

**Mühl'enberg** (FREDERICK AUGUSTUS), b. at the Trappe, Pa., June 2, 1750; held important Lutheran pastorates in Pa. and in New York; was M. C. from Pa. 1779-80 and 1789-97, and was twice speaker of the House; held also important State and Federal offices. D. June 4, 1801.

**Mühlenberg** (HEINRICH MELCHIOR), D. D., b. at Elmbeck, Ger., Sept. 6, 1711, studied at Göttingen and Halle; entered the Lutheran ministry; was an instructor at Francke's orphan-house, and in 1742 was sent as a missionary to Amer.; was stationed first at Phila., and afterward at the Trappe, Montgomery co., Pa.; travelled extensively; founded the Lutheran ministerium of Pa., the first in Amer., and is justly regarded as the chief founder of the Amer. Lutheran Ch. D. Oct. 7, 1787.

**Mühlenberg** (HENRY AUGUSTUS), b. at Lancaster, Pa., May 13, 1782, was Lutheran pastor of Reading, Pa., 1802-08; M. C. 1809-38; was twice a Dem. candidate for gov.; declined the Rus. mission and the secretaryship of the navy; was U. S. minister to Aus. 1838-40. D. Aug. 11, 1844.—His son, HENRY A. (b. July 1823, d. Jan. 9, 1854), was a graduate of Dickinson Coll., a lawyer, author of a *Life of Gen. Mühlenberg*; was sent to Cong. in 1854, but d. soon after, having sat but one day in Cong.

**Mühlenberg** (JOHN PETER GABRIEL), b. at the Trappe, Pa., Oct. 1, 1746, a son of Dr. H. M. Mühlenberg, was ed. in Halle, but ran away from coll. and enlisted in the dragoons; became in 1772 Lutheran minister of Woodstock, Va.; was much in public life, and soon after the outbreak of the Revolution threw off his gown in the pulpit, displaying a military uniform, read his commission as col., and ordered the drums to beat for recruits; served with distinction at Charleston, Brandywine, Germantown, Monmouth, Stony Point, and Yorktown; became a brig.-gen. in 1777, and afterward a maj.-gen.; was v.-p. of Pa. 1785; M. C. 1789-91, 1793-95, and 1799-1801; U. S. Senator 1801-02; became in 1802 U. S. supervisor of revenue for Pa., and in 1803 collector of the port of Phila. D. Oct. 1, 1807.

**Mühlenberg** (WILLIAM AUGUSTUS), D. D., b. in Phila. Sept. 16, 1796, grad. at the University of Pa. in 1814, and entered the Epis. ministry in 1817. From 1846 to 1858 he was rector of the ch. of the Holy Communion, erected by his sister, corner of 6th avenue and 20th st., New York. In 1858 he became the first supt. and pastor of St. Luke's Hospital, which owes its existence to him. The degree of D. D. was conferred upon him by Columbia Coll. in 1834. Author of several popular hymns. D. in New York Apr. 8, 1877.

**Mühlhausen**, mühl-how'zen, town of the Ger. empire, prov. of Alsace-Lorraine, on the Ill, which divides it into the old and the new city, and is crossed here by 4 bridges. The old town is rather indifferently built, though its streets are neat and clean; the new town is very elegant. Even a century ago M. was celebrated for its woollen cloths; many other manufactures have since been added, such as cotton prints, muslins, watered silks, stained paper, parchment, starch, chemicals, etc., and it is now one of the most flourishing manufacturing towns of Ger. Pop. 68,283.

**Mulatto**. See MIXED RACES and NEGRO.

**Mulberry** (Ger. *Maulbeere*; Lat. *morus*; Gr. *μόρον*), a small tree of the genus *Morus*, of which there are many species. Those only which produce leaf adapted for the food of the silkworm are of economical importance. The black M. is doubtless indigenous to Europe, and was cultivated by the anc. for its fruit. Its foliage is sometimes employed to feed the silkworm, though now not often used, the leaf of the white M. (*Morus alba*) having proved more suitable for that purpose. The leaves of both species are good fodder for cattle. The white M. is supposed not to have existed in Europe until after the introduction of the

silkworm in the 6th century. The stocks preferred in It. appear to be the common white of the varieties *Morethiano* and orange or *arancino*. The relative value of the different varieties depends partly on the quantity of foliage obtainable from a given number of trees, partly on the proportion of edible matter furnished the worm by a given weight of leaves, and partly on the amount and quality of silk-forming material yielded by the foliage. Nothing but careful experiment and observation can guide the cultivator in the choice of the stock to propagate from, and in his modes of cultivation. The M. requires a deep, light, rich soil, and thrives well neither in clay nor in sand. It is best propagated by seed, though the methods of layering and cutting are sometimes employed with the *multicaulis*, and grafting is practised with most varieties. Ungrafted trees yield the finest silk, but in smaller quantity than grafted. Irrigation may be employed with advantage to hasten the growth of young plants, but the leaf of freely-watered trees is neither a healthy food for the worm nor rich in material for silk. Water, therefore, should be applied only when clearly necessary. Many high authorities maintain that it is better to strip the trees only in alternate years, the crop of leaf being more than double in quantity and superior in quality to that obtained by annual gathering.

GEORGE P. MARSH.

**Mulberry, Paper**, the *Broussonetia papyrifera*, a tree of the same family as the mulberry, but of a very distinct genus, indigenous to Japan, and now widely distributed through various parts of the world. From its fibrous inner bark it is said that the tapa cloth of the S. Sea Islanders was made by a simple process of beating. The prin. use of this fibrous bark in Japan was for the making of paper.

**Mule** [Lat. *mulus*], a name in its widest sense synonymous with hybrid, but more commonly denoting the offspring of the male ass and of the mare; the corresponding offspring of the male horse and female ass being the jennet or hinny, a very different animal. The M. is a hardy, strong, serviceable animal, peculiarly adapted to hard work in hot weather, such as would be too hot for horse or ox.

**Müller**, mill'er (FRIEDRICH MAXIMILIAN), LL.D., known as MAX MÜLLER, a son of the poet Wilhelm Müller (1794-1827), b. at Dessau Dec. 6, 1823; studied at Leipzig, Berlin, and Paris, giving special attention to Sans., under such masters as Brockhaus, Bopp, Schelling, and Burnouf; went in 1846 to Eng. and in 1848 to Ox.; became in 1850 deputy Taylorian prof. of comparative philology, prof. in 1854, curator of the Bodleian library 1856, fellow of All Souls 1858, and in 1868 received a new professorship of comparative philology. His chief works are a translation of the *Hilopadesa*, the *Meghadita* in Ger., *The Hymns of the Rig-Veda*, with the text and translation of the *Prātis-ākhyā*; *Hist. of Anc. Sans. Lit.*, etc.

**Müller** (JOHANNES), b. at Coblenz July 14, 1801, in humble circumstances; devoted himself exclusively to med.; took his degree in 1822, and became prof. of physiology and anat. in 1825 at Bonn and in 1833 at Berlin, where he d. Apr. 28, 1858. He was one of the greatest physiologists of his age, and his publications number about 100. His prin. works are *Elements of Physiology*, *De Respiratione Fœtus*, *De Glandularum Secretum Structura*.

**Müller, von** (FERDINAND), BARON, M. D., F. R. S., b. at Rostock, Ger., in 1825, ed. at Kiel; investigated the bot. of Schleswig and Holstein; emigrated to Australia 1847; made extensive botanical explorations in S. Australia at his own expense 1848-52; was then made govt. botanist for the colony of Victoria; explored many mt.-ranges previously unknown 1852-55; was naturalist to Gregory's exploring expedition 1855-56; director of the botanical garden at Melbourne 1857-73; wrote *Fragmenta Phytographia Australica*, *Plants of Victoria*, *Flora Australiensis*, and other works; was ennobled by the king of Württemberg 1871.

**Müller, von** (JOHANNES), b. at Schaffhausen, Switz., Jan. 3, 1752, studied at Göttingen; was prof. in Gr. at the gymnasium of Schaffhausen from 1772 to 1774; retired into private life, and resided till 1781 in Geneva, occupied by preparations for his great work on the *Hist. of Switz.*, of which the first vol. appeared at Berne in 1780; was prof. of hist. at Cassel 1781-83, but retired again into private life, and lived at Geneva till 1786. In this yr. he was appointed court councillor and librarian at Mentz, and when the city was taken by the Fr. in 1791, he repaired to Vienna, where he stayed till 1804, when he went to Berlin; was appointed historiographer to the king of Prus., and received permission to use the Prus. archives for a hist. of Frederick II. After the battle of Jena and the occupation of Berlin by the Fr., Nap. succeeded in winning him over to his side, and in 1806 Johannes von Müller accepted a position as minister of state to the king of Westphalia. This act, and the very pronounced manner in which he extolled Nap., excited great indignation in Ger. D. May 29, 1809.

**Mullet** [Lat. *mulus*], a name common to the fishes of the family Mugilidae, and often extended to the very different family Mullidae or sur-mullets and to other fishes. Of the true mullets of the Amer. Atlantic and Gulf waters, the striped M., the white M., and the rock M. are small but esteemed food-fishes. The waters of the Old World abound in true M. of many species. They are generally fine for the table, and often ascend rivers, and can be naturalized in fresh water. The gray M. (*M. capito*) is one of the best.

**Mullins** (WILLIAM), b. in Eng. about 1575; embraced the principles of Puritanism; settled with his family at Leyden, Holl., in consequence of the restrictions upon religious liberty in Eng.; was one of the prin. promoters of the colonization of Plymouth by the Pilgrims; came in the Mayflower, and was one of the signers of the "compact" drawn up on board that vessel in Cape Cod harbor Nov. 11, 1620. He was a man of wealth and influence, and was expected to take a prominent part in the public affairs of the colony, but he d. in the spring of 1621, as also his wife and all the family except his daughter Priscilla, whose refusal of the



hand of Capt. Miles Standish and marriage to John Alden form the subject of Longfellow's poem, *The Courtship of Miles Standish*.

**Mulock** (DINAH MARIA). See CRAIK.

**Multan**, or **Mooltan**, town of Brit. India, in the Punjab, is a military station, interesting on account of its ruins, and of late rising into commercial consequence through the construction of railways and the opening of steamboat lines. Pop. 56,826.

**Multiplication** [Lat. *multiplicatio*], the operation of finding the product of 2 or more quantities. The product of 2 quantities is the result obtained by taking one of them as many times as there are units in the other. The quantity to be taken is called the *multiplicand*, and the quantity by which it is to be multiplied is called the *multiplier*. Both multiplicand and multiplier are called *factors* of the resulting product. In algebra the sign of the product of 2 factors is + when both factors have the same sign, and it is - when the factors have contrary signs. (For the methods of performing the operation of M. the reader is referred to the ordinary treatises on arith. and algebra. See LOGARITHMS.)

**Mummy**, a preserved corpse or body, especially Egyptian. Immediately after death the bodies of males were removed to the establishments of the *tarchentoi* or embalmers; those of females kept at home. A scribe then marked with a reed a line on the right flank, and an operator (*paraschistes*) made an incision along the line under the ribs with an *Æthiopian* stone. The internal and soft parts were then removed, only the heart and kidneys being left in the corpse; the brain was extracted, and the body prepared in accordance with the expense laid out upon it. The most costly of the processes then in use cost a talent of silver, about \$1218, and consisted in arifices, powdered resins, and cassia through the arteries, and in steeping the body in palm wine and soaking it in natron for 70 days. The second style cost about \$406, or a mina, and in this the brain alone was removed, the viscera being left inside, but injected with oil of cedar, and the corpse soaked in natron as before, and the viscera left to come away. In the third manner, the poorest, the body was washed with myrrh and salted. The examination of numerous M. however, shows that certain gen. processes were used at different periods. Those of the "old empire" were less carefully preserved, for they are found as mere skeletons which emit a faint odor of bitumen; at the time of the 11th dynasty they are often in the same condition, or else yellow, dry, and brittle. Under the 12th the M. become black from the use of bitumen, and the skin, though flexible, dried. From the 18th to the 21st dynasty the M. found at Memphis are black and dry, owing to the use of bitumen, while those at Thebes are yellow from the employment of wax, and shining, the nails dyed with *henné*. These styles, with some modifications, continued till the 26th dynasty. After that age the M. become black and heavy, forming a compact mass with their bandages, and only separated by force. Those at the Rom. period are gray and lissome, but some of the later time only rudely bandaged and steeped in natron. The processes were drying in the sand, steeping in natron, and then drying, boiling in resins, bitumen, or in fine resins only—differences to which the color is due. After preparation they were at the oldest age covered with a shroud and deposited in a wooden coffin, in shape of a M. with a face, placed in a rectangular sarcophagus with a flat cover of basalt, red granite, or limestone; more careful bandaging, and deposited in a rectangular sarcophagus or coffin made out of a single tree, filled with implements and utensils, appear at the time of the 11th dynasty; and with scarabæi and other amulets under the 18th, but rich coffins and inferior M. under the subsequent lines. At the time of the 18th the bandaging is more perfect, the tomb filled with sepulchral figures, and the viscera, distributed into 4 portions, and separately embalmed and bandaged, were deposited in the so called canopi or sepulchral vases in shape of the 4 mummied gods or genii of Hades—Amset, Hapi, Tuautmut, and Kabhsenuf—who presided over the 4 quarters of the compass. After this period at Memphis the M. are provided with amulets of stone and porcelain, the flank incisions covered with rectangular tin plates on which is engraved a symbolic eye, and placed in monolith sarcophagi. At Thebes the bodies are more carefully bandaged in the shape known as that of a M., and made symmetrical by the use of pleggets; as many as 700 yards of bandages were sometimes employed, and a papyrus generally placed with the M. They were placed in painted coffins of sycamore-wood in shape of a M., the face of a fine wood, and the eyes sometimes inlaid. They become more beautiful at the time of the 23d and following dynasties, and when the exterior bandages have a kind of leather brace about an inch wide passed round the neck and edged with scarlet leather, stamped at the end with the name and titles of the reigning monarch and scenes of adoration to the god Khem. In other instances the M. have their outer bandages encased by a cartonnage or outer covering of many layers of linen plastered smoothly with a thin coat of lime, on which are painted religious scenes in gay colors in *tempera*, sometimes enhanced by varnish. These are fashioned to the form, and were laced up behind, and the M. were then placed in coffins not very elaborately decorated, sometimes as many as 3 in number. The prin. M. of the 26th and following dynasties, till the conquest of Egypt by Alexander the Great, b. c. art of embalming was in its decadence, some of the M. being literally boiled in bitumen and incapable of being developed. On account of the expense of the funeral, the M. in their cases were sometimes kept in the house, and occasionally pawned or pledged. All persons, even malefactors, were mummied. The sacred animals, birds, reptiles, and fish were also embalmed, wrapped in linen bandages, and deposited in sarcophagi or cases, without amulets.

Some other nations practised, but by different processes,

the art of embalming. The Pers. used for the purpose wax, the Assyrians honey, the Hebs. spices and honey; the Roms. also embalmed, but the dry climate of Egypt has alone preserved for centuries bodies so prepared. The idea of preserving the body is in fact universal, but the various means used in modern times have in very few instances kept the body for 2 or 3, never for 30 centuries. [From orig. art. in *J.'s Univ. Cyc.* by S. BIRCH.]

**Mumps** [Dut. *mumps*]. This is one of the infectious and contagious diseases, and belongs to the same class with whooping cough, measles, scarlatina, etc. It is often met with when the two latter are prevailing. In some localities with a moist and cold climate it is very frequent (endemic). The prin. sufferers are children (mostly male) of 7 to 14 yrs., but adults are not exempt. Its period of preparatory development (incubation) lasts from 1 to 3 weeks; its prin. symptoms are moderate fever; pain on pressure over the region of the parotid gland, mostly of the left side (but of the opposite side also, and sometimes of both) in front of and below the ear; considerable swelling of that region and the whole cheek and chin; difficulty in deglutition and respiration, corresponding with the amount of swelling; change of the voice; fulness of the head, and dizziness. In many cases the spleen and numerous lymphatic glands are also tumefied. In men the testicles and seminal glands, in women the ovaries, may also swell, and catarrh of the mucous membranes of the eyelids, nose, and mouth is not unfrequent. The disease lasts from a few days to a week; the swelling will subside gradually; in some cases, however, the parts remain large and hard; in a few an abscess will form. The treatment is simple. Regulate the diet, give less meat, more milk, gruel, fruit; vegetable acids (lemonade) or dilute muriatic acid (to 15 drops in a tumblerful of water) as a beverage, mild purgatives (Rochelle salts, seidlitz powder, cream of tartar). The best local applications are raw cotton and cold water; warm water or poultices only when an abscess has commenced to form. No internal treatment except quinine, when the fever is high, and iodide of potassium when induration remains behind. It is understood, however, that such treatment ought to be under the superintendence of a phys. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. A. JACOBI, M. D.]

**Münchhausen**, münk'how-zen, von (HIERONYMUS KARL FRIEDRICH), BARON, b. of noble family at Bodenwerder, Hanover, in 1730; served in his youth in the Rus. cav. against the Turks 1757-59, and d. at Bodenwerder in 1797. The baron enjoyed the reputation of being the greatest liar in Ger. It is believed that the first pub. collection of his stories appeared in Eng. and was written by Rudolph Eric Raspe, a Ger. exile, and pub. in 1785 in Lond.

**Mun'de**, city and R. centre, cap. of Delaware co., Ind., 110 m. N. of Cin. Pop. 1870, 2992; 1880, 5219.

**Mun'cy**, R. R. junc., Lycoming co., Pa., on the W. branch of the Susquehanna, has a female sem. Business, farming and lumbering. Pop. 1870, 1040; 1880, 1174.

**Mun'ford** (WILLIAM), b. in Mecklenburg co., Va., Aug. 15, 1775, grad. at William and Mary Coll., studied law; sat in the Va. house of delegates 1797-1801, in the senate 1801-05, and in the privy council 1805-11, and was thereafter clerk of the house of delegates for the remainder of his life. In 1806 he began, in conjunction with W. W. Henley, to report the decisions of the supreme court of appeals of Va., and afterward issued 10 vols. from his own pen; he was also one of the assistants of Benjamin Watkins Leigh in the revision of the Va. statutes in 1819. He wrote a juvenile vol. of *Poems*, and translated the *Iliad* of Homer into blank verse. D. June 21, 1825.

**Mun'go** (SAINT), or **Kentigern**, one of the 3 earliest missionaries who introduced Christianity into Scot. The son of a Brit. prince, he was b. at Culross, on the Forth, about 514, and d. at a monastery he had founded on the site of the cathedral of the modern Glasgow about 601.

**Munich**, mū'ník [Ger. *München*], capital of Bavaria, on the Isar, 1888 ft. above the sea, at S. end of an extensive plain. In architectural respects it is the most beautiful and interesting city in Ger., and one of the richest in sculptures and paintings. A perfect building of almost every known style is found here. Nearly in the centre of the city, on the Max-Joseph place, is the royal palace, consisting of 3 parts—the king's house, the banqueting-house, and the old residence. The palace is connected by a winter garden with the theatre, which is the largest in Ger., having seats for 2500 persons. On the other side of the palace the royal garden is situated, surrounded on 2 sides by arcades which are connected with the banqueting-house. On the S. side of the Max-Joseph place stands the P. O., in Florentine style. The so called generals' hall, an imitation of the Loggia dei Lanzi in Florence, consists of an open hall 58 ft. high, 117 ft. broad, and 39 ft. long, in which stand the bronze statues of Tilly and Wrede. From this building begins the Ludwig st., running northward, terminating at the Siegesthor ("Gate of Victory"), and consisting almost entirely of monumental buildings. Starting from the royal palace to the N. W., and passing by the Theatiner ch., built 1661-75 in It. rococo style, the Wittelsbacher place is reached. It contains the equestrian statue of the elector Maximilian I. by Thorwaldsen, and the Wittelsbacher palace, in mediæval style, with pointed arches. At the end of the Briener st. is the Propylæum, built in imitation of the Propylæum of Athens. On this side of the gate is the Kunstaustellungs-gebäude; to the right, the celebrated Glyptothek, built in Ionic style, with a portico resting on 12 columns, and a magnificent tympanum with a marble group. Near by are the establishment for painting on glass and the famous Pinakothek. Other noteworthy buildings are the bronze-foundry, with a collection of models and an exposition room; the Schwanthaler Museum, containing nearly all the plaster models by this artist; the Acad. of Science and Art, with an immense collection of fossils, a collection of min-



erals, etc. To the S. W. of the city, near the Karl Gate, stands the Ruhmeshalle ("Hall of Fame"), built in the form of a horseshoe, with 48 Doric columns. It contains the busts of 76 renowned Bavarians. The prin. chs. are the Frauenkirche, the metropolitan ch. of the abb. of München-Freyung; St. Michael's Hofkirche, the Auerkirche, the Basilica des heiligen Bonifacius, etc. The city is generally well laid out, and has broad streets and many large public squares. It is, for the most part, a new city. The Acad. of Fine Arts, the Conservatory of Music, and the Univ. attract steadily a great number of young students. There are many scientific associations, good educational and numerous benevolent insts. The manufacturing industry is not important. The bronze-foundries, the porcelain manufactures at Nymphenburg, the glass-painting establishments, all founded by the govt., flourish; also the optical inst. The breweries are very extensive; the commerce is not important; corn is the prin. article. Pop. 240,023. [From orig. art. in J. S. Univ. Cyc., by AUGUST NIEMANN.]

**Munjeet'** [Hindu, *munjī*]. **Rubia Munjistā**, or **East Indian Madder**, a plant extensively cultivated in India, its root being used as a dyestuff for producing colors similar to those of common madder. It was formerly supposed to contain the same coloring-matters as madder, alizarine, and purpurine. Dr. Stenhouse has shown that it contains purpurine, but no alizarine. The substance supposed to be alizarine he has shown to be a distinct body, *munjistine*, having properties very similar to those of alizarine. It dyes with alumina an orange, with iron a brownish-purple, with Turkey-red mordant a deep orange. These colors are moderately permanent. M. is inferior to madder as a dyestuff. The garancine from M. is said to yield much richer shades with alumina if a portion of the *munjistine* is removed by boiling water. C. F. CHANDLER.

**Munkacz**. See APPENDIX.

**Munson** (ENRAS), M. D., b. at New Haven, Conn., June 24, 1734, grad. at Yale 1753; studied divinity; was chaplain in the Fr. war of 1755; studied med., and began practice at Bedford, N. Y., 1756; removed to New Haven 1760; enjoyed there a high professional reputation during more than 50 yrs.; was prof. in the Yale Med. School from its first organization; was pres. of the Med. Society of Conn., and often a member of the legislature. D. June 16, 1826.

**Muntaner**, moon-tah-nair' (RAMON), an eminent Catalan chronicler, b. at Peralada in 1255, d. in 1336; the most important authority on the early hist. of his country, as well as one of the most valuable of mediæval annalists. After having filled many positions of trust under his sovereign, and participated in the remarkable Catalan expedition to Rumelia and Gr., M. retired to Xilvella, near Valencia, and at the age of 60 yrs. began the composition of his chronicle. His narrative covers the period between the "miraculous" birth of King Jaume I., the founder of the Catalan nationality, in 1208, and the coronation of King Alphonsus in 1328. M.'s chronicle was first printed at Barcelona in 1558, under the title *Chronica o Descriptio dels fets e hazenyes del inclyt Rey Don Jaume, primer Rey d'Arago, de Mallorca e de Valencia; fets per lo magnífich en Ramon Muntaner*.

**Muntjak**, the *Cervulus Munjak* of India, Java, etc., a small deer, but little over 2 ft. high. The males have small horns; the females are hornless. Their venison is excellent.

**Münzer** (THOMAS), b. at Stolberg, in the Hartz Mts., about 1490; studied at Wittenberg, and became preacher at Zwickau in Sax. in 1520, and in 1523 at Allstedt in Thuringia. At first he worked in unison with the Reformers, but afterward he turned against the "halfness" of Luther and Melancthon, and demanded a radical reform of Ch. and state. He entertained ideas of infant baptism similar to those of the Anabaptists; his most characteristic ideas were a belief in continuous divine revelation through dreams and visions, and in the community of property. Expelled from Allstedt by the govt., he went to Nürnberg, and next to Schaffhausen, but returned soon to Thuringia, and settled at Mühlhausen. Here he succeeded in overthrowing the city council and appointing another which was entirely under his control; and when in 1525 the Peasants' war broke out in S. Ger., he instigated the whole pop. in and around Mühlhausen and Langensalza to rise in revolt. Murder and plunder ensued, but on May 15, 1525, the peasants were totally routed. M. was taken prisoner and beheaded at Mühlhausen a few days afterward. His *Life* was written by Melancthon (1525).

**Muot'a Valley**, an elevated and secluded valley of Switz., in the canton of Schwytz, traversed by the river Muotta, which hence flows down to the Lake of Lucerne, is famous for the struggle which took place here in 1799 between the Rus. under Suwarow and the Fr. under Lecourbe, Mortier, and Masséna. The Rus. were totally surrounded, but by an onset they broke through the Fr. lines and escaped down the valley. The prin. place of the valley is the village Muotta, with about 2000 inhabs. and a handsome parish ch. containing several valuable pictures.

**Murad V.** (MEHMET MURAD EFFENDI), D. Sept. 21, 1840, the eldest son of the sultan Abd-ul-Medjid. On the dethronement of his uncle, Abd-ul-Aziz (May 29, 1876), he was declared sultan of Tur., but was deposed Aug. 31, 1876.

**Murena** [Gr. *múrena*], the typical genus of the eel family of fishes (Murenidae). It includes the *M. helena*, the famous M. of the anc., a European salt and fresh water fish, stout, heavy, and often 6 ft. long. Its flesh is white and good, and it was artificially bred by the anc. Roms.

**Mural Circle** [Lat. *muralis*], an astronomical instrument, consisting of a large graduated circle, to which is attached a telescope moving only in the plane of the meridian, and supported on the perpendicular face of a wall; whence the name. It is mainly used for the determination of the declinations of the heavenly bodies. It has of late yrs. been superseded by the transit circle, because its unsymmetrical construction renders the determination of its instrumental errors difficult.

**Murat**, mu-rah' (JOACHIM), b. at La Bastide Fortunière, in the dept. of Lot, Fr., Mar. 25, 1771, the son of an inkeeper; was ed. at Cahors and Toulouse, where he prepared himself for the Ch. Dismissed from the sem., he entered a regiment of chasseurs, and, cashiered in the regiment, lived for some time as waiter in a café in Paris. On the establishment of the constitutional guard of Louis XVI. he became a member of that body of troops, and was afterward transferred to a regiment of cav. He proved a brilliant soldier in the field; was aide-de-camp to Nap. in 1795; accompanied him to Egypt 1798; made gen. of division in 1799; married in 1800 a sister of the First Consul, Caroline, and was made marshal of Fr., imperial prince, and grand admiral in 1804. In 1805 he was made grand duke of Berg, and in 1808 king of Naples under the name of Joachim I. Nap. But M. wished to govern his kingdom independently of Fr., and every attempt in this direction Nap. frustrated with indignation. After the battle of Leipsic M. hastened to It. and opened negotiations with Eng. and Aus., which powers guaranteed him, by a treaty on Jan. 11, 1814, the possession of his throne on the condition of his joining the allies against Nap. He marched against Prince Eugene, viceroy of It., but when he heard that the Bourbons insisted violently at the Cong. of Vienna on his expulsion, he stopped, and when Nap. returned from Elba he at once declared war against Aus. (Mar. 31, 1815). Defeated Apr. 12 at Ferrara, and May 2 at Tolentino, he fled to Fr., where Nap. refused to receive him. He lived in the vicinity of Toulon, but after the battle of Waterloo he was compelled to leave Fr. He made an attempt at invading Naples, but failed, was caught near Pizzo, and shot Oct. 13, 1815.

**Murder** [Lat. *murdrum*]. By the common law there was only one degree or grade of this crime. The definition given by Lord Coke is universally accepted as accurate—viz.: "When a person of sound memory and discretion unlawfully killeth any reasonable creature in being and under the king's peace, with malice aforethought, either express or implied." By far the most important element of the crime is the final one: the killing must be with malice aforethought, express or implied. The term "express" is appropriate to those cases in which the wrongful intention is inferred as an ordinary deduction of fact from the evidence which is given for the very purpose of establishing its existence, such as lying in wait, former threats, old grudges, careful preparations, and the like. The malice is "implied" when it is inferred as a legal presumption. Wherever there was a preconceived design to kill the very person whose life was taken, and the act was not excusable nor justifiable, this was plainly M. In addition to this common case, if a person should wilfully kill in such a manner as to show him to be an enemy to mankind in general, the act would be M. Also, if while engaged in the commission of, or in the attempt to commit, a felony, the wrong-doer should undesignedly kill a person, the homicide was M. If the killing was done under great and immediate provocation, upon the spur of the moment, while the passions were inflamed, the crime was manslaughter. In most if not in all the States of this country the whole subject of homicide is now regulated by statute. The various cases which fell within the common-law definition of M. are classified, and are separated into 2 degrees, those in the first degree being punishable with death, and those in the second by imprisonment for life. The characteristic feature of this system as found in most of the statutes is the requirement of deliberation, premeditated intention to kill. When the wrongful homicide is "perpetrated intentionally, but without deliberation and premeditation," it is declared to be M. in the second degree. JOHN NORTON POMEROY.

**Murdock** (JAMES), D. D., b. at Westbrook, Conn., Feb. 16, 1776, grad. at Yale 1797; studied theol.; was Congl. minister at Princeton, Mass., 1802-15, prof. of anc. langs. in the Univ. of Vt. 1815-19, and of sacred rhetoric and ecclesiastical hist. in Andover Theological Sem. 1819-28. In 1829 he removed to New Haven, where he devoted the remainder of his life to lit., producing, among other works, translations of Mosheim's *Ecclesiastical Hist.* and *Commentaries*, and of the Peshito-Syriac version of the N. T., and original *Sketches of Modern Philos.* D. Aug. 10, 1856.

**Murex'ide** [Lat. *murex*, "purple"], or **Purpurate of Ammonium**, is formed by the action of ammonia on alloxantine, and by other reactions. It crystallizes in 4-sided prisms, which are garnet-colored by transmission and rich gold-green by reflected light. In water it forms a splendid purple solution. With mercuric salts it produces fine red and purple colors on silk, wool, cotton, and leather, and with zinc salts orange and yellow colors. These colors are very bright and resist the action of light; they are, however, very sensitive to sulphurous acid, which rapidly discolors them. Hence, they cannot be used in cities where coal-gas is employed. A few yrs. since M. was extensively used for dyeing and calico-printing. It was made from the uric acid of guano. One factory in Manchester, Eng., turned out 12 cwt. weekly. It was driven out by the aniline colors.

**Murfreesboro'**, on R. R., cap. of Rutherford co., Tenn., 32 m. S. E. of Nashville, is the seat of Union Univ., founded by the Baps. in 1841, and of Soule Female Coll. From 1817 to 1827 it was the cap. of the State. Pop. 1870, 3502; 1880, 3800.

**Murfreesboro', Battle of**. On July 13, 1862, M. was occupied by a U. force, which was surprised and captured by a Confed. force under Forrest. Rosecrans, who had assumed command of the army of the O. Oct. 30, 1862, advanced against Bragg's army, which was now posted about M. Leaving Nashville at daylight on Dec. 26, 1862, by night of the 30th a position was reached to the W. of Stone River, the left of the army resting on that stream and extending S. some 3 m. Bragg's army was posted on the E. side of Stone River. Rosecrans's plan contemplated an attack in force on the Confed. right, which was inaugurated early on the morning of Dec. 31, but had not progressed far before



a furious attack upon his own right caused him to abandon the attack with his left and hasten forward assistance to the right and centre. The Confed. success was not stayed until  $\frac{1}{2}$  the ground occupied in the morning had been lost, beside 28 pieces of artill. Both sides had suffered severely, and the next day (Jan. 1, 1863) no serious fighting occurred. On the 2d a furious charge was made by the Confeds. in the afternoon, with temporary success, but resulting in their being driven in turn with great loss. Darkness ended the fight, a rain setting in, and next day was passed without any gen. engagement. Friday morning (Jan. 4) revealed the fact that the Confeds. had disappeared, and pursuit was not deemed advisable. M. was at once occupied and held. Rosecrans, with a reported force of 43,400, lost 1533 killed, 7245 wounded, and some 3000 prisoners; Bragg reports his strength at 35,000, and loss at 10,000, of which 9000 were killed and wounded. This battle is also known as that of Stone River.

**Muriatic Acid.** See HYDROCHLORIC ACID.

**Murillo** (BARTOLOMÉ ESTÉRAN), b. at Seville, where he was baptized Jan. 1, 1618; received the first instruction in painting from his uncle, Juan de Castillo; painted a ship-load of Madonnas, martyrs, street-boys, etc. for the colonies, and with the money thus earned he started for it. In 1643. Arrived at Madrid he met with Velasquez, who received him in his acad., procured him admission to the galleries of Madrid and the Escorial; and M. settled down at Madrid, where for 3 yrs. he studied, copying the works of Titian, Van Dyck, Ribera, and Velasquez. On his return to Seville the friars of the convent of San Francisco intrusted him with the decoration of their cloister, and the 11 pictures he painted for them at once established his fame. He founded an acad. at Seville from which many talented pupils issued, and d. in his native city Apr. 3, 1682.

**Murphy** (HENRY CRUSE), b. in Brooklyn, N. Y., July 3, 1810, grad. at Columbia Coll. 1830; was admitted to the bar 1833; became city atty. of Brooklyn, mayor 1842, M. C. 1843-49, member of the State constitutional convention 1846, minister to Hol. 1857, subsequently a member of both houses of the State legislature. Has made translations of De Vries's *Voyages from Hok.* and of several of the *Early Dut. Poets of New York*, etc., and has written much upon the early Dut. hist. of New York. D. Dec. 1, 1882.

**Murphy** (JOHN), b. in S. C. 1786, grad. at S. C. Coll. 1808; removed in 1817 to Ala.; was gov. of Ala. 1825-29, M. C. 1833-35. D. Sept. 21, 1841.

**Murphysborough**, city and R. R. junc., cap. of Jackson co., Ill., on the Big Muddy River, 6 m. W. of Carbondale and 15 m. E. of the Miss. River. Pop. 1880, 2196.

**Murrah** (PENDLETON), b. in Ala., grad. at Brown Univ. 1848; was gov. of Tex. 1863-65. D. Sept. 23, 1865.

**Murray** (DAVID), Ph. D., LL.D., b. Oct. 15, 1829, at Delhi, N. Y., grad. at Union Coll. in 1852, was successively a prof. and prin. of the Albany Acad. from 1853 to 1863, and from 1863 to 1873 prof. of math. and physics in Rutgers Coll. In 1873 he entered the service of the Japanese govt. as foreign adviser to the dept. of education. He wrote a *Manual of Land Surveying*. Returned from Japan 1878, and became connected with dept. of education, N. Y.

**Murray, or Moray** (JAMES STUART), EARL OF, b. about 1593, was a natural son of James V. by Lady Margaret Erskine; was made by his father commendator of the priory of St. Andrew's in 1598, and subsequently acquired the priory of Pitvenne and that of Maçon in Fr., with a dispensation to hold 3 benefices, and took in 1544 an oath of fealty to Pope Paul III. In 1547 he accompanied his half-sister Mary (afterward "Queen of Scots") to Fr., and in the following yr. received a descent upon the island of St. Monan, on the coast of Fifeshire, made by Lord Clinton, and drove the invaders back to their ships. In 1556 he joined the Scot. Reformers, and assumed the political leadership of the Prot. party. He was one of the Scot. coms. to witness Mary's marriage to the dauphin of Fr. (1558); was appointed member of the council for civil affairs Dec. 1559, and one of the lords of the Articles June 1560; was sent as envoy to Fr. Apr. 1561, to invite his sister Mary to return to Scot. as queen, and on her arrival became her prime minister and chief adviser, protecting the Prots. in the enjoyment of their religious privileges, while he insisted upon the queen's right to worship according to her Catholic antecedents. In Feb. 1562 he was created earl of Mar, and soon afterward married Lady Agnes Keith, daughter of the earl marischal, but in the same yr. resigned the title of Mar in favor of his uncle, Lord Erskine, who claimed it by right, and received in its stead the earldom of M.; defeated the rebel earl of Huntly at Corrichie, and governed Scot. with prudence, though incurring the displeasure of Knox and the extreme Prots. by his studied neutrality in the religious conflict then beginning. In 1565 he lost power by opposing Mary's marriage with Darnley, which he took up arms to prevent, but was defeated and forced to escape into Eng. He was recalled the following yr., and arrived at Edinburgh in Mar., the day after the assassination of Rizzio, to which he was supposed to have been accessory, as also to the murder of Darnley in the following yr. He left Edinburgh the day before that event, and proceeded to Fr., also visiting Queen Elizabeth in Eng.; returned to Scot. in July; found Mary after her marriage with Bothwell a prisoner in Lochleven castle, where he visited her and induced her to abdicate, July 22. He was proclaimed regent Aug. 22; maintained himself by arms against his sister after her escape, defeated her forces at Langside May 13, 1568; attended the same yr. at the trial of Mary at York for the murder of Darnley; gave his testimony against her, and produced as evidence the "casket letters." M. returned to his govt., which he administered until he was assassinated in Linlithgow Jan. 23, 1570.

PORTER C. BLISS.

**Murray** (JOHN), F. S. A., b. in Lond. Nov. 27, 1778, son of John McMurray, who founded a bookselling shop in Lond. Succeeding at the age of 15 to his father's business, young

M. became the friend and liberal patron of a famous circle of literary men, most of whose works he pub. In 1809 he founded the *Quarterly Review*. D. at Lond. June 27, 1843.—His son, bearing the same name, b. in 1808 and ed. at the Univ. of Edinburgh, has since conducted the business. He has edited the *Home and Colonial Library*, personally superintended the preparation of *Murray's Handbooks of Travel*, etc. In 1869 he established the *Academy*.

**Murray** (LINDLEY), b. in 1745 at Swatara, Pa.; removed in 1753 to New York with his father, a Quaker merchant; was admitted to the bar in 1776; became a successful merchant of New York, and in 1784 retired from business; settled at Holdgate, near York, Eng., and devoted himself to lit. pursuits; best known by his *Eng. Gram.* (1795), which was for many yrs. regarded as the best authority on the subject; wrote also several educational and religious works, and an *Autobiography*. D. Feb. 16, 1826.

**Murray** (NICHOLAS), D. D., b. at Ballinasloe, Ire., Dec. 25, 1803, came in 1818 to the U. S. and learned printing; grad. at Williams Coll. 1826; studied theol. at Princeton; assumed a Presb. pastorate at Wilkesbarre, Pa.; pastor of the First ch., Elizabethtown, N. J., 1853-61. His "Kirwan" letters to Abp. Hughes gave him fame as a polemic; wrote *Romanism at Home*, *Parish and other Pencilings*, *Happy Home*, and other works. D. Feb. 4, 1861.

**Murray** (WILLIAM VANS), b. in Md. in 1762; went to Lond. after the peace of 1783, and studied law in the Temple for 3 yrs.; was elected a member of the Md. legislature on his return; M. C. 1791-97. He was appointed by Washington minister to the Netherlands 1797, and by Adams envoy to Fr. 1799. Oliver Ellsworth and William R. Davie were afterward associated with him as plenipotentiaries in Fr., but the convention signed Sept. 30, 1800, which put an end to the difficulties between the U. S. and Fr., was mainly the work of M. He returned to his post at the Hague, where he remained until Dec. 1801. He was the author of a treatise on *The Constit. and Laws of the U. S.* D. Dec. 11, 1803.

**Murshedabad, or Moorshedabad**, town of Brit. India, presidency of Calcutta, on the Bhagratl. It is a stragling town, extending along the river for a distance of nearly 8 m., but, with exception of the palace and some mosques, it is meanly built. It has an important trade. Pop. 150,000.

**Mur'sa** (ANTONIUS), a celebrated phys. at Rome; he acquired celebrity by restoring Augustus to health. Wrote pharmaceutical works, of which only fragments remain.

**Museus**, mu-zee-us, one of the early Gr. minstrels and poets, belonging rather to mythology than hist.; said to be son of Eumolpus and Seleno, or even of Orpheus; there were ascribed to him various works: *Oracles*, a theogony; *Hymn to Demeter*, etc.

**Museus**, a grammarian of whose personal hist. scarcely anything is known; author of the poem on the loves of Hero and Leander.

**Muscadine** (mus'ka-din) **Grape** (*Vitis vulpina*, Linn.), a S. species known by the name of Bullace or Bullit grape, not growing farther N. than N. C. The white succupern, one of its varieties, is much esteemed in the S. States, but is not worth cultivating at the N.

**Muscardine**, mus'kar-din, one of the destructive diseases which have of late yrs. committed such ravages among silkworms. It is characterized by a parasitic vegetation, the growth of a microscopic plant called *Botrytis Bassiana*, a fungus resembling mould and mildew.

**Muscat, or Maskat**, a powerful Arabic imamat, which in 1856, at the death of the imam Said Seid, was divided between his 2 sons, one receiving the Afr. terrs., extending along the E. coast of Afr. from the equator to Cape Delgado, with Zanzibar for its cap., and the other the Asiatic terr., situated in Oman, Ar., and extending along the Per. Gulf and the Strait of Ormuz from lat. 23° 28' to 26° 28' N., with Muscat for its cap. The Afr. terr., or M. proper, to which belongs a tract of land in the Per. prov. of Laristan, consists of a coast-land producing cotton, sugar, rice, maize, water-melons, and bananas. Behind this coast-land rises a mountainous region consisting of bare and naked ranges including beautiful and fertile valleys, where the coffee tree grows, and figs, almonds, grapes, oranges, lemons, walnuts, and apples. On the inner slope of these mts. lies a row of oases, mostly inhabited by Bedouins, and behind the oases stretch the Ar. deserts.

**Muscat, or Maskat**, cap. of the imamat of Muscat, in a fertile plain, surrounded by gardens, on the border of an inlet of the ocean which forms a spacious harbor. The city is fortified, but poorly built, and its climate is unhealthy to Europeans. Its inhabs., numbering about 60,000, carry on a trade in coffee, pearls, salt fish, dyestuffs, etc.

**Muscatel, Muscadell, or Muscat**, a name applied to a large class of fragrant sweet and heady wines. The name comes remotely from the Ar. *maskat*, "musky."

**Muscantine**, mus-ka-teen', city and R. R. centre, cap. of Muscatine co., Ia., 317 m. above St. Louis, on the Miss. River. Pop. 1870, 6718; 1880, 8295.

**Muschelkalk**, moosh'el-kalk [Ger. for "shell-lime"], in Ger., the great Middle Triassic limestone, resting typically upon the Bunter sandstein, and covered by the Keuper or red marl beds. It is named for its abundant fossils, and supplies lime, marl, rock-salt, gypsum, and building-stone.

**Muscle** (mus'sl) **Shoals**, a series of rapids in the Tenn. River, in N. Ala. The river falls 100 ft. in 20 m. Though navigable above and below, steamboats never attempt the shoals except in the very highest freshets. The name is given from the fresh-water muscles here found.

**Muscovite**, the most common species of mica, otherwise known as biaxial or potash mica. It is remarkable for its eminent cleavage, the thin folia being separated easily by the thumb-nail. Its lustre varies from pearly to metallic, and its color from white to gray, pale green, greenish-yellow, and brown. In composition M. is a silicate of alumina,



potash, and iron (silica 43 to 50 per cent., alumina 31 to 39 per cent., potash 5 to 12 per cent., ferric oxide 1 to 8 per cent.). The name is from Muscovy glass, in allusion to its use in Rus. as a substitute for glass in windows. With us it is largely used, under the misnomer of "isinglass," for the same purpose in stoves.

**Muscovy Duck**, the *Anas* or *Cairina moschata*, Linn. The term is a corruption of musk-duck, a name given to the bird on account of the strong odor of the skin.

**Muses** (Μοῦσαι), in Gr. mythology, the divine inspirers of song, are 9 in number, daughters of Zeus and Mnemosyne. Their names are Calliope, the epic Muse; Clio, the Muse of history; Euterpe, of lyric verse; Melpomene, of tragedy; Terpsichore, of dance and song; Erato, of amatory verse; Polymania, or Polyhymnia, of the hymn; Urania, of astron.; Thalia, of comedy and the idyl.

**Musgrave** (GEORGE WASHINGTON), D. D., LL.D., b. in Phila. Oct. 19, 1804; was pastor for many yrs. in Baltimore and Phila.; received the title of D. D. from Princeton in 1845, and of LL.D. from the Univ. of Ind. in 1862; was an able debater, and took a prominent part in healing the Presb. schism of 1837-70. D. Aug. 24, 1888.

**Mushrooms**. The terms *mushroom* and *toadstool* are employed to designate the more conspicuous members of the group of Fungi which have an umbrella-like shape. Strictly speaking, the term "mushroom" should be applied only to *Agaricus campestris*. In this country all other umbrella-shaped Fungi are known under the name of toadstools, and although some are poisonous, many are edible and quite as good as the M., and a very large proportion are certainly harmless; but such of these species as occur in the U. S. are here classed as toadstools from their falsely being supposed to be poisonous.

At the base of the plant is always an entangled mass of fine threads termed the *mycelium* or "spawn" (Fig. 1, *a*), which is the vegetative portion of the plant. Under favorable circumstances this mycelium aggregates at certain centres and sends up above the ground small roundish bodies called "buttons" (*b*), which rapidly increase in size and assume the shape of an expanded umbrella. The expanded portion has received the name of *pileus* or "cap" (*c*), and the upright stem is designated by the term *stipe* (*d*). When young, the outer edge of the pileus is united with the stipe, but as maturity is approached it breaks away, leaving a thin fibrous connection resembling a cobweb, which takes the name of *veil*. Often a portion of the pileus at its place of attachment with the stipe is left adhering in the form of a ring, termed the *annulus* (*e*). At the base of the stipe is the remains of an old covering, the *volva* (*f*), out of which the upper portion of the plant has grown. On the under side of the pileus are the *lamellæ* or "gills" (*g*), over which is spread the *hymenium* or fructifying surface. Under the microscope the hymenium is found to consist of projecting *basidial cells* (*a*), upon which are borne the *sterigmata* (*b*). At the tip of each of the sterigma is formed a single reproductive body (*c*), called a *spore*. By means of the gills, pores, or teeth the hymenium is vastly increased, so that the number of spores produced by a single toadstool is immense.

The mushroom, *Agaricus campestris* (the *champignon* of the Fr.), is a common species of the Agaricini, the first group of the Hymenomycetes, growing almost everywhere, from Lapland to the tropics. The fleshy pileus is white in the young state, becoming of a yellowish-brown when mature. It usually grows in clusters, and never attains a great size. The ring is present and conspicuous. It is easily recognized by its fleshy pileus, solid stipe, and pink-colored gills, often becoming purple with age. It is the most generally eaten of esculent Fungi. The M. is used as an article of food in Fr., and especially in Paris, around which it is largely cultivated; deserted mining-caves have been appropriated for the purpose. They are usually found in the wild state scattered over a rich meadow or pasture in early morning after a warm shower in the night.

The M. is only one of over a thousand species of the genus *Agaricus*, at least  $\frac{1}{4}$  of which are harmless. Closely related to the M. is *A. arvensis*, popularly called "meadow mushroom," from its place of growth. It is larger than *A. campestris*, stronger in flavor, and less esteemed. The "nail fungus," *A. aculeatus*, is the smallest species used for food; it is found in fir woods. One of the most poisonous species of the genus is the "fly-agaric," *A. muscarius*, so named because the fungus is often steeped and the solution used for the destruction of the house-fly. The pileus is raised upon a long stipe, reaching a diameter of 4 to 6 inches, having its bright red surface studded with large white protuberances. It is as poisonous as it is beautiful. In Kamchatka it is

highly prized, producing as it does a peculiar intoxication. Very closely allied to the fly agaric is *A. caesareus*, though not poisonous and very excellent for food. It can always be distinguished by having yellow gills, while *A. muscarius* has them of a pure dead white. In *Hygrophorus* the main feature is the waxy character of the hymenium. There are 3 species of culinary importance, the best being the small pure white *H. virgineus*. It is common, and, like the brown *H. pratensis*, is found in open pastures. The members of the genus *Lactarius* are distinguished by the milky juice which exudes from them when bruised. *L. deliciosus* has the orange-colored pileus marked with zones of a darker color. This species deserves the name *delicious*; it is highly prized by all lovers of edible Fungi. *Russula emetica* acts as an emetic to most persons; it may be distinguished by its rosy pileus, brittle gills, and white stipe dotted with red spots. The genus *Cantharallus* has thick branched gills, with edges blunt and roundish. *C. cibarius* is the beautiful little yellow chanterelle so highly esteemed by the Fr. In *Marasmius* the species are characterized by having a dry hymenium, folds thick and tough and acute at the edge. *M. oreades*, from its peculiarity of growing in circles, and the superstitious belief that these rings had some connection with elfs and goblins, has long been known as a "fairy-ring fungus." It is very small and common, and furnishes a delicate dish.

In the second group of the Hymenomycetes, Polyporei, the gills of the Agaricini are replaced by *pores* or *tubes*. The genus *Boletus* has the pores easily separated, and furnishes a number of species, of which *B. edulis* is the most important. It is an inhab. of the woods, and often attains the dimensions of from 6 to 10 inches across the pileus. *B. borinus* is a gregarious species, growing in fir woods, and much sought for as an article of food. *B. luridus* is sometimes eaten without harm, but should not rank among the foremost esculent species. It is common in woods in summer. The flesh is at first yellow, changing to blue. The genus as a whole is a dangerous one. In the genus *Polyporus* the pores are not easily separated, and many of them are without stems. A few species are of worth as articles of diet. *P. giganteus* and *P. infundibolatus* are of very large size, sometimes weighing 40 lbs. They both grow upon the trunks of trees. *P. fomentarius* is touchwood or "punk," and grows to a great extent on the trunks of dead and decaying trees. The last genus of Polyporei is *Fistulina*, characterized by having the hymenium inferior and a papillated surface when young, which changes into tubes bearing the spores. *F. hepatica*, so named from its resemblance to the liver, is fleshy and juicy, and appropriately bears the common name of "beefsteak fungus." When cut it resembles a beef-rot. It grows upon trunks of trees throughout the summer.

The third group of the Hymenomycetes is termed Hydnel, in which the leading characteristic is the numerous projecting spines or teeth, over the surface of which the hymenium is spread. The most common edible species is *Hydnum repandum*, found in woods and shady places. When raw it has a peppery taste and the odor of horse-radish. In the group Tremellini, or the gelatinous Fungi, only one species has received much attention as an article of food—viz. the curious "Jew's ear," *Hirneola auricula-judee*. It gets its name from its strong resemblance to the human ear.

Most Fungi require a moist atmosphere, with the exclusion of bright sunlight. The most successful method of cultivating the M. and edible toadstools is to mix fresh horse-dung with loam in such proportions as to prevent too violent fermentation, when it is put in long narrow beds of a foot or 18 inches in height in the centre, into which the mycelium or spawn is placed, and the whole coated over with a layer of loam. These beds are usually protected from the light and drying influence of the sun by low sheds, having the roofs thatched to prevent too rapid evaporation of moisture. A covering of hay or straw is often placed upon the beds.

There are no rules for distinguishing esculent from poisonous species that may be taken as infallible guides. If any rules are given, they can only be of a general character, having some exceptions: (1) Avoid bright colors (this would throw out the highly prized *chanterelle* of the Fr. and several other species); (2) avoid those that change color when cut or broken; (3) avoid those with a milky juice (*Lactarius deliciosus* has a milky juice, and is still delicious); (4) those that deliquesce should be avoided (*Coprinus comatus* is a grand exception to this rule). The safest rule is, never to use a fungus about which there is any doubt. Care should also be exercised to gather only the fresh plants, and they should not be allowed to remain a long time before being eaten. (See ROBINSON, *On Mushroom Culture*; COOKE, *British Fungi*; FAULSTICH, *Iconographie des Champignons*.) [From orig. art. in *J.'s Univ. Cyc.*, by PROF. W. G. FARLOW, M. D.]

**Mus'ic** [Lat. *musica*; Fr. *musique*], a succession or combination of sounds arranged with such connection and mutual relation as to express to the ear some distinct form or train of thought, and awaken certain corresponding emotions. Sounds when thus regulated affect the mind through the ear, as painting and sculpture under similar conditions affect it through the eye. The latter, however, deal with tangible objects, or with ideas formed from material types and their attributes, while the agency of M. is limited to certain relations existing between sounds, variously ordered and combined, and the inward springs of emotion. In all time past, and even among the rudest tribes and nations, we find traces of effort to make both the eye and the ear subservient to the stirring up of pleasurable or other feelings. To some such impulse it is most natural to refer not only the production of the rough drawings, chisellings, and carvings often found among tribes and nations of barbarians, but also the varied and persevering attempts of the same untutored races to find gratification for the ear amid the din and clang of their imperfect musical instruments. The results in both cases could not be otherwise than strange in their conception and often marvellous in their ugliness.



From this state of primitive rudeness the progress of the finer arts to higher stages of cultivation was not equally rapid. All historical records, and the still existing monuments and relics of antiquity, bear evidence that arch., painting, and sculpture gradually rose to perfection, while M. still remained a subject of dark and confused speculation. For long ages, and even through the most brilliant periods of anc. civilization and intellectual splendor, it was the fate of M. to be an enigma defying all solution; and we read of no master-minds springing up to reveal its long-hidden beauties or to discover and systematize its real principles till near the close of the Middle Ages. The M. of the present day, both as a science and an art, is therefore a growth of the last 3 or 4 centuries; and (with a rapidity equalled only by the rise and advance of Gothic arch.) it has already reached so high a stage of development as seemingly to leave little room for further discovery, either in its scientific, creative, or practical and mechanical aspects.

**Musk** [Lat. *moschus*], a concrete, strong-smelling, brownish, inflammable substance extensively employed in med. and in perfumery. It was brought to market from Chil., Rus., and Calcutta, and is obtained from a sac beneath the abdomen of the musk-deer, *Moschus moschatus*. The price of M. is very high, and it is in consequence excessively adulterated. Artificial M. is a yellow, resinous substance, having the smell and the general properties of real M. It is obtained by treating rectified oil of amber with strong nitric acid. It is superior to much of the sophisticated M. of commerce, but not equal to the genuine article.

**Musk-Deer**, the *Moschus moschatus*, a small deer of Central Asia, inhabiting lofty mt.-ranges. It is a timid, active creature, without horns, but with tusks, and is hunted for its musk. This is obtained from a post-omphalic sac on male alone. The flesh is esteemed.

**Muskegon**, city and R. R. centre, cap. of Muskegon co., Mich., has a fine c.-h. and opera-house. Prin. business, lumbering. Pop. 1870, 6002; 1880, 11,283; 1884, 17,845.

**Muskingum River**, the longest stream wholly in O., is formed at Coshocton by the confluence of the Tuscarawas and the Walhonding rivers. Thence it flows, generally S. E., 112 m. to the O. at Marietta. It is navigable by slack-water improvements 90 m. to Dresden. From Dresden to its mouth it falls 130 ft. It flows through a coal-country.

**Musk-Ox**. See OVIROS.

**Musk-Rat**, a name applied in different countries to several small rat-like mammals, distinguished by musky exhalations. (1) In N. Amer. it is conferred on the *Fiber zibethicus*. It is some 15 inches in length, with a tail of 10 inches. It is aquatic, sometimes building houses like those of the beaver, and oftener burrowing in river-banks. Its fur is extensively sold in Europe. The creature has a strong smell of musk. (2) In India the name is given to the *Crocidura myosurus*, a large rat-like shrew, which possesses and communicates to whatever it touches an intolerable, musk-like smell. (3) It is also applied to the European *Myogale moschata*, or desman, a representative of the family of Talpidæ or moles.

**Musk-Wood**, the wood of *Guarea grandifolia* and *Moschoxylon Schwartzii*, meliaceous trees of the W. I. whose wood is redolent of musk. The name is also given to *Aster (Hætonia) argophyllus*, a composite-flowered shrub of Tasmania, sometimes cultivated.

**Muslin**. See MOUSSELIN.

**Musquash**. See MUSK-RAT.

**Mus-sel**, or **Muscle** [Lat. *musculus*; Ger. *Muschel*], a popular name for many conchiferous mollusks. (1) The marine species are chiefly of the family Mytilidæ and genus *Mytilus*, of which there are numerous species of world-wide distribution. The M. often contain small pearls. The Mytilidæ have the posterior muscle well developed, the anterior small and far forward, and the pedal muscles large; the foot is small, grooved, and byssiferous; the gills 2 on each side, elongated, and behind united with each other and to the mantle, and the dorsal margins of the outer and innermost laminae are free; the mantle has its opposite margins free, except behind, where they more or less unite; the labial palpi are elongated, pointed, and free. The shell is variable in form, but the apex is generally more or less approximated to the anterior end; it has a thickened and often filamentous epidermis; the ligament is internal and sub-marginal; the hinge edentulous.

(2) The fresh-water M. of N. Amer. belong to the family Unionidæ, and are extremely numerous. Several species produce fine pearls, and many afford fish-bait. In 1857 a pearl was found in a fresh-water M. at Paterson, N. J., which was sold for \$2200.

**Musset**, mu-sâ', de (LOUIS CHARLES ALFRED), b. at Paris Nov. 11, 1810, and ed. in the Collège Henri Quatre; studied first med., then law, finally art; was for some time engaged in a banking-office, but devoted himself after 1830 exclusively to lit.; was appointed librarian in the ministry of the interior by Louis Philippe and reader to the empress by Nap. III., and d. in Paris May 1, 1857. His *Œuvres Complètes*, pub. at Paris in 10 vols., contain poems, lyrical and narrative, of which *Les Nuits*, *Lettre à Lamartine*, and his answer to Becker's Ger. war-song in 1840 ("Nous l'avons eu, votre Rhin Allemand") are the most celebrated; dramas and proverbs, of which *Un Caprice*, *Il faut qu'une porte soit ouverte ou fermée*, and *On ne badine pas avec l'Amour* belong to the gems of the Fr. dramatic lit.; and novels, the most remarkable of which are *Frédéric et Bernerette* and *Confessions d'un Enfant du Siècle*. M. made a sensation at his very first appearance in lit. in his *Les Contes d'Espagne et d'Italie* and *Le Spectacle dans un Fauteuil*, but in the beginning he also gave offence. Afterward he became one of the chief representatives of the romantic school in the Fr. lit., and by his countrymen he was of all living poets the most beloved.

**Mus-sey** (REUBEN DIMOND), M. D., LL. D., b. at Pelham, N. H., June 23, 1780, grad. at Dartmouth 1803, at Phila. Med. school 1809; practised at Salem 1809-14; prof. of physiat

Dartmouth 1814-19, of anat. and surgery 1819-38; prof. of surgery in O. Med. Coll. 1838-52; held the same chair in Miami Med. Coll. 1852-60, and afterward resided in Boston. He was the first to tie both common carotids; he also successfully removed an entire scapula and clavicle together, probably the first operation of the kind ever performed. He wrote, beside addresses, *Experiments and Observations on Cutaneous Absorption and Health: Its Friends and its Foes*. D. June 28, 1866.

**Mus-tang**, a name applied to the small wild horses of Tex. and to the ponies of the Indian tribes of the S. W. of the U. S., which are of one and the same stock. They are hardy and spirited, but often very fractious. The M. is the descendant of horses of Sp. importation. They associate in large troops, are caught for use by the riata or lasso, and are easily broken to the saddle.

**Mus-tard** [Fr. *moutarde*]. There are 2 prin. kinds of M., white and black. Black-M. seeds are small, globular, of a deep-brown color externally and yellow within. The white are larger, and of a light color externally. Flour of M. consists of a mixture of the 2 kinds of seeds, ground and sifted. M. seeds are very complex in composition. Both contain a bland fixed oil and a substance called *myrosine*, which, when the M. flour is moistened with water, determines the decomposition of another principle contained in the seeds, whereby the peculiar pungent, irritant principle is developed which gives M. its value as a food and med. In the case of black M. this new product is a volatile oil; with the white, a non-volatile but equally acrid, oily liquid. M. flour has also medicinal uses. The moistened flour applied to the skin is a powerful irritant and vesicant, and is much used as a counter-irritant application to relieve internal pains and spasms. Swallowed in any quantity, as a tablespoonful diffused in a tumbler of water, it acts as a prompt non-nauseating emetic.

**Mut-tra**, town of Brit. India, in the N. W. Provs., on the banks of the Jumna. It is built on high and hilly ground, with magnificent flights of steps, adorned with temples, leading down to the river, which is kept sacred by the Hindoos, and annually attracts vast numbers of pilgrims. The steep, narrow, dirty streets swarm with sacred apes, parrots, peacocks, and bulls. Pop. 59,281.

**Muys-eas**, or **Chibchas**, a nation of Indians within the limits of the republic of Colombia, S. Amer., who at the time of the Sp. conquest numbered between one and two millions, and occupied a rank immediately after the Aztecs and Peruvians in point of civilization. Like the Aztecs and Peruvians, they worshipped the sun in common with many other divinities, and sometimes offered human sacrifices to the solar god. Corresponding in their mythology to the Manco Capac of the Incas was a legendary ancestor named Nemtereketeba, who was regarded as the author of their civilization. They were skillful agriculturists, workers in metal, weavers of cotton, and artificers in bone, wood, and stone; built wooden houses; had a rude currency, and had a week of 3 days, a month of 10 weeks, a year of 20 months, and an age of 20 yrs. Succession to the chieftainship was in the female line. They formerly occupied the whole table-land of Bogotá and Tunja, and held many tribes in subjection. They readily accepted Christianity, and were rapidly fused with the whites, losing their national lang. about the middle of the last century.

**Muzarabic Liturgy**. See MOZARABIC LITURGY.

**Mycene**, or -næ [Gr. *Μύκην*, or *μύνα*], one of the oldest cities of Gr., was situated on a rocky eminence in the plain of Argos, in the Peloponnesus. It was the residence of the Pelopidæ, and at the time of Agamemnon it was the prin. city of Gr. Its cyclopean walls, the "gate of lions," and the "treasury of Atreus" are among the most interesting antiquities in Gr.

**Myelitis** [Gr. *μυελός*, "marrow"], inflammation of the substance of the spinal cord. At the beginning of this century nearly all affections of the spinal marrow were classified under the title *myelitis*. Forms of M. may be best classified, according to the product of the inflammatory process, into softening M., purulent M., hyperplastic M., and degenerative M. M. causes loss of sensation and power in the lower half of the body. Treatment occasionally arrests the disease, but probably never cures it. [From *orig. art. in J.'s Univ. Cyc.*, by PROF. E. C. SEGUIN, M. D.]

**My'er** (ALBERT J.), b. at Newburg, N. Y., Sept. 20, 1828, grad. at Geneva Coll. 1847; M. D. in the Univ. of Buffalo 1851; in 1854 was appointed assistant surgeon U. S. A.; in 1860 chief signal-officer with the rank of major, serving as such throughout the war (with the rank of col. Mar. 1863 to July 1864), and gaining the brevets of lieutenant-col., col., and brig.-gen. In July 1866 he was again placed at the head of the signal-office, and in 1870 charged with taking meteorological observations at the military stations and other points in the interior, and giving notice by telegraph or signals of the approach and force of storms; in 1873 was authorized to extend his posts of observation to light-houses and life-saving stations. Author of *Manual of Signals for the U. S. Army and Navy*. D. Aug. 24, 1880.

**Myers** (EDWARD HOWELL), D. D., born in Orange co., N. Y., June 9, 1816; taken to Fla. before it was transferred from Sp. to the U. S.; grad. at Randolph-Macon Coll., Va., 1838; in 1839 was elected tutor in Ga. Conference Manual-labor School, and in 1840 tutor of math. In Emory Coll., Ga.; joined the Ga. M. E. conference in 1841; in 1845 was elected to the chair of natural science in Wesleyan Female Coll., Macon, and pres. in 1851; in 1854 was elected ed. of the *S. Chr. Advocate*; in 1871 resumed the presidency of Wesleyan Female Coll.; but resigned in 1874 to take charge of Trinity ch., Savannah; was a member of the Gen. Conferences of 1858, 1866, 1870; has written *The Disruption of the M. E. Ch.*, 1844-46. T. O. SUMMERS.

**Myia** [Myia], daughter of Pythagoras and Themno, and wife of Milo of Crotona, was, like her mother, distinguished in philos.



**Myll'ta**, the Gr. name for BELTIS or BILIT, a goddess worshipped in Babylon, Assyria, and Per., and corresponding to the Gr. Aphrodite, though in a barbarous form.

**Myopia**, *mi-o-pe-a* [Gr. *μυω*, to "close," and *ὤψ*, the "eye"], short-sightedness, due to excessive convexity of the cornea or to convergence of the visual axes of the eyes. (See SIGHT, DEFECTS OF.)

**Myria** [Gr. *μύριοι*, "ten thousand"], a prefix used in the Fr. metric system to denote ten thousand times the measure indicated by the word to which it is prefixed, as *myriagramme*, *myrialitre*, *myriamètre*.

**Myriapods** [Gr. *μύριοι*, "ten thousand," and *πούς*, "foot"]. The M., of which the centipedes and thousand-legs are familiar examples, may be recognized by the long, worm-like body, consisting of many segments or rings, each bearing a pair of legs. Though they are true insects, breathing by tracheæ, with a distinct head comparable with that of the winged insects, one genus even (*Cermatia*) having compound eyes, yet the body behind the head is not divided into distinct thoracic and abdominal regions, thus resembling caterpillars and the larvæ of other insects. When hatched the body of the chilognathic M. is short, has few segments, no more than 9 beside the head, and but 3 pairs of legs. The body is composed of from 9 to 200 segments, the number varying greatly in the different genera. The head is larger than usual in the centipedes, and there is a pair of compound eyes, while in all other M. they are either scattered or simple or collected into irregular patches, scarcely coming under the head of compound eyes. The antennæ are also longer than usual, and the palpi are well developed, being like those of insects. The head is, as in insects, normally composed of 4 segments, and the appendages of the head have much the same form as in the larvæ of many insects, such as the beetles. The mandibles are of the usual form, the accessory jaws (maxillæ) are provided with palpi, and the second maxillæ (labium) are united and provided with palpi. The legs are, like those of the larvæ of the winged insects, composed of 5 joints.

In their internal anat. the M. closely resemble the larvæ of many insects. The nervous system approaches in its simplicity that of the higher worms (annelids). The brain is composed of at least 4 pairs of ganglia. There are 4 long tubular salivary glands and 2 short pyriform conglomerated glands placed on each side of the œsophagus. This latter is pyriform and capacious; the crop forms nearly half the length of the alimentary canal, its lower extremity constricted into 6 rings; just beyond, at the extreme end of the crop, open 2 biliary tubes. The beginning of the stomach is surrounded by a broad fatty band. The stomach forms about  $\frac{1}{4}$  the length of the whole alimentary canal, and is simple and narrower than the crop. The large intestine begins abruptly, being at first nearly twice the breadth of the ventriculus and narrowing posteriorly. The rectum is short and elliptical. The circulatory system consists of a dorsal vessel, the so called heart, with very numerous chambers, nearly corresponding to the segments of the body, and connecting with another system of vessels lying on the under side of the body between the alimentary canal and the nervous cord. The tracheæ are arranged much as in the winged insects, and the stigmata have the same relative position, but are placed on alternate segments of the body. In the centipedes the sexual organs are much as in the 6-footed insects, and the orifices are placed at the end of the body. The ovary is a long single tube, which opens in the last ring of the body. The male organs in the centipedes and allies are much more complicated than in the other M., and the 2 or 3, or even the single testicular tube, open on the end of the body.

Our *Cermatia foreeps*, found in the Middle and S. States, is poisonous, though its bite is not dangerous. The bite of the centipede is very dangerous. The poison is secreted from 2 glands in the throat, and flows into the wound along a canal in the jaws. The eggs of *Julus* are laid in the earth about an inch below the surface. The egg undergoes total segmentation, and the primitive band rests on one side of the egg. The first maxillæ do not develop, these organs wanting in the adult. The egg-shell splits asunder, while the embryo, encased in its embryonic membrane, is retorted, and remains thus for 17 days before running about. Before this membrane is thrown off the embryo moults, and 6 new segments appear between the penultimate and last segment. While the *Julus* is at first but 6-legged, with but 7 body-rings, and passes through a true metamorphosis, the centipede, after passing through the early embryonic stages as in the chilopods, acquires over 40 pairs of legs, and is nearly of the form of the adult before hatching. The mouth-parts are much as in the winged insects. The body, cylindrical in the embryo, becomes flattened later in life. The Myriapoda are among the oldest insects known, occurring in the coal formation of Europe and this country. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. A. S. PACKARD, JR., M. D.]

**Myrmaleon**. See ANT-LION.

**Myrmid'ones**, the followers of Achilles in the expedition against Troy, came originally from Ægina, and were named from *μύρμις*, "ants," because Zeus changed all the ants of the island into men, and thus peopled it. Peleus led them into Thessaly, where they settled.

**Myrob'alan** [Gr. *μυροβάλανος*], a drug formerly used in med. as an astringent, and now used by tanners, dyers, and ink-makers for the tannic acid it contains. M., sometimes called white galls, are the fruit of *Terminalia Bellirica* and *T. Chebula* (E. I. trees of the order Combrétacæ), of *Phyllanthus Emblica*, a euphorbiaceous plant, and of other trees of tropical regions.

**Myrrh**, *mur* [Heb. *mar*, "bitter"], the concrete juice of one or possibly two trees. One source of M. is the *Balsamodendron myrrha*, a small tree growing in Ar. M. is exported from the E. I. in the form of reddish-brown, brittle lumps, of a fragrant odor and bitter aromatic taste. Its prin. con-

stituents are a gum and a resin. M. has been known from the earliest ages, being used as a constituent of incenses, perfumes, and salves. Taken internally, it tends to correct a relaxed condition of the mucous membranes, and in small dose to promote digestion and quicken the action of the heart. Locally, an emulsion of M. makes an agreeable mouth-wash and a dressing for indolent ulcers.

**Myrta'ceæ** [from *Myrtus*, one of the genera], the myrtle family, an important natural order of exogenous trees and shrubs, of tropical and warm temperate regions, distinguished on the whole, the entire leaves dotted with pellucid glands, containing an aromatic oil, no stipules, mostly numerous stamens, and an inferior compound ovary surmounted by a single style. Europe has only the classical myrtle in the Mediterranean region. A large and peculiar portion of the order is Australian, conspicuous among which are the "gum trees" and "stringy-bark trees," the genus *Eucalyptus*. The order produces cloves and allspice, guavas and rose-apples, brazil-nuts, cajuput oil, etc. The eucalyptus trees furnish one kind of kino, tannin, valuable and rapidly grown timber, various essential oils, and a febrifuge principle used as a substitute for quinia. Beside the common myrtle, several Australian shrubs and small trees are cultivated for ornament.

A. GRAY.

**Myrtle** [Gr. *μύρτος*], a genus (*Myrtus*) of trees and shrubs, mostly tropical and evergreen, none N. Amer. The *Myrtus communis*, the common European M., is a fine aromatic shrub whose berries yield a pleasant cordial. The leaves produce an aromatic oil, and water distilled with the flowers is the agreeable perfume known in Fr. as *eau d'ange*. Several tropical species are cultivated.

**Myso're**, an independent state of India under Eng. protectorate, is bounded on all sides by the terr. of the presidency of Madras. It is an elevated table-land, rich in gold-dust and salt, and producing, beside the common Indian grains, pepper, cardamoms, cinnamon, and coffee; but water is often very scarce, and the country is infested with tigers and leopards. Area, 29,325 sq. m. Pop. 4,186,899.

**Myso're**, cap. of the principality of Mysore, is situated at an elevation of 2380 ft. above the sea. It is fortified, and contains the palace of the rajah and the residence of the Eng. gov. Trouble is often caused by lack of drinking-water. Carpets are manufactured here. Pop. 57,815.

**Myst'eries, Mir'acle-Plays, and Moralities** are the names of mediæval dramas treating subjects of the Bible, the lives of saints, or moral observations. They were performed in the chs., by the clergy, or in public squares on huge scaffolds by the burghers, and their direct purpose was religious or moral instruction.

**Mystic Bridge**, New London co., Conn., on R. R. and the E. bank of Mystic River, has important ship-building interests. Pop. 1680, 910.

**Mysticism**, *misti'sizm* [Gr. *μυστικός*, "belonging to secret rites"], in theological usage designates the contemplation of mysteries, especially those relating to divine things, by an internal illumination, either the soul's own or from God. The spiritual nature is released from the shackles of the body, sometimes by overcoming it, sometimes by giving loose rein to it. It is antithetical to reception on authority and to the recognition of truth by the ordinary use of the faculties; but in its soberer forms it takes both into its service, holding them in a relative subservience. The Gers. distinguish between *Myistik*, the legitimate, and *Mysticismus*, the spurious. M., whether in the Vedas, in the Platonists, or in the Hegelians, is neither more nor less than ascribing objective existence to the subjective creations of our own faculties, to ideas or feelings of the mind, and believing that by watching and contemplating these ideas of its own making it can read in the world without. In the common use of the term it involves a morbid inclination to the mysterious, a giving play to the fancy in the realm of the supersensuous, and is often a synonym of the vague and senseless. Nevertheless, M., even in its extravagance, has often been but the reaction against more dangerous extravagances, and in its highest and purest forms it has been and will ever be characteristic in some degree of all the deeper religious thinking and feeling of the race.

**Mythology**. A myth is a story of obscure origin which embodies some belief now become antiquated, or which has its root in some habit of contemplating nature that is now outgrown. A collection of such stories belonging to a particular age or people is called "a mythology," and the science which describes, classifies, and interprets them is also called "mythology." The study of this science, when conducted on proper methods, throws great light on some of the early thoughts of mankind. According to the theory of Euhemerus, a myth is simply a bit of exaggerated or distorted hist., and when the supernatural or extraordinary features of the story are stripped off we have a residuum of genuine hist. Zeus and Wodan, for example, were anc. monarchs or heroes who underwent a *post-mortem* process of deification; and Heracles was a stalwart pioneer, addicted to hunting wild animals, who once broke into a garden and stole the oranges which had been guarded by powerful dogs. Such a theory originated, of course, in an age in which historical criticism was unknown. But the process of eliminating hist. from legendary narrative by simply winnowing out the credible parts from the incredible is entirely inadmissible: and this and all other arbitrary theories characteristic of the infancy of modern scholarship have been once for all set aside by the results of the application of the comparative method to the myths of antiquity and the primitive beliefs of contemporary savages.

*Comparative mythology* is the dept. of study which aims at interpreting the mythical stories of different peoples by comparing them with one another, so that, wherever possible, a story carrying its meaning on its face may throw light upon some parallel story, the meaning of which could not well be detected but for some such comparison. This modern branch of study came into existence as soon as the



philological interpretation of the Vedas had proceeded far enough to enable scholars to compare the myths of Gr. with those of anc. India. In the Rîg-Veda we find to some extent the same mythic phraseology as in Homer and Hesiod, but in a much more rudimentary and intelligible condition. Zeus, Eros, Hermes, Helena, Ouranos, and Cerberus reappear as Dyaus, Arusha, Saraméias, Sarama, Varuna, and Çarvara, but there is no theogony or mythologic system thoroughly worked out, as in Hesiod. The same pair of divinities appear now as father and daughter, now as brother and sister, now as husband and wife; while every now and then they quite lose their personal shapes and appear as mere elemental forces or vivified phenomena of nature. The name of Dyaus, for example, is derived from the root *dyu*, the same root from which comes the verb *dyut*, meaning "to shine." *Dyu*, as a noun, means "sky" and "day"—that is, "the brightness" or "the bright time." Here we have a key which opens at once some of the secrets of Gr. M. So long as there was for the word *Zeus* no better etymology than Plato's guess, which assigned it to the root *zen*, "to live," the real elemental character of Zeus remained undetected. But when it was shown that the word *Zeus* is simply the Gr. pronunciation of the same word which the Brahman pronounced as *Dyaus*, it followed at once that the supreme god of Gr. M. was originally the personified sky. The root *dyu* is again seen in *Jupiter*, which is identical with the Sans. *Dyaus pitar*, or Jove the Father. The same root can be followed into old Ger., where *Zio* is also the god of day, and into A.-S., where *Tiwesdaeg*, the day of Tiw or Zeus, is the ancestral form of *Tuesday*. Again, in Sans. the root *dyu* assumes the form *div*, whence *devas*, "bright" or "divine," and the Lithuanian *dievas*, Lat. *deus*, and Gr. *theos*, all meaning God. It is a great step in advance when we are able to say that Zeus was not some apotheosized Cretan king, but the personification of daylight. But a further step needs to be taken. What is, after all, the meaning of this way of speaking of the sky as a bright hero and the darkness as a three-headed monster? A plausible explanation was offered by Max Müller in 1856. A myth, he says, is a metaphorical saying of which the metaphorical character has been forgotten, so that it has come to be accepted literally. That is, Dyaus was originally a common noun signifying "sky," and when the old Aryan said "Dyaus rains," he only stated the literal fact that the sky pours down rain. But in later ages, when the Gr. had forgotten the meaning of Zeus, the expression "Zeus rains" conveyed the notion that there is a person named Zeus who sends down the rain. And after this manner all M. grew up. But this explanation does not account for the personification of Dyaus in the first place. How did the sky ever get so thoroughly anthropomorphized that people came to forget what its name Zeus originally meant? The principles of philological interpretation are an indispensable aid to us in detecting the hidden meaning of many a legend in which the powers of nature are represented in the guise of living and thinking persons; but before we can get at the secret of the myth-making tendency itself we must leave philology and enter upon a psychological study. We must inquire into the characteristics of that primitive style of thinking to which it seemed quite natural that the sun should be an unerring archer, and the thunder-cloud a black demon or gigantic robber, finding his richly merited doom at the hands of the indignant Lord of light.

It is quite natural to all men, whether savage or civilized, to draw conclusions from analogy, and to imagine intimate relations between phenomena that are in the habit of occurring simultaneously. Newton's theory of gravitation was at the outset a case of reasoning from analogy, and so is the notion of the Zulu who chews a bit of wood in order to soften the heart of the man with whom he is about to negotiate a trade. The superior correctness of the scientific conclusion is due to the fact that the civilized man has learned to exclude as preposterous a great many guesses which the barbarian has not learned to exclude. In his mind that enormous mass of associations answering to what we call "laws of nature" have not been formed, and hence when he tries to reason about what he sees there is little but the most superficial analogy to guide his thoughts hither or thither, and it is inevitable that he should arrive at many conclusions which to us seem quaint or grotesque. To him the visions seen and the voices heard in sleep possess as much objective reality as the gestures and shouts of waking hours. The immense mass of evidence collected by Mr. Tylor shows that all uncivilized people have framed this notion of *another self*. The other self of the dreamer meets and converses with the other selves of his dead brethren, joins with them in the hunt, or sits down with them to the wild cannibal banquet. Thus arises the belief in an ever-present world of ghosts. The weird reflection of his person and imitation of his gestures in rivers or still woodland pools is interpreted by the savage as an appearance of his other self; in the echo he hears the mocking voice of this phantom double, and as his fantastic shadow he sees it dogging his footsteps. Usually in barbaric thought the other self is supposed to resemble the material self with which it is customarily associated. And, taking a step farther, primitive culture makes no such distinction as between the immortal man and the soulless brute, but speaks of the other selves of beasts in the same terms which are used of human ghosts. The Assamese believe that the ghosts of slain animals will become in the next world the property of the hunter who kills them. Even plants and lifeless objects possess other selves which pass into the world of ghosts. Feejeans and other contemporary savages expressly declare that this is their belief: "If an axe or chisel is worn out or broken up, away flies its soul for the service of the gods." This is exemplified in the argument of the Algonquins, who insisted to Charlevoix that since hatchets have shadows as well as men, therefore the shadow or soul of the hatchet must accompany the shadow

or soul of the warrior to the spirit-land. Now, when this general theory of object-souls, universal among uncultured men, is expanded into a still more gen. theory of indwelling spirits, we have before us a set of phenomena which go very far toward explaining the personifications of M. When once habituated to the conception of souls of knives and tobacco-pipes passing to the land of ghosts, the savage cannot avoid carrying the interpretation still further, so that wind and water, fire and storm, are accredited with indwelling spirits akin by nature to the soul which inhabits the human frame.

Thus we have reached something like a satisfactory explanation of the true nature of M. On the one hand, philology has shown that a myth is an attempt to explain some natural phenomenon by endowing with human feelings and capacities the senseless factors in the phenomenon. On the other hand, a brief survey of barbaric superstitions has shown how uncultured man has invariably come to regard all objects as endowed with souls, and all nature as peopled with suprahuman entities shaped after the general pattern of humanity. Thus is suggested a natural mode of genesis for the personifications of which M. is made up. [From orig. art. in *J.'s Univ. Cyc.*, by JOHN FISKE, LL.B.]

**Mytilene**, or **Mytilène** [Μυτιλήνη], an important anc. Gr. city of the island of Lesbos. M. has uninterruptedly flourished down to the present time. It anciently had a large commerce, and was famed for its beauty and military strength. It is at present called Mitlen or Castro, is under Tur. rule, and is the seat of a Gr. metropolitan. Pop. 6000.

## N.

**N**, a nasal dental consonant, being a nasal *d*. In Eng. and Lat. the letter also represents the sound heard in *ink*, *anchor*, a sound represented by *ng* in *sing*, *singer*. N stands for nitrogen, north, new, note, notary, Nepos, (n.) noun, neuter, (n. d.) no date, (Nat.) nativity, natural.

**Nablus**, **Nabulus**, or **Naploose**, the anc. *Sychem*, situated 80 m. N. of Jerusalem, on the watershed of the narrow valley between Ebal and Gerizim, 1½ m. W. of Jacob's Well, which is at the mouth of the valley. Pop. about 10,000, 500 of whom are Chrs., 150 Samaritans, 100 Jews, and the rest Moslems, formerly noted for their fanaticism.

**Na'bob** [Urdu, *na'wab*, a "deputy" pl. for *na'ib*, the less formal singular number], under the Moguls in India, a viceroy or gov. of a prov. It afterward became a mere title. In process of time many of the N. became independent monarchs. It was the mutual jealousy of the N. that made India the comparatively easy prize of Brit. adventurers.

**Nachtigal** (GUSTAV), b. at Eichstadt, Prussian Saxony, Feb. 23, 1831; studied med. at Berlin, entered the service of the Bey of Tunis in 1863, and undertook, 1869-74, a journey to Kooka, the important results of which were published same yr.

**Na'dal** (BERNARD H.), D. D., LL.D., b. in Md. in 1815, grad. at Dickinson Coll.; became a preacher of the M. E. Ch. in Md., Va., and Del.; prof. in the Ind. Asbury Univ. about 1850; was a prominent writer on ch. hist. in the *Meth. Quarterly Review* and other periodicals; pastor in New Haven, New York, Brooklyn, Phila., and Wash.; was at one time chaplain of Cong.; was the first prof. of ch. hist. at Drew Theological Sem., and on the death of Dr. McClintock became acting pres., D. June 20, 1870.

**Na'dir Shah**, or **Kuli Khan**, b. near Kelat, in the prov. of Khorassan, Per., in 1688; became the leader of a gang of robbers, by whose aid he captured several fortified places in Khorassan; espoused the cause of Tamasp, the legitimate ruler of Per., against the Afghan invaders; was appointed commander-in-chief by Tamasp in 1727; defeated the Afghans repeatedly, and succeeded in driving them out of the country in 1730. Tamasp now made him gov. of Khorassan, Mazanderan, Seistan, and Kerman, and he assumed the name of Tamasp Kuli ("Tamasp's slave"), to which the shah added the title of khan. In 1731 he defeated the Turks, and when in 1732 Tamasp was defeated by the Turks, Kuli Khan deposed him, and raised his son, Abbas III., a child, to the throne. The war with the Turks was renewed with success, and when Abbas III. d. in 1736, Kuli Khan was crowned shah of Per. under the name of Nadir Shah. He defeated the Great Mogul, captured Delhi, and restored to Per. her old boundaries from the time of the Sassanides, but in course of time he became a merciless tyrant; whole cities were put to the sword. In the midst of his career he was assassinated, June 20, 1747.

**Nævius** (CNEIUS), b. in Campania about 274 B. C.; served in the first Punic war, and became famous as a writer of tragedies and comedies. He belonged to the plebeian party, attacked the nobility with great virulence, was driven into exile, and d. in Utica, Afr., about 204 B. C. A few insignificant fragments of his epic poem on the Punic war and of his dramas are still extant.

**Nævus**, points or patches of variable size on various parts of the surface of the body, of blue or purplish venous hue. These are often congenital, and are termed birthmarks, and frequently have a fanciful resemblance to persons or objects which appeared to or alarmed the mother previous to the child's birth. Such marks often present only discoloration, due to a venous capillary network, without vessels of perceptible size. Nævi, as a rule, are perceptibly vascular and elevated; they can be emptied of their blood by pressure with the finger, and again fill when the pressure is withdrawn. Nævi are treated by puncture with the white-hot needle, by caustics, compression, electrolysis, styptic injections, and excision.

**Nāgarjuna**, or **Nāgasena**, the thirteenth patriarch of the Buddhist religion, lived in the 1st or 2d century B. C.; was born of a Brahmanical family in the S. of the peninsula.



He became deeply learned in all the sciences of the time; travelled much, performed miracles, founded the Mādhyamika school of philo.; his disciples Aryadeva and Booddhapallita propagated his doctrines throughout S. India.

**Nagasaki**, town of Japan, situated in lat. 32° 43' N., on a peninsula of the island of Kiu-Siu, has an excellent, spacious, and safe harbor, which since 1859 has been open to foreigners. Tea, wax, isinglass, and camphor are exported, and rice, cotton, firearms, and woollen goods imported. Pop. about 80,000.

**Nagoya**, city of Japan, on the main island, at the head of the Owari Bay, is well built, has many public buildings, manufactures fans, lacquered goods, and porcelain, and has a considerable inland trade. Pop. 325,000.

**Nagpoor**, or **Nagpore**, town of Brit. India, cap. of the prov. of Berar or Nagpoor, 430 m. E. N. E. of Bombay, with which it is connected by railway. It is 7 m. in circumference and poorly built. Its manufactures of cotton cloths, coarse and fine chintzes, woollens, silks, and broads are important. Pop. 73,842.

**Nahant**, Essex co., Mass., consists of a peninsula extending into Mass. Bay and forming the E. side of the harbor of Lynn. It is connected with the mainland by a long, narrow isthmus. It is a favorite summer resort. Pop. 1870, 475; 1880, 808.

**Nahum**, one of the minor Heb. prophets, prophecies after Sennacherib's invasion (700 B. C.) and before the destruction of Nineveh (625 B. C.). His Heb. is of the most classical style.

**Naiads**, na'ya'dz [plu., Lat. *Naiades*; Gr. *Naiādes*], in the anc. Gr. mythology, the nymphs of fountains, lakes, and streams, youthful female beings possessed of the power of conferring prophetic gifts.

**Nain**, na'in, a v. of Pal., in Galilee, 6 m. S. E. of Nazareth, is mentioned in the N. T. as the place in which Christ raised the widow's son from the dead.

**Nairne** (CHARLES MURRAY), M. A., L. H. D., b. Apr. 15, 1808, at Perth, Scot., grad. M. A. at St. Andrew's Univ., and afterward at Edinburgh; came to New York 1847; was occupied as lecturer and teacher till chosen prof. of philo. and belles-lettres in Columbia Coll., N. Y., in 1857; was made emeritus prof. 1881. Author of *Lectures and Orations*. D. May 29, 1882.

**Naksha**-tra [Sans. *naksha*, "night" and *tra*, "protecting"], a term, originally meaning "star" was applied in Hindoo astron. to denote the asterisms lying in the moon's path, or mansions in which the moon was supposed to rest. These mansions numbered 27, and afterward 28, and were converted by mythologists into daughters of the patriarch Daksha, who became wives to the moon.

**Nal'a**, one of the most famous of the legendary heroes of India, was king of Nishadha, and married Damayanti, daughter of Bhima, King of Vidarbha. The loves and romantic adventures of N. and Damayanti form the subject of the most beautiful episode of the national epic.

**Nama**-quas, the prin. tribe of the Hottentot race, differ widely from the Bushmen, being tall and well-proportioned, but they have all the gen. characteristics of the race—the olive complexion, the oblique eyes, and the thin, tufted hair; their lang. is different from that of the other tribes. They inhabit the terr. around the Orange River, and live as nomads; rearing cattle is their prin. occupation, hunting and robbery their chief amusement.

**Namaycush**, or **Mackinaw Salmon** (*Salmo maynycush*), *Cristioner*, one of the largest of the fresh-water Salmonidæ. It is caught by the spear mostly, and inhabits the upper lakes of the St. Lawrence basin. Specimens are reported which have weighed 130 lbs., but they do not often exceed 50. The flesh is good, but not of the first quality.

**Namur**, town of Belg., cap. of the prov. of Namur, at the confluence of the Sambre and the Meuse. It is fortified, and has an elegant cathedral and many good educational insts., large breweries, and celebrated manufactures of cutlery and leather. Pop. 25,792.

**Nan'cy**, town of Fr., cap. of the dept. of Meurthe, on the left bank of the Meurthe. It is beautifully situated at the foot of a range of wooded and vine-clad hills, and is one of the finest built towns of Fr. It has a celebrated school of med. and pharmacy, and another of forestry, a lyceum, a library of 26,000 vols., several scientific societies, and many other excellent educational insts., and large museums and collections both for scientific and artistic purposes. Its manufactures of cloths, woollens, and candles enjoy a high reputation, and its embroideries in all kinds of stuffs are celebrated. Pop. 73,225.

**Nan'du**, **Rhe'a**, or **American Ostrich**, the *Rhea Americana*, a bird of the family Rheidæ, a native of Patagonia and the Argentine Republic. It is about 5 ft. high. It is polygamous, and the several females lay their eggs together, to be hatched by the male. It is a swift runner, but cannot fly. It swims readily. The flesh is very good, and the birds are hunted for their feathers, which are not used as ornamental plumes, but are extensively employed in the manufacture of feather dusters.

**Nanek**, nah'nek, founder of the important modern sect of the Sikhs of the Punjab, b. at Talwandi, near Lahore, in 1469; showed an early tendency to mysticism; associated with the fakirs; studied the religious books both of the Brahmans and of the Mohammedans; distributed his property to the poor; visited Mecca and Medina, and wandered through India in quest of a "vision of truth," which he ultimately attained, and thenceforth propagated a new religion. N. taught the unity of God, insisted upon faith in God and love to man, rejected monasticism, and instituted a very simple form of worship, which has since been considerably overlaid by the innovations of his successors. The object of N. was a reconciliation of Booddhism with Mohammedanism, and he embodied his doctrine in a book entitled *Adi Granth*, now the Bible of the Sikhs. D. 1539.

**Nankeen** [from the city of Nanking in Chi.], a cotton

cloth of a buff-yellow color, which is very enduring. It is made in Asia from a variety of cotton whose fibre is of this color. Artificially colored N. are made from ordinary cotton, and have nearly superseded the real article.

**Nanking**, or **Nankin** ("southern capital"), city of Chi., cap. of the prov. of Kiang-Su, generally called by the Chi. Kiang-Ning-Fu since the removal of the court to Peking (the "northern capital"), is situated on an affluent of the Yang-tse-Kiang, 3 m. from this river, and 200 m. from its mouth, in a marshy and swampy plain whose excessive moisture makes the place very unhealthy. By the removal of the cap. to Peking, N. lost its chief source of prosperity, and it began to decline. Nevertheless, its monuments, the imperial palace and tombs, the porcelain tower, etc., its libraries and other insts. of learning, its commerce and manufactures, especially of the so called nankeen, made it an important city. But on Mar. 19, 1853, it was taken by the Tai-Pings, who held it for 11 yrs. and made it the cap. of the rebellion; and when it was retaken by the imperialists July 19, 1864, its monuments had been destroyed in the mean time and its commerce and manufactures ruined; the famous porcelain tower had gone. It was built by the emp. Yungkoh (1413-32) in commemoration of his mother. It was octagonal, 322 ft. high, slightly tapering, and consisted of 9 stories, each provided with a gallery and a projecting roof, from whose corners bells were suspended. In the interior a spiral staircase led to the summit, formed by an elegant spire, on the top of which rested a ball of brass overlaid with gold. The imperial tombs are remarkable for the avenue of colossal sepulchral statues which leads to them, but the place is much disturbed. Of the palace only a few ruins are left. Pop. about 300,000.

**Nantes**, nants [anc. *Condivincum* or *Namnetes*], city of Fr., cap. of the dept. of Loire-Inférieure, stands on the right bank of the Loire, 34 m. from its mouth, at the influx of the Erdre and the Sèvre-Nantaise, and communicates with Brest by a canal. The quays, boulevards, and promenades along the Erdre are very elegant, and the whole modern portion of the city is regular and handsome. The most remarkable architectural monuments are the cathedral, built in the 15th century; the castle, commenced in 938; the bourse, a modern building, etc. The city has a lyceum, a school of navigation, different commercial and industrial schools, a public library, a botanical garden, a museum of antiquities, and an art-gallery. The prin. branch of the industry of N. is ship-building and the production of all kinds of objects necessary to the outfit of a vessel—anchors, cables, cordage, sail-cloth, biscuits, preserved meat, etc. Sugar-refining and the manufacture of linen and cotton fabrics, calicoes, flannels, musical, mathematical, and optical instruments, chemicals, leather, brandy, etc. are also extensively carried on. Pop. 124,319.

**Nanticoke**, Pa. See APPENDIX.

**Nantucket**, et, on R. R., cap. of Nantucket co., Mass., on Nantucket island, 28 m. from Cape Cod peninsula. It is connected by steamboats with New Bedford, Wood's Holl, and Martha's Vineyard, and is a summer resort. Pop. island, 1870, 4123; 1880, 3727.

**Napa City**, on R. R., cap. of Napa co., Cal., 40 m. from San Francisco. The State insane asylum is 1¼ m. from the city. Pop. 1870, 1879; 1880, 3731.

**Naperville**, Du Page co., Ill., on R. R. and the Du Page River, is the seat of N. W. Coll., under the direction of the Evangelical Association, founded in 1861. Pop. 1870, 1713; 1880, 2073.

**Naph'tali**, the sixth son of Jacob, by Bilhah, the handmaid of Rachel. The tribe of N. numbered 53,400 fighting-men before Sinai, and 45,400 at the entrance into the promised country. It was settled in N. Galilee from the foot of Anti-Lebanon to Lake Genesareth; Kedesh was its prin. town.

**Naphtha**, nap'tha [Gr. *νάφθα*], a name applied to a great variety of volatile, mobile, strong-smelling, inflammable liquids. Methyl alcohol is known as *wood N.* The following are the more important naphthas: (1) *Mineral* or *native N.*, petroleum (see PETROLEUM). (2) *Petroleum N.*, the more volatile portion of petroleum, either sold as crude N. or fractionated into gasoline, refined N., and benzine. (See PETROLEUM.) (3) *Shale N.*, obtained by the distillation of bituminous shales or schists. (4) *Boghead* or *Bathgate N.*, similar to shale N., distilled from boghead shale. (5) *Coal oil*, *photogene*, *kerosene*, etc., distilled from bituminous coals, as the Breckinridge coal of Ky., or from rich asphaltic minerals, as the albertite of N. S., the grahamite of W. Va., or the Hartley mineral of Australia. (6) *Coal-tar N.*, the more volatile portions of coal-tar, consisting chiefly of benzol, toluol, xylol, etc. (See TAR and GAS-LIGHTING.) (7) *Bone N.*, *bone oil*, *Dippel's oil*, obtained from the tar of bones and other animal substances. (See TAR.) (8) *Oil of wood-tar*, the more volatile portion of wood-tar. (See TAR.) (9) *Caoutchouc N.*, *caoutchoucine*. (See INDIA RUBBER.)

All these N., except methyl alcohol (*wood N.*) and caoutchoucine, consist of hydrocarbons, belonging chiefly to the marsh-gas series or the benzol series; the former when found in nature (*petroleum*) or produced at low red heats (*shale oil*, *coal oil*, etc.), the latter when formed at high temperatures, as coal-tar N. C. F. CHANDLER.

**Naphtha Gas**. See PETROLEUM.

**Naph'thalene**, a hydrocarbon found among the products of the destructive distillation of bituminous coal. (See GAS-LIGHTING and HYDROCARBONS.) It occurs in Ran-goon petroleum and the tar of shale oil. According to Berthelot, it may be formed synthetically by substituting acetylene for hydrogen in benzol. It is formed by passing the vapors of several other hydrocarbons through a red-hot tube, as toluene, xylene, cumene, or mixtures of ethylene with benzol, cinnamene, anthracene, or chrysene. Alcohol and ether vapor, and even ethylene and vapors of acetic acid, petroleum, essential oils, etc., yield some N. when passed through red-hot tubes. Soot and lampblack contain



N. Sulphide of carbon vapor mixed with sulphuretted hydrogen, or both mixed with carbonic anhydride, yield N. when passed over spongy iron or copper at a dull red heat. Protochloride of carbon, when passed through a red-hot tube with hydrogen, yields N.

**Preparation.**—Crude "dead oil," the heavy oil of coal-tar, deposits large quantities of impure N., which constitutes the material from which N. is prepared by a simple process of purification by sublimation.

**Properties.**—N. appears in brilliant white, scaly crystals, strongly and unpleasantly odorous. The disagreeable odor is said to be due to leucoline oil. Specific gravity, 1.153. It melts at 174.5° F., and boils at 424.5° F. It sublimes at low temperatures and evaporates in the air. It is insoluble in cold, and almost insoluble in boiling water, but dissolves readily in alcohol, ether, fatty and essential oils, and most oils (naphthas) obtained by destructive distillation, in acetic and oxalic acids. It is one of the most stable of the more complex hydrocarbons, and withstands very high temperatures without decomposition, provided oxygen be absent. It dissolves in warm sulphuric acid, forming 2 crystallizable acids—sulpho-naphthalic or naphthalene-sulphonic acid, and disulpho-naphthalic or naphthalene-disulphonic acid. N. unites directly with 4 atoms of chlorine and bromine. Chlorine also produces substitution products, replacing from 1 to 8 atoms of hydrogen; bromine replaces from 1 to 4 atoms. Derivatives containing both chlorine and bromine are known. Nitric acid produces 3 substitution products, replacing 1, 2, or 3 atoms of hydrogen with a corresponding quantity of nitryl. The first nitro-naphthalene is converted by reducing agents into naphthylamine, which bears the same relation to N. that aniline does to benzol. By an indirect process H<sub>2</sub> in N. may be replaced by O<sub>2</sub>, producing naphthaquinone, which bears the same relation to N. that quinone bears to benzol and anthraquinone to anthracene.

**Naphthalene Colors.**—Many of the derivatives of N. exhibit beautiful and intense colors, but a few only have been found available as dyes. (1) Martius yellow, Manchester yellow, *jaune d'or*, is the ammonium calcium or sodium salt of dinitro-naphthyllic acid. (2) Victoria yellow or dinitro-naphthol is isomeric with binitro-naphthyllic acid, and is also a beautiful yellow dye which requires no mordant for either silk or wool. (3) Magdala red, N. red, naphthylamine red, roseo-naphthalene, is generated from 3 molecules of naphthylamine by the elimination of 3 molecules of hydrogen. (4) Naphthylamine violets and blues are produced by the same reactions employed in converting aniline red into violets and blues. (5) Azo-colors in great variety are now prepared from the derivatives of N. *Rocelline* or *fast red* is the azo-compound of naphthionic acid and beta naphthol; *orange A* or *No. 2* is the azo-compound of sulphilic acid and beta-naphthol.

**Benzoic Acid, from Naphthalene.**—By converting the phthalic acid obtained from N. into a calcium salt and heating with slaked lime, it is converted into benzoate of calcium, from which the acid is easily separated. The preparation of benzoic and chloro-naphthalic acid by these processes is largely carried on in Fr. C. F. CHANDLER.

**Naphthylamine.** See NAPHTHALENE.

**Napier** (Admiral Sir CHARLES JOHN), K. C. B., b. at Merchiston Castle, Stirlingshire, Scot., Mar. 6, 1786; entered the navy at 13; distinguished in naval engagements with Fr. vessels and at the capture of Martinique, 1809; served as a volunteer in the Brit. army in Port.; became commander of the Thames (32 guns) in 1811, and inflicted great damage upon the Fr. in the Mediterranean; was engaged in the Brit. naval operations in the Potomac and against Baltimore in 1814; was placed on naval duty on the coast of Port. in 1829; inflicted upon the fleet of Dom Miguel a decisive defeat off Cape St. Vincent July 5. In 1839 he resumed service in the Brit. navy; in 1840 he stormed Sidon with a land-force, captured Acre, blockaded Alexandria, and concluded a convention with Mehemet Ali. He sat in Parl. 1841-47; was appointed rear-admiral of the blue, and given command of the Channel fleet in 1847; made vice-admiral May 1853; commander of the Baltic fleet in the war with Rus. 1854, and captured Bomarsund; was made admiral of the blue 1858, and sat in Parl. for Southwark from 1855 till his death, Nov. 6, 1860. Wrote *An Account of the War in Port. and The War in Syria*, and furnished materials for a *Hist. of the Baltic Campaign*.

**Napier** (JOHN), a Scotch math., b. near Edinburgh in 1550. In 1614 he pub. his great discovery of logarithms, in a work entitled *Meriti Logarithmorum Canonis Descriptio*, which, according to Kepler, he had indicated as early as 1594, in a letter to Tycho Brahe. D. Apr. 4, 1617.

**Napier** (Lieut.-Gen. Sir WILLIAM FRANCIS PATRICK), K. C. B., b. at Castle-town, Kildare, Ire., Dec. 17, 1785. He entered the army in 1800; became capt. 1804; served at the siege of Copenhagen 1807; accompanied Sir John Moore to Port. 1808; was wounded at Almeida 1810, and at Casal Nova 1811; was engaged in the battles of Busaco 1810, Fuentes de Onoro 1811, Salamanca 1812, Bidassoa 1813, and Orthes 1814; became major 1811, lieutenant-col. 1813, and wrote a *Hist. of the War in the Peninsula and in the S. of Fr. from 1807 to 1814*. N. was made col. in 1830, maj.-gen. 1841, lieutenant-gov. of Guernsey 1842, knighted 1848, and made lieutenant-gen. 1851. He illustrated his brother's exploits in the E., publishing *The Conquest of Scinde, Administration of Scinde, and The Life of Sir Charles Napier*. D. Feb. 12, 1860.

**Napierian Logarithms.** See LOGARITHMS.

**Napier of Magdala** (ROBERT CORNELIUS NAPIER), BARON, b. in Ceylon in 1810, was ed. at the Military Coll. at Addiscombe, and entered the Royal Engineers as second lieutenant in 1826; served throughout the Sutlej campaign of 1845-46 in the battles of Moodkee, Perozhah (severely wounded), and Soobraon; served in the Punjab campaign of 1848-49, was chief engineer during the siege of Mooltan 1849, at the battle of Goojerat and pursuit of the Sikh army; actively engaged throughout the Indian mutiny campaigns;

distinguished in the actions leading to the first relief of Lucknow and subsequent operations; brigadier and chief engineer at the siege and capture of Lucknow; commanded a brigade at the capture of Gwalior, reducing the fort of Powrie Aug. 1858; distinguished throughout the campaign resulting in the surrender of Peking; commanded the Abyssinian expedition resulting in the capture of Magdala and release of the Brit. prisoners. Was gov. and commander-in-chief of India 1870-76, when transferred to Gibraltar as gov. Became gen. in 1874.

**Napier's Bones (or Rods)**, a set of tablets of bone, horn, ivory, or other material, invented by the math. Napier for facilitating multiplication and division. They are of no practical use, and are only interesting as a mathematical curiosity.

**Naples**, na'pelz [It. *Napoli*; Gr. *Neapolis*], the largest and most magnificently situated town of It., lying on the bay of the same name. From the curving line of the bay the city ascends from the Castello dell' Ovo to the top of the Capodimonte, a distance of more than 3 m., and then sweeps round the summits of the semicircular hills down to the extreme points of the bay, thus forming a crescent. Extensive as the bay is, the harbor is very limited, and large vessels find safer anchorage near Baia. The city is dominated on the W. by the castle of St. Elmo, which crowns the hill of S. termio; on the seaside are the fortresses of Castello Nuovo, the Castello dell' Ovo, which was probably built by the Norman William I. (1150), and many batteries. There is regular steam-communication by water between N. and all the prin. Mediterranean ports, and railways connect it with Central and N. It. The city is divided into the Old, or E., and the New, or W., towns by the ridge extending from the palace of Capodimonte to the sea, thus forming a kind of double crescent. The modern streets are broad and well paved, while the older thoroughfares are, the Toledo excepted, extremely narrow. The prin. streets of N. are the Via Roma, the Chiaja, or Riviera di Chiaja, which is the fashionable promenade of the city; the Vittorio Emmanuele, the Corso Garibaldi, the Molo, etc. The lower part of the Toledo formerly offered to the visitor the most animated pictures of Neapolitan habits, where the whole domestic life of the poorer classes might be studied in the open air. The public squares, called *larghi*, are irregular, and not generally attractive. The chs. are numerous (over 300), some very quaint and curious in their construction, with domes glittering with gilded and colored tiles, which give them a semi-Oriental aspect, but as a whole they have more archaeological interest than architectural merit. The convents, including those recently suppressed, number more than 100, exclusive of those in the suburbs, and among these the monastery of Certosa of San Martino, near the castle of St. Elmo, is the most conspicuous. Of the 14 theatres, San Carlo is the largest and most elegant, and, next to the Scala of Milan, ranks as the first in Europe. The National Museum is one of the most interesting in the world. N. is well provided with the higher insts. of learning, and has always been distinguished for the number and extent of its charitable organizations; but the poverty and beggary for which it has been no less remarkable are a proof of bad management in these latter insts. Among the many objects of interest in the immediate vicinity of N. is the grotto of Posilipo, a gallery cut through the rocky promontory of Posilipo, about 1850 ft. long, 17 or 18 in width, and at the extremities above 50 ft. in height. Just over the E. entrance is the reputed tomb of Virgil.

The foundation of N. is pre-historic. The still older town, *Parthenope* or *Palæopolis*, was named from the siren Parthenope, here vanquished by Ulysses. Both towns were Gr. colonies, and Gr. continued to be spoken until the 2d century of the Chr. era. The anc. city first appears in hist. as an ally of Rome against the Samnites. It continued faithful to the Romans in their wars with Hannibal. After suffering much from the barbarians, it was besieged (537) by Belisarius, who, entering the town through an aqueduct, gave it up to his soldiers. Totila, who took it afterward, treated it more humanely. Later it became the cap. of a dukedom, always partially dependent upon Sic. The duchy of N. had fierce conflicts with that of Benevento, sustained itself against the Saracens, and finally employed them as allies in spite of papal excommunication. In 1087 the city fell into the hands of the Normans under Ruggiero. The Suabian dynasty followed in 1194, and in 1250 N. rebelled unsuccessfully against Conrad, the son of Frederic, but in 1268, at the instigation of the pope, Conradine, the last of his house, was taken prisoner and beheaded by Charles of Anjou, on whom the pope had bestowed the kingdom of N. The weakness of Joanna I., the assassination of her husband, etc., brought upon N. the vengeance of Louis of Hungary, who, entering it preceded by a black flag, treated it with terrible severity. In 1442 Alfonso of Aragon besieged the city and entered it through an aqueduct. In 1495 N. opened her gates to Charles VIII. of Fr., who was soon forced to share his prize with Sp. Francis I. vainly endeavored to recover it from his rival, Charles V. In the siege of 1538 both besieged and besiegers suffered cruelly from plague and famine. Under the govt. of the Sp. viceroys N. presented a scene of disorder. Strong efforts were made to introduce the Reformed religion, and a popular tumult in 1547 forced Charles V. to annul the order for the establishment of the Inquisition. But cruel religious persecution finally brought about (1647) the insurrection of Masaniello. Not long after a terrible plague appeared, during which 30,000 persons perished in 6 months. In 1701 the nobility attempted to overthrow the existing govt. and place an archduke of Aus. at its head. When Charles III. entered the city (1734) he is said to have found 16,500 priests and 30,000 thieves. During the wars of the Fr. Revolution N. was several times taken, lost, and retaken by the Fr. In 1815 the Bourbons were once more restored; the citizens endeavored to obtain reforms, and the govt. promised them, but they never came. Remonstrance



was followed by repression, resistance by fair promises and foul treachery, until 1860, when, on Sept. 7, Garibaldi entered the city, and the people being called upon to decide their own destiny, voted for the annexation of N. to the constitutional kingdom of Victor Emmanuel II. Since then marked changes for the better have taken place; extensive machine-factories (the result of Eng. enterprise) are in operation; native industries are multiplying; common schools have been established; and, though in the neighborhood of the Porto may still be seen too much of that mad gayety clothed in filthy rags which has made N. notorious, yet on the whole there is an aspect of greater decency and greater comfort. Pop. 498,115.

**Naples, N. Y.** See APPENDIX.

**Naples, Bay or Gulf of,** a portion of the Mediterranean on the S. W. coast of It., running inland about 10 m. between Cape Miseno and Cape Campanella, 20 m. distant from each other. It is noted for its beauty.

**Naples, Kingdom of,** one of the old political divisions of It. (See ITALY, also SICILY.)

**Napoleon, on, R. and Maumee River,** cap. of Henry co., O., 35 m. S. W. of Toledo. Pop. 1870, 2018; 1880, 3032.

**Napoleon I., b. at Ajaccio,** in the island of Corsica, Aug. 15, 1769, was the second son of Carlo Bonaparte and Letizia Ramolino; he had 3 sisters and 4 brothers. He obtained a free place at the military school of Brienne in 1780, and here, as in Paris, whither he was removed in 1784, he attracted attention by his talent for math., by the clearness and power of his perceptions in gen., and by the impetuosity of his temper. In 1785 he was made a sub.-lieut. of artill., in 1793 a capt., and was sent the same yr. as lieutenant to the besieging army before Toulon. On Dec. 19 the Eng. and Sp., who occupied the city, were compelled to abandon it, and N. was made a brig.-gen. Feb. 6, 1794, and sent by the Convention to the army in It. But, implicated in the fall of Robespierre (July 28), he was called to Paris, and the active command was taken from him. A period of misery followed. He thought of going to Asia. But the Directory knew about him, and when it saw itself beleaguered in the Louvre by the Parisian mob it sent for him. On Oct. 4, 1795, he received the command of the garrison of Paris, and the next day he ended the Fr. Revolution. On Mar. 9, 1796, N. married Josephine Beauharnais. Her household was arranged in great style, and her receptions gathered all the celebrities of the day. N. was appointed commander-in-chief of the army in It. On Mar. 21 he left Paris, and now followed, till Apr. 18, 1797, the most brilliant campaign the world ever saw. The Fr. army sat perched somewhere on the rocks of the Maritime Alps, watched by the allied Aus. and Sard. armies. N. descended from the Alps, defeated the Aus. at Montenotte and Millesimo (Apr. 11 and 15), beat the Sardis. at Ceva and Mondovì (Apr. 30 and 22), defeated the Aus. at Lodi (May 10), and conquered Lombardy in a few weeks. At the end of July a new Aus. army under Wurmser appeared in the field. It was beaten at Lonato and Castiglione (Aug. 3 and 4), at Roveredo and Bassano (Sept. 4 and 8). A third and a fourth Aus. army were defeated at Arcole (Nov. 17) and Rivoli (Jan. 14), and N. broke into Styria, approaching Vienna, and by the Peace of Campo Formio (Oct. 17) Aus. ceded the Netherlands and Lombardy. On Dec. 5 he returned to Paris, and was received with boundless enthusiasm. He proposed an invasion of Egypt, with a further design of conquering the Eng. possessions in India. On May 18, 1798, he set sail from the harbor of Toulon, and on July 2 he landed at Alexandria. After the battle at the Pyramids (July 21) he entered Cairo and conquered Egypt. But when in the spring of 1799 he pushed forward into Syria, he was stopped at St. Jean d'Acre and returned to Cairo. In Egypt, however, he could not remain; all communication with Fr. had been cut off by the Eng. fleet since Aug. 1, 1798, and his situation was difficult and barren. In the fall of 1799 he secretly left Egypt and appeared unexpectedly (Oct. 14) in Paris. The Directory labored at this time under internal dissensions between its members. N. allied himself with the party of Sleyes, and on Nov. 9, 1799, the govt. of the Directory was overthrown. On Dec. 27 a new const. was promulgated. N. became first consul, with the whole administration, civil and military, in his hands, and with the power of appointing all public officers and proposing all public measures. He was from this moment the ruler of Fr.

The first period of N.'s govt. was marked with order, wisdom, and sagacity. The concordat with the pope was concluded and the Ch. re-established; the lists of emigration were closed, and about  $\frac{1}{10}$  of the emigrants returned; the Bank of Fr. was founded, and the finances brought into order; the *Code Napoleon* was produced, and a truly popular scheme of education was started. Peace was concluded with Aus. at Lunéville Feb. 9, 1801, and with Eng. at Amiens Mar. 25, 1802. Fr. was increasing without and recovering within, and on Dec. 2, 1804, N. crowned himself emp. of the Fr. in the ch. of Notre Dame. In 1805 the war recommenced. A coalition was formed between Eng., Rus., Swe., and Aus., and the reduction of Fr. to her boundaries of 1792 was fixed as the purpose of the coalition. But N. literally overwhelmed his enemies before any of them could strike a blow. Aus. had to sue for peace, and bought it at Presburg (Dec. 26, 1805) by ceding all her It. possessions and Tyrol. N. now endeavored to secure his position as master of Central and S. Europe by establishing one of his brothers, Joseph, as king of Naples; another, Louis, as king of Hol.; his stepson, Eugene, as viceroy of It.; and his brother-in-law, Joachim Murat, as grand duke of Berg; and this brought him into collision with Prus. On Sept. 25, 1806, he left Paris; on Oct. 14 he defeated the Prus. army at Jena; on Oct. 27 he entered Berlin; and the Rus., who hastened to the support of Prus., were defeated at Eylau (Feb. 8, 1807) and at Friedland (June 14). On July 9 the Peace of Tilsit was concluded, the kingdom of Westphalia was erected for Jerome Bonaparte, the dukedom of Warsaw

for the king of Sax., and the whole N. part of Ger. was to remain occupied by Fr. troops. On May 8, 1808, the Sp. king was compelled to abdicate. Joseph was made king of Sp., Murat of Naples. Meanwhile Aus. again began war against Fr. But N. defeated the Aus. at Thann, Landshut, Eckmühl, and Regensburg (Apr. 19-23), pursued them farther along the Danube, and entered Vienna May 13. On July 6 he nearly routed the Aus. army at Wagram, and peace was concluded at Vienna Oct. 14, 1809, Aus. again ceding large parts of its terr., this time its Polish possessions. On his return to Paris N. was divorced from Josephine (Dec. 16, 1809). On Apr. 2, 1810, he married the Aus. archduchess Maria Louisa, daughter of the emp. Francis, and on Mar. 20, 1811, she bore him a son, the king of Rome.

This moment is generally considered as the culmination of the career of N., but in reality he was already far down the descent. He had promised a hero—he turned out a business-man. He became false, he told lies, and his falsity again affected his friends. Some of them became traitors; his brothers left him. But the worst was that he had made a mistake. He had no other means of carrying on war against Eng. than starvation, and no other means of starving her than to exclude her from the Continent. This plan was consequently adopted, but, unfortunately, the measure worked both ways; in starving Eng. the Continent was starved. The emp. Alexander of Rus. at last refused to carry through the system. N. then gathered on the Rus. frontier the largest army Europe had ever seen, and on June 24, 1812, he crossed the Niemen. On Sept. 15 he entered Moscow, but between the 15th and the 30th  $\frac{3}{4}$  of Moscow was burned to the ground, and he began the retreat (Oct. 19). Leaving the command to Murat, he hastened to Paris, where he arrived Dec. 18. But the Rus. disaster had broken the spell. His enemies, Rus., Prus., Aus., Ger., gathered around him, and the battle of Leipsic was lost (Oct. 19). He retreated, and the allied armies followed him into Fr.; on Mar. 30 they captured Paris, and on Apr. 4 N. abdicated at Fontainebleau. The island of Elba was erected into a sovereignty and given him for a residence. But he stayed here only from May 3, 1814, to Feb. 26, 1815. Secretly he left the island, and landed (Mar. 1) at Frejus. All Fr. rushed to meet him. The assembled sovereigns at Vienna began to tremble. After the first effervescence, however, it became evident to him that he had nothing to lean on. On June 18 he lost the battle of Waterloo; he went on board the Eng. man-of-war Bellerophon and surrendered himself to his life-long foe. The Eng. carried him to St. Helena, and here he d. May 5, 1821.

CLEMENS PETERSEN.

**Napoleon II.** (FRANCIS JOSEPH CHARLES), the only child of Nap. I. by Maria Louisa of Aus., b. in the Tuileries Mar. 20, 1811, and baptized June 9 as king of Rome. After the defeat at Waterloo Nap. I. abdicated in favor of his son, and proclaimed him emp. of the Fr. (June 22, 1815) under the title of Napoleon II., but the allied powers paid no regard to this arrangement. While, in the spring of 1816, Maria Louisa went to Parma, which was given her as a sovereignty, the child was brought to Vienna to be ed. under the immediate tutelage of his grandfather, the emp. Francis. He was entered in the Aus. almanac of state without the name of Napoleon, and his official title was duke of Reichstadt. He was instructed in military science, and in 1830 was made major of a battalion. In Apr. 1832 he was seized with consumption, and the progress of the disease was so rapid that his mother had hardly time to reach Vienna before his death. D. June 22, 1832.

**Napoleon III.** (CHARLES LOUIS), the youngest son of Louis Bonaparte, king of Hol., and Hortense Beauharnais, the stepdaughter of Nap. I., b. at Paris Apr. 30, 1808. After the death of his elder brother in 1831, and of the duke of Reichstadt in 1832, he became the bearer of the idée Napoléonienne and the heir of its destiny. A sort of conspiracy in Strasbourg proclaimed him emp. Oct. 30, 1836, but only for 2 hours. He was brought to Paris, but the govt. found it too ridiculous to prosecute him; he was sent to Amer. On Aug. 6, 1840, he landed at Boulogne with 50 men and conquered the toll-gates. This time, however, he was sentenced to imprisonment for life, and he remained in the citadel of Ham till May 25, 1846, when he succeeded in making his escape. The revolution in Paris of Feb. 1848 brought at once the name of Napoleon into the foreground. On Sept. 25 he took his seat as a member of the National Assembly, and on Dec. 20 was elected pres. of the Fr. republic by a majority of 6,048,572. The relations, however, between him and the Assembly continued disagreeable, but he dissolved the Assembly (Dec. 2, 1851) and appealed directly to the people, putting down with merciless severity all opposition. But his measures were sanctioned by an overwhelming majority, and on Jan. 14, 1852, a new const. was promulgated—an imitation of the const. of 1799—by which he actually became the ruler of Fr. The transition from this form of govt. to the imperial monarchy was easy, and took place Dec. 2, 1852, without any disturbances. On Jan. 30, 1853, he married Eugénie de Montijo, and Mar. 16, 1856, she bore him the Prince Imperial, who d. June 1, 1879.

The position he occupied in Europe was at one time brilliant. The Crimean war (1854-56), which was only a half success, immensely expensive, and small in its results, brought him into intimate intercourse with the other sovereigns. The It. war (1859), although likewise only a half magnificence, made him immensely popular. The Mex. war (1862-63) was showy enough, as far as it gave him a crown to dispose of, but from this time people began to entertain certain doubts. When, after the battle of Sadowa, the Aus. emp. telegraphed and ceded Venetia to him, Europe laughed and felt the trick, and when in 1870 he declared war against Ger., many expected his fall, though none so piteous an exit. D. at Chislehurst, Eng., Jan. 9, 1873.

**Naraka**, the gen. term used by the Brahmans of India for hell, in which they enumerate 21 or 28 separate divisions, beside an indefinite number of others.



**Narbonne'**, town of Fr., dept. of Aude, 8 m. from the Mediterranean, is an old town, known to the Grs. 500 B. C. In 118 B. C. it was colonized by the Romans, and in the times of the emps. it became a magnificent city, the cap. of Gallia Narbonensis, adorned with temples, triumphal arches, and amphitheatres, and famous for the purity and salubrity of its air. In 719 the Saracens burned it, in 859 the Northmen plundered it, yet in the 12th and 13th centuries it was a city with extensive commercial connections. The city sank suddenly. All its splendor has now shrunk into a collection of antiquities. Its only celebrity at the present time is its honey. Pop. 28,134.

**Narcissus**, a genus of bulbous plants of the order Amyridaceae, natives of the Old World. The genus includes the garden and green-house plants called jonquil, narcissus, daffodil, and polyanthus.

**Narcissus**, in Gr. mythology, a son of the river-god Cephissus and the nymph Liriope; was celebrated for his beauty, but was punished by Nemesis for his vanity by falling in love with himself on seeing his image in a fountain. Pining away with this love-sickness, his body was metamorphosed into the flower which bears his name.

**Narcotics** [Gr. *νάρκη*, "numbness"], a term used in med. to refer generically to such drugs as have the power of stupefying the cerebral faculties, or inducing sleep, or deadening ordinary sensibility. No exact division of narcotics can be made, but such drugs as opium, belladonna, stramonium, henbane, Indian hemp, chloral, and the ethers are those to which the term is commonly applied.

**Nar-do**, town of S. It., prov. of Lecce, about 4 m. from the Gulf of Taranto and 12 from Gallipoli, is a very ancient city, mentioned both by Ptolemy and Pliny, and its entrenched walls with their 24 towers, as well as the old castle, still recall the feudal age. The inhabs. are mostly engaged in agricultural and pastoral pursuits. Pop. 10,220.

**Narragan'sett Bay** reaches N. 28 m. from the Atlantic into the State of R. I. It is deep and well sheltered, containing the islands of Aquidneck (or R. I. proper), Conanicut, Prudence, and other smaller ones. Its climate is mild as compared with the rest of N. Eng. It has valuable fisheries, and receives the estuaries of the Providence and Taunton rivers.

**Nar'ses**, b. in the latter part of the 5th century, was a eunuch in the palace of the Byzantine emps. His talents attracted the attention of Justinian, who made him keeper of the privy purse and a member of the council. In 538 he went to it as commander of a force, but he was recalled in 539. After the death of Belisarius he was made commander-in-chief in it. In 552, and his success as a gen. was brilliant. At Sentaglio he defeated the Gothic king Totila, who was killed in the battle. He then conquered Rome, defeated Teias, Totila's successor, on the banks of the Sarna, and completely crushed the power of the Goths in It. Justinian made him gov. of It. with the title of exarch. He fixed his residence at Ravenna. After the death of Justinian and the accession of Justinus II. he was deprived of his office in 565, and d. in retirement at Rome in 568.

**Nar'va**, town of Rus., gov't. of St. Petersburg, on the Narova. Dec. 30, 1700, Charles XII., with 8000 Swedes, here defeated Peter the Great, with 80,000 Rus. Pop. 6482.

**Narvaez**, nar-vah'eth, **de** (PANFILO), b. at Valladolid, Sp., about 1480; went to the W. I. soon after their discovery by Columbus; took an active part in the conquest of Santo Domingo, Jamaica, and Cuba; was sent in 1520 by Velasquez in command of an expedition to Mex., with orders to imprison Cortes, but was taken prisoner by the latter at Zempoalla, losing an eye in the engagement. In 1528 he was given command of an expedition of 400 men with which to found a colony in Fla.; discovered Tampa Bay; landed Apr. 16, 1528, and while coasting in boats along the N. shore of the Gulf of Mex. perished in a storm near the mouths of the Miss, Sept. 1528.

**Narvaez** (RAMON MARIA), duke of Valencia, b. at Loja, Sp., Aug. 4, 1800; entered the army in youth, and in the first Carlist war attained the position of capt.-gen. of Old Castile. He took part in an attempted revolution against Espartero in 1839, and had to take refuge in Fr., where he plotted with the ex-queen, Maria Christina, in whose interest he placed himself at the head of an expedition with which he penetrated to Madrid in 1843 and overthrew the gov't. of Espartero. In the following year he became prime minister; was created field-marshal, count of Cañadas Altas, and duke of Valencia, and effected the formation of a new const. (1845), suppressing with rigor all opponents. In 1846 he quarrelled with the ex-queen, resigned his post, and went as ambassador to Fr.; resumed power in 1847, but soon lost it again for the same reason as before. In 1849 he was again at the head of the gov't. during the diplomatic quarrel with Eng. In 1851 he went as ambassador to Vienna; became again prime minister in 1856; repressed several revolutionary outbreaks and took stringent measures against the press; was overthrown Nov. 1857; was again prime minister from Sept. 1864 to June 1865, and from July 1866 until his death, at Madrid Apr. 23, 1868.

**Nar'whal** [Icelandic *nákvæll*], or **Sea-Unicorn** (*Monodon monoceros*, Linn.), belonging to the family of the Delphinidae, or dolphins, is most nearly related to the white whale (*Delphinapterus catodon*), and forms with it the sub-family Delphinapterinae. In both sexes the lower jaw is edentulous; in the male the upper jaw is provided, on the left side, with a fully developed tusk, which attains to a length of from 8 to 10 ft. This tusk is straight, spirally grooved externally, and hollowed within into a persistent pulp-cavity. On the right side the corresponding tooth generally remains hidden, smooth and solid, within the jaw. In addition to these, there are 2 small rudimentary molars concealed in the upper jaw. The female, although as a rule without apparent teeth, has the incipient tusks concealed in the jaw; one of these is, however, said to be sometimes developed as in the male; and in the latter also both are sometimes symmetri-

cally produced. The N. in form of body resembles the porpoises; its mouth is small, and its single blow-hole is situated on the top of the head. Its flippers or "fins" are small, and it has no dorsal fin. It attains to a length of 15 ft., exclusive of the tusk, and in color is marbled with brown and whitish. The single species inhabits the Arctic seas.

**Nase'by**, a v. of Eng., co. of Northampton, famous for the battle (June 14, 1645) in which Cromwell defeated Charles I.

**Nash** (ABNER), b. in Prince Edward co., Va., about 1780; removed to Newbern, N. C., where he became a lawyer; was a member of the provincial cong. of 1774 and 1776, of the council 1775, and of the house of commons 1777-78; was speaker of the senate 1779, gov. 1780-81, and delegate to Continental Cong. 1782-84 and 1785-86. D. Dec. 2, 1786.

**Nash** (Gen. FRANCIS), brother of the preceding, b. in Va.; settled in Orange co., N. C., where previous to the Revolution he was clerk of the superior court of the co.; served as capt. of the royal militia in suppressing the "Regulators" at the battle of the Alamance 1771; was a member of the provincial cong. of 1775, by which he was appointed lieutenant; was made brig.-gen. by the Continental Cong. Feb. 1777; commanded a brigade at Brandywine and Germantown; was mortally wounded at the latter battle, and d. Oct. 17, 1777.

**Nash** (FREDERICK), son of Abner, b. at Newbern, N. C., Feb. 9, 1781, grad. at Princeton in 1799; became a lawyer; served frequently in the State legislature; was judge of the superior court 1818-26 and 1836-44, and of the supreme court from 1844 until his death, Dec. 4, 1858.

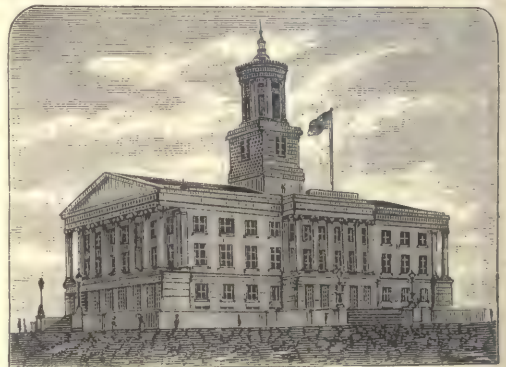
**Nash** (WILLIAM), D. D., b. in Stuttgart, Ger., in 1807, ed. at the Univ. of Tübingen. While young became a M. E. minister in the Western U. S., and founded Amer.-Ger. Methodism. Since 1859 has edited the Ger. publications of the M. E. Ch.; is author of a Ger. commentary, *Christological Meditations*, etc.

**Nash'ua**, on R. R., Chickasaw co., Ia., has valuable water-power. Pop. 1870, 817; 1880, 1116.

**Nashua**, city and R. R. centre, one of the caps. of Hillsborough co., N. H., on W. bank of Merrimack River, 35 m. S. of Concord and 40 N. W. of Boston, was incorporated as a city in 1853, and ranks second in point of manufactures in the State. Pop. 1870, 10,543; 1880, 13,397.

**Nash'ville**, city, on R. R., cap. of Washington co., Ill. Pop. 1870, 1640; 1880, 2232.

**Nashville**, city, cap. of Tenn. and of Davidson co., an important R. R. centre, on S. bank of the Cumberland River, 200 m. above its mouth, here spanned by a railway bridge and a suspension bridge. The river is navigable below N. for 9 months in the yr., and to Carthage, several hundred m. above, for some time. The city rests on a rocky foundation, the river-bluffs rising 80 ft. above low-



State Capitol (Nashville, Tenn.).

water mark. On Capitol Hill, overlooking the city, is the State capitol, built of Tenn. granite. It is the seat of Vanderbilt, Fisk, and Nashville univs. and of the Montgomery Bell Acad.; has 2 sems., a med. coll., and hospital. N. is the chief commercial centre and wholesale market S. of the Ohio River. Two celebrated mineral springs (sulphur and chalybeate) are located within the corporate limits. Pop. 1870, 25,865; 1880, 43,350.

**Nashville, Battle of.** After the battle of Franklin, which was not ended until 10 p. m. of Nov. 30, 1864, Gen. Schofield withdrew, and by noon of Dec. 1 occupied the heights surrounding Nashville. Hood's advance appeared by noon of the 2d, and by the morning of the 4th he had established his lines in front. By this time reinforcements had arrived, which raised the effective force of Thomas to nearly that of Hood, leaving the latter, however, still superior in cav. Thomas would have been ready to commence an offensive movement at an earlier day but for a storm of sleet on the night of Dec. 8, by which the armies were ice-bound until the 14th, when, the weather moderating, a plan of attack for the next morning was agreed upon. A dense fog prevailed in the morning (15th), but soon lifted sufficiently to permit the movement of the troops, and the original plan of operations, with but slight change, was carried out, resulting in driving the army of Hood out of its original line of works and the capture of 16 pieces of artl. and 1200 prisoners. The battle was resumed by Thomas on the morning of the 16th, and continued until the Confed. lines were broken and the shattered army was in full retreat. During the 2 days' operations 4462 prisoners were taken, 63 pieces of artl., and many small arms. The pursuit was continued next day, and until the 27th, when the remnant of Hood's army succeeded in crossing the Tenn. The results of



this campaign, extending from Sept. 7, 1864, to Jan. 20, 1865, were 13,189 Confed. prisoners, 72 pieces of artill., and 2000 deserters. The estimated loss of Thomas was 10,000 in all. Hood escaped with a mere wreck of his army, and at his own request was relieved from command Jan. 23, 1865.

**Nashville, University of**, dates its origin more than 10 yrs. anterior to the birth of the State of Tenn. In 1785 it was founded and endowed under the name of the Davidson Acad. The univ. underwent many vicissitudes, but had attained a high position, especially in the med. dept., when a few yrs. ago the chancellor, Gen. E. Kirby Smith, and faculty resigned, and the buildings of the literary dept., with the funds, increased by a Peabody donation, are devoted to normal instruction.

**Nas'sau**, formerly an independent duchy of Ger., but since 1866 forming part of the Prus. prov. of Hesse-Nassau, comprises an area of 1800 sq. m., with 468,311 inhabs. The country, extending along the Rhine, the Main, and the Lahn, and traversed S. by the Taunus and N. by the Westerwald, is beautiful and rich. The mts. are covered with extensive forests abounding in game, and contain iron, lead, copper, coal, marble, and building-stone. The valleys produce wheat, tobacco, flax, fruit of superior quality, and the choicest Rhenish wines. Its mineral springs, such as Wiesbaden, Ems, and Selters, are as celebrated as its wines.

**Nassau**, town of New Providence, and cap. of Bahama Islands, has a good harbor, is fortified, well built, and celebrated for its salubrious climate. Pop. about 9000.

**Nasser-ed-din**, shah of Per., b. in 1829, son of the late monarch, Mehemet Shah, by Queen Veillat of the Kadjjar tribe, and grandson of Abbas Mirza; succeeded to the throne Sept. 10, 1848; suppressed several revolts of the nomadic tribes; maintained neutrality during the Crimean war, at the close of which he signed a treaty with Rus.; waged a nominal war against Eng. in 1856, which was terminated by the Treaty of Paris 1857; supported the passage of the Anglo-Indian telegraph through his dominions 1866; visited prin. countries of Europe 1873 and 1878.

**Nast** (Thomas), b. at Landau, Bavarian Palatinate, Sept. 27, 1840; came with his father to the U. S. in 1846; received only 6 months' art-instruction; began when 15 yrs. old to furnish illustrations for papers; was in Europe 1860-61, and during the war began his long series of effective political caricatures, most of which appeared in *Harper's Weekly*, and they are still continued.

**Nasturtium** (Lat. "nose-twist," from its pungent quality), a genus of cruciferous herbs, mostly aquatic, containing many species, among which are water-cress and horse-radish. Popularly, the names nasturtium and nasturtion (often abridged to 'sturtion) are given to *Tropaeolum majus*, a showy climbing herb, a native of Peru. Its orange flowers are used in salads, and its pungent buds and fruit are pickled and incorrectly called capers.

**Natal'**, an Eng. colony on the S. E. coast of Afr., extending along the Indian Ocean, and bounded S. by Kaffraria, from which it is separated by the Umzimolou; N. by the Tugela River, which divides it from Zululand, and W. by the Quattilamba Mts., which form the boundary between it and the Orange River Free State. Area, 17,000 sq. m. Pop. 380,000. The surface rises from the low coast-land, where cotton, rice, and sugar are grown, through terraces where the common European cereals and fruits are cultivated, into an elevated table-land at the foot of the Quattilamba, where excellent pastures are found. Sugar is the chief product. Elephants, hippopotami, lions, leopards, crocodiles, and poisonous serpents are frequent. Cap. Pietermaritzburg.

**Natatores** [Lat. "swimmers"], an artificial combination of birds, agreeing only—and but partially even in this respect—in being adapted for swimming. The group is characterized by having the upper part of the "crus" (tibia and fibula) inclosed within the skin of the trunk, and by having the feet generally webbed. In addition to the above characters, the legs are placed comparatively far backward, and are usually short; the hind toe is occasionally altogether wanting; the plumage is thick and well supplied with oil from the gland on the rump. The term Natatores is sometimes rendered into Eng. literally as "the swimmers;" otherwise the group is known as "the water-birds." But, admirably fitted as the N. are for an aquatic life, there are some members of the group which have so far diverged from the typical habit as seldom to approach the water, and many sea-fowl do little more than obtain their prey from that element by darting down on it from the air. On the other hand, the more typical forms live almost altogether on the water, some flying badly, or altogether unable to fly, by reason of the shortness or rudimentary condition of their wings, and only visiting the land for temporary rest or breeding. We thus find in it illustrations of extremes of habit and of structure—penguins, with wings reduced to almost fin-like appendages, associated with the longest-winged, the most powerful, the most enduring, the most graceful, and the swiftest of flyers, such as we find among the frigate-birds, the albatrosses, and the terns. So also some species are carnivorous, while others are almost exclusively herbivorous; and while some carry food to their helpless young, the young of others are enabled to seek their own food almost as soon as hatched.

The N. are found abundantly distributed in all parts of the world, and many species have very extended ranges; while a few are very limited in their distribution and confined to certain islands or groups of islands.

**Natchez**, city, cap. of Adams co., Miss., on R. R. and the E. bank of the Miss. River, has a Catholic cathedral and 3 orphan asylums. Prin. business, handling cotton. Pop. 1870, 9357; 1880, 7058.

**Natick**, on R. R., Middlesex co., Mass., 17 m. from Boston, has good graded schools, and a public library of 10,000 vols. Business, shoe manufacturing. Pop. tp. 1870, 6404; 1880, 8479.

**National Banks**. See BANKS.

**National Bureau of Education**, an office in the dept. of the interior, had its rise in a need long felt by leading educators of some central agency by which the general educational statistics of the country could be collected, preserved, condensed, and properly arranged for distribution. The Bureau was created by the act of Cong. of Mar. 2, 1867, Gen. Garfield being chairman of the committee of representatives which reported the bill, and its foremost supporter on the floor of the House. In the text of the act the functions of the Bureau are thus stated: "For the purpose of collecting such statistics and facts as shall show the condition and progress of education in the several States and Territories, and of diffusing such information respecting the organization and management of school systems and methods of teaching as shall aid the people of the U. S. in the establishment and maintenance of efficient school systems, and otherwise promote the cause of education." The Bureau is not an administrative agency, and is not invested with any authoritative direction of the school systems of the States, its operations being limited to the collection and diffusion of information; but the field of research for obtaining the requisite information is not restricted. Hence the publications of the Bureau comprise, in addition to the reports and papers on the condition of education at home, a large amount of valuable information as to the systems, means, and results of instruction in foreign countries. The Bureau is conducted by a com. of education appointed by the Pres. The first incumbent of the office was Hon. Henry Barnard, LL.D., of Conn., who retired after 3 yrs.' service, and was succeeded in 1870 by the present com., Gen. John Eaton. The working force consists of 38 clerks and employes of different grades. The appropriation for the expenses, 1882-83, is \$44,580 salary fund, \$5975 contingent fund, and \$2000 for the distribution of documents. The expense of printing is chargeable to the printing fund of the dept. of the interior. The publications thus far issued comprise 12 annual and 3 special reports, averaging more than 1000 pp. each, and upward of 50 "circulars of information," in the shape of pamphlets, varying in size from a few pp. to more than 200, and containing a great variety of educational information of very great value and utility. These documents are printed in large numbers, and are circulated gratuitously throughout the country. A vast amount of useful information respecting the school systems and institutions of our own and of foreign countries is thus made accessible to all persons sharing in the management of educational affairs.

As one of the fruits of its operations, the Bureau has collected a pedagogical library of almost unexampled richness in its special line, comprising about 16,000 bound vols. and 32,000 pamphlets. The Bureau has also laid the foundation of a pedagogical museum, to illustrate school arch., furnishing, and fitting, and appliances and apparatus for instruction of all descriptions. Some indication of the extent of the operations of the Bureau is afforded by the fact that the number of its correspondents is over 13,000. So marked has been its success and efficiency that it is now generally regarded by educators as an indispensable agency for the promotion of the educational interests of the country. Every educational inquirer feels it necessary to have access to its publications. Its system of statistics has gradually been perfected until it may be regarded as in most respects a model. M. Levasseur, an eminent savant and educator of Fr., says: "The Bureau is a mirror in which Amer. schools may see themselves grouped side by side, compare their organization, appreciate their differences, and measure their progress in successive years. Its reports are the most copious fountain from which one can draw; having them one can dispense with others; without them it is almost impossible to obtain a complete idea of Amer. education as a whole, the original documents are so numerous, diverse, and difficult to get together." JOHN D. PHILBRICK.

**National Debt**. See DEBT, NATIONAL.

**National Military Home**, O. See APPENDIX.

**National Parks**, portions of the public lands reserved from sale and settlement in order that they may be maintained as places of public resort forever. Only 2 such have ever been made in this country by authority of the gen. govt.—viz. the Yosemite Valley and the Yellowstone N. P. The former was granted to the State of Cal. by Cong. June 30, 1864; the tract was the "clef," or gorge in the Granite Peak of the Sierra Nevada Mts., in the co. of Mariposa, at the head-waters of the Merced River, and known as the Yosemite Valley, with an estimated length of 15 m., and a width of 1 m. from the main edge of the precipice on both sides, and was declared inalienable for all time. At the same time the Mariposa Big Tree Grove, comprising an area not to exceed 4 sections, was set apart under like legislation. The Yellowstone N. P. is located in the extreme N. W. corner of the Terr. of Wyo. It is 65 m. in length from N. to S., and 55 in breadth from E. to W., comprising an area of 3575 sq. m. The act establishing this park became a law Mar. 1, 1872. The main purpose was the protection of the wonderful curiosities from injury or spoliation, and their retention in their natural condition. Perhaps no other area of equal dimensions on the globe contains so many objects of wonder, as hot springs, geysers, waterfalls, cañons, etc.

**National Stock Yards**, Ill. See APPENDIX.

**Na'trolite** [from *natron*, "soda," and Gr. *λίθος*, "stone"], a mineral belonging to the zeolitic section of hydrous silicates, and essentially a silicate of alumina and soda, with 9.5 per cent. of water. It occurs generally in slender crystals assignable to the trimetric system, also frequently in radiated fibrous masses. It is most common in volcanic rocks, but occasionally found in granite and gneiss.

**Natron**. See SODA.

**Nat'terjack**, the *Epidaleia calamita*, a toad-like batrachian of Europe, abundant in parts of Eng. and Ire. It



resembles the common toad, but does not hop. Its progression is by running. It frequents dry places near the sea. It is 7 inches long, and has a very disagreeable odor.

**Natural Bridge.** (1) In Walker co., Ala., is an arch in the sub-Carboniferous conglomerate stone. It has a span of 120 ft. and is 70 ft. high. There is a smaller arch in the immediate vicinity. (2) In Trinity co., Cal., a small creek runs for 3000 ft. through an arch of 80 ft. span and 30 ft. in height. The bed of the stream is 170 ft. below the top of the bridge. (3, 4) In Siskiyou co., Cal., the Lost River flows under 2 arches of sandstone 30 ft. apart. The stream is 80 ft. wide, and the bridges each measure about 12 ft. from side to side. (5, 6) The Coyote Creek in Tuolumne co., Cal., 10 m. N. from Sonora, flows under 2 N. B. The larger one is 285 ft. from side to side, but of small span. The top of the arch is 30 ft. above the cavity and 66 ft. above the water. The other bridge is of about the same dimensions, and is  $\frac{1}{2}$  m. lower down the stream. (7) A bridge in Christian co., Ky., has a span of 70 ft. and is 133 ft. high. (8) In Adams, Berkshire co., Mass., the Hudson Brook flows for 30 rods under an arch of white marble. The cavity is from 30 to 60 ft. deep and 15 ft. wide. (9) At the v. of Natural Bridge, in Jefferson co., N. Y., the Indian River flows through passages under the surface-rock of coarse white sandstone. (10) The most famous of all in the U. S. is that in Rockbridge co., Va., 14 m. from Lexington. Cedar Creek here reaches the lower end of a cañon of silicious limestone, 200 ft. deep. The arch is 60 ft. in spring. Its crown is 40 ft. thick, and crossed by a road 240 ft. above the water.

**Natural History**, properly speaking, is the hist. of natural objects—minerals, plants, and animals—in their various normal conditions, and has been divided (e. g. by Cuvier) into *General and Particular*. *General* N. H. embraces the consideration of all objects in their relations to each other and to the economy of nature. *Particular* N. H. is restricted to the consideration of special forms in regard to (1) the sensible properties of the entire body and its parts; (2) "the mutual relations of those parts, the motions which they produce, and the changes which they undergo while they remain united;" (3) "the active and passive relations of this body with every other body in the universe;" and (4) "the explanation of all these phenomena." The objects taken cognizance of by N. H. fall naturally into 2 great groups: (1) the *Mineral Empire* or *Mineral Kingdom*, considered under the head of MINERALOGY; and (2) the *Organic Empire*, discussed under the term BIOLOGY. Biology is itself subdivided into (a) BOTANY, which treats of the Vegetable Kingdom, and (b) ZOOLOGY, which has for its domain the Animal Kingdom.

**Natural Philosophy.** See DYNAMICS AND MECHANICS.

**Natural Theology** treats of the existence and attributes of God as revealed to us in the const. and order of the natural world. As a perfected system it results from the investigation of the 2 following questions: (1) Is this universe, with all its orders of being, the work of a personal creator or the result of impersonal forces? (2) The existence of a personal creator being proved, what can be learned from nature of his character and of his relations to his creatures?

The investigation of these questions starts with the assumption that every event must have an adequate cause, and that there may be such relations between causes and effects, such combinations of matter and manifestations of force producing specific results, that the existence of a designer may be inferred and his character revealed. But N. T. embraces much more than the simple recognition of design in the universe. A full investigation of the subject concerns itself with the complexity and perfection of means in carrying out design, and especially with the relation of design to sensitive and rational beings, as revealing the character of the designer. The materials for this investigation are found in the whole natural world, as well as in the phys., intellectual, and moral nature of man.

The conditions of the problem and the opposing theories of the case may be stated briefly as follows: (1) It is now conceded by all that there was a time when there was no living thing upon the earth. (2) Since plants and animals and men are now here, there must be some cause adequate to produce them. There seem to be but 2 hypotheses possible as to their origin: (1) That plants and animals have been produced through the agency of forces eternally inherent in matter; (2) that they have been produced by the design and organizing power of a personal being acting, directly or indirectly, through forces controlled by him. The large majority of the students of nature have seen in its different depts. such combinations to produce specific results, such likeness to the works of man, that they have believed in a being who has originated by some method all the living things upon the earth. *I am, therefore God is*, may be regarded as the central proposition in N. T. It is claimed by students of N. T. that belief in the existence of a personal creator is reached in the study of man and nature through the same processes of thought by which every science has been built up. The necessary principles of belief, careful investigation of facts, and sound induction, are all relied upon in proving the existence of a personal creator from the works of nature, as the existence and nature of any cause would be proved from its effect. It is also claimed that no scientific process has been more legitimate than the investigations and conclusions reached in N. T. It claims a place, therefore, among the sciences.

**Objections.** That N. T. has any just claim to scientific rank is denied by a class of philo. (Positivists), who seek to limit all investigation to observed phenomena, denying both efficient and final causes. Others, without denying the propriety of investigating final causes, affirm that we have no evidence of final cause in the works of nature. They regard the adaptation which we see in the natural world simply as the result of materials and forces mutually limited in producing the existing forms.

**History of Opinions.**—The hist. of the race shows that there has been at all times, except among the most degraded tribes, some distinct notion of God or gods, or of some supernatural agents to be feared and worshipped. So constantly has the belief in the existence of God prevailed in all ages that it has been claimed by some that the *idea* of God is *innate*. An *a priori* proof for the existence of God has been accepted by some from the supposed power of the human mind to form a conception of a perfect being. The inference is made from this power of the mind that a being must exist to correspond to the conceptions of it. The *teleological* argument may fairly be made to include the study of nature, and also the study of man as a phys., intellectual, and moral being. It is simple, readily apprehended, finds its materials in thousands of forms, and has been illustrated and enforced by thinking men in all ages.

**Objections.**—It has been objected to the argument from design drawn from the natural world that at best it only proves the existence of a worker or world-builder—that it is only in the creation of the mind of man that we have proof of the existence of a personal creator. It may be added that the creator of man is not necessarily the self-existent God. But the existence of man's creator proves that there must be a self-existent personal God. After we reach the proof that our creator is a personal being, we must wait for him to declare whether he is the Almighty or not. Thus we join N. T. to revelation. N. T. declares a creator of man, of the heavens, and of the earth. He declares himself to be the Almighty.

**Tendencies of Present Discussions.**—As already intimated, positive philo., of which Comte was the father, would render the science of N. T. impossible. The doctrine of *evolution* is supposed by some to destroy the proof for the existence of a personal creator. But such a result can follow only from denying the plainest principles of causality. For one who accepts the doctrine of causation, belief in the existence and wisdom of a designer cannot be affected at all by the secondary agencies employed in producing results. The only question that could arise would be in reference to power. When a certain effect is produced, such an effect demands belief in a cause adequate to produce such a result; and if there is evidence of wisdom and skill in it, the evidence is there, irrespective of the secondary agencies concerned in its production. The belief that a being of low rank can be raised to a higher rank by any process of development or natural selection without the same agency, in kind, as would be required to produce the being of high rank directly, is belief that an effect can be produced without an adequate cause.

**Natural Religion.**—N. T. and natural religion are sometimes used as synonymous terms. So far as they differ, natural religion relates to the natural proofs of man's immortality and accountability. While N. T. proper relates to the existence and character of God, natural religion treats of man's relations to God and duties toward him. (See CHADBOURNE, *Natural Theology*.) [From orig. art. in *J's Univ. Cyc.*, by PRES. P. A. CHADBOURNE, LL.D.]

**Naturalization.** See APPENDIX.

**Nature-Printing**, a process by which flat objects, like ferns, sea-weeds, laces, and embroidery, may be used for preparing a plate for printing without executing any engraving, or even drawing. By one method the object to be represented is pressed with great force between a polished plate of copper and one of lead, leaving an impression upon the leaden plate. A copy of this plate is then taken by electrolyte, which is used, like any other electrolyte plate.

**Naugatuck**, New Haven co., Conn., on the Naugatuck River and R. R., 27 m. by rail N. by E. of Bridgeport, has manufactures of rubber goods, farming implements, woolens, etc. UNION CTRY, 1 m. to the N., is a part of the same town, and has manufactures of malleable iron-castings, etc. Pop. pt. 1870, 2830; 1880, 4274.

**Nau'plia**, or **Napoli di Romania** [so named from its being accessible to ships—ἀπό τοῦ τῶν ναυῶν προσπλεύσθαι.—*Strabo*, viii. 6, 2], the Gibraltar of Gr., near the head of the Argolic Gulf. It was captured from the Turks Dec. 12, 1822, and made in 1829 the cap. of the Gr. kingdom till Dec. 1834. Since then its pop. has declined from 9000 to 4598.

**Nautical Almanac.** See EPIHEMERIS.

**Nautilidæ** (from the name of the genus *Nautilus*), the only family represented by existing species of the class of cephalopod mollusks of the order Tetrabranchiata; it includes species whose shell is generally curved and more or less involute upon itself, with the outer chamber very large, and the aperture with its outer margin sinuous; the septa are simple, and are convex backward toward the middle; in the typical forms the siphon is nearly central; there are 2 well-developed shell-layers, and a third incompletely developed one near the aperture. The animal has a mantle with an entire margin which extends about even with the border of the aperture; it also has (1) a circular fleshy lip; (2) numerous labial tentacles combined in 4 groups; and (3) still farther outward are the "arms" or brachial tentacles, about 36 in number, and in 2 rows. The tentacles are lamellated on their inner surface, and are retractile within sheaths or digitations which correspond to the 8 ordinary arms of the cuttle-fishes; "beside these, there are 4 ocular tentacles, one behind and one in front of each eye." On the side of each eye is a hollow oblique process which is not tentaculiferous, and which bears the external ears. The mandibles are to a considerable extent calcified, thus differing from those of the cuttle-fishes. "The shell-muscles are united by a narrow tract across the hollow occupied by the involute spire of the shell, and are thus rendered horseshoe shaped. The siphuncle is vascular; it opens into the cavity containing the heart (pericardium), and is most probably filled with fluid from that cavity." The family is at present represented by a single genus, *Nautilus*, containing several living species, and has survived from the Silurian epoch to the present time.



**Nautilus Propeller**, a system of propelling steam-vessels at sea by means of the expulsion of strong currents of water backward. Many of the lower animals move about in the water in this way.

**Navarino**, nah-vah-ree'no, a small town of Gr., where the allied Rus., Fr., and Eng. fleets defeated the Tur. and Egyptian fleets on Oct. 20, 1827. Pop. about 3000.

**Navasota**, N. R. junce, Grimes co., Tex., 70 m. N. of Houston, has an acid, and a sem. Pop. 1870, 1500; 1880, 1611.

**Na'vesink**, (or **Neverusk**), **Highlands of**, a range of hills on the S. side of Sandy Hook Bay, in Monmouth co., N. J. Two first-class light-houses, 53 ft. high, stand 100 ft. apart on ground 195 ft. high. Both show fixed white lights.

**Navicular Disease**, in horses, is an inflammation in the navicular bone and the strong flexor tendon near this bone. It may sometimes be cured when taken in season, by perfect rest and thorough poulticing for a time, followed by 6 months' feeding in a soft pasture.

**Navigation** [Lat. *navigare*, "to sail"], the art which instructs the mariner how to proceed from port to port and across the ocean with safety and despatch. Before going to sea care should be taken that the ship is provided with a good sextant or octant, a chronometer, a compass fitted with attachments for observing the azimuth of the sun, a nautical almanac for the current yr., and a chart of the ocean to be traversed.

When passing from the bay or harbor into the ocean, the bearings of two landmarks whose positions are noted on the chart are taken with the compass, and these compass-bearings having been corrected, the true bearings are laid down on the chart, the lines passing through the points observed. The intersection of these 2 lines gives the position of the ship for the instant when the bearings were noted. This is called taking a *departure*.

At or about 8 A. M., or better still when the sun bears most nearly E., and yet has sufficient altitude, say 10°, to avoid the irregular refraction near the horizon, its altitude is observed with the sextant, and the instant of observation is noted by the chronometer. Then, with the ship's lat. and lon. at the time of taking the departure, and with the courses and distances sailed corrected up to the time of taking the observation, the ship's position by *dead reckoning* is found. Now, from the observation we have the altitude of the sun, from the nautical almanac its declination, and from the dead reckoning the approximate lat. By comparing the local with the Greenwich time, as given by the chronometer, the lon. by observation is obtained.

Near noon the observer commences to observe again the altitude of the sun, and continues to do so as long as the altitude increases. The maximum altitude is assumed to be the meridian altitude. With this meridian altitude, and with the declination of the sun for that instant, the declination of the zenith is really found, which is the lat. of the place. In the afternoon the observation for lon. and for variation is repeated, and these operations continue throughout the voyage.

But should the ship be a long time out of sight of land, or should any accident befall the chronometer, then the lon. is obtained by a "lunar." The moon's angular distances, as seen from the earth's centre, from the sun, from the prin. planets, and from several selected stars, are given in the nautical almanac for every 3 hours of Greenwich mean time. If, then, we measure carefully any of these angular distances, we find by appropriate reductions what that angle would have been had we been at the centre of the earth. Then, if we compare our reduced angle with the one given for that body observed in the almanac, we find the Greenwich mean time; and having at the same time taken the observation for the local time, the difference between the 2 times is the lon. in time from Greenwich.

So far we have treated of the methods of finding the position of a point on the earth's surface by the 2 co-ordinates, *latitude* and *longitude*; and therefore by these methods the required position is determined by the intersection of 2 circles, one a parallel of lat. and the other a meridian. This position can be determined by what is known as "Summer Method." It is, that if an altitude of the sun or any heavenly body be observed and reduced to the true altitude, and the Greenwich time noted, and if the position of the body at that time be plotted by its hour-angle from Greenwich and declination on a globe, and if from this as a centre a circle be described with a radius equal to the body's zenith distance, then the observer is situated somewhere on this circle, and his place is as well determined as if either his lat. or lon. was alone known. Now, if some time after, the observer remaining stationary, the same body be again observed, and a second circle be plotted as before, then, as he is now at the same time on the circumferences of 2 circles, he must be at one of their intersections. There is no difficulty in knowing at which intersection the observer is situated, and his position is well determined. Instead of observing the same heavenly body at different times, 2 bodies may be observed at the same time. But on a Mercator's chart the circle of position will be distorted, and as the line in practice is projected on these charts, it is necessary to select that part of the circle which embraces the ship's lat. Then, by assuming lats. embraced within this belt, and computing the corresponding lons., the points of the circle of position where it crosses these assumed lats. are fixed; and when plotted on the chart a line called the *line of position* may be traced through them. [From orig. art. in *J. S. Univ. Cyc.*, by LIEUT. COM. ALEXANDER H. MCCORMICK.]

**Navigation, Freedom of**. It is now admitted on all hands that the open or high sea is common to all nations. But Port. formerly claimed the exclusive use of the Afr. seas and the empire of Guinea, under a bull of Pope Nicholas V. in 1454. Alexander VI. (1493) granted to Sp. the lands lying W. of a meridian drawn 10 leagues W. of the Azores, and divided the seas between Sp. and Port. So, a claim of Eng. to narrow channels adjoining G. Brit. brought on a war with

Hol. Russia's claim to sole jurisdiction of the Pacific N. of lat. 51 is now abandoned. T. D. WOOLSEY.

**Navigation, Inland (Canals)**. See CANAL.

**Navigation, Inland (Rivers and Lakes)**. There is no portion of the world favored with a better system of inland water-communication than that part of the N. Amer. continent included within the limits of the U. S. and Canada.

**River Navigation**.—The lengths of the Miss. and its chief tributaries are—main Miss., 1268 m.; Mo., 2506; Upper Miss., 1830; O., 1265; Ark., 1514; Red River, 1200. The total area drained by the Miss. is 1,244,000 sq. m. Almost the entire area of the U. S. lying between the Alleghany and the Rocky Mts. drains into the Gulf of Mex. through the Miss., and a large portion of this area is thus made accessible to water-craft. But all the tributaries from the W. flow for a considerable distance through dry or desert lands, and as a rule are unnavigable until they have entered more fertile regions. The Mo., though much longer, is less navigable than either the O. or the upper Miss., and none of its tributaries, except the Yellowstone and the Osage, are navigable at all. Of late yrs. the character of W. river commerce has materially changed. The multiplication of R. Rs. has reduced the passenger travel by river, and steamboats are seldom used except to reach towns not yet touched by R. R. lines. On the other hand, the commerce in heavy commodities, especially in coal on the O., has greatly increased.

**Lake Navigation**.—The larger portion of the surplus of grain raised in the States bordering on and W. of the Miss. is carried to tide-water by way of the great lakes. From Chicago or Milwaukee the route is through Lakes Mich., Huron, and St. Clair to the E. end of Lake Erie. Beside grain, there is a heavy business in lumber, coal, salt, iron ore, and manufactured iron.

**Other Rivers and Lakes**.—Beside these 2 great systems of inland navigation, there is a heavy commerce on the Hudson River, some of which is local, but as the Hudson is the direct continuation to the sea of the Erie Canal, the greater portion of its commerce consists of freight on its way to New York. The canal-boats are made up into fleets and towed by tow-boats, one boat frequently towing 3 fleets. The other navigable waters of the U. S. may be briefly described: The Penobscot conveys lumber; the Kennebec, ice and lumber; the Connecticut, freight and passengers; the Potomac, coal coming to it from W. Md. by canal; the James, connecting at Richmond with the James River and Kanawha Canal, conveys the varied products of Va.; the Ala. carries cotton; the Sacramento, the Columbia, the San Joaquin, and the Willamette are navigable for greater or lesser distances from their mouths.

**THROUGH TRANSPORTATION ROUTES**.—A committee of the U. S. Senate, appointed in Dec. 1872, recommended the construction or improvement of a number of through water-lanes, and the cost of these improvements was subsequently determined by the U. S. engineers in charge. The routes and estimated cost of these lines are as follows:

**Mississippi Route**.—The opening of the mouth of the river so as to permit the free passage of vessels drawing 28 ft. (by act of Cong. approved Mar. 3, 1875, James B. Eads is authorized to create and maintain a channel out of the S. Pass of the Miss., having the ultimate depth of 30 ft.); construction of reservoirs at the sources of the river (estimated cost, \$488,551); improvement to give 3 to 5 ft. above the Falls of St. Anthony (estimated cost, \$2,100,000); 4½ to 6 ft. from Falls of St. Anthony to St. Louis (estimated cost for 4½ ft. from Falls to La Crosse, \$348,670; for 6 ft. at Rock Island Rapids, \$2,404,000; for 6 ft. at Des Moines Rapids Canal, \$953,134; for 6 ft. between mouth of Ill. and St. Louis, \$1,000,000); 8 to 10 ft. from St. Louis to New Orleans (estimated cost of 8 ft. from St. Louis to Cairo, \$6,160,000—no engineer's estimate below Cairo; committee's estimate from St. Louis to New Orleans, \$5,000,000).

**Northern Route**.—Improvement of Fox and Wis. rivers, \$3,600,000; canal from Rock Island on the Miss. to Hennepin on the Ill., \$4,541,000; enlargement of the Erie Canal, from Buffalo to Albany, \$6,676,231; enlargement of the Oneida Lake Canal, from Oswego to Albany, \$25,218,857; Champlain Canal, from Lake Champlain to deep water on the Hudson, \$14,115,893. Total estimated cost of N. route, \$54,146,981.

**Central Route**.—Improvement of the O. River from Pittsburgh to Cairo, so as to give 6 to 7 ft. of water, \$40,000,000; improvement of the Kanawha River up to Great Falls, so as to give 6 ft. of water, \$4,071,216; a connection by canal or freight-railway from the Kanawha or O. to tide-water in Va., about \$55,000,000. Total cost of central route, \$99,071,216.

**Southern Route**.—Improvement of the Tenn. from its mouth to Knoxville, so as to give 3 ft. in low water, \$5,000,000; canal or freight-railway from the Tenn. River to the Atlantic by shortest route, \$35,612,000.

**Other Routes**.—A survey was also made for the extension to Pittsburgh of the Chesapeake and O. Canal. The engineer's estimate is \$25,000,000. A survey was made in 1868 of various routes for an Amer. canal between the Niagara River above the Falls and Lake Ontario, and the average cost was \$12,500,000.

**IMPROVEMENT OF RIVERS**.—**Tidal Rivers**.—The essential principle in all works for the improvement of tidal rivers is to give the freest possible entrance to the flood-tide by removing all projecting points and dredging away shoals. If the currents of the ebb are much diffused, they should be guided and concentrated by low training-walls.

**Non-tidal Rivers**.—Rivers with currents that flow constantly in one direction may be improved by assisting the natural navigation or by canalizing. Natural navigation is assisted by building dikes or wing-dams to contract the river where it is too wide, by moving loose rocks, snags, and wrecks, and by removing when it is divided by dams or weirs into a number of navigable reaches or pools. Boats pass from one pool into another by one or more locks in each dam. When a dam is built on anything but hard rock, special precau-



tions must be taken to prevent undermining. The latest improvement in canalizing rivers is to build movable dams (*barrages mobiles*), that can be lowered on the bed of the river when not needed.

A review of inland navigation by rivers and lakes would be incomplete without allusion to projects for grand systems of water-communication which might be effected by establishing brief artificial links of connection between natural reaches of river, lake, or sound navigation. The chain of interior water-communications which can easily be established from the Bay of New York and of the St. Lawrence, stretching through the lakes, and, by their union with the Miss. River, to New Orleans, to St. Paul, Pittsburg, and the foot-hills of the Rocky Mts., might be called a second coast-line, created by making a navigable channel near to and parallel with the coasts on the Atlantic and Gulf, and having numerous connections with those waters. An interior channel, beginning in the Miss. River, may be continued along the coast between the islands and the mainland, *vid* Mobile and Pensacola (crossing Fla. with a ship-canal), Savannah, Charleston, Beaufort, Norfolk, near Baltimore, Philadelphia, and New York (through L. I. Sound, Narragansett and Buzzard's Bays, and by a short canal) to Mass. Bay. Portions of this are now in operation. Here is an interior channel, which, will be a safe one along an extensive and important part of our coast, from New London to Beaufort, directly communicating with several of our largest States and cities. To make this extensive portion available both in peace and in war requires an *enlargement* of 78½ and inexpensive canals, of an aggregate length of but 38½ m. Thus, with a few slight interruptions where it might be necessary to venture upon the open sea, an interior line of water-communications can be established from New Orleans to New York and to Boston; and this may be continued along the La. and Tex. coast to the Rio Grande. (See *Report of Senate Committee on Transportation*.) [From orig. art. in *J's Univ. Cyc.*, by COL. W. E. MERRILL.]

#### Navigation Laws. See INTERNATIONAL LAW.

**Navigation, Ocean Steam.** Amer. may fairly claim the merit of having sent the first steamboat across the Atlantic, the Savannah (300 tons) having passed in 26 days from the U. S. to Liverpool in 1819. That this success was not followed up at once can only be accounted for by the fact that the Amers. were for some yrs. more directly interested in pressing on their grand system of river and lake communication by steam vessels than in providing others for transatlantic purposes. Something, too, is perhaps due to the opposition of so called men of science, who long resisted the idea that steam could ever impel vessels for a distance of 3000 m. Ten yrs. elapsed before the next experiment, when the *Curacao*, an Eng.-built vessel of 350 tons, made in 1829 several successful voyages between Hol. and the Dut. W. I. Nearly another 10 yrs. passed before steam was energetically applied for ocean purposes. In 1838, however, the *Sirius* started from Lond. on Apr. 4 and the Great Western from Bristol on Apr. 7, the first vessel accomplishing her voyage in 17 days, the second in 15. These voyages settled the question of the practicability of crossing the Atlantic in steam-driven vessels. The *Sirius* and Great Western were soon after followed by other similar ships. The *Royal William*, in July 1838, was the first steamer from Liverpool to New York. The same yr. saw the commencement of the Cunard line. The next important vessel was the *Great Britain*, which was launched July 19, 1843, and forms an era in ship-building, from the fact that she was built of iron and fitted with the newly invented screw-propeller. In 1845 the Amers. adopted the plan of "auxiliary screws," sending forth from Boston the *Massachusetts*. But she was not sufficiently speedy, so a line of steamers was established between New York and Bremen, calling at Southampton, the *Washington*, the first ship of this line, being started in June 1847 from New York. The *Britannia* for Liverpool was started on the same day, and this was the first ocean-race between Amer. and Eng. vessels. The *Britannia* won by 2 days. Not long after this the Collins line was proposed. The first 4 ships sent forth in 1850-51, the Arctic, Baltic, Atlantic, and Pacific, were in many ways superior to any Eng. merchant-ships then afloat, and for 4 yrs. this line was preferred by passengers. It met, however, shortly after with great misfortunes in the foundering of the Arctic and Pacific, and was ultimately relinquished in 1858. In 1841 2 other considerable cos. arose—one, the *Royal W. I. Mail Co.*; the other, the *Pacific Steam Navigation Co.* The Peninsular and Oriental Co., though then in existence, could hardly be called an ocean co. till their ships from Aden eastward were in working order; while the *Messageries* (first *Impériales*) and *Maritimes* did but little business till the Crimean war of 1854-56. The *Pacific Co.* owes its creation to Mr. Wheelwright, U. S. consul for Panama, who obtained a charter from the Eng. govt. in Feb. 1840. These vessels by their contract were not to touch at any places in Her Majesty's dominions. The progress of this co. was slow, and for some yrs. almost unremunerative. A more recent undertaking is connected with Central Amer. on the one side and Panama and the W. coast on the other. This was formed by the combination of 3 separate cos., and bears the name of the W. I. and Pacific Steamship Co., started in 1864. With them may also be noticed a private co., formed in 1865, with the title of the Liverpool, Brazil, and River Plate Steamship Co., which now possesses 39 vessels, some of them starting in turn from Lond., Antwerp, and Havre.

The success of the early lines soon led to the creation of others. Among these is the Liverpool, New York, and Phila. Co. (better known as the *Inman Line*) in 1850; the Allan or Canada Line in 1853; the National Steam Navigation Co. in 1863; the Guion Line in 1863; the Miss. and Dominion Co. in 1870, plying during the summer between New Orleans and Canada, and in the winter between New Orleans and Liverpool; the White Star Line in 1870; the Pa.

and Liverpool Co. in 1873; the Anchor Line; the Hamburg Amer. Steam-Packet Co., and the N. Ger. Lloyds, trading between Bremen and New York, with extensions to the W. I. and Brazil. Since the opening (in 1869) of the Suez Canal the Peninsular and Oriental Co. has vastly extended their operations, and with the *Messageries Maritimes* send their steamships to almost all places of importance in Indian, Chinese, or Pacific waters. The last-named co. is entirely under the Fr. govt. control and very largely subsidized. In the N. Pacific the Amers. have started from San Francisco the N. Pacific Transportation Co. Excellent vessels are supplied for the W. coast of Afr. by the Cape of Good Hope Steamship Co., the Union Steamship Co., and the Afr. Steamship Co. In India a gigantic undertaking exists with the name of the Brit. India Steam Navigation Co., which has extended over the whole of the Indian and Afr. oceans. The Netherlands Steam Navigation Co. was started in 1866, and now owns 23 steamers, trading between Singapore, Batavia, and the Dut. ports, and thence with Brisbane, Sydney, and Melbourne. In 1875 a line of steamers was commenced by Japanese merchants with 4 steamers and a weekly service between Nagasaki, Hio, Imioseki, and Yokohama, their caps. and engineers being Amer. or Eng., but the sailors Japanese. [From orig. art. in *J's Univ. Cyc.*, by W. S. W. VAUX, F. R. S.]

**Navigator's Islands.** A group of 10 islands, comprising an area of 1650 sq. m., situated in the Pacific Ocean between lat. 13° 30' and 14° 30' S., and between lon. 169° and 173° W. They are high, mountainous, of volcanic origin, with a rich soil, a hot, moist climate, and a luxuriant vegetation. Coffee, sugar, yams, and nutmegs are produced. The inhabs. are a tribe of the Polynesian race. The largest island is Sawai; the most fertile and most peopled is Tutuila. Pop. 34,265.

**Navy** (Lat. *navis*, a "ship"), a word applied exclusively to the war marine of a state, the vessels composing it being in gen. called "men-of-war." In the U. S. there were in the service, in 1884, 44 naval steam vessels, all screw propellers except 4, besides 13 wooden sailing vessels, 19 iron-clad vessels, 2 torpedo rams, and 15 tugs; total, 93, of which comparatively few are in efficient service. The number of guns is 550. The active list is composed of 1064 officers of the line, 591 officers of the staff, and 204 warrant officers; total, 1859 officers of all grades. There were, July 1884, in the service, provided for by the navy appropriation act for the fiscal yr. 1885, 7500 enlisted men and 750 boys.

In Austria-Hungary there were 68 vessels, 7222 men; Chi., 56 vessels; Fr., 302 vessels, 39,365 men; Ger., 91 vessels, 15,200 men; G. Brit., 246 vessels, 57,250 men; It., 72 vessels, 15,140 men; the Netherlands, 165 vessels, 3438 men; Nor., 46 vessels, 915 men; Rus., 373 vessels, 28,975 men; Sp., 124 vessels, 21,678 men; Swe., 133 vessels, 7723 men; Tur., 49 vessels, 40,392 men.

**Naxos**, an island belonging to Gr., the largest and most fertile of the Cyclades, is 20 m. long and 14 m. broad, and has about 11,000 inhabs. It is high and mountainous, but contains many fertile valleys, which produce wheat, wine, figs, and olives. Naxos, the cap., situated on the N. W. coast of the island, has about 5000 inhabs. There was a duchy of Naxos which lasted (from 1206 A. D.) 360 yrs., giving place to the Tur. dominion in 1566.

#### Nazareans. See MENDEANS.

**Nazarene** (Gr. *Ναζωραίος* or *Ναζαρενός*), a term employed in several significations in the N. T. and in ecclesiastical hist. As first used (Matt. ii. 23), it is applied to Christ's residence at Nazareth as the fulfilment of a prophecy that "he shall be called a Nazarene;" but as no such passage occurs textually in the O. T., the term has been referred to the Nazarites; or to *Neiser*, "the Branch" (Isa. xi. 1); or, rather, it expresses reproach, Nazareth being a proverbially contemptible place (John i. 46). Where Jesus "of Nazareth" is mentioned the correct translation is *Nazarene*, and might therefore have a signification distinct from that of "inhabitant of Nazareth."

**Nazareth**, v. of Pal., in the anc. dist. of Galilee, 70 m. N. of Jerusalem, in the modern eyalet of Beyroot, is celebrated as the place of the Annunciation and the abode of Christ during most of his life. Pop. about 6000.

**Nazarite**, more properly **Naz'rite** [Heb. *nāzār*, "to separate"], among the anc. Hebs. an ascetic of either-sex who had taken a vow to abstain from wine, strong drink, and everything that is made of the vine, to let the hair grow, and to touch no dead body. Naziritism is older than the time of Moses.

**Neale** (LEONARD), D. D., b. in Md. Oct. 15, 1746, was consecrated a R. Cath. bp. and made coadjutor to Abp. Carroll in 1800; became abp. of Baltimore 1815. D. June 15, 1817.

**Neander** (JOHANN AUGUST WILHELM), b. at Göttingen Jan. 17, 1789, of Jewish parents and in humble circumstances; was ed. in Hamburg, where he frequented the *Johanneum*; embraced Christianity in 1806; studied theol. at Jena and Göttingen, and was appointed prof. of ch. hist. in 1812 at the Univ. of Berlin, where he d. July 14, 1850. His prin. work is his *Gen. Hist. of the Chr. Religion and Ch.*, from the close of the apostolic age to the Council of Bâle in 1431, translated into Eng. by Prof. Torrey. But several of his monographs, on Julian the Apostate, St. Bernard, Gnosticism, St. Chrysostom, are models of that kind of composition. He also wrote *Hist. of the Apostolic Age, Life of Jesus Christ*, in refutation of Strauss, etc. A complete edition of his *Works* appeared at Gotha 1862-66.

**Nearchus**, ne-ar'kus, one of the gens. of Alexander the Great, commanded the fleet during the Indian expedition, and conducted it at the end of the campaign from the mouth of the Indus, through the Per. Gulf, to the mouth of the Tigris. Of his voyage he wrote an account, the substance of which is in Arrian's *Indica*.

**Ne'bo** [Aecadian, *Nabû*; Assyrian, *Nabu*], one of the prin. divinities of the Babylonian pantheon, generally identified with the Egyptian Thoth and the Gr. Hermes.



**Nebraska**, one of the central States of the Amer. U.,

between 40°  
and 43° N.  
lat. and 95°  
23' and 104°  
W. lon.;  
bounded N.  
by Dak., E.  
by the Mo.  
River, which  
separates it  
from Ia. and  
Mo., S. by  
Kan. and  
Col., W. by  
Col.; length  
from E. to  
W. about  
412 miles;  
breadth  
from N. to  
S. 208 m.;  
area, 76,855  
sq. m. or 49,  
187,900 acres.



**Face of the Country, Etc.**—The N. W. portion, bordering upon "The Bad Lands" (Mauvaises Terres), has some hills of considerable height. The river-beds are deeply eroded by the action of water, and the high bluffs with which they are lined give an appearance of hills where none in reality exist. The greater part of the State is a rolling prairie, rising gradually toward the W. The E. portion is well drained and watered, the Mo., which forms the entire E. boundary, receiving the Niobrara and Nebraska or Platte, and the Great Nemaha, Little Nemaha, and Weeping Water rivers; the Republican Fork of the Kan. also drains the S. part of the State, and receives numerous tributaries. The Big Blue, another large branch of the Kan. River, drains several cos. in the S. and S. E. and receives a number of smaller streams. The Neb. or Platte, a broad and majestic but not a navigable river, is the prin. stream, and traverses the entire State from W. to E. The Niobrara or Eau-quil-Court River also traverses nearly the entire State from W. to E., receiving several considerable affluents. The Republican River, or Republican Fork of the Kan., is of great value to S. N., both from its great length and broad stream and from its numerous tributaries. There are no lakes of importance in the State.

**Mineralogy.**—The mineral wealth of the State consists mostly of coal from the upper coal-measures, and not of sufficient thickness to furnish more than a local supply; this coal is confined to the Upper Carboniferous region along the Mo. River, and mostly below the Platte River; the lignite-beds in the S. W. part of the State will probably prove a more profitable source of supply of coal. Lime, sandstone, limestone, and marble for ornamental purposes, gypsum, and especially salt, are the other prin. minerals. There are numerous salt-basins in the central and W. parts of the State. The most extensive is in Lancaster co., in a dist. of 12 by 25 m. surrounding Lincoln, the cap. of the State. The springs contain 20 per cent. of salt, and the salt is manufactured by solar evaporation. The salt is said to be the purest in the world, being 98<sup>2</sup>/<sub>10</sub> per cent. of pure chloride of sodium. The sandstone is soft at first, but hardens on exposure to air, and becomes an excellent building material. The limestones are of the blue Trenton limestone, a fair building-stone, and a gray magnesian limestone, susceptible of a fine polish and as enduring as It. marble.

**Soil and Vegetation.**—The E. part of the State is well watered, and the soil of the Mo. bottoms and the whole region S. of the Platte and E. of the 99th meridian is a rich black vegetable mould from 2 to 10 ft. deep. The subsoil is mostly yellow clay, but is not impervious to water. The wild grasses grow luxuriantly both upon the bottom and table lands, yielding from 1½ to 3 tons of hay per acre, and are nutritious and well adapted to the raising of sheep and cattle. The soil readily withstands the extremes of drought and rain, the crops being abundant in either case. There is but a limited supply of timber, and that along the water-courses. The W. portion of the State is not well watered. With the exception of the 2 forks of the Platte and Niobrara and a few small affluents of each, there is a lack of running streams. The region N. of the Niobrara and along its banks is a country of sand-dunes, sandhills, or heaps of fantastic forms, and a little farther N. is succeeded by the "Bad Lands." This portion of the State is barren and worthless for cultivation. N. of the Platte and W. of the 99th meridian the river-bottoms are the only arable portions of land.

**Zoology.**—The buffalo still roams over the W. prairies of the State, though in diminishing herds; the grizzly bear, black and brown bears, the big-horn or Rocky Mt. sheep, antelopes, deer, elk, panthers, wolves, otters, lynxes, coyotes, and the army of rodents, as well as the mink, raccoon, opossum, skunk, muskrat, and beaver, furnish abundant supplies of peltry to the hunter and trapper. There are 2 species of venomous serpents and a considerable number of harmless ones. Toads, frogs, and lizards are found in most parts of the State. There is a great variety of game birds, including wild-turkeys and several species of grouse, and all the birds of prey, singers, and birds of fine plumage pertaining to the Rocky Mt. region.

**Climate.**—N. has a fine climate. It is essentially a dry one, though the rainfall is not much less than in the E. The mean temperature during the winter months ranges from 20° to 30°; that of the spring, from 47° to 49°; the summer, 70° to 74°, and the autumn, 49° to 51°. A weather record of 7 yrs. at Nebraska City gave the mean annual rainfall as 30.36 inches, of which 20.87 inches fell between Apr. 1 and Oct. 1, and only 9.49 inches between Oct. 1 and Apr. 1.

**Agricultural Products.**—The census of 1880 showed the production of Indian corn to be 65,450,135 bushels; wheat, 13,847,007 bushels; oats, 6,555,875 bushels; barley, 1,744,686 bushels; rye, 424,348 bushels. The wool clip of 1880 yielded 1,282,656 lbs.; 57,979 lbs. of tobacco were raised.

**Farm Animals.**—In 1880, 204,864 horses, 19,999 mules and asses, 758,550 cattle, 199,453 sheep, and 1,241,724 swine.

**Manufactures.**—Number of establishments (1880), 1403; hands employed, 4793; cap. invested, \$4,861,156; wages paid, \$1,742,311; aggregate product, \$12,627,336. Amount of coal mined in 1881, 100,000 tons.

**Railroads.**—There were in operation, Jan. 1882, in N., 2310 m. of R. R., costing \$172,057,659, with net earnings of \$11,719,921, paying in interest and dividends \$8,895,252. Two of these are great trunk lines—the Union Pacific and the Chicago, Burlington and Quincy.

**Finances.**—The valuation of taxable property as assessed in 1881 was—real estate, \$54,279,362; personal, \$38,863,095; total, \$93,142,457. Rate of State tax, 65 cents on \$100, producing in 1881, \$573,066. Total taxation in 1880, \$2,792,480; State debt, Nov. 30, 1880, less sinking fund, \$440,000; aggregate indebtedness, State, co., and municipal, \$7,425,757.

**Commerce.**—N. has no port of entry, but her internal commerce is very considerable, both by R. Rs. and rivers. No complete statistics are attainable. The number of registered vessels in 1881 was 29, all steamboats, with a tonnage of 5887.

**Banking Institutions, Etc.**—N. had in operation, in Oct. 1881, 12 national banks, with cap. of \$910,000; circulation, \$665,000; U. S. bonds to secure circulation, \$739,000; deposits, \$5,557,124. Number of State banks and trust co., 12, with \$269,072 cap. and \$607,905 deposits; number of private bankers, 86, with \$675,900 cap. and \$2,063,586 deposits. Insurance losses of \$303,800 were paid in N. in 1881, and insurance premiums to the amount of \$417,524 received.

**Education.**—The number of children of school age (5-21 yrs.) in 1880 was 142,348, of whom 100,871 were enrolled in public schools, with estimated average attendance of 62,510. Aggregate expenditure for common schools in 1880, \$1,079,966, of which teachers' salaries consumed \$565,651. N. has 4 colls. and univs., employing 37 instructors, and having 661 students, paying tuition fees of \$1800.

COUNTIES.	*Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
Adams.....	11-F	19	10,235	Hastings.....	9,817
Antelope.....	9-F	...	3,953	Valhalla.....	326
Blackbird.....	10-F	21	109	Albion.....	330
Boone.....	10-F	...	4,170	Ainsworth.....	1,782
+Brown.....	8-E	...	...	Kearney.....	1,774
Buffalo.....	10-E	193	7,531	Tekamah.....	1,000
Burt.....	9-H	9,247	6,937	David City.....	4,175
Butler.....	10-G	9,194	12,290	Plattsmouth.....	1,000
Cass.....	10-H	8,151	16,683	St. Helena.....	200
Cedar.....	8-G	1,032	2,899	...	...
Chase.....	11-C	...	70	...	...
+Cherry.....	8-C	...	...	...	...
Cheyenne.....	10-A	190	1,558	...	...
Clay.....	11-F	54	11,394	...	...
Colfax.....	10-G	1,424	6,588	...	...
Cuming.....	9-G	2,964	5,569	...	...
Custer.....	10-E	...	2,211	...	...
Dakota.....	10-F	2,940	3,212	...	...
Dawson.....	10-D	103	2,909	...	...
Dixon.....	8-G	1,345	4,177	...	...
Dodge.....	10-G	4,212	11,263	...	...
Douglas.....	10-H	19,992	37,645	...	...
Dundy.....	11-G	...	...	...	...
Fillmore.....	11-G	238	10,294	...	...
Franklin.....	11-E	26	5,465	...	...
Frontier.....	11-D	...	934	...	...
Furnas.....	11-D	...	6,407	...	...
Gage.....	9-E	3,359	15,164	...	...
+Garfield.....	9-E	...	...	...	...
Gosper.....	11-E	...	1,672	...	...
Greeley.....	10-F	...	1,461	...	...
Hall.....	10-F	1,057	8,572	...	...
Hamilton.....	10-F	129	8,267	...	...
Harlan.....	11-E	...	6,088	...	...
Hayes.....	11-C	...	119	...	...
Hitchcock.....	11-C	...	1,012	...	...
Holt.....	10-F	...	3,287	...	...
Howard.....	10-F	...	4,391	...	...
Jefferson.....	11-G	2,440	8,096	...	...
Johnson.....	11-H	3,429	7,595	...	...
Kearney.....	11-E	58	4,072	...	...
Keith.....	10-C	...	194	...	...
Knox.....	11-G	7,074	28,090	...	...
Lancaster.....	10-D	17	3,633	...	...
+Loup.....	9-E	...	...	...	...
Madison.....	8-F	1,133	5,898	...	...
Merrick.....	10-F	557	5,341	...	...
Nance.....	10-F	44	1,212	...	...
Nemaha.....	11-H	7,593	10,451	...	...
Nuckolls.....	11-F	8	4,325	...	...
Otoe.....	11-H	12,345	15,727	...	...
Pawnee.....	11-H	4,171	6,920	...	...
Phelps.....	11-E	...	2,447	...	...
Pierce.....	9-G	152	1,202	...	...
Platte.....	10-G	1,899	9,511	...	...
Polk.....	10-G	158	6,546	...	...
Red Willow.....	11-D	...	3,044	...	...
Richardson.....	11-H	9,780	15,031	...	...
Saline.....	11-G	3,106	14,491	...	...
Sarpy.....	10-H	3,213	4,481	...	...
Saunder.....	10-G	4,547	13,210	...	...
Seward.....	10-G	2,553	11,147	...	...
Sherman.....	10-E	...	2,081	...	...
Sioux.....	8-B	...	...	...	...
Stanton.....	9-G	636	1,518	...	...
Thayer.....	11-H	...	6,113	...	...
Valley.....	10-E	...	2,334	...	...
Washington.....	10-H	4,432	8,631	...	...
Wayne.....	9-G	182	813	...	...
Webster.....	11-F	16	7,104	...	...
Wheeler.....	10-F	...	444	...	...
York.....	10-G	604	11,170	...	...
Unorganized Terr.....	...	205	2,936	...	...
Total.....	...	122,993	455,492	...	...

\* Reference for location of counties. See map of Nebraska and Dakota in this tiele DAKOTA.  
† Formed since census of 1880.



**Churches.**—The Lutheran denomination has the most adherents, numbering 144 chs., 80 ministers, and 17,500 members; Christians (Disciples of Christ), 75 chs., 13,580 members; Meth. Epis., 96 chs., 12,494 members; Presbs., 121 chs., 4940 members; Baps., 126 chs., 4226 members; Congregationalists, 111 chs., 3121 members; R. Caths., 67 chs., 49 priests; 22 other denominations have from 1600 to 20 members each.

**Population.**—In 1860, 28,841; 1870, 122,993; 1880, 452,402 (white 449,764, colored 2638, including 18 Chi. and 235 Indians).

**Principal Cities and Towns.** Pop. 1880.—Omaha, 30,518; Lincoln (cap.), 13,003; Nebraska City, 4193; Plattsmouth, 4175; Fremont, 3013; Grand Island, 2963; Hastings, 2817; Beatrice, 2447; Columbus, 2131; Crete, 1870; Kearney, 1782; Falls City, 1583; Seward, 1525; Brownville, 1309.

**History.**—N. was a part of the La. terr. ceded to the U. S. by Fr. in 1803. It was traversed by Lewis and Clarke in 1804-05. In 1812 it formed a part of Mo. Terr. In 1844 Senator Douglas introduced a bill for the establishment of a Nebraska Terr., including Kan., Dak., and portions of Col. and Wyo., and the following yr. an amended bill on the same subject, but nothing was done in regard to it. In 1848 he introduced another bill, which was reported the following Apr., and recommitment in Dec., but not acted upon. In 1853-54 the Kansas-Nebraska bill was introduced, which permitted the inhabs. to decide whether slavery should be admitted into their respective Terrs. N. was organized as a Terr. May 30, 1854, and included part of Dak., Mont., most of Wyo., and the N. E. part of Col. In 1861 and 1863 the extent of N. Terr. was greatly diminished by the setting off of Dak., Col., Wyo., and Mont. Terrs. Its pop. increased very slowly at first, as it had little or no gold or silver; but as the Pacific R. R. stretched westward it began to fill up, and its great advantages for agricultural purposes, its rich soil, and genial climate attracted great numbers of immigrants. Its prin. growth has been from 1867 to the present time. It was admitted into the U. Mar. 1, 1867, and lived under the const. then adopted until the close of 1875, when a new const. was ratified by the people, to take effect 1876.

#### Governors.

TERRITORY.		STATE.	
Francis Burt.....	1854	David Butler.....	1867-71
T. B. Cuming (acting).....	1854-55	W. H. James (acting).....	1871-73
Mark W. Izard.....	1855-58	Robert W. Furnas.....	1873-75
Wm. A. Richardson.....	1858	Silas Garber.....	1875-79
J. S. Morton (acting).....	1858-59	Albinus Nance.....	1879-83
Samuel W. Black.....	1859-61	James W. Dawes.....	1883-87
Alvin Saunders.....	1861-66		
David Butler.....	1866-67		

REVISED BY A. R. SPOFFORD.

**Nebraska City,** city and R. R. centre, cap. of Otoe co., Neb., on the Mo. River, 35 m. S. of Omaha and 45 m. E. of Lincoln; has a convent, opera-house, and public library, and is the seat of Nebraska Coll., an Epis. inst. founded in 1865. Pop. 1870, 6050; 1880, 4183.

**Nebuchadnezzar** [in the Babylonian cuneiform texts *Nabu-kuduri-ussur*, "Nebo protects the crown"], the greatest of the kings of Babylon, son and successor of Nabopolassar, the founder of the empire; was of marriageable age at the time of his father's revolt against Assyria (B. C. 625), at which time Amubia, daughter of the Median king, was betrothed to him; regained Carchemish on the Euphrates from the Egyptian king 605; subjugated Syria and Pal., carrying the prin. Jews into captivity in the same yr.; succeeded to the throne 604; besieged Tyre 598; completed the reduction of Judæa 586; destroyed Tyre after a siege of 13 yrs. 585; invaded and ravaged Egypt some yrs. later; rebuilt in a splendid manner all the cities of Upper Babylonia; constructed vast temples, aqueducts, and palaces, of which the ruins still testify to his grandeur. D. about 561. (See RAWLINSON'S *Five Great Monarchies*.)

**Neb'ulae**, the name given to a class of celestial objects characterized by a certain cloudy aspect resembling the light of the Milky Way or the Magellanic clouds, or in numerous cases the diffused light of a comet's tail. Many bodies having this nebulous appearance can by means of powerful telescopes be shown to be merely clusters of apparently faint stars, whose light, commingling together, gives in the feeble telescopes a hazy or nebulous appearance, nor does there appear at present any impropriety in treating of clusters and N. under one gen. name—nebulae. The N. are distinguished from the fixed stars by their apparent diameter, since the latter bodies appear, even under the most powerful magnifying powers, without sensible magnitude. They are, on the other hand, distinguished from the planetary and cometary disks, not only by their peculiar lustre, but by their immobility, since, as yet, a proper motion has not been demonstrated for any nebula except the trifold (G. C. 4355), although changes are known to have occurred within the body of one nebula and perhaps others. (See HOLDEN in Silliman's *Amer. Jour.*, 1876, May.) On account, therefore, of their fixity in position, it has always been considered that the N. belong to the regions of space very far removed from our solar system. Our knowledge of these celestial bodies has been peculiarly dependent upon the successful construction of large telescopes, and is therefore almost exclusively the result of the labors of modern astron., beginning with Sir William Herschel. The extensive catalogues of Sir William Herschel contain descriptions of the various N., which he classifies as follows: 1st, clusters of stars; 2d, resolvable N.; 3d, N. properly so called in which there is no appearance of stars; 4th, planetary N.; 5th, stellar N.; and 6th, nebulous stars. Herschel's classification of both N. and clusters into orders, defined by their actual shapes, is one more philosophical and equally instructive. Thus, we have 1st, circular; 2d, elliptic; 3d, annular; 4th, long or ray-like; 5th, spiral; 6th, very irregular N.

Another equally suggestive classification has regard to the distribution of light over the apparent disk of the neb-

ula; in respect to this, we find, 1st, the perfectly uniform, under which we include in strictness only a few mostly so called planetary N.; 2d, those which exhibit a decided increase of brightness toward the centre, in which class would be enumerated the stellar N. and the nebulous stars, together with numerous clusters and irregular nebula; 3d, those in which an increase of brightness takes place as we proceed from the centre outward, under which must be included the annular N. and some of the more complicated forms, as, for instance, the double annulus in Toucani. An important classification is based on the information derived from the application of spectrum analysis to these bodies. This difficult branch of observational astron. we owe to Wm. Huggins of Lond., who in Aug. 1864 first turned his delicate spectroscopic and moderately powerful refracting telescope upon the planetary N. Secchi, D'Arrest, and a few others, especially Bredichin of Moscow and the younger (or Lieut.) John Herschel, have also contributed to our knowledge of this subject. It is apparent from the observations of these spectroscopists that among the N. we find some whose spectra have the characteristics belonging to the spectra of gases, and this almost entirely irrespective of the apparent resolvability or stellar nature of the nebulous mass. Other N. have the equally characteristic spectra peculiar to glowing solids. In a third and numerous class of N. we place all those whose spectra combine the characteristics of both the preceding classes. [From orig. art. in *J. S. Univ. Cyc.*, by PROF. C. ABBE.]

**Neb'ular Hypothesis**, an hypothesis proposed by Swedenborg (1734), whom Buffon (1749) closely followed, and by Kant and Wright, but elaborated by Laplace and William Herschel, and modified by later writers, according to which the present state of the universe is explained as the result of a process of gradual condensation and evolution from a primordial chaotic gaseous matter. Laplace, in the earliest editions of his *Système du Monde*, conceived that an atmosphere might originally have surrounded the sun extending to beyond the limits of the solar system; that it contracted with the loss of heat by radiation, and threw off in its rotation about a central axis certain rings of matter, which subsequently broke up into the planets and their satellites. He did not suppose that this primordial gas still existed, but that the nebulae were aggregations of stars. Herschel, who in 1794 at first also supposed the nebulae to be composed of stars, finally in 1811 and 1814 read before the Royal Society 2 memoirs in which he advanced the conclusion, based on his studies among the nebulae, that some, and especially the irregular nebulae, must be in part at least composed of nebulous matter, a remnant of an original vapor or gas, and that from this primordial matter there were by a process of condensation still being formed irregular nebulae, nebulous stars, stars, etc. In the order here given. These 2 theories being thus complementary of each other, Laplace, in subsequent editions of his *Système du Monde*, adopted Herschel's primordial nebulous matter and its actual present existence, and extended his own theory so as to include a cosmogony of the entire universe.

Some of the objections to the N. H. are very grave, and in the present state of our knowledge we are forced to decline to accept certain details as propounded by Herschel and Laplace, either substituting therefor ideas derived from the meteoric and cometic theories of Schiaparelli, etc., or from the molecular theories of Clausius, etc., or in other points acknowledging our complete ignorance. Of recent gen. writers upon this subject we refer especially to Herbert Spencer (*Westminster Review*, 1858) and R. A. Proctor. The dynamic principles involved in the formation and preservation or disruption of revolving rings have been treated of by Maxwell, Peirce, and Hirn in memoirs on Saturn's rings, and especially in some remarkable memoirs on *Vortex Rings* by Helmholtz and Thomson, and on *Molecular Vortices* by Rankine, which latter works have a direct bearing on this subject, although perhaps not so intended. [From orig. art. in *J. S. Univ. Cyc.*, by PROF. C. ABBE.]

**Needah**, Wis. See APPENDIX.

**Ne'cho**, in the Bible called **Pharaoh Necho** and in the hieroglyphics **Neku**, king of Egypt, belonged to the 26th dynasty, a son and successor of Psammeticus I., and reigned from 610 to 594 B. C. He defeated Josiah, king of Judah, and penetrated into Babylon, but was afterward routed by Nebuchadnezzar, and lost all his conquests. A canal connecting the Nile with the Ar. Gulf was commenced by him.

**Neck'er** (JACQUES), b. at Geneva Sept. 30, 1732; went in 1750 to Paris as a clerk in a banking-house; established afterward a business of his own, and accumulated a great fortune during the Seven Years' war. In 1764 he retired from business, but continued to reside in Paris as the diplomatic representative of his native city, and acquired great authority in financial matters by his *Éloge* on Colbert and *Essai sur la Législation et le Commerce des Grains*. After the removal of Turgot in 1776 and the short administration of Clugny, N. was appointed director-gen. of the finances in 1777, and the results of this appointment were brilliant. Confidence was restored among capitalists, order was established in the administration, and economical reforms were introduced. But after the publication of his *Compte Rendu au Roi sur les Finances de l'État* in 1781 he was suddenly dismissed. He returned to Geneva, whence he pub. in 1784 his *Administration des Finances*. Meanwhile the administration of Fleury, Calonne, and Loménie de Brienne had brought financial matters in Fr. to a crisis, and on Aug. 25, 1788, N. was recalled and made comptroller-gen. and minister of state. His popularity was at this moment immense, and when the king once more dismissed him on July 11, 1789, Paris rose in insurrection, and he returned to his office in triumph. He was, however, a good banker rather than a great financier, and in the National Assembly he was completely outshone by Mirabeau and others. He resigned Sept. 4, 1790, and d. Apr. 9, 1804.



**Necromancy.** See **Magic**.

**Nectarine**, nek'ta-rin [Old Fr. *nectarin*], a tree and its fruit, differing from the peach, from which it is undoubtedly derived, mainly in having a smooth skin instead of a downy one. In some instances N. have smooth stones, thus approaching still nearer the apricot than the peach. A delicious fruit, but more delicate than the peach, and much exposed to the attacks of the curculio.

**Ned'jed**, an Ar. word signifying "table-land" or "elevated land," is by Ar. writers used in connection with other names, as the N. of Yemen or the N. of Oman, but is by European writers generally applied only to the large table-land of the Ar. peninsula belonging to the Wahabees.

**Nee'dle-Gun** (Ger. *Zündnadelgewehr*), a form of breech-loading small-arms designed for military use, and at present the regulation weapon of the Ger. inf. It is the invention of Nicolaus Dreyse, and is extensively manufactured at Sömmerda, Prus., his native town. Its efficiency has been demonstrated in all the Ger. wars since 1848.

**Nee'ly** (HENRY ADAMS), D. D., b. at Fayetteville, N. Y., in May 1830, grad. at Hobart Coll. 1849; was tutor there until 1851; ordained in the P. E. Ch. 1852; became rector of Calvary ch., Utica, and of Christ ch., Rochester, 1855-62; minister of Trinity chapel 1862, and was consecrated bp. of Me. Jan. 25, 1867.

**Neely** (PHILIP P.), D. D., b. in Tenn. Sept. 9, 1819; joined Tenn. M. E. conference in 1837; had charge of Columbia Female Coll. and was agent for Transylvania Univ.; was member of the Mobile conference at his death. D. Nov. 9, 1868.

**Nee'nah**, city and R. R. centre, Winnebago co., Wis., has abundant water-power. Pop. 1870, 2655; 1880, 4302.

**Negan'nee**, city and R. R. centre, Marquette co., Mich., has extensive iron-mines. Pop. 1880, 3931; 1884, 4103.

**Neg'ley** (JAMES S.), b. at E. Liberty, Pa., Dec. 22, 1826, ed. at Western Univ.; was a private soldier in the Mex. war; raised a brigade of 3 months' volunteers in 8 days, and was commissioned brig.-gen. Apr. 19, 1861; served in Ala. and Tenn. with the Army of the O.; commanded at the battle of Lavergne, Oct. 7, 1862, in which he defeated Anderson and Forrest; was made maj.-gen. for gallantry at Stone River; was engaged in the Ga. campaign; he represented Pittsburg in Cong. 1869-75.

**Negril'los**, **Negritos**, **Alfooroos**, **Arafuras**, names given to the various tribes of the Melanesian or Papuan race. The wild-men of the Philippines are the typical N. They have woolly hair, longer and less crisped than the negroes. The hair of some tribes grows in patches, like that of some S. Afrs. The features of most are of a decidedly Afr. cast, but their langs. are clearly not Afr. The skin is sometimes perfectly black.

**Ne'gro** (derived through the Sp. or It. from the Lat. *niger*, "black"), the name of one of the prominent races or species of mankind. This race is indigenous to the tropical portions of Afr., and extends from about the 15th degree of N. lat., or the S. boundary of the Sahara Desert, to the 20th degree of S. lat., or the country of the Hottentots and Bushmen, and in the W. from the Atlantic Ocean to near the borders of the Indian Ocean toward the E. It is perhaps the most distinct of all the races. The color is very dark; the mouth is protuberant, on account of the forward trend of the jaws and the thick and outward turned lips; the nose is broad and flat; the forehead flat and receding backward; the hair short and very curly; the hair of the face is rather scanty; the thorax more compressed than in the white race; the nates comparatively flattened, and meeting the thighs at nearly a right angle instead of a curve; the arms relatively larger in comparison with the legs, and the distal segments of both comparatively larger than the proximal; the knees are more bent outward; the calves weak; the ankles lower; the foot comparatively flat, and the heels longer; the great toes freer and more opposable to the others. The bones are, on the whole, heavier and whiter; the skull is generally high and narrow; the projecting jaws entail a low facial angle; the pelvis is of the oblong type, and is narrow, conical, or cuneiform, and small in all its diameters; the calcaneum or heel-bone is in nearly a continuous straight line with the other bones of the foot, and projects farther backward. The muscles of the limbs have shorter bellies and longer tendons than in their correspondents in the white race, and those of the calves are less developed. The brain is essentially similar to that of the white race, but as a rule the gyri and sulci seem to be more symmetrically developed, as well as less numerous and more massive, and the nerves are larger, in proportion to the brain, than in the European. The average size is less.

Numerous physiological characters have also been attributed to the N. as distinctive of his race. It has been claimed that there is a greater uniformity of temperament, and that only the choleric and phlegmatic are developed in the race; that the N. is only capable of a minor degree of cultivation, and that he is less subject to malarious diseases than the white race. These statements are to be accepted as only generalities, and not as absolute.

The system of slavery has resulted in the alienage of large numbers of the race from their country and transportation to foreign lands—mostly to the S. part of the U. S., the W. I. islands, and Brazil and Guiana. In all these countries they have largely increased, readily assumed the habits and lang., as well as religion, of the citizens, and exhibited frequently considerable aptitude for higher cultivation. Although their powers of origination seem to be comparatively small, they readily copy the manners of their superiors, and frequently display much superficial polish. They are very emotional, and chiefly select those religions which appeal most strongly to the senses. As a natural result of the transportation of large numbers of the race to foreign countries, there has been an intermixture between representatives of the race and those of the dominant races of the countries to which they have been carried. The offspring between the 2 races are called mulattoes. They are to a

certain extent intermediate as to their characters between the 2 races, but perhaps on the whole exhibit more features of the father than of the mother.

THEODORE GILL.

**Negropont.** See **CEPHEA**.

**Nehem'iah** [Heb. "the Lord consoles him"], **Book of**, a historical book of the O. T. Its author lived in the 5th century B. C. He was a Jew, with the title of *thrashath*, ("cup-bearer") to Artaxerxes Longimanus, and gov. of Judea under the Per. rule after the restoration of the Jews. His work is a continuation of that of Ezra, and is the last in historical order of the O. T. narratives.

**Nelli**, neel (THOMAS H.), b. in Pa. in 1825, grad. at W. Pt. 1847; served mainly on frontier duty and at W. Pt. previous to 1861; in the c. war he organized the 23d Pa. Volunteers, which he commanded throughout the Va. peninsular campaign of 1862; brig.-gen. of volunteers Nov. 1862; commanded a brigade at the battle of Fredericksburg, Dec. 1862; at the storming of Marye Heights, May 1863; at Gettysburg, July 2-3, 1863; in command of a division during the Richmond campaign of 1864 and siege of Petersburg; engaged in the battle of Winchester, Oct. 19, 1864; brevetted from major to maj.-gen. for gallantry. In 1870 he was transferred to the 6th Cav. with the rank of lieut.-col., and after an active campaign against the Indians was in 1875 assigned to W. Pt. as commandant.

**Nelli** (WILLIAM), D. D., b. near Pittsburg, Pa., in 1779, grad. at Princeton 1803; was tutor there 1803-05; was for several yrs. Presb. pastor at Cooperstown, N. J., Albany, and Phila.; pres. of Dickinson Coll. 1824-29; sec. and gen. agent of the Presb. Board of Education 1829-31; minister at Germantown 1831-42; ed. for some yrs. of the *Presb. Magazine*, and author of *Lectures on Biblical Hist.*, *Exposition of the Epistle to the Ephesians*, *Divine Origin of the Chr. Religion*, and *A Ministry of Fifty Years*. D. 1860.

**Nellis'ville**, on R. R., cap. of Clarke co., Wis., on Black River. Pop. 1880, 1050.

**Nélaton'** (AUGUSTE), b. in Paris June 17, 1807, studied med.; became prof. in clinical surgery in 1839; invented a new method of extracting calculi, which he applied with great success. D. Sept. 21, 1873.

**Nelligh**, Neb. See **APPENDIX**.

**Nelles**, nelz (SAMUEL SOBIESKI), D. D., LL.D., b. at Mt. Pleasant, Ont., Canada, Oct. 17, 1823, grad. in 1846 at Middletown, Conn.; became a Wesleyan preacher in Canada, and in 1850 pres. of Victoria Coll., Cobourg.

**Nel'son** (DAVID), M. D., b. near Jonesborough, Tenn., Sept. 24, 1793, grad. at Washington Coll., Va., 1810; studied med. at Danville, Ky., and at Phila. Med. School; served in Canada as surgeon during the war of 1812; was for some yrs. a sceptic upon religious topics, but became a Presb. minister (1825) in Tenn., Ky., and Mo.; was the founder and first pres. of Marion Coll., near Palmyra, Mo., 1830, which existed but a few yrs.; established near Quincy, Ill., an inst. for the training of students for the ministry, which also failed; was actively engaged in the anti-slavery cause, and wrote *The Cause and Cure of Infidelity*. D. Oct. 17, 1844.

**Nelson** (HORATIO), Viscount Nelson of the Nile, duke of Bronté, b. at Burnham Thorpe, Norfolkshire, Eng., Sept. 29, 1758; obtained at 12 an appointment as mdpn.; accompanied Capt. Phipps's Arctic expedition 1773; served in the E. I. 1775-76; became lieut. Apr. 8, 1777, and post-capt. July 11, 1779; given command of a man-of-war, with which he took Ft. San Carlos in the San Juan River; captured 4 Amer. vessels for violation of the navigation laws; commanded a small squadron on the coast of Corsica which co-operated with Paoli, and took Bastia May 1794; aided in the siege of Calvi, where he lost an eye; participated in Admiral Hotham's victory over the Fr. squadron Mar. 15, 1795; took the island of Elba; blockaded Leghorn Apr. to Oct. 1795; distinguished himself under Admiral Jervis in the naval victory over the Fr. fleet off Cape St. Vincent Feb. 14, 1797; was appointed rear-admiral Apr. 1797; took part in the blockade and attempted bombardment of Cadiz May to July, and in the unsuccessful attack upon Santa Cruz, Tenerife, July 1797, where he lost his right arm; followed Nap.'s expedition to Egypt, and destroyed the Fr. fleet at the Bay of Aboukeer, being wounded in the engagement, Aug. 1, 1798; aided the govt. of Naples in resisting the Fr. invasion and in recovering the cap. after it had been taken, but stained his reputation by violating the capitulation concluded June 23, 1799, and hanging Caraccioli, the insurgent admiral; aided in the siege of Malta; was made vice-admiral Jan. 1801; was second in command of the Baltic fleet in the naval battle of Copenhagen, Apr. 2; took command of the squadron for the defence of Eng. against the contemplated Fr. invasion in July; attacked the Fr. flotilla off Boulogne Aug. 15; blockaded Toulon; unsuccessfully pursued a Fr. fleet to the W. I. May 1805; inflicted a total defeat on the combined Fr. and Sp. squadrons off Cape Trafalgar, losing his life in the engagement, Oct. 21, 1805.

**Nelson** (JOHN), b. in Frederick, Md., in 1791, grad. at William and Mary Coll. 1811; was M. C. 1821-23, *chargé d'affaires* to the Two Sicilies 1831-33, and atty.-gen. of the U. S. from Jan. 2, 1844, to Mar. 5, 1845. D. Jan. 8, 1860.

**Nelson** (SAMUEL), LL.D., b. at Hebron, N. Y., Nov. 10, 1792, grad. at Middlebury Coll. in 1813; was admitted to the bar in 1817; became a lawyer of Cortland co., N. Y.; judge of the circuit court 1823-31, of the State supreme court 1831-37, its chief-justice 1837-45; in 1845 was appointed judge of the U. S. supreme court, from which he retired in 1872; member of the joint high commission to settle the Alabama claims 1871. D. Dec. 13, 1873.

**Nelson** (THOMAS), b. in York co., Va., Dec. 26, 1738, was ed. at Trinity Coll., Cambridge, and before his return, when just 21, was chosen to the house of burgesses of Va.; was a member of the Williamsburg convention 1774, of the convention of 1775, and of the Va. constitutional convention of 1776; was in Cong. 1776-77 and 1779; signed the Dec. of Ind.; served as col., and afterward as a gen. officer, in the army; was gov. of Va. in 1781; expended his great fortune



for the cause of liberty, and at the siege of Yorktown directed the artill. to play upon his own mansion, the supposed headquarters of Cornwallis. D. Jan. 4, 1789.

**Nelson** (THOMAS A. R.), b. in Roane co., Tenn., Mar. 19, 1812; grad. at E. Tenn. Coll. in 1838; was admitted to the bar before he had attained the age of 21, and was appointed dist. atty. for the first dist. of Tenn. in 1833; in 1844 canvassed his dist. as elector for Henry Clay, and in 1848 for Gen. Taylor; in 1851 was appointed com. of the U. S. to Chi., but declined to accept; in 1859 was elected M. C. He adhered to the cause of the U. during the c. war, but at its close befriended the South; was one of the counsel who defended Pres. Johnson upon his impeachment in 1868; in 1870 was elected one of the 6 judges of the State supreme court under the new const., but resigned after a little more than a yr.'s service on the bench. D. Aug. 24, 1873.

**Nelson** (THOMAS HENRY), b. in Mason co., Ky., about 1824; studied law; removed to Rockville, and subsequently to Terre Haute, Ind., where he became a political leader of the Whigs and one of the founders of the Rep. organization; was several times delegate to national and State conventions, candidate for Presidential elector, for Cong., and other offices, but was usually defeated, as he resided in a strong Dem. district; was minister to Chili 1861-66, where he was conspicuous in the rescue of numerous victims at the burning of the Jesuits' ch. at Santiago Dec. 6, 1864; took an active part as mediator between Chili and Sp. in the war of 1864-66; was envoy to Mex. 1869-73, and afterward resided as a lawyer at Washington, D. C.

**Nelson** (WOLFRED), M. D., b. at Montreal, Canada, July 10, 1792; became a phys. 1811; was surgeon to a Canadian battalion during the war with the U. S. 1812-15; elected to the Canadian Parl. for Sorel 1837; engaged in a rebellion against the Brit. govt. 1837; won an engagement at St. Denis on the Richelieu River, but was captured and exiled to Bermuda; settled at Plattsburg, N. Y., 1838; returned to Montreal 1842 on the amnesty; was M. P. 1844-46; became inspector of prisons 1851; was pres. of the Coll. of Phys. and Surgeons; twice mayor of Montreal. D. June 17, 1863.

**Nelsonville**, O. See APPENDIX.

**Nelumbrum**, a genus of water-plants, akin to the water-lilies (Nymphaeaceae); contains only 2 or 3 species. The *N. speciosum* (the Egyptian bean, nelumbo of the Ceylonese, lotus of Tibet and India) furnishes in Chi. and the E. much food. This plant is nearly or quite extinct in Egypt, where it was once worshipped. The *N. luteum* of the U. S. has dull yellow flowers (those of the preceding generally are rose-colored). Its roots and seeds are very palatable.

**Nemean Games**. See GRECIAN GAMES.

**Nemesianus** (MARCUS AURELIUS OLYMPIUS), a Lat. poet, b. at Carthage in middle of 3d century of our era, and wrote didactic poems on hunting, fishing, etc., of one of which, *Cynethetica*, a considerable fragment, is extant.

**Nemesis** [Gr. *Némesis*], the Gr. goddess who personifies the idea of strict divine retribution. In the earlier writers she stands for the guilty conscience, and later she appears as the just dispenser of good and ill fortune.

**Nemesius**, a Chr. philos. of whose life nothing is known, except that he was bp. of Emesa and lived about 400 A. D., but of his works one is still extant—*Ἡερί Φύσεως Ἀνθρώπου*. It was for a long time attributed to Gregory of Nyssa, and under his name translated into Lat.

**Nemours**, neh-moor', de (LOUIS-CHARLES-PHILIPPE-RAPHAEL D'ORLÉANS), DUKE, second son of King Louis Philippe, b. 1814; served at the siege of Antwerp, and in 1836 and 1837 in the 2 expeditions against Constantine. The occasion of his marriage the yr. after became the cause of the deposition of the Sout ministry, owing to the rejection by the Fr. Chambers of a bill of "dotation" which the ministry had brought in. As the eldest living son, the regency by law devolved on him on the abdication of the king, but neither he nor his junior brothers were disposed to have recourse to what might result in c. war. His life of exile in Eng. was passed in great seclusion. Since the abrogation of the decree of exile he has been restored to his former rank of *général de division* in the Fr. army.

**Nemulus**, the supposed author of the *Historia Britonum* or *Englogium Britannie*, a Lat. hist. of Britain from the arrival of Brutus the Trojan, grandson of Æneas, to A. D. 655. According to several passages of this work, the writer was a monk of Bangor, Wales.

**Neo-Platonism**, in the more limited sense of the word, is the name of a philosophical school which originated in Alexandria in the 3d century after Christ, was tempt of the doctrines of Plato, and denotes the last attainment of the speculative spirit of the Gr. civilization to establish a scientific basis for its development. The school was founded by Ammonius Saccas (241 A. D.), further developed by Plotinus (205-270), and continued by Porphyrius (233-305), Iamblichus, Proclus (412-485), and others. In a wider sense the name is applied to the whole speculative tendency which grew up in Alexandria from the amalgamation of Gr. philos., Oriental theosophy, and Jewish and Chr. theol. Philo Judeus (48 A. D.), Clemens Alexandrinus (220), Origen (185-254), and the Gnostics are severally representatives of the Neo-Platonic form of speculation.

**Nepaul**, or **Nepal**, an independent state of Hindostan, situated between Tibet and Brit. India. The S. part of the country consists of a belt of low land covered with tropical forests, which yield many sorts of valuable timber, but which is hot, utterly unhealthy, and infested with wild animals, such as elephants, tigers, and leopards. From this low land the ground gradually rises, first into hills, where rice, maize, millet, sugar, indigo, and coffee are cultivated, mostly on artificial terraces along the hillsides; then into mts., in whose elevated valleys wheat, oranges, walnuts, grapes, and other kinds of fruits are grown; and then into alps, among which are the highest peaks of the Himalayas, and on whose pastures large herds of cattle, sheep, and goats are reared. Iron, copper, lead, tin, zinc, and salt

have been found and are mined; cotton cloths and earthenware are manufactured; timber, hides, ivory, fruits, sheep, cattle, and elephants are exported. The inhabs. consist of several tribes, of which the Gorkhas, of Hindoo descent and faith, form the warrior-caste and hold the govt., while the Newars, of Mongolian origin, and Boeddhist, make the artisans; a third tribe, the Marm, have retired to the mts., where they live as agriculturists. Cap. Khatmandoo. Area, 53,000 sq. m. Pop. 5,000,000.

**Neodesha**, Kan. See APPENDIX.

**Neosho**, Mo. See APPENDIX.

**Nepenthes**, a remarkable genus of pitcher-plants (the sole type of a peculiar order, Nepentaceae) of over 30 species, all natives of the S. tropical region of which the Indian Archipelago is the centre, ranging from Madagascar to New Caledonia. Several are cultivated as curiosities in conservatories. Their peculiarity is in the leaves: these are rather long and narrow, traversed by a very strong midrib, which is prolonged into a tendril serving for climbing, the apex of this developed into a tubular or oblong pitcher, closed with a hinged lid. Until the pitcher is full grown the lid closes the orifice. A watery liquid, having a slight acid reaction, is secreted in the pitcher in small quantities. At maturity the lid opens, and remains so, more or less elevated on its hinge. About the rim of the pitcher a sweet secretion forms under favorable circumstances, which is attractive to insects; and dead insects generally abound in the pitcher. The recent researches of Dr. Hooker nearly prove that the liquid within possesses digestive properties, and that its powers of dissolving animal matter are augmented by a peculiar secretion, hardly if at all poured out until insects or other animal substances are introduced. (For analogous cases see PITCHER-PLANTS.) A. GRAY.

**Nepheline**, nef'-e-lin [Gr. *νεφέλη*, "cloud"], a silicate of alumina, soda, and potash, crystallizing in hexagonal system and allied to feldspars. It occurs in volcanic rocks.

**Nephrite** [Gr. *νεφρός*, "kidney," so named from being formerly worn as a remedy for diseases of the kidneys], or **Jade**, a compact translucent stone, generally greenish in color, variable in composition, but essentially a variety of hornblende; much valued by savages for stone weapons.

**Nepomuk** (JOHN), a saint of the R. Cath. Ch., the patron saint of Bohemia, b. at Nepomuk, Bohemia, about 1390; studied at the Univ. of Prague; became rector of the ch. of St. Gall in that city, and was appointed court-preacher to the emp. Wenceslas in 1378. In this position he opposed the cruelty of Wenceslas, but at last, in 1379, he was imprisoned, tortured, and thrown into the Moldau. His body was found and buried; many miracles were wrought at his grave, and on Mar. 19, 1729, he was canonized by Pope Benedict XIII.

**Nepos** (CORNELIUS), a Rom. historian, and a friend of Atticus, Cicero, and Catullus; d. under Augustus; wrote various works, all of which have been lost with the exception of parts of his *De Viris Illustribus*. The work *Vite Excellentium Imperatorum*, now commonly used as a school-book, and generally ascribed to C. N., was first printed under the name of Æmilius Probus, an obscure writer of the 4th century. But Lambinus claimed the authorship of the book for C. N., and identified it as a part of his lost *Die Viri Illustres*.

**Neptune** (Lat. *Neptunus*), the principal sea-god of the anc. Roms. He is completely identified in later times with the Gr. Poseidon, who was the god of the Mediterranean, the creator of the horse, and one of the great gods of the maritime Grs. He was the son of Cronos and Rhea, and the husband of Amphitrite.

**Neptune**. The discovery of this planet is justly regarded as the most remarkable astronomical achievement of the century. Up to about the beginning of the present century it was found that the motions of all the planets could be perfectly accounted for by the attraction of the sun and their mutual attraction on each other. But when, about 1820, Banvard proceeded to construct tables of Uranus, then the outermost known planet, an apparent exception presented itself, and the observations could not be reconciled with the motions computed from the attraction of the sun, Jupiter, and Saturn. The cause of this deviation was a subject of consideration among astrons., and it seems to have occurred to several that it might be due to the action of an unknown planet beyond Uranus. In 1840 the deviations had become so wide, amounting to 2' of arc, that they attracted more attention than before.

Mr. John C. Adams was then a student at Cambridge. In the summer of 1841 he became acquainted with the state of this question by reading a report of Mr. Airy, and it occurred to him that it ought to be within the power of math. to calculate the position and movements of the disturbing planet from the observed deviations of Uranus, and he determined to undertake the problem as soon as his studies would permit. In the autumn of 1845 he had so far advanced as to have computed an approximate orbit of the hypothetical planet, and about the end of Oct. of that yr. he communicated the position of the planet to Prof. Airy, within 1½° of the real position of N. But Prof. Airy had so little confidence in the prediction that he did not take the trouble to look for the planet. In the mean time another person entered the field. This was Mr. U. J. Leverrier, then a young man of little over 30, who had proved his mathematical ability by a very important paper on the secular variations of the orbits of the planets. In June 1846 he presented to the Paris Acad. of Sciences a paper in which he assigned an approximate position of the planet, agreeing very nearly with that already found by Adams. After Airy heard this he began to consider the planet worth looking for, and at his suggestion Prof. Challis, director of the Cambridge Observatory, commenced a search. Meanwhile Leverrier was engaged in determining more accurate elements, which he communicated to the Acad. about the end of Aug. Being now entirely confident that the planet must be very near the assigned place, he wrote to Dr. Galle of



Berlin requesting him to search for it. Galle received the letter on Sept. 23, 1846, and the very same evening went to the telescope and proceeded to compare the stars in the neighborhood of the assigned place with a star-chart of that region which had just been finished. He soon found a star of the seventh or eighth magnitude which was not on the chart, within a degree of the position sent by Leverrier. As it presented a sensible disk, there could be no reasonable doubt that it was the object sought. But, desirous of proceeding with caution, he waited till the following night, when he found that it had actually changed its position among the stars. There was no longer any doubt of the reality of the discovery. After considerable discussion astrons. in general agreed upon the name Neptune for the newly discovered planet.

This planet, which, so far as is yet known, is the most remote from the sun of all the members of the solar system, moves in an orbit nearly circular, having an eccentricity of only 0.00872; yet on account of the vastness of the dimensions of this orbit, the absolute eccentricity in miles exceeds 25,000,000, and the difference of its distances from the sun in aphelion and perihelion is more than 50,000,000. The inclination of the orbit to the ecliptic is  $1^{\circ} 47'$ , and its mean radius about 2,746,000,000 m. The period of revolution of the planet is about  $164\frac{1}{2}$  yrs., and its diameter about 37,000 m. Its bulk is therefore more than 100 times that of the earth, but its density is so much less ( $\frac{1}{4}$ ) that it has only about  $16\frac{3}{100}$  times as great a mass. N. has a single satellite, discovered in 1847 by Mr. Lassell of Liverpool. Its period is 5d. 21h. 2m. 44s., and its mean distance from the planet about 230,000 m. [From orig. art. in *J's Univ. Cyc.*, by Prof. S. NEWCOMB, LL.D., F.R.A.S.]

**Nereids** (Gr. *Nepereis*, pl. of *Nepereis*), the 50 daughters of the sea-god Nereus by Doris, his wife. The ancients regarded them as the nymphs of the Mediterranean Sea, as opposed to the Oceanids, nymphs of the ocean-sea or outer sea.

**Nereids.** See SEA-MOUSE.

**Nero**, Rom. emp. from 54 A. D. to 68, b. at Antium, on the coast of Latium, Dec. 15, 37 A. D., a son of Cn. Domitius Ahenobarbus and Agrippina, a daughter of Germanicus Caesar and a sister to the emp. Caligula, was adopted by the emp. Claudius in 50. In 53 he was married to Claudius's daughter, Octavia, and on Oct. 12, 54, he succeeded to the imperial throne by the intrigues of his mother. The prin. events of his reign were the long war with the Parthians; the insurrection of the Jews, put down by Vespasian; the rebellion in Britannia under Boadicea, suppressed by Suetonius Paulinus; the conflagration in July, 64, by which  $\frac{3}{4}$  of the city of Rome was burned down; the rebuilding of the city by the emp. on a magnificent scale, etc. But even his own time, which had borne and educated him, considered him a monster. The most groundless suspicions and the most unnatural jealousies drove him to actions which the cruellest tyrants never have committed save in the frenzy of passion. In 68, when he had just returned from a journey in Gr., he was overwhelmed by an insurrection in Gaul, Sp., and Rome itself. He fled, and killed himself in the house of one of his freedmen, near Rome, June 11, 68.

**Ner'va** (MARCUS COCCÆUS), Rom. emp. from 96 to 98 A. D., b. at Narnia, in Umbria, in 32 A. D.; was elected emp. by the senate on the death of Domitian, Sept. 18, 96; carried through some reforms in the administration; adopted Ulpian Trajanus, commander of the army of the Rhine, and d. Jan. 27, 98.

**Nervous Diseases**, affections of the nervous system, which are either organic or functional—i. e. diseases produced or accompanied by an anatomical alteration which can be recognized with the naked eye or the microscope, and such as are caused by morbid states not accompanied by any such alterations. It is, however, probable that intimate chemical changes, not to be recognized with our present means of observation, occur in organs which are "functionally" diseased. The growth of physiological and psychological knowledge in the last few yrs. has caused mental affections to be classed with N. D. Beside these, there are the following prin. morbid states (many of which are treated of separately in this work under appropriate headings): anemia, hyperemia, mal-nutrition of the great nervous centres; hysteria, spinal irritation, epilepsy, chorea, neuralgia, tetanus, catalepsy; inflammations of the brain, spinal cord, and nerves (and their envelopes); tumors and injuries of the same; apoplexy. It should be borne in mind that many N. D., so called, are only expressions of general pathological states, or sympathetic reactions to local morbid states of non-nervous organs. It has been thought that certain N. D., such as insanity, hysteria, epilepsy, etc., become more frequent with increasing civilization. This is not fully established, and yet there can be no doubt that the strains of social life, the struggle for existence, the enormous striving of ambition, the intemperate use of sensual gratifications, cause the above diseases in a more or less direct manner. N. D.—or more exactly speaking, the liability to N. D.—are very easily transmitted from parents to their children, this being most strikingly shown in insanity, hysteria, epilepsy, neuralgia, and apoplexy. An important factor in the development of N. D. is wrong education, the cultivation of the mental powers during the age of growth; not enough rest, and insufficient (especially fatty) food being allowed. The evil effects of school-life are seen in both sexes, though perhaps more often in the female. *Mens sana in corpore sano* is not a mere adage, but a physiological truth.

E. C. SEGUIN.

**Nervous System, Ganglionic.** See GANGLIONIC NERVOUS SYSTEM, by Prof. E. C. SEGUIN, M. D.

**Nes'mith** (JAMES W.), b. in Washington Co., Me., July 23, 1830; removed in youth to N. H., in 1838 to O., thence to Mo., and in 1843 to Or.; served as an officer in Indian wars; was U. S. marshal for Or. 1853-55; was Dem. U. S. Senator from Or. 1861-67; was elected to Cong. in 1873, and has held other important offices in Or.

**Nes'mith** (JOHN), b. in Londonderry, N. H., Aug. 3, 1793; began his career with few resources, but became a successful merchant of New York with his brother Thomas; removed in 1831 to Lowell, Mass., where he became a prominent manufacturer, real-estate owner, and inventor; was one of the founders of Lawrence, Mass.; was lieut.-gov. of Mass. 1863; was distinguished for liberality in charitable causes. D. Oct. 15, 1869.

**Nes'selrode, von** (KARL ROBERT), COUNT, b. Dec. 14, 1780, at Lisbon, where his father was Rus. ambassador; entered very early on a diplomatic career; was made minister of foreign affairs in 1812, vice-chancellor of the empire in 1829, chancellor in 1844, and governed the relations of Rus. with foreign powers to 1856, when, after signing the Peace of Paris, he retired into private life. He played a prominent part in all the diplomatic negotiations which preceded and followed the downfall of Nap. I., and adhered stubbornly to the policy of the Holy Alliance. His *Autobiography* was pub. after his death. D. Mar. 23, 1862.

**Nes'tor** (Nes'tor), the friend of Hercules, the aged hero of the Grs. at the siege of Troy, distinguished alike for valor, wisdom, justice, and eloquence. He was honored by those seeking advice and direction as though he were of equal authority with the immortal gods.

**Nestor'ians**, a portion of the Oriental Ch., adherents of Nestorianism (dioprosopysm, two-person-ism), a Christological theory which takes its name from Nestorius, who was not its first nor ablest, but became its most renowned, representative. I. Nestorius was a native of Germanicia in Syria, and became a pupil of Theodorus of Mopsuestia (383-428), and from him received the views characteristic of the school of Antioch. First a monk, then a presbyter in Antioch, his gifts caused him to be chosen patriarch of Constantinople (428-431). The new patriarch and his presbyter, Anastasius, heard in Constantinople on every hand the darling phrase of the school of Alexandria, "Mary, mother of God"—a phrase which the extreme wing of the school of Antioch would not tolerate. The presbyter (428) assailed this phrase. Proclus, the unsuccessful rival of Nestorius for the patriarchate, eagerly caught at the opportunity of assailing Nestorius through his presbyter. Nestorius stood by Anastasius. Dorotheus, the court-bp., pronounced an anathema against those who should style Mary the mother of God. At the festival of the Annunciation (429) Nestorius and Proclus preached in the same ch., against each other. The monks and people rose in fury, renounced fellowship with the patriarch, who in his anger had the monks scourged, and at a local synod (429) anathematized his opponents as Manicheans.

II. Cyril, bp. of Alexandria (412-444), now entered into the conflict. His theol. was antagonistic to that of Antioch, and his see was the rival of Constantinople. Nestorius afforded him the opening for dealing one decisive blow against both the objects of his dislike. Cyril charged Nestorius with making two persons, of two natures, and thus denying the proper personal deity of Christ, making him in one person God, in another person man, and not, as he was in truth, in one person, the God-man, so that every act and every passion was personal, though it were according to one or the other nature. At the synod of Alexandria (430) Cyril issued 12 anathemas, to which Nestorius replied in the same form.

III. The third Ecumenical Council was convened at Ephesus (431). The emp. Theodosius II., who called it, was friendly to Nestorius. After a delay of 15 days, in consequence of the involuntary detention of John and the other Syrian bps., the council proceeded in their absence. In a very hurried way, to condemn and depose Nestorius and acknowledge the anathemas of Cyril as the true doctrine of the Ch. The delayed bps. held a separate council, and made decisions reversing all that had been done by the other. Nestorius voluntarily retired to his old cloister. The emp. attempted to unite the parties at the Council of Chalcedon (452), but without success. The deposition of Cyril, Memnon, and Nestorius had been pronounced in form by the emp., but only in the case of Nestorius did it take effect. The overthrow of Nestorius made it safe for Cyril to accept the advances of the emp. toward a settlement of the controversy. A formula was prepared by Theodoret (433) which confessed that there is, without confusion, such a union of the two natures in the one Christ as to justify the lang. that Mary is the mother of God. This was signed by Cyril on the one side, and on the other side John of Antioch concurred in the anathema pronounced on Nestorius. Many of the earnest men on both sides, but especially those of the school of Antioch, were dissatisfied with the compromise. The emp. urged it. Theodoret yielded on condition that he should not be required to sign the condemnation of Nestorius. Meletius and Alexander continued their resistance, and were deposed. Nestorius had now lost all favor with the emp., and he was hunted from one place of exile to another until his death (450).

IV. The Nestorian party did not become extinct. Their school at Edessa, a daughter of the school at Antioch, trained men for the priesthood of the Ch. in Per. It was the policy of the Per. kings to foster the division between their own Chr. subjects and the Chrs. of the Rom. empire. The N. established a distinct ch. govt., and called themselves not Nestorians—which was the title by which their enemies stigmatized them—but Chaldee Christians. At the Council of Seleucia-Ctesiphon (498-99), a statement of their doctrine and of its divergence from what claimed to be orthodox was made, and the Ch. of Per. was formally separated, making its doctrinal basis the assertion that Christ consists of two substances, two natures, and of two persons or hypostases, in one "partsupo" of filiation, the natures continuing to subsist unchanged, and the persons also. Partsupo seems to mean "hypostatical relation."

V. In the 6th century Nestorianism spread into Egypt and Ar. At the beginning of the 11th century we find N. in



Tartary. They ultimately established congregations in India and Chl. During the Ar. domination the high places of state were open to them. In the 19th century they were oppressed, and from that time there has been a decline in their activity.

VI. The N. remained under one ecclesiastical head until in the 16th century. The influence of Rome was sufficient to divide them in the choice of their patriarch in 1551. One party favored Sulakas, who under the name of John had been consecrated by Julius III. The others adhered to Simeon Barmas. The partisans of John went over to the Ch. of Rome, and form the United Nestorians or Chaldee Christians. They acknowledge the primacy of the pope and the 7 sacraments, and observe the ritual of the Gr. Ch. Their patriarch has his see at Diarbekr. The non-united N. acknowledge 3 sacraments only, baptism, the Lord's Supper (in both kinds and without solitary masses), and ordination. They have been styled for these and other reasons "the Protestants of the East." They have no pictures or images. Their clergy are allowed to marry. The internal energy which once marked the Nestorian chs. has almost vanished.

VII. Missions have been attempted by Amers, among the N. in Tur. and Per. Among the laborers in this work the most distinguished has been Dr. Perkins since 1834. (See GRANT'S *Nestorians*.) C. P. KRAUTH.

**Nests of Birds.** Of all the features that characterize bird-life, and separate it in the most marked manner from every other form of vitalized existence, the most distinguishing are what we call their *nests*. Its many exposures of life, its numerous enemies, and the constant dangers to which it is subjected render a large propagation necessary for its preservation. The common *Oryz. Virginianus*, or quail, of E. N. Amer., has been known to have 36 eggs in a single N., and such a case illustrates the peculiar advantages of this manner of reproduction, for the weight of the aggregate product of one N. before maturity is many times that of the parent. To provide for even a single bird of this numerous flock by any internal organ would be inconsistent with its safety. It is all the more apparent that to rear so large a brood requires a receptacle wholly separate and external. This external shelter we call a nest, even though it may be nothing more than the bare rock or the flat house-top. Some N. are wonderful in their design and beautiful in their structure. Others are simple and even rude in form, and many are an unchanged place, suitable in itself and without additional adaptation. The N., in the economy of the bird, corresponds in its uses and its duties with the uterine organs of all mammals and the marsupial pouches of certain others. It becomes to the bird an external organ for continuing the means of reproduction distinct and separate, and is indispensable for the proper development of the immature young from the egg to a maturity more or less advanced.

Attempts have been made to classify the various features exhibited by different birds in the construction of their N. These have been necessarily incomplete. Birds classed as "ground-builders," for instance, do not always build on the ground, but very many species, whose natural instincts would thus prompt, are not infrequently taught by the insecurity of this position to nest elsewhere. Again, ground-builders may be also what are classed as "miners," or "mound-builders," or may deposit their eggs on the bare surface, making no N. whatever. "Masons" may be also "cementers." Some, without being "miners" in the exact sense, always make use of excavations in the earth, and others, without being themselves "carpenters," usually accept and make use of holes in trees, natural or artificial. Some are true "parasites," always dependent upon other birds for rearing their young, or are only partially so; and again others are at times partially parasites, and on other occasions provide for themselves with remarkable ingenuity and in the most thorough manner. The "ground-building birds," including all that occupy its surface or penetrate within it, and those that resort to high cliffs and to remote islands, comprise with more or less exactness, not far from  $\frac{1}{2}$  of all the several species, including all the diving birds, nearly all the swimmers, and a large proportion of the shore-birds and waders. But very many shore-birds, waders, grebes, etc., and also birds which nest on the ground in swampy places, construct large and elaborate N. of reeds, rushes, and other water-plants in a moist and decaying state, chosen because of their pliable condition, and not because a moist N. is desired. Very many of our land-birds, as the song-thrush, the robin, etc., use moist materials in building their N., but only occupy it when it has become dry. The robin (*T. migratorius*) always works from preference in rainy weather.

Several species belonging to different genera have been grouped together in some systems as "masons," so called because they knead together, in the manner of the house-builder, a rude mortar of tempered earth or clay. It is not a well-marked group, and all its members might claim a place in other connections. The barn-swallow of Amer., the house-swallow of Europe, and several other species of *Hirundines* are true masons. Our own *Hirundo horreorum*, which once nested only in caves or under overhanging cliffs, now attaches its elaborate and curiously wrought N. to the sides of rafters in barns, under the protection of their roof, and even to the porches of dwellings. These are made of the finest mason-work, are put together in the most artistic manner, piece by piece, with an order and a regularity quite curious. And attached to the nest there is often an equally elaborate extra platform designed for the use of the mate, on which it can sit, and where, when the young no longer require the cover of a parent, the latter may stay and keep them company.

Certain classes of birds build what are styled "platform nests." Nearly all the eagles are true platform-builders, the only exceptions being those that use cliffs as substitutes for platforms and add little to their natural advan-

tages. Others, like our own white-headed eagle, when they build in trees, construct large and massive structures of 5 or 6 cubic ft., and almost as solid as the natural rock-plat-

FIG. 1.

*Haliaeetus leucocephalus* (Bald Eagle).

form of the golden eagle. In striking contrast with these are the slight N. of nearly all the Columbidae, the cuckoos, etc. These are platforms of the frailest description, made

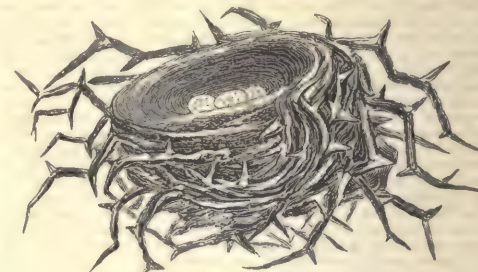
FIG. 2.

*Zenaidura macroura* (Carolina Dove).

of a few sticks loosely laid together, and as loosely crossed with other sticks, the whole so rudely made as apparently not strong enough to keep together, and not suitable to preserve the egg from falling to the ground. An ex-

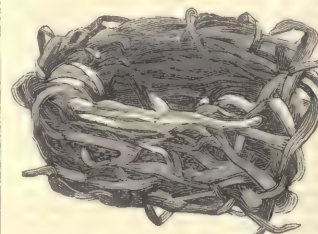
ample is the nest of the Carolina dove. A large group of nest-makers are classed together as "basket-makers." It is designed to include birds which

FIG. 3.

*Mimus polyglottus* (Mocking-Bird).

construct a rude basket-work of sticks, not unlike the common baskets of osier. The mocking-bird builds as an

FIG. 4.

*Xanthocephalus icterocephalus* (Yellow-headed Blackbird).

outer framework for its N. a strong barricade of brambles and thorns, and places within this rude basket an elaborately woven structure made of the finest roots.

FIG. 5.

*Pitangus derbianus* (Mexican Fly-Catcher).

among basket-makers the remarkable N. of the Mex. fly-catcher (*Pitangus derbianus*). This bird, not larger than our common king-

bird, builds a structure of enormous size, sometimes 3 or 4 ft. in length and about 2 in breadth. The cavity is on the top and of suitable size. The huge structure is loosely made of coarse materials, twigs, dried plants, leaves, etc. In its chinks and cavities smaller birds seek shelter, and are permitted to build their own nests in peace and safety, the warlike proprietor of the whole driving far off each thing of guilt and sin in the form of hawk, owl, or other bird of prey, but never molesting its tenants who seek shelter for themselves and offspring within its walls.

The "weaving" birds construct N. for the most part, more or less pensile, but of very various styles and shapes. All the orioles are first-class weavers, and their N. partake somewhat of the peculiarities of the basket-makers and the so called tailor



birds, and are all conspicuous for the wonderful skill with which they are wrought, their beauty of design, and the strength with which the materials are intricately woven together. The vireos, of which there are in N. Amer. 16 different species, all construct a curious pensile N., hemispherical in shape, and peculiar to the genus. These birds build in communities. The bottle-nest sparrows of India have N. of equal ingenuity. Another species of the weaving grosbeaks (*Loxia socia* of Linnaeus) greatly excel all of the family, at least in the extent of their workmanship. They build an enormous structure, in shape resembling an open umbrella, wrought, in the manner of a thatched roof, of Bush-

FIG. 6.



Ploceus socius (Social Weaver).

man's grass without any intermixture, and so completely woven as to be impervious to rain. Under the shelter of this canopy each pair build their own particular N., placed under the eaves. Each individual N. is 3 or 4 inches in diameter; they are all in contact with one another around the eaves, and each N. has its own individual aperture forming the entrance.

The tailor-bird of India is known to bend over one end of a leaf and to sew it securely to the stem-end, and to place its tiny N. in the hollow thus created. Our own northern blue yellow-backed warbler (*Parula Americana*) constructs its N. of the long gray lichens of our forests, the entrance being usually on one side. Even more strikingly beautiful is the N. of the yellow-throated warbler of the S. States (*Dendroica dominica*). Here the long pendent moss of the Southern swamps is carried up and fastened in loops; mosses 3 ft. in length are fastened together into a woven bag of half the original length. In the centre is hidden the tiny N. wrought of the softest vegetable down. Another interesting group, styled by Prof. Rennie the "felt-makers," is distinguished not so much by the architectural peculiarities of their N. as by the remarkable changes they create in the character of the materials they use. The group includes 2 kinds, the true felt-makers, who create a composite material, and those that use only a single material. The finches of both the Old and the New World are typical felt-makers. Of these the canary, the several goldfinches, and the chaffinches may be mentioned as examples. In the N. of the finches there is always an external framework, filled out and lined with felting.

All the Polioptila of N. Amer. and the W. I. are superior felt-makers. The black-capped species of St. Lucas (*Polioptila melanura*) uses the living tendrils of a wild vine as the framework of its N., interweaving with them its soft felted N. so intricately as to render them inseparable. A distinct group are the "dome-builders." They construct covered N. entered by holes in their sides. With many species the domed cover of their N. is not a uniform feature. The golden-crowned thrush and the black and white creeper have almost always a covered N., yet both occasionally build without any cover.

Another singular peculiarity, found only in species belonging to a few genera, is the employment of cement-like secretions in the construction of their N., and these are grouped together as "cementers" in certain systems. The chimney-swallow fastens its simple cradle of twigs against the inner walls of a hollow tree or the inside of the chimney, and glues together, twig by twig, the N. itself, by means of a powerful cement which it secretes from its own throat. The

Parula Americana (Blue Yellow-back.)



FIG. 7.

edible nests of the esculent swallow are without doubt constructed with the aid of similar secretions.

There are various forms of parasitic reproduction found among birds, by means of which they wholly avoid and

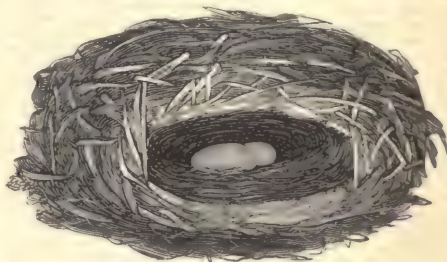
FIG. 8.



Carduella tristis (Goldfinch).

throw upon strangers the rearing of their offspring. A few very remarkable parasitic forms, like many of the cuckoos of the Old World and all the *Molothrus* of Amer., after the deposition of the egg in the N. of other birds, take no

FIG. 9.



Selurus aurocapillus (Golden-crowned Thrush, or Oven-Bird).

charge of their own offspring, but leave them entirely to the nurture of strangers. [From orig. art. in *J's Univ. Cyc.* by T. M. BREWER, M. D.]

**Neth'erland, The** [Dut. *Nederlanden*; Fr. *Pays Bas*], kingdom of W. Europe, bounded W. and N. by the N. Sea, which forms 2 large inlets, the Zuyder Zee and Dollart Bay, E. by Ger., and S. by Belg., with an area of 12,648 sq. m., with 4,012,693 inhabs., and consisting of the following provs.:

	Area.	Population.	Capital.
North Brabant.....	1,980	466,497	Bois-le-Duc.
Gelderland.....	1,965	466,805	Arnhem.
South Holland.....	1,166	803,530	The Hague.
North Holland.....	1,070	679,990	Amsterdam.
Zealand.....	690	188,685	Middelburg.
Utrecht.....	534	191,679	Utrecht.
Friesland.....	1,282	329,877	Leeuwarden.
Overijssel.....	1,291	274,136	Zwolle.
Groningen.....	700	253,246	Groningen.
Drenthe.....	1,030	118,845	Assen.
Limburg.....	850	239,453	Maestricht.

Its connection with Luxemburg is merely a dynastic union, the king of the N. being also grand duke of Luxemburg, which country he received in 1815 as a compensation for Nassau; but the N. possess extensive and important colonies in the E. I., Java, Madura, Bali, Lombok, Ternate, Amboyna, Banda, Timor, and parts of Sumatra, Borneo, and Celebes, with a pop. estimated at 24,000,000; and in Amer., Surinam or Dutch Guiana, Curaçoa, St. Eustatius, Aruba, Bonaire, St. Martin, and Saba, with a pop. estimated at 100,000. The country is low and flat, and forms the delta of the Rhine, Meuse, and Scheldt. Where the Rhine enters the N. from Ger. it is a powerful stream,  $\frac{1}{4}$  m. broad, but after sending to the S. the Waal and the Leck, which connect with the Meuse, and to the N. the Yssel and the Vechte, which fall into the Zuyder Zee, it disappears among the sand-banks of the N. Sea. The Meuse and Scheldt divide also into different arms, and cut up their basin into a number of islands; indeed no other country is so peculiarly intersected by rivers and canals. Of the canals, constructed partly for drainage, partly for communication, may be mentioned as important for traffic the N. Hol. Canal, 52 m. long, 120 ft. broad, 20 ft. deep, constructed 1819-25, and connecting Amsterdam with the N. Sea, and the Voorn Canal, from Voorn to Helvoetsluis, shortening the outlet from Rotterdam. Far more important is the N. Sea Canal. In many cases the river-bottom is higher than the adjoining surface, and large tracts of the country lie below the level of the ocean. Along the sea the land is in some places protected against inundation by lines of naturally formed sand-banks, the so called dunes, but in places where no such



sand-banks exist, and along the rivers, it has been necessary to construct huge dikes, 30 ft. high, 70 ft. broad at the base, and built of granite brought from Nor., or of clay, peat, and timber. The fields are generally divided into small holdings and cultivated like gardens. Production of cheese and butter is one of the chief occupations. Rye, barley, and wheat are raised, but more especially oil-seeds, tobacco, hemp, flax, and vegetables. The country is naturally treeless, but plantations are frequent. Peat is generally used as fuel. The only other mineral of special importance found in the country is a peculiar kind of clay well adapted for pottery. Of the manufactures, the most celebrated are those of linens (Hertogenbosch), earthenware (Delft), gin (Schedam, Rotterdam, and Weesp); but those of paper, leather, oil, sugar, cottons, silks, powder, etc. are also very extensive. The fisheries are very important. Herring, cod, turbot, ling, anchovies, oysters, etc. are taken in the adjacent parts of the sea, and it is estimated that about 20,000 families support themselves by this industry. The commerce of the country, at one time the most important in the world, has declined during the last 2 centuries, though it is still very extensive and active. It is principally carried on between its colonies and the coasts of the Baltic.

**History.**—The N. or Low Countries denoted, when first spoken of in hist., the whole plain extending from the foot of the Vosges and the Ardennes to the N. Sea. It was inhabited by 3 distinct though kindred tribes—the Frisians to the N., the Batavians, of Germanic stock, in the centre, and the Belgæ, of Gallic stock, to the S. In the 4th century the Batavians disappeared; the Belgæ gave way to the Franks; the Sax. pushed onward from the E.; new though kindred tribes took possession of the soil; only the Frisians withstood. On the establishment of the great Frankish empire under the Carolingians the whole plain was incorporated and the pop. christianized. But by the division of the empire of Charlemagne the country was divided, the S. part falling to Fr., the central to Lotharinga, and the N. to Ger., and for centuries the different parts followed the different destinies of the main bodies to which they belonged. Meanwhile the feudal system got a foothold in the country. By a marriage the countship of Flanders became united to Burgundy in 1384. By another marriage the N., with the other Burgundian dominions, came into the possession of the house of Hapsburg in 1477, and Charles V. took a great interest in the development of Dut. industry and commerce. By the division of his empire between Aus. and Sp. the N. fell to Sp. The result was a war which lasted over 80 yrs. (1566-1648), and ended with the humiliation, not to say the ruin, of Sp. and the establishment of the N. as one of the prin. powers of Europe. The prosperity of the young state was prodigious. For about a century it was absolute master of the sea. At the same time their achievements in science and art gained the admiration of all Europe. Their resistance to the arrogance of Louis XIV. was their greatest glory. After that period the importance of the republic gradually decreased, and when in 1782 it declared war against Eng. its maritime supremacy received a final blow from which it never recovered. In the winter of 1794-95 the Fr. army, after conquering the Sp. N., entered the terr. of the United Provs., and the Batavian republic was proclaimed May 16, 1795. In 1806 the N. was made a kingdom under Louis Bonaparte (the kingdom of Hol.); in 1810 it was incorporated with Fr. The Cong. of Vienna established the kingdom of Hol. gave the crown to the house of Orange-Nassau, and joined the former Sp. N. with it. But the discrepancy between the 2 parts of the new state was so palpable that in 1830 the kingdom of Belg. was erected.

CLEMENS PETERSEN.

**Nettle** [A.-S. *netele*], a popular name for many plants, mostly covered more or less densely with poisonous stinging hairs. They belong to the order Urticaceæ, and mostly to the genus *Urtica*. The species are very numerous, and many are tropical, some of the latter having severe and even dangerous stinging powers. The stalks of some kinds abound in a strong fibre, which, especially in Asia, has a considerable use in the arts. The common N.-fibre is employed like hemp in it. This species (*Urtica dioica*) is naturalized in the U. S. from Europe.

**Nettle-Rash, or Hives** [Lat. *urticaria*], consists of elevations of the skin of the size of a pea or a bean, or larger. These elevations are usually white, or white with a red centre, or white with a red margin, or red or white with a small vesicle in the centre. The disease is of an acute character; the elevations spring up quite suddenly, and disappear after hours or days. External causes are contact with nettles, the influence of insects, a hot bath, the sun. In predisposed persons gentle pressure with the finger, friction, or slight irritation suffice to produce it. Internal causes are such as irritate the nerves of the digestive organs, the genito-urinary organs, or the blood-vessels; certain articles of food, such as champagne, beer, sausage, strawberries, raspberries, currants, oysters; meds., such as quinine or cod-liver oil. A general irritability of the nervous system may produce it. Not infrequently, therefore, it sets in with fever, sometimes with a chill, always with burning and itching. The treatment is simple, but not always efficient. Locally, the use of glycerine, cold-cream, regulated—no coffee, spice, beer, not much meat. The stomach must be improved by alterative treatment or purgatives will be beneficial. [From orig. art. in J. s. Univ. Cyc., by PROF. A. JACOB, M. D.]

**Nettleton** (ASAHEL), D. D., b. at N. Killingworth, Conn., Apr. 21, 1783, grad. at Yale 1809; studied theol. at New Haven; was licensed to preach in 1811, and ordained in the Congl. denomination in 1817. Declining all offers of settlement over chs., he devoted himself to labors as a travelling evangelist, and in the course of 10 yrs. (1812-22) he had labored with success in revivals in nearly 40 towns in W.

Mass., Conn., and N. Y. He edited a collection of *Village Hymns*, visited Va. 1827-28, again preached in N. Eng. and N. Y. 1829-30, preached in G. Brit. and Ire. 1831, and was appointed prof. of pastoral duty at the newly founded theological sem. at E. Windsor, Conn., in 1832. He declined the office, but settled at E. Windsor, and lectured occasionally to the students for several yrs. His *Remains and Sermons*, with a *Memor.* by B. Tyler, were pub. D. May 16, 1844.

**Nettle Tree**, a name of the *Celtis australis*, a handsome tree of S. Europe, belonging to the Ulmaceæ, formerly regarded as a part of the collective order Urticaceæ, and valued for its wood, much used in turnery. It has several congeners in various parts of the Old and New Worlds, the common species of the U. S. being called Hackberry.

**Neully**, nuh-ye', town of Fr., dept. of Seine, 14½ m. from the W. extremity of Paris, on the right bank of the river Seine, which is here crossed, on the prolongation of the avenue through the Champs Elysées, by the noble stone bridge built by Perronet. The beautiful grounds about N., once the favorite resort of the Parisians, are now laid out in walks skirted by charming villas. N. has a varied manufacturing industry, comprising starch, chemicals, straw goods, porcelain, etc. Pop. 25,235.

**Neumann** (KARL FRIEDRICH), b. at Reichmannsdorf, Bavaria, Dec. 22, 1798, of Jewish parents; studied at Heidelberg, Munich, and Göttingen, and was converted to Lutheranism; went in 1827 to Venice to study Armenian in the convent of San Lazzaro, thence to Paris to study Chi.; made a journey to India and Chi. in 1829-30; brought back a large collection of Chi. and Hindoo books, which are now partly in Berlin and partly in Munich; was appointed prof. of Oriental langs. at Munich in 1831, but dismissed in 1852 on account of his liberal views in politics; removed in 1863 to Berlin, and d. there Mar. 17, 1870. Wrote *Mémoires sur la Vie et les Ouvrages de David, Philosophe Armenien, Chronique de l'Arménien Kingdom in Cilicia, by Vahram; Geschichte der Vereinigten Staaten von Amerika, and Hoein Schein, or the Discovery of Amer. by Buddhist Monks*.

**Neuralgia** [Gr. *νεῦρον*, "nerve," and *ἄλγος*, "pain"]. Pain in the course of a nerve is a symptom of many morbid conditions. The track and distribution of a cerebral, spinal, or visceral nerve may be the seat of the pain, which is sharp, occurs in paroxysms repeated at intervals of a few seconds or a day, the pain between the paroxysms disappearing or being replaced by soreness or dull pain. The suffering is often very intense. One curious feature of neuralgic pain is its occurrence on one side of the body only at any one time. Usually no redness or inflammation is visible in the affected region, though an exception to this rule is observed in N. of the face, during attacks of which the eye is red and lachrymose. The parts which are the seat of pain are usually over-sensitive during the paroxysms, and numb between them; there may even be loss of sensibility. Along the track of the affected nerve one or more tender points are usually found. N. are divided (1) on the basis of their distribution, (2) on the basis of their causes. The former, or topographical classification, includes the following varieties among others: facial, occipital, brachial, intercostal, N. sciatica. According to the second or ætiological classification, there are—malarial, gouty, anæmic, hysterical N.; N. from injuries to nerves, from inflammation of nerves, and from disease of the nervous centres. Beside, in the present state of science, there are cases of N. for which no cause can be made out—idiopathic N. The rational treatment of N. consists in treating the pathological states causing it. E. C. SEGUIN.

**Neuritis** [Gr. *νεῦρον*, "nerve," and *ῖτις*, "inflammation of nerves." N. presents itself as (1) parenchymatous N., (2) interstitial N., and (3) peri-N. Parenchymatous N. consists in a multiplication of the nuclei of the membrane of Schwann of common nerve-fibres, with simultaneous disintegration of the myeline and destruction of the axial cylinder, the connective tissue between and around the fibres undergoing relatively little change. This lesion is seen in the Wallerian degeneration of nerves after section, and has been observed (Charcot) after disease of the spinal cord. (2) Interstitial N. consists in the development of young cells from the nuclei of the connective tissue of the nerves, and the formation of more connective tissue from these young cells, the increase of connective tissue causing compression of the nerve-fibres. To the naked eye the nerve appears larger, more or less translucent (instead of dead white), and is tougher. Such a N. is produced by injuries, extension of inflammation from other parts; it is found in the Gr. elephantiasis. The N. may be localized, but tends to extend above and below the starting-point; it may lead to myelitis. (3) Peri-N. is that form of inflammation of nerves in which the general sheath of the nerve and the circumjacent connective tissue are the seat of trouble. There occurs increased cell-formation, effusion of lymph or serum, and escape of the white globules of the blood. The nerve appears to the naked eye larger, reddened, oedematous, and may be unnaturally fixed in its bed of connective tissue. The causes of peri-N. are partly unknown; cold may cause it, as well as injuries, and it is possible that the gouty disposition produces it. N. symptoms are pain, numbness, loss of function, expressed by paralysis and anesthesia. E. C. SEGUIN.

**Neuroptera** [Fr. *névroptère*]. The net-veined insects or Neuroptera (*νεῦρον*, a "nerve," and *πτερόν*, a "wing") comprise the white ants, the May-flies, dragon-flies, and ant and aphid lions, and caddis-flies. They are usually recognized by the large net-veined wings. The mouth-parts are constructed on the same type as the Orthoptera and Coleoptera; the mandibles are usually large and adapted for biting. Great changes in form occur in the thorax, but it may be said to be unusually large, with all 3 segments quite equally developed. The legs are generally weak, not adapted for walking. The body of N., though sometimes short, is apt to be very long, especially the abdomen. This region consists of 11 rings, 10 being the normal number in the



higher groups of winged insects. The ovipositor is quite varied in structure, and simpler than in other insects. Indeed, it is impossible to satisfactorily define the N., as the different groups vary so much in form. This is due to the lowness of the type, and to the great degree of geological extinction.

A number of strange wingless forms, the spring-tails and bristle-tails (*Thysanura*), though differing in some important characters, separating them from the other N., yet have some fundamental characters which seem to unite them with the latter. The mouth-parts when well developed are framed like those of the N.; the bristle-tail is much like a larva of *Perla*. The earliest changes of the embryo in the spring-tails or *Podurans* (*Isotoma*) are nearly identical with those of the thousand-legs or myriapods. For this and other reasons the *Thysanura* should perhaps form a group equivalent to the N., instead of a subdivision of the latter.

The nervous system of the N. differs much in different groups. In *Corydatus* Leidy describes, beside the brain (supra-oesophageal ganglion), the optic and antennal nerves proceeding from the brain. 8 abdominal ganglia. The alimentary canal is divided into a long oesophagus, which widens posteriorly into a spacious

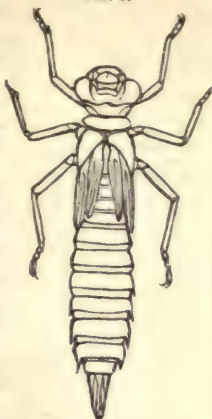


Fig. 1.  
Larva of a Dragon-fly.

Fig. 2.



Adult, larva, and egg of *Chrysopa perla* of Europe.

crop (proventriculus), which extends as far back as the fifth abdominal segment. The large intestine has a large twist, and abruptly dilates into an oval or pyriform cæcum. The crop or gizzard is often large, and armed internally with teeth. The 2 salivary glands differ much in the N. There are generally 6 or 8 long, flexuous urinary tubes. The ovaries consist of many-chambered tubes, and the testes consist in many species of 2 tufts of long or round follicles.

The N. comprise a less number of species than any of the other groups except the Orthoptera. A large proportion, more so than in any other sub-order, are aquatic in their early stages. The terrestrial species and those forms which are aquatic only in the larva state breathe in the normal manner through the breathing-holes (stigmata) in the side of the body, but in the aquatic larvae there are usually external appendages, either leaf-like or simply filiform, which are permeated by tracheal branches which absorb the air and convey it to the body. Among the more remarkable forms of N., and of most interest as foreshadowing the social ants, is the termites or white ant. Not only are there 2 kinds of males and females, but the neuters or soldiers are both male and female. Beside the males and females there are 2 wingless forms—the soldiers, which have large square heads and long powerful mandibles, and the workers, which have small round heads and minute mandibles. Beside the winged males and females, which are produced in vast numbers, there are wingless males and females, which never leave the territory where they are born, and which replace the winged males or females whenever a community does not find in due time a true king or queen.

The May flies are interesting from the short life of the imago, and from the nature of the mouth-parts, which are partly aborted and unfitted for taking food. They live but a few hours or a single day after acquiring wings, but in the early stages 2 or 3 yrs. The dragon-flies are beneficial as scavengers, both in the larval, pupal, and winged states, as they spend their lives in devouring smaller insects. They lay their eggs in masses attached to floating objects. The larva is remarkable for the large labium, forming a mask which covers the face. It is let down, exposing the jaws, when the insect seizes its prey. The pupa is active, as in the grasshoppers. Another neuropterous insect of a good deal of importance in an economical point of view is the aphidion, or larva of the lace-winged fly (*Chrysopa*). It is armed with powerful jaws, within which, in a groove, slide the accessory jaws (maxillæ). With these sabre-like jaws they pierce the body of the aphid, holding them aloft, and suck their blood. The eggs are laid on long stalks among the aphides. The larva spins a spherical white silken cocoon, the pupa being inactive and rudely resembling that of a fly, while the adult insect is green, with beautiful gauze wings and golden eyes. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. A. S. PACKARD, JR., M. D.]

**Neutrality.** See INTERNATIONAL LAW.

**Neutral Trade.** See INTERNATIONAL LAW. We add here that the inconveniences of suspension of intercourse caused by war are much lessened by the rule of Paris in 1856 for the parties to these rules, especially by the rule that an enemy's goods, if not contraband, are safe on a neutral vessel.

T. D. WOOLSEY.

**Nevada**, ne-vah'da, one of the Pacific States of the U., lying between



35° and 42° N. lat. and 114° and 120° W. lon.; bounded N. by Or. and Id., E. by Ut. and Ari. S. W. and W. by Cal.; extreme length from N. to S., 483 m.; greatest breadth from E. to W., 423 m.; area, 110,700 sq. m. Face of the Country.—The greater part of N. is included in the Great American Basin, which

has for its walls the Sierra Nevada on the W. and the Wahsatch Mts. on the E. It is bounded N. and S. by cross ranges, and has no outlet for its waters. This vast basin is a table-land about 4000 ft. above the sea, and mts. rise from 1000 to 8000 ft. above its level. About 12,000 sq. m. in the S. E. of the State are outside of this basin, and belong to the Col. River Basin. The Sierra Nevada Mts. constitute the W. boundary of the State. They throw out one spur, however, the Washoe Mts., which have a N. E. direction. Most of the mt.-chains are parallel to each other and have a gen. course from N. to S. The prin. chains, beginning at the W., are the Virginia Mts., W. of Pyramid Lake; the Lake range, between Pyramid and Winnemucca Lakes; the Truckee Mts., E. of Winnemucca Lake; the Trinity and Antelope Mts., which form the W. boundary of the Lower Humboldt River and Lake valley; the W. Humboldt Mts., and, separated from these by a broad valley, the E. Humboldt Mts.; S. of the Humboldts are the Toyabe Mts., and a parallel range, the Santa Rosa. The Pah-Ute and Coyote Mts., also outliers of the Toyabe range on the W., extend northward toward the Humboldt River and Lake. E. and S. E. of the E. Humboldt range are the Edwards Creek Mts., the New Pass range, the Shoshone and Reese River ranges, the Hot Creek, Reville, and Smoky ranges, the Diamond, Egan, Ungoweah, and Goshoot Mts., parallel ranges, with valleys between. In the S. W. is an isolated range, the White Mts. The Col. valley has numerous abrupt ranges rising from its plateau, and 3 peaks of considerable height—viz. Tem Piute, Pahrnegat, and Picche. The most important ranges of the Col. region are the Muddy, Vegas, Spring Mt., and Kingston Mts. Some of the peaks of the W. Humboldt and S. Toyabe ranges rise to the height of 10,000 to 12,000 ft. The E. slope of the Sierra Nevada and the Humboldt, E. Humboldt and Toyabe ranges have a considerable number of streams, which, however, disappear very suddenly from the surface and reappear as lakes or pools farther on. The prin. rivers are the Truckee, which rises in Tahoe Lake and flows N. E. and N. W. into Pyramid Lake; the Humboldt, which is formed by the confluence of several small streams in the N. E. of the State, and after a general S. W. course falls into Humboldt Lake; Walker River, in the S. W., which, after a circuitous course, falls into Walker Lake; Carson River, discharging into Carson Lake; Quinn's River in the N. W.; Reese River in the central portion of the State; the Rio Virgin in the S. E., and the Col., which forms for a considerable distance a part of the S. E. boundary. The prin. lakes are—Pyramid, 33 m. long and 14 wide; Walker, nearly as large; Carson, 12 m. in diameter; Humboldt, somewhat smaller; Winnemucca, 18 m. long, 8 wide; Lake Tahoe, 1/4 of which is in N., 1500 ft. deep, 6000 ft. above the sea, and numerous shallow lakes of large extent in the rainy season, but dry or nearly so in the dry season. Among these are several known as mud lakes, Franklin Lake, Preuss Lake, Pahrnegat Lake, etc.

**Mineralogy.**—Gold is not an abundant metal in N., but some of the argentiferous ores contain a large amount of gold in combination. The percentage of gold in these ores varies from 21 to 52 per cent. of the entire metallic product. Silver is, however, the staple mineral product of N. The silver lodes are found in almost every part of the State, some yielding from \$65 to \$100 to the ton, others ranging from \$450 to \$2500 or more to the ton. Of these the mines on the Comstock vein or lode have proved the most valuable. The number of mines in the State is very large, and new mines are constantly being opened. The other minerals of N. are lead and copper in various forms, iron in numerous forms, as magnetic, spathic, specular, common iron pyrites, arsenical and magnetic pyrites, etc.; it is not as yet mined to any extent; antimony, arsenic, possibly quicksilver, manganese, sulphure of zinc, graphite or plumbago, sulphur (pure), gypsum, rock-salt, nitrate of potassa, carbonate of soda in immense quantities, borax, lignite or brown coal, kaolin, sulphate of magnesia, agates, amethyst, epidote, tourmaline, chalcedony, jasper, carnelian, fluor-spar, selenite, etc. There are numerous mineral springs and some geysers in the State.

**Soil and Vegetation.**—While the State will never be largely agricultural, it possesses a sufficiency of arable lands to supply, with the aid of irrigation, and possibly without, the needs of such a pop. as it is destined to have; and its mt.-slopes and some of its valleys will prove to be among the best grazing-lands of the Pacific region. Its timber-lands proper, those on which grow the lofty pines of the sierras, are of very moderate extent. A part of the lower portions



of the mt. regions and some of the valleys, along which the rivers flow, are covered with a smaller growth of piñon or nut-pine, cottonwood, birch, willow, dwarf cedar, etc. Of the 65 natural families of plants catalogued in the State, many are represented by a large number of genera and species. Lupines, clovers, vetches, and nutritious grasses are the most characteristic plants of the State.

**Zoology.**—The animals are those of the Pacific slope: the grizzly bear, the Mex. bear, cougar, wild-cat, lynx, Rocky Mt. sheep, antelope, deer, 2 or 3 species, and most of the smaller game, including the sage-hare, sage-grouse, etc., are the most characteristic mammals. The larger lakes are stocked with trout, salmon trout, etc.

**Climate.**—It is characterized by great extremes. In winter snow falls upon the summits of the mts., though there is not much in the valleys. The air is dry, the winds strong, and though the sunshine is bright and pleasant at midday, the nights are often intensely cold. In Jan. the mercury falls to from 10° to 16° below zero in the valleys, and much lower in the mts. The last of Feb. the approach of spring is announced, though there may be piercing winds and sharp frosts, chilling rain and snow in Mar. or even Apr. Thunder-storms of great severity occur in Apr. and May and into June. When these have passed away the dry season prevails until Oct. The temperature rises to 100° or 105°. It falls every night to between 70° and 80°, and does not average in July and Aug. more than 90° at midday. In the E. part of the State there are frequent thunder-storms in summer and till Sept. 15, and the heat is longer continued and more oppressive. There is less intense cold, very little snow or frost in winter in S. E. N., and the culture of cotton and the sugar-cane has been attempted there. The climate is remarkably healthy and invigorating.

**Agricultural Products.**—The crops of this State are comparatively meagre. The census of 1880 showed of wheat 69,398 bushels; corn, 12,891 bushels; oats, 186,860 bushels; barley, 513,470 bushels. The wool clip of 1880 was 655,012 lbs.

**Farm Animals.**—By the census of 1880 there were in N. 32,087 horses, 172,221 cattle, 133,695 sheep, and 9080 swine.

**Manufactures.**—These are confined almost wholly to the milling and mining industries, except in the smaller manufactures carried on by individual enterprise. The total manufacturing products of N. in 1880 amounted to \$32,534,605, employing 5232 hands in 544 establishments, and paying \$4,497,251 in wages, on a capital invested of \$9,947,113. There were 143 quartz-crushing mills, 27 saw mills, and 14 grist mills. The statistics of the U. S. Mint show that \$77,000,000 in silver and \$15,000,000 in gold have been coined from N.

**Railroads.**—N. has in operation, Jan. 1, 1882, 890 m. of railway, costing \$16,570,715, with net earnings of \$833,918, and paying in interest and dividends, \$987,750. The Central Pacific is the prin. trunk line, running for 450 m. of its course through this State.

**Finances.**—The valuation of taxable property, Jan. 1, 1881, was—real estate, \$17,742,714; personal, \$9,855,944; total, \$27,598,658. Rate of State tax, 55 cents on \$100, producing \$196,070 in 1880; total raised by taxation, State and local, \$871,673; amount of State debt, Nov. 1881, \$507,000; aggregate indebtedness, State and local, \$1,024,523.

**Commerce.**—N.'s isolated position and her total lack of water-communication render her commercial facilities inferior to those of most of the States.

**Banks.**—In Oct. 1881 there was in operation in N. one national bank, with a capital of \$75,000; circulation, \$36,000; U. S. bonds to secure circulation, \$40,000; deposits, \$114,237. There were also 6 other banking insts., with capital of \$89,000 and deposits of \$617,119, and 9 private bankers, with \$547,827 capital and \$2,705,441 deposits.

**Education, Etc.**—In 1880 the number of children of school age (6-18 yrs.) was 10,592, of whom 8918 were enrolled in public schools, with average daily attendance of 5385. Total expenditure for public schools in 1880, \$212,164, of which teachers' salaries amounted to \$131,019. N. has but 1 univ., which had 24 students in 1880.

**Churches.**—The M. E. denomination has 11 chs., 8 ministers, and 635 members; Prot. Epis., 9 chs., 328 members; R. Cath., 3 chs., 8 priests, and about 5000 Catholic pop.; Presb., 5 chs., 247 members; Bap., 3 chs., 52 members; Congl., 1 ch., 30 members; Jews, 1 synagogue, 29 members.

**Population.**—In 1870, 42,491; 1880, 62,366 (white 53,556, colored 8710, including 5416 Chl., 2803 Indians, and 3 Japanese).

**Principal Cities and Towns.** Pop. 1880.—Virginia City, 10,917; Gold Hill, 4531; Carson City (cap.), 4229; Eureka, 4207; Austin, 1679; Tuscarora, 1364; Reno, 1302; Winnemucca, 763; Elko, 752; Pioche, 745; Cherry Creek, 566.

COUNTIES.	*Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
Churchill.....	3-D	196	479	Stillwater.....	.....
Douglas.....	3-C	1,215	5,121	Genoa.....	313
Elko.....	2-E	3,447	5,718	Elko.....	752
Esmeralda.....	4-D	1,553	2,320	Hawthorne.....	.....
Eureka.....	3-E	.....	7,056	Eureka.....	4,207
Humboldt.....	2-D	1,916	3,490	Winnemucca.....	763
Lander.....	3-D	2,815	3,624	Austin.....	1,679
Lincoln.....	4-E	2,985	2,637	Pioche.....	745
Lyon.....	3-C	1,837	2,409	Davison.....	391
Nye.....	3-E	1,087	1,815	Belmont.....	284
Ormsby.....	3-C	3,668	5,412	Carson City.....	4,229
Storey.....	3-C	1,139	1,115	.....	.....
Washoe.....	3-C	3,091	5,964	Virginia City.....	10,917
White Pine.....	3-E	7,189	2,682	Reno.....	1,302
Total.....		42,491	62,366	Hamilton.....	203

\* Reference for location of counties. See map of Nevada in article CALIFORNIA.  
† Now part of Washoe co.

**History.**—N. is a part of the terr. ceded to the U. S. by Mex. by the Treaty of Guadalupe Hidalgo, Feb. 2, 1848. It was at first a part of Cal. Terr., and was subsequently attached to U. T.; it was constituted a Terr. Mar. 2, 1861, with somewhat smaller boundaries than at present. The const.

was ratified and N. admitted into the U. as a State Oct. 31, 1864. Additions were made to its terr. by congressional enactment in 1866.

Governors.

TERRITORY. John H. Kinkaid..... 1879-83  
James W. Nye..... 1861-64 Jewett D. Adams..... 1883-87  
STATE.  
Henry G. Blaisdell..... 1864-71  
Louis R. Bradley..... 1871-79

REVISED BY A. R. SPOFFORD.

**Nevada**, on R. R., cap. of Storey co., Ia. The State Agricultural Coll. is located 9 m. W. Prin. business, stock and corn raising. Pop. 1870, 982; 1880, 1541.

**Nevada**, R. R. junc., cap. of Vernon co., Mo., 90 m. S. W. of Sedalia. Pop. 1880, 1913.

**Nevada City**, on R. R., cap. of Nevada co., Cal., has large gold-mining interests. Pop. 1880, 4022.

**Nev'in** (JOHN WILLIAMSON), D. D., LL.D., b. in Shippensburg, Pa., Feb. 20, 1803, grad. at Union Coll. 1821; studied theol. at Princeton Sem., where he remained as tutor, and wrote his *Biblical Antiquities*. He was prof. of Heb. and biblical lit. in the Presb. Theological Sem. at Allegheny City (1829-39), where he edited a weekly literary journal entitled *The Friend* (1833-34); became pres. of the Mercersburg Theological Sem. 1840, and was pres. also of Marshall Coll. 1841-53. He wrote in 1843 *The Anxious Bench*, which occasioned much controversy on the subject of revivals, and in 1844 a translation of Dr. Schaff's inaugural address, *The Principle of Protestantism*, which gave rise to what is known as the "Mercersburg theology;" also *The Mystical Presence*, which increased the controversy alluded to; *The Hist. and Genius of the Heidelberg Catechism*, and *Antichrist, or the Spirit of Sect and Schism*. He edited the *Mercersburg Review* 1849-53; resigned the direction of the Theological Sem. 1851, and the presidency of Marshall Coll. on its removal to Lancaster and consolidation with Franklin Coll. in 1853. He was pres. of Franklin and Marshall Coll. 1866-76.

**New** (JOHN C.), b. in Vernon, Ind., July 6, 1831, grad. at Bethany Coll., Va., in 1853; began the study of law in Indianapolis, but was never admitted to the bar. He served as State senator and as adjutant-gen. of Ind., and subsequently became cashier of the First National Bank of Indianapolis. In 1875 he was appointed by Pres. Grant U. S. treas. Was assistant sec. of the treas. 1882-84.

**New Albany**, city, important R. R. centre, and cap. of Floyd co., Ind., on the O. River, 3 m. below Louisville; has immense water-power from the falls of the O., 2 m. distant; contains a c.-h., city hall, opera-house, and female coll. Pop. 1870, 15,396; 1880, 16,423.

**New Amsterdam**, the old name of New York city. The v. was called Manhattan until the arrival of Gov. Stuyvesant, in 1647, when it was called New Amsterdam. On its capitulation, in Sept. 1664, to the Eng., its name was changed to New York.

**Newark**, Del. See APPENDIX.  
**Newark**, city and important R. R. and commercial centre, cap. of Essex co., N. J., on the Passaic River, 9 m. from New York. It has an acad. and a number of handsome and costly public buildings. Its manufactures represent an extensive industry, embracing hats, carriages, jewelry, leather, saddlery, harness, brass and iron castings, thread, springs, and axles. The Newark Industrial Institute is an organization of mechs. and manufacturers (chartered in 1873), which has for its object the encouragement and advancement of manufactures and the mechanical arts. Its shipping interests are extensive; it has a line of docks over 1 m. in length. Pop. 1880, 136,508; 1885, about 140,000.

**Newark**, R. R. junc., Wayne co., N. Y., on Erie Canal, has Ger. coll. and an acad. Pop. 1870, 2348; 1880, 2450.

**Newark**, city and R. R. centre, cap. of Licking co., O., on the Licking River and the O. and Erie Canal, 33 m. N. E. of Columbus, in a fertile agricultural region, near extensive coal-fields. Pop. 1870, 6698; 1880, 9600.

**New Bedford**, city and important R. R. centre, one of the caps. of Bristol co., Mass., 55 m. S. of Boston, on the Acushnet River, was formerly the chief seat of the Amer. whale fishery. It has a Friends' acad., St. Joseph's Hospital, an orphan asylum, and a free public library of 30,000 vols. Is connected with New York by a line of propellers. Pop. 1870, 21,320; 1880, 26,845.

**Newberne**, city, on R. R., cap. of Craven co., N. C., 90 m. from Hatteras Inlet, was settled by the Swiss in 1710. It has an acad. and is a port of entry, the custom-house for Pamlico dist. being located here. A large traffic in early vegetables for the N. markets is carried on. Pop. 1870, 5849; 1880, 6443.

**Newberry**, C. H., R. R. junc., cap. of Newberry co., S. C., 47 m. N. W. of Columbia, has 2 acads. Pop. 1870, 1891; 1880, 2342.

**Newberry** (JOHN STRONG), M. D., LL.D., b. at Windsor, Conn., Dec. 22, 1822, grad. from Western Reserve Coll. in 1846, and from Cleveland Med. Coll. in 1848. The yrs. 1849 and 1850 were spent in travel and study in Europe. In 1851 he established himself as a phys. in Cleveland. He accepted in 1855 an appointment as acting assistant surgeon in the army, and accompanied as surgeon and geologist the expedition under Lieut. Williamson, U. S. A., in the exploration of the terr. between San Francisco and the Columbia River. In 1857-58 he was attached, in the same capacity, to the expedition under Lieut. Ives, U. S. A., which made the first exploration of the Col. River. In 1859 he accompanied Capt. Macomb, U. S. Engineers, in the exploration of the country bordering the upper Col. and San Juan rivers. During the war he was a member of the U. S. Sanitary Commission, and to him was delegated the organization and direction of all its operations in the valley of the Miss. In 1866 he was appointed prof. of geol. in the School of Mines, Columbia Coll., New York, a position which he still holds. In 1869 the geological survey of O. was organized, and he was placed at its head. Under his direction the work was vigorously



prosecuted to completion. He is a member of most of the learned societies of this country and many of Europe, was one of the original incorporators of the National Acad. of Sciences, has held the office of pres. of the Amer. Association, and is now pres. of New York Acad. of Sciences and of the Torrey Botanical Club. He has published a report on the *Geol., Bot., and Zoology of N. Cal. and Or.*, *The Geol. of the Col. Expedition*, *The U. S. Sanitary Commission in the Valley of the Miss.*, *Reports of the Geological Survey of O.*, *Iron Resources of the U. S.*, etc. He was one of the associate eds. of *J. S. Davis*, *Op.*

**New Brighton**, Richmond co., N. Y., on Staten Island, also containing W. New Brighton P. O. Here are the "Sailor's Snug Harbor" for aged mariners and an inst. for destitute children of seamen. Pop. 1870, 7495; 1880, 12,679.

**New Britain**, Beaver co., Pa., on R. R. and Beaver River, 29 m. N. N. W. of Pittsburg, has excellent water-power. Pop. 1870, 4037; 1880, 3653.

**New Britain**, a group of islands in the Pacific, lying E. of New Guinea, between lat. 4° and 6° 30' S., and between lon. 148° and 152° 30' E. It consists of several small islands and one large one, named New Britain, and comprising an area of about 10,000 sq. m. They are all mountainous and contain active volcanoes, but fertile, covered with forests, and producing palms, sugar-cane, and bread-fruit trees. The islands are inhabited by a tribe of Papuans.

**New Britain**, city and R. R. centre, Hartford co., Conn., 9 m. S. W. of Hartford, has a public library, park of 74 acres, and the State Normal School. Pop. tp., including city, 1870, 9480; 1880, 13,973, city 11,800.

**New Brunswick**, a prov. of the Dominion of Canada, Brit. N. Amer., bounded N. by the prov. of Que. and the Bay of Chaleurs, E. by the Gulf of St. Lawrence, Northumberland Strait, and the Bay of Fundy, S. by the Bay of Fundy, W. by the State of Me. It lies between 44° 30' and 48° 5' N. lat. and 63° 47' and 69° 5' W. lon. Cap. Fredericton. Area, 27,322 sq. m. Pop. 1881, 321,120.

N. B. has been described as a "flat sandstone plain." There are, however, ranges of hills in various parts, sometimes high enough to be called mts. The isthmus that joins N. S. to this prov. is only 13½ m. across. N. of the isthmus the coast abounds in good harbors. The highlands of the E. part have occasional bodies of heavy timber-growth, but the soil is generally thin; the valleys, however, are remarkably fertile. Two thirds of the surface of N. B. is of the Carboniferous formation. The strata are very flat, and the coal is near the surface, but the coal-seam is thin. Iron, copper, manganese, plumbago, and lead are found. Limestone, gypsum, sandstone, marble, and roofing-slate are abundant. Freestone of great beauty is quarried and sold extensively in the U. S. N. B. abounds in wild animals. Ducks, geese, grouse, and a great variety of sea-fowl are numerous. Among the sea-fish are the cod, herring, mackerel, haddock, hake, lobster, bass, and smelt, while trout and salmon are very numerous in the fresh waters. The bays of Fundy, Verte, Chaleurs, and Miramichi are remarkable for their excellence as fishing-grounds, and the first mentioned for its marvellously high tides. The rivers St. Croix, St. John, Petitcodiac, Miramichi, and Restigouche are all navigable to a greater or less extent. The climate is much like that of Me., but much more foggy and moist.

N. B. was formerly a part of Acadia, an old colony of Fr., which included N. S. also. It was first colonized in 1604. At the capture of Que. it passed into the hands of G. Brit. Miramichi was settled by Scotch immigrants in 1762. N. B. was set off as a prov. from N. S. in 1784. The first R. R. was opened in 1860. N. B. entered the Dominion of Canada at its inauguration in 1867.

**New Brunswick**, city and R. R. centre, cap. of Middlesex co., N. J., 80 m. from New York, on the S. W. bank of the Raritan River, at the head of navigation and at the E. terminus of the Del. and Raritan Canal. It has Rutgers Coll. and a theological sem., both under the Reformed (Dut.) Ch. It has a sem. Pop. 1880, 17,166; 1885, about 20,000.

**Newburg**, city and R. R. centre, one of the caps. of Orange co., N. Y., on W. bank of the Hudson River, 60 m. N. of New York, with which it is connected by several regular steamers. The theological sem. of the Associate Reformed Ch. is located here. It has an acad. Pop. 1870, 17,014; 1880, 18,049.

**Newburyport**, a city, R. R. centre, and seaport, one of the caps. of Essex co., Mass., 35 m. N. E. of Boston, contains the Univ. of Modern Languages and the Putnam Free School; is largely engaged in manufactures and ship-building. Pop. 1870, 12,595; 1880, 13,538.

**New Caledonia**, an island in the S. Pacific, belonging to Fr., lies between lat. 20° and 22° 30' S., and between lon. 164° and 167° E. 230 m. long and 30 m. broad; it is high, mountainous, and contains several active volcanoes in the interior, but surrounded by sand-banks and coral-reefs along the coasts. The valleys are fertile. The inhabs., numbering about 29,000, consist of different savage tribes.

**New Caanan**, on R. R., Fairfield co., Conn. Pop. tp. 1870, 2497; 1880, 2673.

**New Castle**, city, on R. R., New Castle co., Del., on the Del. River, has a c-h. and public library. Pop. 1870, 1916; 1880, 3700.

**Newcastle**, R. R. junc., cap. of Henry co., Ind., 83 m. S. E. of Ft. Wayne. Pop. 1870, 1556; 1880, 2299.

**New Castle**, city and R. R. centre, cap. of Lawrence co., Pa., has 2 colls., an opera-house, and manufactures of iron and glass. The neighboring hills are rich in deposits of coal, iron ore, limestone, and fire-clay. Pop. 1870, 6164; 1880, 8418.

**Newcastle-upon-Tyne**, city of Eng., in the co. of Northumberland, on the left bank of the Tyne, 8 m. from its mouth in the Ger. Ocean, opposite Gateshead. The city is built on 3 steep hills, and one of its most prominent features is the double bridge across the Tyne. The old part of

the city has a very antiquated appearance, but since the conflagration in 1864 most of the city has been rebuilt in a modern and elegant style. St. Nicholas ch., in the Decorated style, is a very fine structure; also the Moot Hall, the depot, etc. The prin. branch of the manufacturing industry is iron. Next to the iron industry ranks the ship-building, especially iron vessels; then come the manufactures of earthenware, fire-brick, cement, glass, paper, leather, etc. The prin. article of trade is coal. Pop. 145,228.

**Newcomb** (HARVEY), D. D., b. at Thetford, Vt., Sept. 2, 1803; was for 8 yrs. teacher at Alfred, N. Y.; ed. the *Western Star* at Westfield, N. Y., 1826-28, the *Buffalo Patriot* 1828-30, and the *Pittsburg Chr. Herald* 1830-31; was for several yrs. in the employ of the Amer. Sunday-School Union; was licensed to preach in 1840; became pastor of Congl. chs. in Roxbury, Needham, and Grantville; was one of the eds. of the *Boston Traveller* 1849, and of the *New York Observer* 1850-51; wrote the *Cyc. of Missions*, etc. D. Aug. 30, 1863.

**Newcomb** (SMON), L.L.D., F. R. A. S., b. at Wallace, N. S., Mar. 12, 1835; came to the U. S. in childhood; taught school in Md. for several yrs., and displayed so great a talent for math. as to be employed as a computer on the *Nautical Almanac* for 1857. In the following yr. he first gave special attention to theoretical astron.; was appointed in 1861 prof. of math. in the navy, and stationed at the Naval Observatory, for which he supervised the construction and erection of the great telescope; was sec. and chief director of the commission created by Cong. in 1871 for the observation of the transit of Venus, Dec. 9, 1874. He was chosen in 1872 a foreign associate of the Royal Astronomical Society of Eng., which in 1874 awarded to him a gold medal for his tables of Uranus and Neptune. He has written a number of astronomical memoirs, *A Critical Examination of the Financial Policy during the Southern Rebellion*, etc.

**New Edinburgh**, Carleton co., Ont., Canada, is a suburb of Ottawa, from which it is separated by the river Rideau, here crossed by a suspension bridge. It has a beautiful park, and contains the fine cataract of the Rideau, which affords a great water-power. The v. contains Rideau Hall, the residence of the gov.-gen. Pop. of sub-dist. 596.

**Newell** (WILLIAM A.), M. D., b. in O., grad. at Rutgers Coll. 1836; was M. C. from N. J. 1847-51 and 1865-67, gov. of N. J. 1857-60.

**New England**, comprising the States of Me., N. H., Vt., Mass., R. I., and Conn., was originally called North Virginia, when granted in 1606 by James I. to the Plymouth Co. for colonization, but received subsequently its present name from Capt. John Smith, who explored it in 1614.

**Newfoundland**, nu'fond-land', a Brit. colony, consisting chiefly of the great island of that name, lying E. of the Gulf of St. Lawrence, between 46° 36' and 51° 39' N. lat. and 52° 37' and 59° 24' W. lon. Area, 42,000 sq. m. Pop. 1884, about 185,000. To this are attached many small adjacent islands and a prin. part of the coast of Labrador.

The island is roughly triangular in outline, its E. and S. coasts being much broken by deep bays. Placentia Bay on the S. and Trinity Bay on the E. approach to within 4 m. of each other, almost severing the peninsula of Avalon. The extreme length of the island from N. W. to S. E. is 350 m., the average breadth 130 m. The coast abounds in good harbors. The shore-line is usually bold and rocky, with little shoal-water near it. The interior is in great part very uneven, having hills over 1000 ft. high. There are numerous lakes and some rivers. The trees near the shore are often stunted, but along the larger streams, and especially inland, there is much excellent timber. A great part of the island is uninhabited save by a few wandering Micmac Indians from the mainland. A large part of the interior consists of marshy savannahs, based upon great deposits of peat, sometimes as much as 100 ft. deep. But along the streams there is much excellent land; the climate, too, is much pleasanter than along the coast. The greater part of the pop. is confined to the Avalon peninsula and the E. and S. coasts. The inhabs. are mostly engaged in the cod and other fisheries, and in seal-catching along the coast of this island and of Labrador. The Long Range of hills, extending E. by N. from Cape Ray, is of Laurentian age. The Cambrian-Huronian rocks, found in the E. peninsulas, contain lead, iron, and copper ores. The Lower Silurian is extensively found, and is highly metalliferous. The Cape Breton coal-measures are represented in the S. W. part of the island by 3 areas, one of which, at George's Bay, is estimated to contain 38 sq. m., with a seam of coal about 3 ft. thick. The useful minerals thus far found are iron ores, coal, lead, copper, graphite, nickel, gypsum, marbles, oil-shales, petroleum, etc.

N. was first discovered, probably, by the Northmen of Iceland in the 10th century, and was visited, probably in 1000, by Leifr, son of Eric the Red. John and Sebastian Cabot visited the coast in 1497, and almost immediately there sprang up here a great cod-fishery, in which Port., Sp., Fr., and Eng. engaged. The attempts of Gilbert (1570 and 1583), of Lord Bacon's co. (1610), and of Calvert (1623) were failures, but permanent settlements were made at many points at very early dates, so that the prov. claims to be the oldest Brit. N. Amer. colony. In 1629 the Fr. established themselves at Placentia, and attempted to conquer the island, which they had long claimed. During the wars between G. Brit. and Fr. in the 17th century there were many bloody events in N., which, however, in 1713, was ceded to G. Brit. by the Treaty of Utrecht. Twice since then the Fr. have invaded the island, but with no permanent advantages; but they still retain the right of curing fish on a part of the coast. The island was first made a prov. in 1783.

**New Granada**, see COLOMBIA, UNITED STATES OF.

**New Guinea**, see PAPUA.

**Newhall** (FALES HENRY), D. D., b. at Saugus, Mass., June 19, 1827, grad. in 1846 at Wesleyan Univ.; entered M. E. ministry (after teaching 1846-53); prof. of rhetoric and Eng. lit. in Wesleyan Univ. 1863-71; studied in Europe 1867-68; became pres. of O. Wesleyan Univ. 1873.



**New Hampshire**, one of the N. Eng. or E. States,

and one of the original 13, lying between 42° 42' 30" and 45° 18' N. lat., and 70° 43' 40" and 73° 33' W. lon.; on the S. its breadth is a little more than 90 m.; at the extreme N. it is 3 or 4 m.; average breadth, about 45 m.; extreme length, 178 m. It is bounded on the N. and N. W. by the prov. of Que., on the E. by Maine and the Atlantic, on the S. E. and S. by Mass., and on the W. by Vt.; area, 9,905 sq. m. or 5,955,200 acres.



Seal of New Hampshire.

**Face of the Country.**—N. H. has but 18 m. of sea coast, and Portsmouth is the only good harbor for large vessels. The Isles of Shoals, a group of 8 rocky islands, lie about 8 or 9 m. from the shore; 3 of them belong to N. H. The sea-coast is low and level, and a portion of it marshy for quite a number of miles inland; but with this exception the surface of the State is broken and mountainous. The Appalachian range of mts. enters the State from Me., and forms a plateau varying in elevation from 800 to 1500 ft. through nearly the entire length of the State, from which rise at irregular intervals numerous summits. That portion of this plateau occupying the S. part of Coos and the N. portion of Grafton and Carroll cos. has a great number of lofty peaks, and is known by the gen. name of the White Mts., though it is locally divided into the White and Franconia ranges. Mt. Washington, the highest of these peaks, and the loftiest summit of the N. or N. E. States, is 6,285.4 ft. in height, and there is now a R. R. running from the base to its summit. The Ammonoosuc River flows through the valley immediately N. of Mt. Washington. Other peaks are scattered over the State, which from their isolated positions seem higher than they really are. Between these mt. summits are many beautiful valleys, some of them containing lakes, others watered by the numerous streams of the State, and most of them fertile and yielding abundantly such crops as the somewhat severe climate will permit. There is a moderate slope from N. to S., and most of the streams have considerable falls in their course.

**Rivers and Lakes.**—The Conn. River is the longest river in the State, rising in its extreme N. limit, and forming after its union with Hall's Stream the W. boundary throughout the entire length of the State; only the affluents of the E. bank belong to N. H., except near its source; these are Perry's Stream, Indian Stream, Hall's Stream, Mohawk River, Sim's Stream, the Upper Ammonoosuc River, Lower Ammonoosuc or Mink River, Mascomy River, Sugar River (the outlet of Sunapee Lake), and Ashuelot River. The Merrimack River drains the S. half of the State; it receives from the W. the Contoocook, Piscataquol, and Sowhegan rivers; from the E. the Suncook River. The Piscataqua River, which forms a part of the S. E. boundary of the State, rises in E. Pond. It receives the Salmon Falls and Cochecho rivers. The Saco and Androscoggin rivers have their sources and receive several affluents in N. H. The State is noted for the number and beauty of its lakes. Of these, Winnisseeogee Lake (i. e. "the smile of the Great Spirit") is the largest. Squam Lake, Lakes Ossipee and Sunapee, Umbagog, Connecticut, and many other lakes and ponds give variety and beauty to the scenery.

**Geology and Mineralogy.**—Iron is found in the form of magnetic and specular ores in Grafton and Carroll cos., and in bog-iron ore all over the State. There are iron furnaces at Franconia, near one of the largest mines, but the ore is less rich than in some of the deposits in other States, and at the present low price of iron its production is not profitable. Silver, copper, lead, zinc, graphite, and tin are also found; the graphite is largely in demand for crucibles. Mica or isinglass of great purity and in sheets of considerable size is obtained at Alstead and Grafton. There are quarries of steatite or soapstone at Franconia and Oxford, and a large deposit of the mineral usually known as Bath brick not far from Manchester. Building granite of excellent quality abounds. The other minerals are gneiss, crystallized quartz, ochres, different kinds of spar, talc, terra sienna, tourmalines, beryls, garnets, jasper, amethysts, asbestos, manganese, sulphur, and magnesia.

**Vegetation.**—The N. portion of the State and the mountainous regions are covered with heavy forests of oak, pine, beech, sugar-maple, birch, etc. The S. portion has less timber, having been longer under cultivation; but along the streams there are heavy growths of deciduous trees, more especially of the chestnut, elm, poplar, locust, hornbeam, hickory, willow, sugar-maple, butternut, alder, etc. The flora is to a large extent alpine and sub-alpine.

**Climate.**—The climate is cold, the winters long and severe, but the warm season is pleasant and genial. Owing to the gen. elevation of the State, it is somewhat colder than Me. in the same lat. It is, however, very healthful. The prevalent winds of N. H. are, in the order of their frequency, N. W., S. W., N., S. E., and S. The mean temperature of the State averages 43.4°, ranging from 38° in the White

Mt. region to 47° in the S. portion of the State. The highest temperature in 7 yrs. was 98°, the lowest—30°, and the range 128°. The average rainfall over the entire State is 47.16 inches. The heaviest rainfall occurs in the autumn, and usually in Oct.; the lightest in the summer, generally in July.

**Zoology.**—In the N. and the mountainous portions of the State the bear, panther, lynx, wild-cat, wolf, and fox, as well as the mink, marten, raccoon, and skunk, are found in considerable numbers; deer, and rarely the elk and moose, as well as smaller game, are also found in that section, as well as around the lakes, and game and aquatic birds are plentiful, as are birds of prey and the various song-birds common to N. Eng. The rattlesnake is the only venomous snake. The lakes and rivers abound in choice fish.

**Agricultural Products.**—The sterility of the soil is such that but very small crops are grown, except of corn, oats, and potatoes. Of Indian corn, 1,350,348 bushels were raised in 1879; oats, 1,017,620 bushels; wheat, 169,316 bushels; buckwheat, 94,090 bushels; barley, 77,877 bushels. The clip of wool in 1880 yielded 1,060,589 lbs.; 170,843 lbs. of tobacco were raised.

**Farm Animals.**—In 1880 there were in N. H. 46,773 horses, 232,405 cattle, 211,825 sheep, and 53,437 swine.

**Manufactures.**—N. H. is a heavy manufacturing State, the splendid water-power of her rivers running through so hilly and diversified a country being turned to the utmost advantage. Cotton, woollen, and paper mills abound; there were, in 1880, 25,487 cotton looms, with 1,008,521 spindles, employing 16,657 persons, and consuming 172,746 bales of cotton. In this industry N. H. ranks as second among the States in the product, and third (or next after R. I.) in the number of spindles. The iron and steel manufacture was of the value of \$807,340 in 1880.

**Railroads.**—In Jan. 1882 there were in operation in N. H. 1026 m. of R. R., costing \$25,370,787, with net earnings of \$1,287,133, and paying in interest and dividends \$1,189,657. The Boston, Concord and Montreal and the Portland and Ogdensburg are the most important lines.

**Finances.**—The assessed valuation of property in N. H. in 1881 was—real estate, \$123,511,284; personal, \$77,366,732; total, \$200,878,016. Rate of State tax, 20 cents on \$100, producing \$398,692; aggregate taxation, State, co., and town, \$2,697,640; State debt, 1881, \$3,411,248; aggregate State and local indebtedness, \$10,724,170.

**Commerce.**—N. H. has one port of entry, Portsmouth, where imports to the amount of \$20,031 and exports of \$2761 were entered in 1881. The interior trade of the State is extensive, but no statistics of it exist. The fisheries of N. H. yielded only \$176,684 in 1880. The registered shipping of N. H. in 1881 exhibited a total of 74 vessels—69 sailing and 5 steam—with tonnage of 9688.

**Banks.**—In Oct. 1881 N. H. had in operation 47 national banks, with capital of \$5,890,000; circulation, \$5,158,159; U. S. bonds to secure circulation, \$5,777,000; aggregate deposits, \$4,542,590. There were beside, 67 savings banks, with deposits of \$32,092,232; one State bank, with \$50,000 capital and \$25,658 deposits, and 4 private bankers, with \$45,234 deposits. The insurance cos. (all foreign except one) wrote risks to the amount of \$40,000,000 in 1880, receiving in premiums \$483,621, and paying for losses \$413,600.

**Education, Etc.**—In 1880 the number of children of school age (5-21 yrs.) was estimated at 71,132, of whom 64,670 were enrolled in public schools, with average daily attendance of 48,943. Total expenditure for public schools, 1880, \$568,103, of which salaries of teachers required \$415,777. N. H. has 1 univ., Dartmouth Coll. at Hanover, having 15 profs. and 247 students in 1880, with receipts from tuition of \$16,000. There are many normal schools, female sems., and acads. of high class, of which Phillips Acad. at Exeter is notable for its excellence and antiquity. There were pub. in N. H., in 1882, 89 newspapers and periodicals, 9 of them daily.

**Churches.**—The Congregationalists take the lead, with 187 chs., 196 ministers, and 20,547 members; M. E., 112 chs., 138 ministers, 12,659 members; Baps., 86 chs., 110 ministers, 9127 members; Free Will Baps., 108 chs., 8849 members; Second Adventists, 48 chs., 5750 members; Prot. Epis., 27 chs., 1967 members; R. Caths., 27 chs. and 27 priests; and a dozen other denominations, with from 1700 to 35 members each.

**Population.**—In 1860, 326,073; 1870, 318,300; 1880, 346,991 (white 346,229, colored 762, including 63 Indians and 14 Chl.).

**Principal Cities and Towns.** Pop. 1880.—Manchester, 32,680; Concord (cap.), 13,843; Nashua, 13,397; Dover, 11,687; Portsmouth, 9690; Keene, 6784; Rochester, 4688; Suncook, 3487; Franklin Falls, 1957; Lebanon, 1954; Littleton, 1651; Exeter, 1526; Laconia, 1445; Lancaster, 1409; Hinsdale, 1351.

COUNTIES.	*Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
Belknap	8-F	17,681	17,948	Laconia	1,445
Carroll	6-G	17,332	18,224	Ossipee	160
Cheshire	10-D	27,265	28,734	Keene	6,784
Coos	3-F	14,932	18,580	Colebrook	655
				Lancaster	1,409
Grafton	6-E	39,103	38,788	Haverhill	517
				Plymouth	941
Hillsborough	10-E	64,238	75,634	Amherst	484
Merrimack	8-F	42,151	46,300	Manchester	32,680
Rockingham	10-G	47,297	49,064	Nashua	13,397
				Concord	13,843
Strafford	8-G	30,243	35,558	Exeter	1,526
Sullivan	8-D	18,058	18,161	Portsmouth	9,690
				Dover	11,687
				Rochester	4,683
				Newport	1,342
Total		318,300	346,991		

**History.**—The Piscataqua River and the coast of N. H. were visited by the famous Capt. John Smith in 1614. In 1632 all the territory between the Merrimack and the Kennebec rivers and the sea-coast, 60 m. inland, was granted by the

\* Reference for location of counties. See map of New Hampshire, in VERMONT.



Council for N. Eng. to Sir Ferdinando Gorges and Capt. John Mason, both churchmen and royalists, and designed to be called the Province of Maine. In the spring of 1623 the first Eng. settlement in this prov., W. of Piscataqua River, was made at Little Harbor (now Rye). Some time after, Gorges and Mason divided their great prov., Mason taking all W. of the Piscataqua River. In 1629 the Council granted Mason his share, lying between the middle of the Merrimack River and the Piscataqua River, and reaching inland 60 m. from the sea-coast, with all islands within 5 leagues thereof. Mason called it *New Hampshire*, and sent over substantial colonists with cattle, mills, etc. needed for a great plantation. Little Harbor, Strawberry Bank (now Portsmouth), and Dover soon became considerable settlements. The first settlers were churchmen. Mason's untimely death in 1635 retarded the progress of the settlements. The rigor and the intrigues of the Bay Colony soon introduced among the settlements an active Puritan element, which got control of affairs, and annexed all the settlements to Mass. in 1641. The latter claimed nearly all N. H. to be within the charter limits. This action overthrew Mason's proprietary interest, but the claims of his heirs in Eng. issued, 40 yrs. later, in the emancipation of N. H. In 1677 a royal order restrained Mass. to within 3 m. N. of the Merrimack River, and in 1679 a royal commission established a govt. over the prov. of N. H. The king appointed the pres. and council, and the people elected an assembly. In 1692 a royal commission established a new govt., which continued till overthrown by the Revolution. The king appointed the gov. and council, and the people chose a legislature. From 1675 to 1750 the inhabs. suffered terribly from the Indians. The limits of the prov., much the same as now, were fixed by royal determination—the S. and E. in 1740, and the W. in 1764. N. H. took an active part in the Revolution, and one of the first assaults on royal authority in the country was the capture by her patriots of the fort at New Castle, Dec. 1774. A State const. was adopted in 1784. The Federal const. was adopted by a small majority June 21, 1788. While provincial authority continued, Portsmouth was the seat of govt. The provisional govt. during the Revolution was at Exeter. Since 1805 Concord has been the cap. of the State.

## Governors.

Josiah Bartlett	1792-94	Samuel Dinsmore	1849-52
John Taylor Gilman	1794-1805	Noah Martin	1852-54
John Langdon	1805-09	Nathaniel B. Baker	1854-55
Jeremiah Smith	1809-10	Ralph Metcalf	1855-57
John Langdon	1810-12	William Halle	1857-59
William Plumer	1812-13	Ichabod Goodwin	1859-61
John Taylor Gilman	1813-16	Nathaniel S. Berry	1861-63
William Plumer	1816-19	Joseph A. Gilmore	1863-65
Samuel Bell	1819-23	Frederic Smyth	1865-67
Levi Woodbury	1823-24	Walter Harriman	1867-69
David L. Morrill	1824-27	Onslow Stearns	1869-71
Benjamin Pierce	1827-29	James A. Weston	1871-72
John Bell	1829-30	Ezekiel Straw	1872-74
Matthew Harvey	1830-31	James A. Weston	1874-75
Jos. M. Harper (act'g.)	1831	Person C. Cheney	1875-77
Samuel Dinsmore	1831-34	Benj. F. Prescott	1877-79
William Badger	1834-36	Natt Head	1879-81
Isaac Hill	1836-39	Charles H. Bell	1881-83
John Page	1839-42	Samuel W. Hale	1883-85
Henry Hubbard	1842-44	Moody Currier	1885-87
John H. Steele	1844-46		
Anthony Colby	1846-47		
Jared W. Williams	1847-49		

REVISED BY A. R. SPOFFORD.

**New Hamp'ton**, on R. R. cap. of Chickasaw co., Ia. Prin. industry, farming. Pop. 1870, 455; 1880, 1105.

**New Hartford**, Conn. See APPENDIX.

**New Haven**, city and important R. and commercial centre, cap. of New Haven co., Conn., and the prin. settlement of the independent colony, founded by Davenport and Eaton in 1636. The charter of Charles II. given to Conn. in 1662 included this colony, which had no royal charter, under the same jurisdiction. From that time Hartford and N. H. were joint caps. until 1873. N. H. is at the head of a shallow harbor, into which 2 small streams discharge their waters. The town and city have now the same limits. The town officers are selectmen, 7 in number, with jurors, constables, assessors, etc., according to the practice of N. Eng. before there were any cities. The pop. in 1850 was 20,345; in 1860, 39,267; in 1870, 50,840; in 1880, 62,882; 1885, about 75,000. The city govt., over a terr. divided into 12 wards, is vested in a mayor, with 2 aldermen and 3 common councilmen to each ward, biennially chosen. The funded debt in Jan. 1880 was \$849,000, with \$25,000 of floating debt. The receipts were \$451,141.99, and the expenses \$445,463.62, as stated by the mayor for the preceding yr. The cost of the police dept. was \$77,718; of the fire dept., \$55,501; of the road dept., \$105,250; for education, \$281,293. There were 26 public schools in 1880. The number of chs. is over 40. A new park of large dimensions has been laid out, and the harbor is undergoing very important improvements. N. H. is the seat of Yale Coll., and has large manufactures of carriages, rifles, etc.

T. D. WOOLSEY.

**New Hebrides**, heb'rid-ēz, a large group of islands in the Pacific, situated between lat. 14° and 20° S. and between 168° and 170° E. The largest and best known of them is Tanna, with the harbor Erupabo; Santo, Mallicolo, and Erromango have also been visited by Europeans, though the extreme savageness of the inhabs. makes all intercourse very difficult. The islands are volcanic and fertile, covered with forests of sandal and other valuable trees. The inhabs. belong to the Papuan race, and were cannibals. Their number is estimated at from 70,000 to 100,000.

**New Holland**, See AUSTRALIA.

**New Iberia**, on R. R. cap. of Iberia parish, La., on the Bayou Teche, 55 m. W. S. W. of Baton Rouge, surrounded by sugar and cotton plantations. Pop. 1870, 1472; 1880, 2709.

**New Jersey**, one of the Middle Atlantic States, and



one of the original thirteen, situated between Del. River and Bay and the Atlantic Ocean and Hudson River, and between 38° 55' 50.42" and 41° 21' 19" N. lat., and 73° 51' 51.25" and 75° 33' 02.74" W. lon.; bounded on the N. by N. Y., on the E. by Hudson River, Staten Island Sound, Raritan Bay, and the Atlantic, S. by Del. Bay, and

W. by Del. and Pa.; extreme length, 167 3/4 m.; greatest breadth, 59 m.; least breadth, 32 m.; area, 7815 sq. m. or 5,001,600 acres.

**Face of the Country.**—The N. half of the State is traversed by 3 distinct ranges of mts.; 2 of them, the Kittatinny or Blue Mt., called Shawangunk in N. Y., and the Highland Range, belong to the Appalachian chain, while the third and lower range lies between the Highlands and the ocean, and is a part of the low mountain-range which descends from Mass. through N. Y. and enters N. J. below the Palisades. The interval between the second and third ranges of mts. is throughout most of its extent largely charged with trap-rock, which at times, as at the Palisades, completely obscures its matrix and appears as an independent line of basalt. The Blue or Kittatinny range is somewhat the highest, rising to a height of not far from 1800 ft. at High Point, near the N. Y. line. It forms an almost unbroken ridge from the N. Y. State line to the Del. Water Gap. Its E. slope is steep. The top of this ridge is flat and generally covered with a heavy forest-growth. The Highland range is composed of a great number of mt.-ridges. It has really no long unbroken ridges except the Green Pond Mt. range. The highest point is Rutherford's Hill on Hamburg Mt., 1488 ft. above the sea, though Wawayanda Mt., near the N. Y. line, is 1450 ft. Schooley's Mt. and the Musconetcong Mt., both favorite summer resorts, are 2 of the many ridges of this range. Most of these ridges slope gently to the gen. level on their N. E. faces, while the S. W. terminate abruptly and sometimes precipitously. The trap ridges are irregularly distributed. The longest and most widely known of these is that generally known as Palisade Mt., which, commencing between 8 and 9 m. W. of the Hudson River, in Rockland co., N. Y., reaches the river by a bold curve, and thence follows the W. bank down in the almost perpendicular and frowning Palisades. Nearly parallel with this ridge, and from 10 to 18 m. W. of it, are the First, Second, and the less continuous Third Mts., which, though broader and somewhat higher than the Palisades, are not so long. They include the Orange Mt., Fairmount, etc. S. W. of these are other less extensive but prominent trap ridges known as Rocky Hill, Ten-mile Run Mt., Long Hill, Sourland Mt., Goat Hill, and farther N. Round Mt., and a large horseshoe-shaped mass of trap rising 767 ft. above the sea, and known as Pickle Mt. These trap ridges all have their E. front abrupt and almost perpendicular, while on the W. side they slope gradually toward the plain. The S. half of N. J. has no elevations deserving the name of mts. The Highlands of Navesink, S. of Sandy Hook, are about 400 ft. high. All of S. N. J. is a gently undulating plain in the centre, 150 to 190 ft. above the sea, and sloping gradually to the ocean on one side and Del. River on the other. The valley of the Del. River, from the N. Y. State line to the Del. Water Gap, a distance of 40 m., varies in breadth from 1/4 m. to 3 m., and possesses great beauty and a rich and productive soil. At the Water Gap the Kittatinny or Blue Mt. crosses the river, and from that point the valley is broader. Below this the valley stretches out in wide plains of sandy loam, broken only by occasional trap-dikes, as far as Trenton, when clay deposits take the place of sand as far S. as Elsinborough, when the sand again resumes its sway. The Kittatinny Valley lies between the Kittatinny Mt. and the Highland Range, and is everywhere noted for its rural beauty and agricultural wealth.

**Rivers, Bays, Lakes.**—The Hudson River bounds the State for 28 or 30 m. It receives from this State only the Walkkill River, with 3 small affluents of that stream. Newark Bay receives the Passaic and the Hackensack rivers, with their affluents. Raritan Bay receives the Raritan River, with its N. and S. branches, and three other tributaries and 3 affluents of these. The Atlantic Ocean receives the Rahway River, Navesink and Shrewsbury rivers, Shark River, Manasquan River, Metedeconk and Tom's rivers, and Cedar Creek. Little Egg Harbor or Mullica's River, and Great Egg Harbor River. Delaware Bay receives the Del. River, with its 15 tributaries and 4 affluents of these; and in the extreme S. of the State Cohansey Creek and Maurice River, as well as a number of smaller streams. The numerous bays along the coast, beside Del. Bay and Newark, Raritan, and Sandy Hook bays, are sometimes called bays, sometimes harbors or sounds. They form a line of internal water communication along the Atlantic coast from Metedeconk River to Cape May for vessels of light draught. The prin. are Bar-negat Bay, Little Egg Harbor, Great Bay, Absecon Bay, and Great Egg Harbor. There are numerous lakes and ponds in



the State, but few of them are of considerable size. Greenwood Lake, partly in N. Y., is from  $\frac{1}{2}$  to  $\frac{1}{4}$  m. wide and 7 or 8 m. long. Lake Hopatcong in Morris co. is  $\frac{1}{2}$  m. long and from  $\frac{1}{4}$  to  $\frac{1}{2}$  m. wide. Budd's Lake is nearly 2 m. long and  $\frac{1}{4}$  to 1 m. wide. Green Pond, also in Morris co., between Green Pond and Copperas Mts., 1044 ft. above the sea, is 3 m. long and from  $\frac{1}{4}$  to  $\frac{1}{2}$  m. in width.

**Mineralogy and Economic Geology.**—The clay marls, pure marls, and shell marls of the State are used to the amount of more than 200,000 tons per annum; lime, also, for fertilizing purposes; marsh mud, peat both as a fertilizer and fuel, not to speak of the great variety of marine products, partially mineral, used for fertilization; building materials, including a very fine gneiss, white and blue limestones, Potsdam sandstone and the variety of N. J. free or sand stones; roofing and writing slates throughout the Kittatinny valley, and flag and paving stones of large size and excellent durable material, are abundant along and near the Hudson. Hydraulic lime and clay suitable for brick-making are plentiful and largely used. N. J. has vast beds of the best iron ores. There are in Somerset co. and elsewhere in the State veins of copper ore which have been worked in the past, but they would not now prove profitable, yielding only 9 or 10 per cent. of pure copper. Zinc ores have been found only in 2 localities, but they are of excellent quality, and supply  $\frac{1}{10}$  of the zinc oxide and more than  $\frac{1}{10}$  of the metallic zinc produced in the U. S. The quantity of both is said to be much superior to the imported. Lead ore (galena) occurs at several localities, but is not sufficiently abundant to pay for working. Nickel has also been found in small quantities. Porcelain and potter's clays of excellent quality are dug annually to the extent of nearly 300,000 tons. Kaolin is also found in extensive deposits, but not of the best quality, and infusorial earth, in demand for polishing purposes and for the preparation of dynamite or giant powder, in Morris co. A pure white sand, equal to any known for glass-making purposes, abounds in S. N. J. Moulding sand of good quality, and sand for making the brick for reverberatory furnaces, are found in Burlington and Morris cos. Graphite or plumbago occurs in several parts of Morris and Passaic cos.; it has been mined with profit. Sulphate of baryta, manganese, molybdenum, iron pyrites, used largely for producing sulphuric acid, and greensand for chemical purposes and glass-making, are among the other mineral products of the State.

**Soil and Vegetation.**—Though much of the soil is a light sandy loam, it is easily tilled, and by the addition of rich marls, lime, and marsh-mud of the tide-washed portions of the State, it has a high value. Taking all parts of the State, the forest area may be calculated as comprising about  $\frac{1}{2}$  of the State, though portions of this are scrub. The prevalent timber of the S. part is pine, with some cedar in the swamps; in the N. portion, and especially the forests on the hills, are composed mostly of oak, hickory, chestnut, hornbeam, tulip tree, basswood, dogwood, sassafras, with wild cherry and some ash and elm. The *Magnolia glauca* is found in the swamps. Wild grapes, cranberries, whortleberries, blackberries, and raspberries are abundant, and the bitter-sweet, wax-berry, button-bush, shad-bush, and box-elder are plentiful. The flora of the State is very large, and many of the flowers are of great beauty.

**Zoology.**—There are in N. J. bats, moles, shrews, the wild-cat, now very rare; red and gray foxes, the fisher, weasel or stoat, mink, otter, and skunk; the black bear, raccoon, opossum, squirrels; woodchuck or ground-hog, muskrat, the common rabbit, a few deer, the black whale, and porpoise. The birds are very numerous, comprising the turkey-buzzard and black vulture, the eagle, falcon, hawk and fish-hawk, owl, cuckoo, woodpecker, humming-bird, swift, or chimney swallow, whippoorwill and night-hawk, kingfisher, fly-catcher, thrush, robin, and several species of wren; wood-warbler, swallow, waxwing, shrike, creeper, titmouse, shore-lark, finch, sparrow, oriole, crow, bluejay, turtle dove and wild pigeon; ruffed grouse and quail, heron, ibis, plover, oyster-catcher, avoet, snipe, curlew, woodcock, rail, swan, wild-geese, duck, brant, teal, etc.; petrel, gull, tern, pelican and gannet, cormorant, loon and diver, auk and guillemot. Of reptiles there are turtles, terrapins, tortoises, and lizards, the rattlesnake, copperhead, and large milk-adder, with harmless snakes, including the black-snake and water-snake; salamander, frog, tree-toad, and toad. The number of fishes is enormous, comprising the perch, sunfish, darter, tautog or blackfish, cunner or conner, sheephead, and porgy; weakfish, angel-fish, surgeon, pilot, ribbon-fish, the little barracuda; the mackerel family, including the common and Sp. mackerel, bonito, tunny, spinous dory; bluefish, swordfish, gar or bill-fish, flying-fish, pipe-fish, stickleback, mullet, silver-side, sandlarie, red sea-perch, bullhead, sculpin, gurnard, toad-fish, goby, blenny, angler, mouse-fish, lump-fish, the cod family, flounder, including the halibut; killie-fish, salmon, brook-trout, smelt, soury, the shad and herring family, including several species of herring, the common shad, alewife, moss-bunker, and anchovy; pike and gar, chub, minnow, dace, shiner, sucker, eel, catfish, file-fish, trunk-fish, head-fish, globe-fish, balloon-fish, puffer, sea-horse, sturgeon, shark, ray, devil-fish, and lamprey.

**Climate.**—The climate of the State is in general healthy, differing in the character of its winds on the sea-coast from that in the interior, milder and with somewhat less range in the S. than in the N. cos. Mean temperature of year—Newark (lat. 40° 44' 30" N., lon. 74° 10' W., elevation 35 ft.), 51.25°; New Brunswick, lat. 40° 29' N., lon. 74° 16' 40" W., elevation 75.8 ft., 51.1°; Sandy Hook (lat. 40° 28' N., lon. 74° 1' W., elevation 28 ft.), 49.9°. Annual rainfall—Newark, 52.78 inches; New Brunswick, 49.32 inches; Sandy Hook, 52.93 inches.

**Agricultural Products.**—According to the census of 1880 the leading crops of N. J. were: Indian corn, 11,150,705 bushels; oats, 8,710,573 bushels; wheat, 1,901,739 bushels; rye, 949,064

bushels; buckwheat, 466,414 bushels; barley, 4,091 bushels. The wool clip of 1880 produced 441,110 lbs. The yield of tobacco was 172,315 lbs.

**Farm Animals.**—The census of 1880 showed 86,940 horses, 223,886 cattle, 117,020 sheep, and 219,069 swine.

**Manufactures.**—N. J. is heavily engaged in manufactures of almost all descriptions, its vicinity to the great marts of New York and Phila. giving it great facilities both for marketing its products and importing raw materials at a minimum of cost. Cotton and woollen factories abound, and the various products of iron and steel (as machinery, hardware, steam-engines, locomotives, railway cars, etc.) are produced by the N. J. shops in great number, and exported even to foreign countries. The aggregate product of the iron and steel manufactures in 1880 was \$10,341,896. There were then 3344 cotton looms, running 232,305 spindles, employing 4658 persons, and using 20,569 bales of cotton.

**Railroads.**—In Jan. 1882 there were in operation in N. J. 1733 m. of railway, costing \$167,618,355, with net earnings of \$11,509,911, and paying in interest and dividends \$9,847,202. The State is a net-work of railways, of which the Central of N. J., the N. J. Southern, and the Pa. are among the chief.

**Finances.**—The assessed valuation of property in N. J. in 1880 was—real estate, \$442,632,638; personal, \$129,885,723; total, \$572,518,361; rate of State tax,  $\frac{2}{10}$  mills on \$1, producing \$895,250; aggregate raised by taxation, State, co., and municipal, \$8,558,065; amount of State debt, less sinking fund, \$813,675; total State and local indebtedness, net, \$49,547,102.

**Commerce.**—The direct foreign commerce of N. J. from its 3 ports of entry was, in 1881—imports, \$166,219; exports, \$88,595. The interior commerce is enormous, but no statistics of it exist. The aggregate shipping of N. J. in 1880 exhibited 1303 registered vessels, with a tonnage of 108,962.

**Banks.**—In Oct. 1881 there were in N. J. 67 national banks, with capital of \$12,960,000; circulation, \$10,386,784; U. S. bonds to secure circulation, \$11,671,350; aggregate deposits, \$28,469,730. There were also 33 savings banks, with deposits of \$20,388,409; 10 State banks and trust cos., with \$1,167,683 capital and \$3,487,561 deposits, and 5 private bankers, with \$26,231 capital and \$1560 deposits. There were 21 insurance cos. belonging to the State, which paid losses in 1881 of \$1,218,820; premiums received in 1880, \$1,678,886.

**Education, Etc.**—In 1880 the number of children of school age (5-18 yrs.) was 390,655, of whom 205,240 were enrolled in public schools, with average attendance of 116,890; aggregate expenditure for public schools in 1880, \$2,039,988, of which teachers' salaries required \$1,391,550. N. J. has 4 univs. and colls., with 71 instructors and 688 students, paying tuition fees of \$21,136 in 1880. The Coll. of N. J. at Princeton is one of the oldest insts. of learning in Amer. Normal schools, female sems., and acads. are numerous and excellent. In 1882 there were pub. in N. J. 209 newspapers and periodicals, of which 24 were daily.

**Churches.**—The M. E. denomination comes first, with 492 chs., 338 ministers, and 74,926 members; Presb., 288 chs., 365 ministers, 46,070 members; Bap., 172 chs., 32,367 members; R. Cath., 142 chs., 184 priests, and about 175,000 pop.; Reformed Ch., 114 chs., 18,683 members; Prot. Epls., 136 chs., 14,926 members; Lutheran, 74 chs., 8560 members; and 20 other denominations, with from 3400 to 100 members each.

**Population.**—In 1880, 672,035; 1870, 906,096; 1860, 1,151,116; (white 1,092,017, colored 39,069, including 170 Chi., 74 Indians, and 2 Japanese).

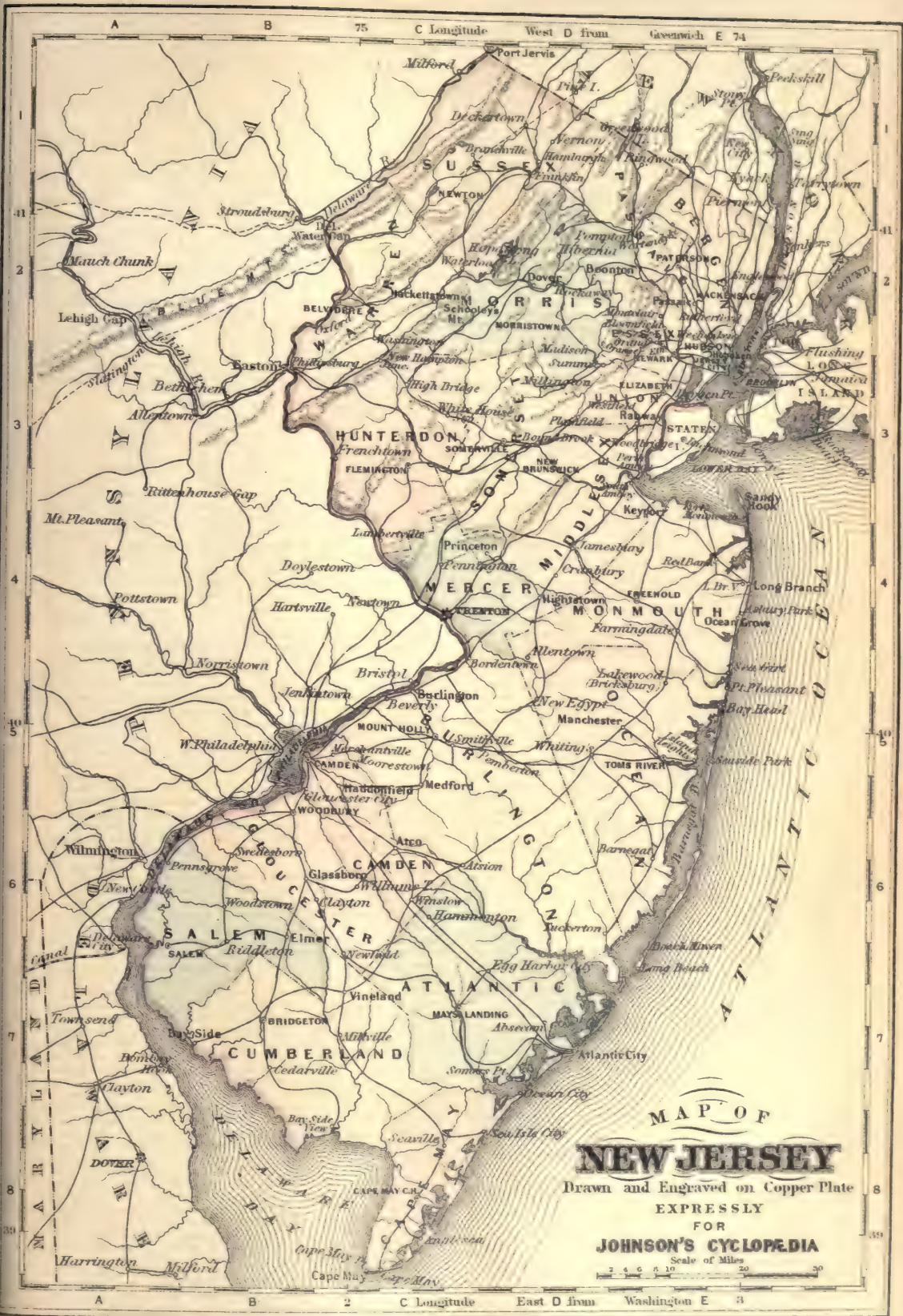
**Principal Cities and Towns, Pop. 1880.**—Newark, 136,508; Jersey City, 120,722; Paterson, 51,039; Camden, 41,659; Hoboken, 30,999; Trenton (cap.), 29,910; Elizabeth, 28,229; New Brunswick, 17,166; Orange, 13,307; Bayonne, 9572; Bridgeport, 8722; Plainfield, 8125; Millville, 7660; Phillipsburg, 7181; Passaic, 6532; Rahway, 6455; Burlington, 6090; Atlantic City, 5477; Morristown, 5418; Salem, 5066; Hackensack, 4248.

COUNTIES.	*Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
Atlantic .....	7-C	14,093	18,704	May's Landing....	744
Bergen .....	2-E	30,122	36,768	Hackensack .....	4,248
Burlington .....	2-D	55,639	69,409	Mt. Holly .....	2,432
Canden .....	6-C	46,193	62,942	Canden .....	41,659
Cape May .....	8-C	8,349	9,765	Cape May C. H....	570
Cumberland .....	7-B	34,665	37,687	Bridgeton .....	8,722
Essex .....	2-D	143,839	189,929	Newark .....	136,508
Gloucester .....	6-B	21,562	25,886	Woodbury .....	2,298
Hudson .....	2-E	129,067	187,944	Jersey City....	120,722
Hunterdon .....	3-C	36,963	38,570	Flemington .....	1,751
Mercer .....	4-C	46,286	58,061	Trenton .....	29,910
Mid Sussex .....	3-D	45,029	52,296	New Brunswick..	17,166
Monmouth .....	4-E	46,195	55,538	Freshhold .....	2,432
Morris .....	2-D	43,137	60,861	Morristown .....	5,418
Ocean .....	5-D	13,628	14,455	Tom's River .....	.....
Passaic .....	2-D	46,415	68,860	Paterson .....	51,031
Salem .....	6-B	23,940	24,379	Salem .....	5,056
Somerset .....	5-C	32,510	37,164	Somerville .....	3,105
Sussex .....	1-C	23,168	23,539	Newton .....	2,513
Union .....	3-D	41,899	55,571	Elizabeth .....	28,229
Warren .....	2-C	34,336	36,589	Belvidere .....	1,773
Total .....		906,096	1,131,116		

\* Reference for location of counties. See map of New Jersey.

**History.**—It is probable that somewhere between 1614 and 1620 a few Del. traders established themselves in Bergen. The whole region was claimed by the New Netherlands colonists, and in 1623 a fort was established 4 m. below Phila., on the Del. The region along the Del. was granted in 1634 to Sir Edmund Ploeden, who called it New Albion. About 1638 the Del. River was visited by a party of Swedes and Finns, who purchased land from the Indians and planted a colony, calling it New Sweden. In 1655 a Dut. force, headed by Petrus Stuyvesant, gov. of the New Netherlands, conquered the Swe. colony. In 1664 the Dut. were conquered by an Eng. force sent by Charles II., who had granted the entire region between the Del. and Conn. rivers to his brother, the duke of York. Some N. Eng. colonists the same yr. settled at Elizabethtown. In this or the following yr.





MAP OF  
**NEW JERSEY**

Drawn and Engraved on Copper Plate  
EXPRESSLY  
FOR  
**JOHNSON'S CYCLOPEDIA**

Scale of Miles  
2 4 6 8 10 20 30







the duke of York conveyed the present terr. of N. J. to Lord Berkeley and Sir George Carteret, and it was called New Jersey, in compliance to Sir George Carteret, who had held the Isle of Jersey as royalist gov. for Charles II. Sir George sent out his brother, Philip Carteret, in 1665 to be gov., but his administration proved unpopular. In 1670 he was obliged to leave the colony, and a natural son of Sir George was for a short time gov. In 1674 Lord Berkeley sold his half to 2 members of the Society of Friends, Fenwick and Byllinge, who in 1682 sold it to William Penn. The colony was now divided into E. and W. Jersey by a line drawn from Little Egg Harbor to a point on the Del. in lat. 41° 40' N. In 1682 or 1683 Penn purchased all Carteret's rights in E. Jersey, and the colony became a refuge for the persecuted Friends. The colony had no Indian troubles, and its growth was rapid until the Revolution, in which a majority of its inhabs. took an eager part. Active preparations were made for the coming conflict by the N. J. patriots; they were represented in the Continental Cong., and on the 2d of July, 1776, 2 days before the adoption of the Dec. of Ind., their provincial cong. reported and adopted a const. for an independent State, which was ratified on the 18th of July following, and under which the State was governed until 1844, when its present const. was adopted. During the war N. J. suffered severely from the incursions of Brit. troops and Tories, and the important battles of Trenton, Princeton, Millstone, Red Bank, and Monmouth were fought within the State. The Federal const. was adopted by a unanimous vote Dec. 18, 1787. It is worthy of notice that the State const. of 1776 allowed universal suffrage, both male and female, white and colored. Women continued to vote when they chose till 1807. The const. of 1844 restricts suffrage to white males over 21 yrs., and this provision was modified subsequently to accord with the U. S. constitutional amendments.

#### Governors.

William Livingston.....	1789-94	Daniel Haines.....	1848-51
William Patterson.....	1794	George F. Fort.....	1851-54
Richard Howell.....	1794-1801	Rodman M. Price.....	1854-57
Joseph Bloomfield.....	1801-12	William A. Newell.....	1857-60
Aaron Ogden.....	1812-13	Charles S. Olden.....	1860-63
William S. Pennington.....	1813-15	Joel Parker.....	1863-66
Mahlon Dickerson.....	1815-17	Marcus L. Ward.....	1866-69
Isaac H. Williamson.....	1817-29	Theodore F. Randolph.....	1869-72
Peter D. Vroom.....	1829-32	Joel Parker.....	1872-75
Samuel L. Southard.....	1832-33	Joseph D. Bedle.....	1875-78
Elias P. Seeley.....	1833	George B. McClellan.....	1878-81
Peter D. Vroom.....	1833-36	George C. Ludlow.....	1881-84
Philemon Dickerson.....	1836-37	Leon Abbett.....	1884-87
William Pennington.....	1837-43		
Daniel Haines.....	1843-44		
Charles C. Stratton.....	1844-48		

REVISED BY A. R. SPOFFORD.

**New Jersey, College of.** founded under the auspices of the Presb. synod of N. Y., which then included N. J. Chartered by N. J. in 1746, it was opened in Elizabethtown in May 1747, received a more liberal charter in 1748, was removed to Newark, and finally to Princeton in 1757, where a large coll. was erected named Nassau Hall. The coll. yr. is divided into three terms; some of the studies are elective in the junior and senior yrs. There are many prizes and fellowships, the recipients of the latter being required to pursue a prescribed course of study for one yr. after graduation.

**New Jersey Tea.** See CEANOTHUS.

**New Jeru'salem Church.** This is the name given by Emanuel Swedenborg to the Ch. which he declared it to be his mission to found. The essentials of this Ch., as stated by Swedenborg himself, are—I. The divinity of our Lord and Saviour Jesus Christ; II. the holiness of the Word; III. a life of charity.

I. *The Divinity of the Lord.*—Swedenborg utterly rejects the doctrine of 3 persons in one God. He asserts a trinity of essence, but not of person, in God. It may assist us to comprehend this Trinity if we look at the corresponding trinity in man, who is made in the image and likeness of God. The soul is by itself inconceivable and without shape or force. But the soul forms and fills a body—a material body while we live on earth, and a spiritual body afterward. The soul is manifested in and by the body, and acts through it as its instrument. Here we have soul, body, and action, and these 3 make up the living man. Jehovah, the Father, is in himself inaccessible to thought. He is forever in the Divine Humanity, and through this Divine Humanity he acts, and this action is of the Holy Spirit. Before his incarnation his Divine Humanity made itself known by various revelations. Since that event he, as our Lord and Saviour Jesus Christ, is the only proper object of love and worship for all who know him. Jehovah, the Father, assumed a human nature, and was born of the Virgin Mary. This human nature was full of germs of evil which she had inherited. Jesus Christ was tempted through them, but overcame them all; and as each evil was overcome and put away, the opposite good took its place, until the indwelling divinity filled the assumed humanity, and made it divine and one with the Father. The glorification of the assumed humanity is a perfect type of the regeneration of man. Swedenborg's doctrine of "Proprium" is important. The word may be translated "Ownhood;" and the doctrine is this: Life flowing into man from the Lord is given to him to be his own. He is in no sense and no measure independent of God, for every thought and every feeling come to him from God. It is given to him to be his own; and by this gift of the ownhood of his life man is himself and free. Hence, what a man loves and does from love he appropriates; that is, adds to his ownhood. By this doctrine of man's ownhood of life Swedenborg explains the origin of evil. Man, being actually free, may turn to evil or to good, and may pervert the life he receives by influx. Nevertheless, the Lord gave and gives him freedom. Children inherit the qualities of their parents and ancestors. By this inher-

itance man's natural "proprium" is full of proclivities to evil; and the whole effort of Divine Providence in relation to every man is to cleanse and vivify this ownhood.

II. *The Holiness of the Word.*—The Bible is the word of God, uttered by him through writers who were fully inspired, and whose minds he used as his instruments. It was so written that it might be the expression of infinite and divine wisdom. This word, or wisdom, is in the heavens, a perpetual source of light for all angels. Upon earth it is expressed in human language, that it may give the light of life to all who live on earth. Within the literal sense is the spiritual sense, in which the Word is read by those in heaven; and this internal sense is adequately expressed by the literal sense, because this literal sense corresponds perfectly to the spiritual sense.

III. *A Life of Charity.*—This word does not mean with Swedenborg eleemosynary gifts or acts. These are good, and should be done when and as they are called for. But charity is the love of the neighbor; and this is heavenly and leads to heaven when it is founded upon love to the Lord. Its highest and truest work is the faithful discharge of our daily duty in all the things required of us by the place or position which Providence has assigned to us. So it is we may do the most good to others, and manifest our love to Him who has given us this way of being useful, and therefore happy; for all happiness is founded upon usefulness. [From orig. art. in *J. S. Univ. Cyc.*, by T. PARSONS, LL.D.]

**New Lebanon, N. Y.** See APPENDIX.

**New Lexington, O.** See APPENDIX.

**New Le'on,** a state of the Mex. Republic, is bounded by San Luis Potosi, Tamaulipas, and Cohahuila, and comprises an area of 23,635 sq. m. Pop. 203,284. Cap. Monterey.

**New Lis'bon,** on R. R., cap. of Columbiana co., O. Pop. 1870, 1569; 1880, 2028.

**New Lon'don,** city and R. R. centre, port of entry, and one of the caps. of New London co., Conn., on the Thames River, 3 m. from its entrance into L. I. Sound; has daily communication with New York by steamboat. Its harbor is one of the finest on the Atlantic coast. Ft. Trumbull is located here. Pop. 1870, 9576; 1880, 10,537.

**New London,** city and R. R. junc., Waupaca and Outagamie cos., Wis., on Wolf River, just below the mouth of the Embarras, 40 m. S. W. of Green Bay and 48 m. N. W. of Fond du Lac. Pop. 1870, 1015; 1880, 1808.

**New'man (FRANCIS),** one of the early settlers in N. H. (1638), and subsequently at New Haven; was sec. under Gov. Eaton; was in 1653 a com. to the Dut. gov't. at Manhattan to complain of encroachments upon the rights of the colony; was chosen assistant gov. 1653, com. of the united colonies 1654 and 1658, and was gov. of New Haven from 1658 to his death, Nov. 18, 1660.

**Newman (FRANCIS WILLIAM),** LL.D., b. in Lond. June 27, 1805, grad. at Worcester Coll., Ox., 1826; was fellow of Balliol 1826-30, when he resigned on account of theological objections to subscribing the Thirty-nine Articles; proceeded with Mr. Graves and others on a kind of mission to the Mohammedans; acquired a familiar knowledge of Arabic and of Oriental lit., but became widely alienated from Anglican theol.; was classical tutor in Bristol Coll. from 1834-40, prof. of classics at Manchester New Coll., Lond., 1840-46, and prof. of the Lat. lang. and lit. at Univ. Coll., Lond., 1846-63, since which time he has devoted himself exclusively to lit. Mr. N. has diverged from the Ch. of Eng. in precisely the opposite direction, though the title of his first book betrays a longing for ecclesiastical unity. Wrote *Essays toward a Ch. of the Future and the Organization of Philanthropy*, *Hist. of the Heb. Monarchy*, *Phases of Faith*, or *Passages from the Hist. of my Creed*, etc.

**Newman (JOHN HENRY),** D. D., brother of F. W. Newman, b. in Lond. Feb. 21, 1801, was ed. at Ealing and at Trinity Coll., Ox.; grad. B. A. 1820; was chosen a fellow of Oriel, took Anglican orders 1824; was vice-prin. of St. Alban's Hall 1825-26, tutor of Oriel 1826; opposed Catholic emancipation 1829; was one of the univ. preachers 1830; joined with Hurrell Froude in forming a conservative Anglo-Catholic party within the Ch. of Eng.; visited Rome and Sic. 1832-33; took part with Keble and Pusey in originating the "Oxford Movement;" was a leader in the propaganda of "High Church" doctrines by means of the celebrated *Tracts for the Times*; rapidly developed his tendencies toward Rom. Catholicism; was in 1828-43 incumbent of St. Mary's, Ox., and chaplain of Littlemore, and acquired great fame as a preacher and writer; founded at Littlemore in 1842 a community of ascetics. In 1845 he joined the R. Cath. priesthood, and became head of the Oratorian establishment at Birmingham; was rector of the R. Cath. Univ., Dublin, 1854-58, and then became head of the R. Cath. school at Edgbaston. Wrote *Essay on Development of Chr. Doctrine*, *Arians of the Fourth Century*, *Theory of Religious Belief*, etc. He was appointed cardinal May 12, 1879.

**Newman (JOHN P.),** D. D., b. in New York Sept. 1, 1826, ed. at Cazenovia Sem.; became a minister of the M. E. Ch.; was for several yrs. pastor of the Metropolitan M. E. ch., Wash., D. C., and chaplain to the U. S. Senate 1869-74; is a member of the Society of Biblical Archaeology, and author of *From Dan to Beersheba* and *The Thrones and Palaces of Babylon and Nineveh*. Pastor of Madison avenue Congl. ch., New York, 1882-84.

**Newman (SAMUEL),** b. at Banbury, Oxfordshire, Eng., 1602, grad. at Ox. 1620; took orders in the Ch. of Eng.; came to Mass. 1639; preached nearly 2 yrs. at Dorchester; was pastor of the ch. at Weymouth 1638-43, and removed in 1644, with a portion of his ch., to Seconet, where they founded town of Rehoboth. Author of a *Concordance for the Bible*, known as the *Cambridge Concordance*. D. July 5, 1663.

**Newmar'ket,** town of Eng., partly in the co. of Cambridge, partly in that of Suffolk, is the seat of the most famous race-course in Eng., and most of its inhabs. are jockeys, grooms, trainers, and stablemen. Pop. 4534.

**New Market, N. H.** See APPENDIX.



**New Mexico**, a S. W. Terr. of the U. S., between 31° 20' and 37° N. lat. and 103° 2' and 109° 2' W. lon.; bounded on the N. by Col. on the E. by Ind. Terr. and Tex., on the S. by Tex. and Mex., on the W. by Ari.; length from N. to S., 345 m. on the E. side, 380 m. on the W. side; breadth from E. to W., 380 m. on the N. line, 352 m. on the S.; area, 122,580 sq. m. or 78,451,300 acres.

**Face of the Country.**—N. M. forms a part of the lofty tableland which is the foundation of the Rocky Mt. ranges as well as those of the Sierra Madre. This tableland gradually slopes southward to the Llano Estacado or Staked Plain and at El Paso. The Llano Estacado is a broad, almost level, treeless, and waterless plain, extending over 3 or 4 degrees of lon. and nearly as many of lat., which is apparently barren, but is capable, if by any means it can be irrigated, of yielding large crops. From the elevated tableland there rise hundreds of summits of the Rocky Mts., and W. of the Rio Grande the peaks of the Sierra Madre lift themselves from 3000 to 10,000 ft. above the mesa or plateau. The mt.-chains E. of the Rio Grande valley are known as the Guadalupe, Sacramento, and Organ Mts., and still farther E. the Sierras Blanca, Hueca, Capitana, etc., which form the W. boundary of the valley of the Rio Pecos. W. of the Rio Grande the Sierra Madre is divided into numerous chains and some isolated peaks. The prin. of these mt.-chains are the Sierra San Mateo, the Zuni Mts., the Sierra del Datil, and the Sierra Mimbre. Still farther W. the San Juan Mts. enter the Terr. from Col. and the heavy masses of the Mogollon Mts. and the Pinaleno, Peloncillo, and Chiricahua Mts. from Ari. The prin. river of N. M. is the Rio Grande, which has a gen. direction from N. to S., but is not navigable in any part of its course through N. M. It receives from the W. 2 tributaries, the Rio Chama and the Rio Puerco, and from the E. several smaller streams. The Rio Pecos, a large affluent of the Rio Grande, drains the S. E. and E. portion of the Terr., and the Canadian River and 2 or 3 of its branches the N. E. The W. portion is drained by the large tributaries of the Col. River and their affluents, and particularly by the San Juan, Little Col., and Gila, each of which has 3 or 4 considerable tributaries.

**Minerals.**—Gold and silver are both abundant in this Terr. The oldest mining dists. are the Old and New Placers, Pinos Altos, Cimarron, Arroya Hondo, Manzano, and Moreno, and tracts in the Organ Mts., the Sierras Blanca, Carriza, Jicarilla, and the Mogollon and Magdalena Mts. Copper is found in very rich ores in several parts of the Terr., the Santa Rita mine in Grant co. producing 3000 lbs. of copper per week. Galena mines in the Organ Mts. yield 80 per cent. of pure lead, beside about \$50 worth of silver to the ton. Iron and salt are abundant. Anthracite coal is found in the Placiere Mts., on the E. border of the Rio Grande valley, 30 or 40 m. S. W. of Santa Fé, and bituminous at various points in cañons in the Cretaceous plains, where by erosion the strata have been cut through to the coal-measures, and the lignites in the Tertiary beds of the N. part of the Terr. There are numerous mineral springs in N. M., and the Hot Springs, about 5 m. from Las Vegas, have a very high reputation. The temperature varies from 80° to 140° F.

**Soil and Vegetation.**—The mt.-ranges are partially covered (where they are not basaltic) with pine, cedar, spruce, and other evergreens. The foot-hills have extensive tracts of piñon or nut pine and a smaller cedar, and in the river bottoms are belts of cottonwood, sycamore, and other deciduous trees. In the S. part of the Terr. there are numerous groves of oak and walnut; in the Llano Estacado the mesquite grows to a varying height of from 5 to 20 ft. In the S. and S. W. portions of the Terr. the tree cactus is a marked feature in the landscape. There are many indigenous grasses in the Terr., the most widely spread and valuable of them all being the nutritious mesquite or gama-grass, which grows during the rainy season of July and Aug., ripens in the autumn, and dries on its stalk, furnishing to cattle, in its stalks and rich seeds, a valuable natural hay, of which they are exceedingly fond. The arable soils, under the influence of irrigation, yield fair crops, but the soil is not remarkable for fertility.

**Zoology.**—The deer, elk, bighorn, wild-hog, antelope, cougar or panther, ocelot, lynx, the grizzly, Mexican or brown, and the black bear, the coyote, wolf, marmot or gopher, beaver, skunk, weasel, rabbit, hare, and squirrel are the prin. quadrupeds, while vultures, hawks, turkeys, geese, swans, brant, ducks, and teal are the most common birds, and scorpions, lizards, and horned frogs are the most abundant reptiles. Centipedes are not uncommon.

**Climate.**—The climate of N. M., though varied, is dry. In the N. the range of the thermometer is between 10° and 75° F. In the S. the temperature is very mild, the thermometer rarely indicating as low a temperature as 32°. The rainy season in the S. part of the Terr. is in July and Aug. The amount of annual rainfall is 15.80 inches. The prevalent winds are E., S. E., S. W., W., and N. The climate has justly a high reputation for healthfulness.

**Agricultural Products.**—The sterility of soil and paucity of pop. do not permit large production of cereal crops. By the census of 1880 there were raised 706,641 bushels of wheat, 633,786 bushels of Indian corn, 156,527 bushels of oats, 50,053 bushels of barley, and 240 bushels of rye. The wool clip of 1880 yielded 4,019,188 lbs.; 890 lbs. of tobacco were raised.

**Farm Animals.**—By the census of 1880 N. M. had 14,547 horses, 160,701 cattle, 2,088,831 sheep, and 7857 swine.

**Manufactures.**—These are insignificant, the Terr. being dependent on importation for nearly all products, except a few of the ruder and more common manufactures.

**Railroads.**—There were in operation, Jan. 1882, within the Terr. 975 m. of railway, costing \$28,369,300, with net earnings of \$211,756, paying in interest and dividends \$106,780. The S. Pacific and Atchison, Topeka, and Santa Fé are the longest lines.

**Finances.**—The assessed valuation of property in 1881 was \$19,523,624; rate of tax, 50 cents on \$100 for Territorial pur-

poses; total taxation, \$136,942; aggregate debt, Territorial, local, etc., \$84,872.

**Banking Institutions.**—In Oct. 1881 there were 4 national banks in N. M., with capital of \$400,000; circulation, \$352,437; U. S. bonds to secure circulation, \$400,000; deposits, \$1,125,640. There were also 8 private bankers, with capital of \$13,333 and \$459,518 deposits.

**Education, Etc.**—The number of children of school age (7-15 yrs.) as last reported was 29,312, of whom only 4755 were enrolled in public schools in 1880. Total expenditure for public schools in 1880, \$28,973, of which \$28,002 was for teachers' salaries.

**Churches.**—The R. Cath. religion is greatly in the ascendency, owing to the Sp. origin of so many of the inhabs. It claims 121,000 Catholic pop., 38 chs., and 94 priests; the Presbs. have 7 chs. and 162 members, and the Baps. 1 ch. and 20 members.

**Population.**—In 1870, 91,874; 1880, 119,565 (white 108,721, colored 10,844, including 57 Chi. and 9772 Indians).

**Principal Cities and Towns, Pop. 1880.**—Santa Fé (cap.), 6635; Albuquerque, 2315; Silver City, 1900; Las Vegas, pop. not given; Socorro, 1272; Bernalillo, 1223.

COUNTIES.	*Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
Bernalillo.....	6-J	7,591	17,225	Albuquerque.....	2,315
Colfax.....	5-K	1,192	3,398	Springer.....	34
Don Ana.....	7-J	5,864	7,512	Las Cruces.....	.....
Grant.....	7-I	1,143	4,539	Silver City.....	1,900
Lincoln.....	7-K	1,303	2,513	Lincoln.....	638
Mora.....	5-K	8,056	9,751	Mora.....	915
Rio Arriba.....	5-I	9,294	11,023	Tierra Amarilla.....	.....
San Miguel.....	6-K	16,058	20,538	Las Vegas.....	.....
Santa Fé.....	6-J	9,699	10,867	Santa Fé.....	6,635
†Sierra.....	7-J	.....	.....	Hillsborough.....	.....
Socorro.....	7-I	6,603	7,875	Socorro.....	1,272
Taos.....	5-I	12,079	11,029	Fernandez de Taos.....	.....
Valencia.....	6-J	9,093	13,095	Los Lunas.....	576
Total.....		91,874	119,565		

\* Reference for location of counties. See map of New Mexico in article CALIFORNIA.

† Formed since census of 1880.

**History.**—At the time of the discovery of the Amer. continent N. M. had a large and industrious pop., either Aztec or Toltec, who had their walled towns, their stone dwellings, several stories in height, their manufactures of cotton and wool, their rude but effective weapons of war, and who cultivated and irrigated the soil and gathered therefrom large crops. They were idolaters. The Sp. adventurers Alvar Nuñez, Marco de Niza, and Coronado penetrated to this region in 1537, 1539, and 1540. In 1581 the country was explored by Capt. Francisco de Bonillo and his comrades, all Sp. adventurers, through whose account of it it was named New Mexico. Between 1595 and 1599 Juan de Oñate was sent thither by the viceroy of Mex. to establish forts, colonies, and missions, and to take possession of the whole country in the name of his master, the king of Sp. Oñate was successful, but at length the Indians rose, and drove the Spaniards out of the country in 1680. In 1698 the Spaniards regained a portion of their former power. In 1822 the inhabs. of N. M. united with the other inhabs. of Mex. in throwing off the yoke of Sp., and thenceforward until 1846 they were governed in the same way with the other states of Mex. In 1846 Gen. Stephen Kearny with a small U. S. force captured Santa Fé, and soon after conquered the whole terr. and raised the Amer. flag there. In 1848 it was ceded to the U. S. by the treaty of Guadalupe Hidalgo. The present Territorial govt. was organized Sept. 9, 1850. By the treaty of Dec. 30, 1853, what was known as the Gadsden purchase was added to it. It then comprised the whole of Ari. and a portion of what is now Col. Ari. was set off from it in 1863, and the portion of Col. in 1865. During the early part of the late c. war N. M. was the scene of a protracted and bloody strife. In 1859 the Territorial legislature passed a law recognizing the existence of slavery in the Terr., but this was repealed in 1861, and with it was abolished the system of peonage, a modified slavery.

#### Governors.

James S. Calhoun.....	1851-52	William A. Pile.....	1869-71
William C. Lane.....	1852-53	Marsh Giddings.....	1871-76
Solon Borland.....	1853	Samuel B. Axtell.....	1876-78
David Merriwether.....	1853-57	Lewis Wallace.....	1878-81
Abraham Rencher.....	1857-61	Lionel A. Sheldon.....	1881-85
Henry Conolly.....	1861-65		
Robert B. Mitchell.....	1865-67		
W. F. M. Army (acting).....	1867-69		

REVISED BY A. R. SPOFFORD.

**New Milford**, Litchfield co., Conn., 36 m. N. of Bridgeport, on the Housatonic River and R. R., contains the Adelpic Inst., and is one of the largest tobacco-packing towns in N. Eng. Pop. tp. 1870, 3586; 1880, 3907.

**Newnan**, city and R. R. junc., cap. of Coweta co., Ga. Pop. 1870, 1917; 1880, 2006.

**New Netherlands**, the old name of the country situated between Del. and Conn. rivers. The exclusive right to trade here was granted, Oct. 11, 1614, by the States-General to the explorers. In 1623 N. N. was made a prov. or co. of Hol., and the States-General granted it the armorial distinction of a count. In Sept. 1664 N. N., which Charles II. had granted to his brother, the duke of York, was conquered by the capitulation of New Amsterdam.

**New Orleans**, or le-anz, city and important R. R. centre of La., the commercial metropolis and port of entry of the Gulf States, on both sides (chiefly the N.) of the Miss., 115 m. above its mouth, 1040 m. below the mouth of the O., and 1336 m. by rail from Wash. The lines of lat. 30° N. and lon. 90° W. intersect in its suburbs. N. O. has an area of about 150 sq. m., but the settled part within the drainage dists. comprises only 40 sq. m., stretching back to lakes Pontchartrain and Borgne. The gen. course of the river is



from W. to E. past the city, which, however, occupies a curve or bend in the shape of an S 10 m. in length along the N. side of the river, giving it the name of "the Crescent City." It is built entirely on the alluvial bank, and is wholly below high-water level of the river, being protected from yearly floods by a levee raised in front along the river-bank and extended back to the lake above the city, and also along the lake front as a precaution against the back-water caused by storm-winds on the lake and Gulf. A system of drainage-canals, with powerful machinery, drives out into the lake the rainfall and sewage. The city is reached both by river and railway. The river abounds in boats plying up and down. There are steamers running to the prin. Atlantic and Gulf ports, and to Liverpool, Havre, and Bremen.

The original plat of N. O. was laid out in 1718 under Gov. de Bienville, and was less than 1 m. square, the streets crossing at right angles, facing the river. As the city extended in the bend of the river, it became necessary to conform the streets to its shape; hence in the upper and lower additions they meet and diverge in a very irregular manner. The streets in the original or Fr. part are very narrow. Canal st., the dividing line between the old Fr. and what is now called the Amer. part, is a fine boulevard, 150 ft. in width; so also are Claiborne, Rampart, Esplanade, St. Charles, and other avenues. There are 11 public parks and squares. The prin. public buildings are the U. S. custom-house, the cathedral and court-halls, the city hall, the univ. buildings, the charity hospital, the marine hospital, the Hôtel Dieu, and the St. Charles and St. Louis hotels. The prominent public monuments are a granite shaft 100 ft. high, erected on battle-field of 1815; an equestrian statue of Jackson, from cannon captured by him in battle of New Orleans; a colossal bronze statue of Henry Clay, a marble one of Benjamin Franklin, a marble shaft in honor of Gov. Allen, in Washington Cemetery, a marble monument to Confed. dead in Cypress Grove Cemetery, and a bronze colossal statue of Gen. R. E. Lee on a marble shaft 100 ft. high.

Among the insts. of learning are the Univ. of La. (of which the literary dept. is at Baton Rouge), the Mechanical and Agricultural Coll., the Dental Coll., the Jesuit Coll., a Heb. educational inst., the Peabody Inst., and several Catholic schools and convents. There is also a series of schools, under the care of the R. Cath. Ch., which corresponds to our free schools, as that denomination does not send its children to the public schools. Among the benevolent insts. are several large orphan asylums, R. Cath. and Prot.; the Asylum for the Old and Infirm, and the Widows' Home. There are several hospitals and infirmaries, foremost among which is the great Charity Hospital.

N. O. is peculiar in the disposition of its dead. The lowness of the ground, being below the flood-level of the Miss., renders it impracticable to bury in the earth; hence all interments have to be in sepulchres of some sort. The oldest cemeteries are situated in the lower part of the city, but of late yrs. higher grounds have been selected on the ridge-lands of Metairie Bayou, on the outskirts of the city. These grounds are laid out in right angles, the tombs being ranged upon the intersecting avenues and streets, which are lined with trees—mostly evergreens—and adorned with flowers, thus realizing the idea of a "city of the dead." Such tenements need constant care, and All Saints' day (Nov. 1) has here a special significance. For a week or two previously all needful repairs are made, and on the grand festival-day the whole city unites in its floral decorations. The festival preceding the first day of Lent is one of special interest in N. O., and the city is distinguished for the splendor she gives to her favorite holiday, the "Mardi Gras."

The history of N. O. dates from 1718, when De Bienville, the newly appointed gov., ordered the engineer De la Tour to lay it out and to build a levee to protect it from the floods. It contained in 1785 about 4780 inhabs. In 1804 La. was transferred to the U. S. The city then contained 10,000 persons,  $\frac{1}{4}$  of whom were colored. After the introduction of the steamboat in 1812-20, and the battle of N. O. in 1815, her commercial progress was rapid. The World's Industrial and Cotton Centennial Exposition was opened here Dec. 16, 1884, with great success. Pop. 1870, 191,418; 1880, 216,090; in 1885, 234,500. [From orig. art. in *J.'s Univ. Cyc.*, by Prof. C. G. FORSHEY.]

**New Orleans, Battles of (1814-15).** After the battle at Villeré's plantation (Dec. 23, 1814), Lieut.-Gen. Edward Pakenham immediately prepared to effect the capture of N. O. But Gen. Andrew Jackson defended the city against the Brit. Jackson's victory, Jan. 8, 1815, gave him great renown, while the British forces were utterly defeated, Pakenham himself being killed.—In 1862, N. O., as a centre of military operations, was closely blockaded by a Federal fleet, but on Apr. 24, Farragut, in command of his expedition, forced the defences near the mouth of the river, and the city was compelled to surrender.

**New Philadelphia, R. R. centre and cap. of Tuscarawas co., O.,** in heart of Tuscarawas coal and iron ore region, 100 m. W. of Pittsburgh. Pop. 1870, 3143; 1880, 3070.

**Newport, Ark.** See APPENDIX.

**Newport, city, on R. R., cap. of Campbell co., Ky.,** on S. bank of O. River, opposite Cin., and separated from Covington by Licking River; is connected by bridges with Cin. and Covington. Pop. 1870, 15,067; 1880, 20,433.

**Newport, cap. of Sullivan co., N. H., on R. R. and Sugar River.** Pop. 1870, 2163; 1880, 2612.

**Newport, on R. R., Perry co., Pa., 28 m. W. of Harrisburg.** Pop. 1870, 945; 1880, 1399.

**Newport, city, on R. R., cap. of Newport co. and one of the caps. of R. L., near the head of Narragansett Bay, 30 m. S. of Providence;** is connected by steamers with New York and Providence. The U. S. torpedo station and the naval training school are here. Ft. Adams, one of the largest fortifications in Amer., is  $\frac{1}{4}$  m. S. W. of the city. N. has many antiquities; claims the oldest newspaper now pub. in the U. S., the *Mercury*, started in 1758 by James

Franklin, nephew of Benjamin; the oldest M. E. ch. building, the Redwood Library (1750), the State-house (1742), city hall (1763), beside Revolutionary relics. Hundreds of families spend the summer here. The Society of Friends have had their annual meetings here for nearly 250 yrs. U. S. Naval War college is here. Pop. 1870, 12,521; 1880, 15,693.

**Newport, Vt.** See APPENDIX.

**Newport (Capt. CHRISTOPHER), b. in Eng. about 1565;** commanded the squadron which conducted the first permanent Eng. colony at Jamestown, Va., May 13; returned to Eng. in June, and brought over in the following yr. additional emigrants and fresh supplies; accompanied Capt. John Smith on visits to Powhatan; returned to Eng.; made another voyage to Va. in 1608, and came again in the fleet, bringing the new charter and Lord Delaware as gov. 1610; returned to Eng. about 1612, and wrote *Discoveries in Amer.* The subsequent career of N. is unknown.

**Newport News, Va.** See APPENDIX.

**New Richmond, Wis.** See APPENDIX.

**New Rochelle, ro-shell,** on R. R., Westchester co., N. Y., on L. I. Sound, 20 m. N. E. of New York. Pop. tp. 1870, 3915; 1880, 5276.

**New Siberia,** a group of islands in the Arctic Ocean, situated N. of the mouth of the Lena, E. Siberia. They are uninhabited, and covered with snow and ice all the year round, but they are important on account of the remains of vegetable and animal life which they contain; large quantities of ivory are dug out of the ground every yr. Some of the islands are believed to be nothing but an accumulation of drift-timber and bodies of mammoths and other antediluvian animals frozen together.

**New South Wales,** a colony of G. Brit. in the S. E. part of Australia, extending along the S. Pacific Ocean from Point Danger to Cape Howe, bounded by the colonies of Queensland, S. Australia, and Victoria. Area, 316,320 sq. m. The whole dist. is traversed from N. to S. by a range of mts., running parallel with the coast at a distance of from 100 to 150 m. from the shore. The N. part of this range is called the Liverpool Hills, the middle the Blue Mts., and the S., which contains the highest peak, Mt. Kosciusko (6500 ft.), the Australian Alps. Toward the coast they present a steep and rugged face, rent with frightful fissures and crags, rising into fantastic peaks, and sending out a multitude of high, wild spurs, from which many short but deep and rapid rivers rush to the ocean. Toward the interior they slope gradually, forming the large basin of the rivers Murray and Darling, whose numerous affluents during the dry season generally form only strings of pools. They are very rich in coal, copper, lead, and tin, and gold is found in many places. The coal-fields around New Castle are considered almost inexhaustible and the coals are of superior quality. Gold was first discovered in 1851. The soil is everywhere rich. In the N. and hotter part of the colony cotton, sugar, rice, and other tropical products are raised; in the S. and more temperate part wheat, oranges, peaches, grapes, and mulberries are grown. Wine and silk culture has succeeded very well. Severe droughts seem to be periodical, and occur every 10th or 12th yr. Rain often falls for long periods, and when it does come it pours in torrents. The chief industry is sheep-breeding, carried on on the W. slopes of the mts. The colony was founded in 1788 as a penal establishment; transportation ceased, however, in 1840. To the discovery of the gold-mines the colony is indebted for its rapid progress. Pop. 503,981. Chief town, Sydney.

**New Testament.** See BIBLE, THE.

**Newton, Ill.** See APPENDIX.

**Newton, city and R. R. junc., cap. of Jasper co., Ia., 35 m. E. of Des Moines.** Pop. 1870, 1983; 1880, 2607.

**Newton, city and R. R. junc., cap. of Harvey co., Kan., 135 m. S. W. of Topeka.** Pop. 1880, 2601.

**Newton, city, Middlesex co., Mass., on R. R. and Charles River, 8 m. W. of Boston,** is the seat of Newton Theological Inst., Laselle Female Sem., and 2 acads. Pop. 1870, 12,825; 1880, 16,995.

**Newton, on R. R., cap. of Sussex co., N. J., 62 m. from New York;** has a collegiate inst. and a public library. Pop. 1870, 2403; 1880, 2513.

**Newton (Sir ISAAC), b. Dec. 25, 1642 (O. S.), at Woolstrop, Lincolnshire, Eng.; d. Mar. 20, 1727.** He was entered at Trinity Coll., Cambridge, in 1660; in 1661 he had been made sub-sizar, and in 1664 scholar; in 1665 he took his degree as B. A.; in 1667 became junior fellow and M. A.; in 1668 senior fellow, and in 1669 he succeeded Dr. Barrow as Lucasian prof. of math.; in 1672 he was elected a member of the Royal Society of Lond. His first paper was upon some invention in connection with the reflecting telescope. Soon after a communication on light was read before the Royal Society, which stirred up a violent controversy. N. advocated the material or corpuscular theory; Hooke, the undulatory theory of light. N. brought forward many remarkable experiments and much mathematical knowledge to his support. Hooke had little more than an hypothesis to offer. In 1682 a new measurement of an arc of the meridian gave him the requisite information to make his calculation relative to gravity. As he approached its completion his agitation became so great that he was forced to trust it to a friend to finish. The result justified his intense feeling; observation and calculation corroborated each other; the magnificent theory of universal gravitation was complete. His discovery was given to the world under the title *Philosophiæ Naturalis Principia Mathematica* in 1687. In 1689 he became M. P. for Cambridge, but at the expiration of the yr. Parl. was dissolved. In 1695 he was appointed warden of the mint, and the duties of which office he fulfilled with great ability. The following is a list of his works: (1) *Principia*, (2) *Optics*, (3) *Arithmetica Universalis*, (4) *Analysis per Equationes Numero Terminorum Infinitas*, (5) *Methodus Differentialis*, (6) *De Mundi Systemata*, (7) *The Chronology of Anc. Kingdoms Amended*, (8) *Table of Assays*, (9) *Optical Lectures*.



(10) *Observations on the Prophecies of Daniel and the Apocalypse of St. John*, (11) *A Method of Fluxions and Analysis of Infinite Series*, (12) *A Historical Account of Two Notable Corruptions of Script.*

**Newton** (ISAAC), b. at Schodack, N. Y., Jan. 10, 1794; became a distinguished naval arch., and constructed more than 90 vessels, including the fine Hudson River steamers Hendrick Hudson and New World. D. Nov. 22, 1858.

**Newton** (JOHN), b. at Lond., Eng., July 24, 1725, was the son of a sea-capt., with whom he made several voyages to the Mediterranean; was pressed into the navy as a seaman in 1744; became a mdpn.; exchanged into a vessel engaged in the slave-trade at Madeira; resided some time near Sierra Leone in the employ of a slave-dealer; returned to Eng. 1747, and for 4 yrs. thenceforward commanded a Liverpool slave-ship; taught himself Lat., Gr., and Heb.; was deeply affected by the religious movement directed by Wesley and Whitefield; took orders in the Eng. Ch. 1764; became soon afterward curate of Olney, Buckinghamshire; pub. a *Narrative* of his early life and remarkable religious experience, and with the poet Cowper wrote the *Olney Hymns*; became in 1779 rector of St. Mary Woolnoth, Lond.; was a leader of the Calvinistic or evangelical party in the Ch. of Eng., and author of numerous religious treatises. D. Dec. 31, 1807. (See his *Life*, by Rev. RICHARD CECIL.)

**Newton** (JOHN), b. in Va. in 1833, grad. at W. Pt. 1842. With the exception of some 3 yrs. at W. Pt. as prof. of engineering and while chief engineer of the Ut. expedition of 1858, he was engaged in the construction of fortifications on the Atlantic and Gulf coasts until the outbreak of the c. war, when, after serving as chief engineer of the dept. of Pa. and of the Shenandoah, he was, in Aug. 1861, appointed a brig.-gen. of volunteers, and commanded a brigade in the defenses of Wash., at the same time performing the duties of an engineer until the spring of 1862. With the Army of the Potomac he led his command in the expedition to W. Pt., at Cold Harbor and Frazier's Farm, at South Mountain and Antietam, and at Fredericksburg, Dec. 1862, where he commanded a division; promoted to be maj.-gen. Mar. 1863, he commanded a division of the 6th corps in the storming of Marye Heights May 3; at Gettysburg he succeeded to the command of the 1st corps July 2, which he retained until the reorganization of the army Mar. 1864, when he was transferred to the W., where he led a division of the 4th corps in the Atlanta campaign; commanded various dists. in Fla. from Oct. 1864 to Jan. 1866, when he resumed duty with his corps, in which he had risen to be lieut.-col., and since that date has been charged with important engineering duties—in removing the obstructions at Hell Gate and other points on the E. River, the proposed enlargement of the Harlem River, the improvement of the Hudson from Troy to New York, of the channel between N. J. and Staten Island, and of harbors on Lake Champlain.

**Newton** (ROBERT), b. at Roxby, Yorkshire, Sept. 8, 1780; received a limited education; became a Meth. preacher 1798; became a noted pulpit-orator and evangelist, and for 50 yrs. was constantly engaged in laboring from place to place in G. Brit., chiefly in the service of the Brit. and Foreign Bible Society and the missionary associations. He was 4 times pres. of the Brit. Meth. Conference; visited the U. S. in 1880, and attracted great attention by his eloquence. D. in Eng. Apr. 30, 1884.

**Newton** (THOMAS), D. D., b. at Lichfield, Eng., Jan. 1, 1704, grad. at Trinity Coll., Cambridge, where he obtained a fellowship; took orders in the Ch. of Eng. 1729; became curate of St. George's, Hanover Square, Lond., afterward of Grosvenor chapel; was made rector of St. Mary-le-Bow 1744, lecturer at St. George's 1747, prebendary of Westminster 1757, bp. of Bristol 1761, and dean of St. Paul's 1768. He edited Milton's *Poetical Works* (1749-52), with critical and variorum notes, and pub. *Dissertations on the Prophecies* (3 vols., 1754-58), once considered extremely valuable, but now superseded. D. in Lond. Feb. 14, 1782. His autobiography was printed the same yr., and his *Works* appeared in 3 vols., 1783.

**Newton Centre**, on R. R., Middlesex co., Mass., 7 m. from Boston, contains the Newton Theological Inst.; is part of the city of Newton.

**Newton Theological Institution**, Bap., located in Newton Centre, Mass., was commenced Nov. 28, 1825; the act of incorporation was passed Feb. 22, 1826. The first professorship established was that of biblical theol., and the first prof. was the Rev. Iraah Chase. Revs. Henry J. Ripley, James D. Knowles, Barnas Sears, Horatio B. Hackett, Robert E. Pattison, Alvah Hovey, Albert N. Arnold, Arthur S. Train, George D. B. Pepper, Galusha Anderson, Oakman S. Stearns, Heman Lincoln, and Ezra P. Gould have been profs. in the inst. The last 3, with Alvah Hovey, the pres., and S. L. Caldwell, lately elected, are now holding offices as profs. in the inst. This sem. is pleasantly located, has 4 public buildings and 2 dwelling-houses; the library of 12,000 vols. is well selected and constantly increasing. It was the first Bap. theological sem. in America.

**Newtownville**, on R. R., Middlesex co., Mass., is part of the city of Newton.

**Newtown, Pa.** See APPENDIX.

**New Ulm**, city, cap. of Brown co., Minn., on R. R. and Minnesota River, contains a Catholic nunnery. Pop. 1870, 1310; 1880, 2471.

**Newville, Pa.** See APPENDIX.

**New Year's Day**. The custom of keeping the first day of the yr. as a day of festivity is a widely prevalent one, but the day on which the yr. commences varies much in different countries. In the R. Cath. Ch., since the establishment of the Gregorian yr., it falls upon the festival of the Circumcision, a holiday of obligation, which also is the feast-day of several saints, of whom St. Sylvester is the most widely honored. In the other chs. it has no specially religious character. It is a widespread custom to make calls upon one's acquaintances on this day.

**New York**, "the Empire State," one of the Middle



States of the Atlantic slope, and one of the original 13, between 40° 29' 40" and 45° 0' 42" N. lat., and 71° 51' and 79° 45' 54.4" W. lon.; bounded on the N. and N. W. by the Dominion of Canada, from which it is partly separated by St. Lawrence River, Lake Ontario, Niagara River, and Lake

Erie; also on the N. by L. I. Sound, which washes the N. shore of L. I. and the Atlantic; E. by Vt., Mass., and Conn., the lower N. Y. Bay, and the Atlantic; S. by the Atlantic, the lower Bay, and the States of N. J. and Pa., and W. and N. W. by Pa., Lakes Erie and Ontario, and Niagara River, which divide it from the Dominion of Canada; greatest length, N. to S., 311½ m.; greatest breadth, E. to W., including L. I., 412 m.; area, 49,170 sq. m. or 31,468,800 acres.

**Face of the Country**.—The surface of N. Y. is divided into 3 sections of unequal size. These sections are—E. of the Hudson, N. and S. of the Mohawk and Erie Canal, and are designated E., N., and S. sections. E. of the Hudson there is a continuation of the Green and Hoosac ranges southward, reaching the Hudson in Putnam co., reappearing on the W. side of the river as the Kittatinny Mts. The N. section has 6 distinct ranges of mts., beside 2 ridges of lower altitude. These ranges all trend from N. E. to S. W. They are, beginning at the S. E.: (1) The Palmetown range, from the vicinity of Whitehall S. W. to the lower part of Saratoga co. (2) The Kayaderosseras or Luzerne Mts., beginning at Ticonderoga, passing along the W. side of Lake George through Warren and Saratoga cos. to Montgomery co. (3) The Clinton or Adirondack range, proper, beginning at Point Trembleau on Lake Champlain, passing through Essex, Warren, Saratoga, Hamilton, Fulton, and a part of Montgomery co. to Mohawk River. This range contains the highest summits in the State—Mt. Marcy or Tahawas, whose height is variously stated at from 5379 to 5467 ft.; Dix Peak, 5200 ft., etc. It forms the watershed between the tributaries of the St. Lawrence and those of the Hudson and Mohawk. (4) The Au Sable or Peru range, beginning still higher on Lake Champlain, near the mouth of Au Sable River, and trending S. W. through Essex, Hamilton, and Fulton cos. into Montgomery. (5) The Chateaugay range, which commences near the N. extremity of Lake Champlain in Canada, passes through Clinton, Franklin, and Hamilton cos. to Herkimer co. and the Mohawk River. (6) The St. Lawrence range, parallel with the last and about 10 or 12 m. N. of it, follows the course of the S. shore of the St. Lawrence. The broad plateau known as the Highlands of Black River is about 60 m. in length. Between these Highlands and the Mohawk is a ridge about 20 m. long, known as Hasenclever Ridge. The section S. and S. W. of the Mohawk and the Hudson may be divided into 2 sub-sections—the E., which includes 3 distinct ranges of mts.—viz.: (1) the Highlands of Orange and Rockland cos., having a gen. N. E. direction and coming to the W. shore of the Hudson; (2) back of these, the Shawangunk Mts., skirting the valley of the Rondout; (3) and most considerable, the Kaatsberg or Catskills, called the Helderberg Mts., near the Mohawk. In Sullivan and Delaware cos. the Blue Mts., or Delaware Mts., take their rise. The W. sub-section of this S. section is a series of terraced plateaus rising from the shore of Lake Ontario, first, to the Ridge Road; this terrace extends from the Genesee to the Niagara above the Falls; second, from the Ridge Road to the falls of the Genesee at Nunda and Portageville; from this point there is a gradual ascent to the summit-level in Chautauqua, Cattaraugus, Allegany, and Steuben cos.

**Rivers, Lakes, Bays, Etc.**—The Hudson River is the prin. river. It is navigable to Troy, nearly 160 m. It has many tributaries, of which the Mohawk is the most important. St. Lawrence River washes the N. boundary of the State for nearly 100 m., and has several important affluents from the State. Oswego River—which is navigable for canal-boats and steamers for 120 m.—Black River, and the Genesee all flow into Lake Ontario; Niagara River, connecting Lakes Erie and Ontario; the Alleghany, one of the constituents of the Ohio, has a course of 50 m. in the State; the Susquehanna, with its tributaries, the Tioga and Chenango; and the Delaware, with its E. and W. branches and its affluents, are the most important of the other rivers which drain the State. **Lakes**.—The E. end of Lake Erie, ¼ of Lake Ontario, and ½ of Lake Champlain belong to N. Y. In the N. E., Lake George, Schroon Lake, and about 200 smaller lakes, in Warren, Essex, and Hamilton cos., add great beauty to the landscape. In Central N. Y. there are 3 groups of lakes; farther W. commences a chain consisting of Oneida, Onondaga, Otisco, Cross, Skaneateles, Cayuga, Seneca, Crooked or Keuka, and Canandaigua lakes; still farther W. is another chain of 5 lakes—Owasco, Honeoye, Canadice, Conesus, and Silver Lake; in the S. W. corner of the State is Chautauqua Lake. A remarkable feature of the natural scenery of N. Y. is its waterfalls. The Falls of Niagara (see



**NIAGARA FALLS**) and those of Trenton, the Watkins Glen, the Taghkanic, and the numerous falls near Ithaca are noteworthy. The falls of the Genesee at Rochester, the High Falls in the same river at Portage, the falls at Ticonderoga, and those in the Adirondacs are worthy of mention. **Islands.**—The most important islands are Manhattan, Long Island, and Staten island; numerous smaller islands surround these, as Randall's, Ward's, Blackwell's, Governor's, Bedloe's, and David's, around New York; Coney Island, Fire Island, Shelter Island, and a great number of islands in L. I. Sound. There are many small islands in the Hudson River, about 1500 in the St. Lawrence, of which  $\frac{1}{2}$  belong to N. Y.; many in Lakes Erie, Ontario, and Champlain, and about 200 in Lake George. **Bays, Sounds, Etc.**—The upper and lower New York bays form one of the finest approaches to a great harbor in the world. Staten Island Sound is rather a strait than a sound, as is also the E. River, but L. I. Sound beyond it is almost an inland sea. The Hudson River forms a broad expanse near Haverstraw, known as the Tappan Zee. There are several small bays and harbors on the N. Y. coast of Lake Ontario, and Buffalo and Black Rock harbors on Lake Erie.

**Minerals.**—The most important mineral of the State of New York is iron, of which there are magnetic, red and brown hematite, specular, and bog-iron ores, and in Dutchess co. carbonate of iron is found. Galena or lead ore is found in St. Lawrence and other cos. in large quantities. Zinc, copper, arsenic, manganese, barytes, strontian, and alum occur in various parts of the State, but do not possess much economic value. Salt springs, from which a vast amount of salt is made, occur along the line of the Onondaga salt group, especially in Onondaga co. Gypsum and water-lime accompany them. The State abounds in building material; its granite, white and colored marbles, Potsdam and Medina sandstones, and gray and blue limestones, as well as its excellent clay and sand for brick, furnish a sufficiency of material for its dwellings; but while it exports some of these, it imports more from other States and countries. Its quarries furnish also large quantities of slate, flagging-stones, and trap-rock for paving purposes. Serpentine (soapstone) talc, asbestos, amianthus, magnesia, in several forms are among the minerals of merely scientific value. The State has numerous mineral springs of high repute—the chalybeate and saline at Saratoga, sulphur in Madison and Monroe cos., acid in Genesee, Erie, and Orleans, those evolving nitrogen gas, as in Columbia, Rensselaer, and Seneca cos., and those possessing magnetic or electrical qualities, as in Tompkins co. In Chautauqua, Dutchess, Oneida, and Monroe cos. are illuminating gas springs. Fredonia, in Chautauqua co., has utilized this gas for lighting its streets and dwellings, and the light-house at Barcelona in the same co. is illuminated by it.

**Soil and Vegetation.**—The greater part of the soil of N. Y. is arable, and some of it very fertile. Most of the mountainous dists. are fine grazing-lands, and yield the best milk, butter, and cheese. The plains and valleys are adapted to the culture of cereals, and the N. and the N. W. cos. to root-crops. Oneida, Madison, Otsego, and a part of Chenango are engaged in hop-culture. Tobacco is cultivated in several cos., grapes on the islands of the Hudson and on the shores of the Central N. Y. lakes, and Indian corn in almost every part of the State. Market-gardening is extensively practised in the vicinity of the large cities, and great quantities of fruit are grown in the central cos. The forest trees of the State present a great variety, and a few yrs. ago nearly  $\frac{1}{2}$  the area of the State was covered with forests. The State has 12 species of the pine family, including the hemlock, balsam fir, black and white spruce, and tamarack, and the allied species of red and white cedar (arbor-vitæ) and Canada yew. There are 15 species of oak, of which the white oak is the most valuable and the most abundant; 3 species of elm, 3 of ash, 5 of maple, the sugar-maple being the most plentiful; the black walnut and butternut, and 4 species of hickory; the beech, chestnut, 3 species of birch, the sycamore, several species of poplar, numerous willows, the robinia or locust, the tulip-tree or whitewood, the linden or basswood, the ironwood or hop hornbeam, and the sumachs: the *Magnolia glauca*, the cornel or dogwood, and various alders, elders, the button-bush, the shad-bush, and spicewood, are other forest growths.

**Zoology.**—There are, among the mammals, the opossum, bat, mole, shrew, black bear, raccoon, Wolverine, skunk, fisher, Pennant's marten, pine marten, weasel, ermine, weasel or stoat, mink, otter, wolf, gray and black panther, Canada lynx, wild-cat or bay lynx, seal, hooded seal, and walrus. There are also the gray fox, the red or common fox, the squirrel, the woodchuck, Labrador rat, beaver, muskrat, porcupine, Norway or brown rat, 2 species of black rat, the gray rabbit, and the prairie hare. Of hoofed animals, besides the domestic animals, there are the fallow deer, elk, moose; there are the whale, porpoise, and the grampus. Six orders of birds are found in the State—birds of prey, birds of passage, the cock tribe, waders, lobe-footed birds, and swimmers. There are 3 orders of reptiles—the turtle, lizard, and serpent tribes. There are 17 species of turtles, tortoises, and terrapins, 2 of lizards, and 2 venomous and 17 or 18 harmless serpents. Of the Amphibia or batrachians there are 4 families—the frog tribe, the salamander tribe, the triton tribe, and the proteus tribe. The number of fishes is very large. The bony and cartilaginous fishes are both represented, the first by 6 orders, and the second by 3. The crustaceans include 10 orders and about 60 species. Of mollusks there are 6 orders and a large number of species, many of them edible.

**Climate.**—The mean temperature of the State is 46.49°; the mean annual maximum of heat, 92°; the mean annual minimum, -12°; the annual range of the thermometer, 104°. The climate is generally healthy; the death-rate, even in the large cities, is below the average of the country. Bilious affections prevail in the W. cos., diseases of the throat

and lungs in the E. Annual rainfall—New York city (lat. 40° 42' 48", lon. 74° 00' 03", elevation 165.60 ft.), 42.63 inches; Buffalo (lat. 42° 53', lon. 78° 55', elevation 662 ft.), 39.37 inches. **Agricultural Productions.**—By the census of 1880 there were produced, of Indian corn, 25,990,156 bushels; oats, 37,575,506 bushels; wheat, 11,587,766 bushels; barley, 7,792,062 bushels; buckwheat, 4,461,200 bushels; rye, 2,634,600 bushels. The wool clip of 1880 yielded 8,827,195 lbs.; of tobacco the yield in the census yr. was 6,481,431 lbs.

**Farm Animals.**—There were reported, in 1880, 610,358 horses, 2,339,721 cattle, 1,715,180 sheep, and 751,907 swine.

**Fisheries.**—The amount of fish taken in the marine and inland waters of N. Y. is not very large; the yield in 1880 was \$154,870 in net value of marketable fish, beside amateur fishing. Total product of all fisheries for 1880, \$4,380,565.

**Manufactures.**—N. Y. is one of the most productive States in the U. in all classes of manufactured articles, including iron and steel, textile fabrics, furniture, wooden-ware, pottery, glass, machinery, agricultural implements, watches, jewelry, hardware, drugs, etc. The aggregate value of iron and steel manufactures alone, in 1880, was \$2,319,219, the State ranking next to Pa. N. Y. had, in 1880, 12,822 cotton-loom, with 578,512 spindles, employing 10,710 persons. There were, in 1880, 69 salt-manufacturing establishments, employing a capital of \$2,286,081, producing 8,748,203 bushels of salt; aggregate value, \$1,107,760.

**Railroads and Canals.**—There were in operation, Jan. 1, 1882, within the State of N. Y. 6279 m. of railway, costing \$564,737,784, with net earnings of \$29,108,551, and paying interest and dividends to the amount of \$23,149,511. Of these several are very important trunk lines, as the N. Y. Central and Hudson River, the N. Y., Lake Erie and Western, the Del. and Hudson Canal Co.'s R. Rs., and the N. Y., Ont., and Western. There are 11 canals, of which the Erie is the prin., owned by the State. These with their navigable feeders have a total length of 906.95 m. Beside these State canals there are 2 others, partly in this State, which belong to corporations—viz. Del. and Hudson Canal, of which 87 m. are in this State, and the Junction Canal, 13 m. long.

**Finances.**—The assessed valuation of property in N. Y. for 1881 was—real estate, \$2,329,408,450; personal, \$339,702,783; total, \$2,669,111,233. Rate of State tax, 6 $\frac{1}{2}$  mills on the dollar, producing, in 1881, \$9,232,542. The real estate bears about 88 per cent. of the entire taxation, and personal property only about 12 per cent. State debt, less sinking fund, 1881, \$7,000,000; total net indebtedness, State, co., and municipal, \$218,723,314; total raised by taxation, State and local, 1880, \$56,401,099.

**Banks, etc.**—In Oct. 1881 there were in operation in N. Y. 291 national banks, with aggregate capital of \$83,980,160; circulation, \$46,529,277, secured by U. S. bonds to the value of \$52,703,403; deposits, \$322,302,691. There were, in addition, 81 State banks and trust cos., with \$27,805,221 capital and \$131,255,430 deposits; 120 savings banks, with \$552,149,128 deposits; and 674 private bankers, with \$47,583,862 capital and \$59,724,923 deposits. Of insurance cos. there were 91 in operation in 1881, paying losses in that yr. to the amount of \$10,301,500; risks written in 1880, \$2,861,479,432; premiums received, \$15,957,977.

**Commerce.**—Both in foreign and interior commerce N. Y. takes the lead among the States. Her shipping, in 1881, aggregated 1,150,222 tons, numbering 1048 steam vessels, 2948 sailing vessels, 971 canal-boats, and 444 barges. Value of direct importations from foreign countries, 1881, \$453,969,119; of exports, \$398,063,346, the latter being of Amer. production solely. N. Y. harbor is the great entrepot for the foreign commerce of the country, whence it is distributed all over the States and Terrs. The internal commerce by Erie Canal and the great R. R. lines is prodigious and constantly increasing.

**Education.**—The number of children of school age (5-21 yrs.) in 1880 was 1,641,173, of whom 1,027,938 were enrolled in public schools, with average daily attendance of 551,958. Total expenditure for public schools in 1880, \$9,986,662, of which there was expended for teachers' salaries \$7,438,277. Number of univs. and colls. in 1880, 29, with 524 instructors and 6625 students, paying in tuition fees, \$474,229. Among the prin. colls. are Columbia Coll., New York city; Cornell Univ., Ithaca; Union Coll., Schenectady; Vassar (female) Coll., Poughkeepsie, etc. Normal schools, acads., and female sems. are very numerous; technical schools and commercial colls. are found in nearly all the large cities, while the metropolises abound in insts. for instruction in music, art, telegraphy, household economy, decorative art, etc. The law and medical schools of N. Y. are extensively patronized, and the leading religious denominations have theological sems. In 1882 there were 1319 newspapers and periodicals pub. in the State, of which 181 were daily journals.

**Churches.**—The M. E. denomination comes first, with 1868 chs., 1121 ministers, and 214,836 members; Presb., 799 chs., 979 ministers, 125,298 members; Bap., 863 chs., 773 ministers, 113,215 members; R. Cath., 666 chs., 975 priests, and more than a million Catholic pop.; Prot. Epis., 592 chs., 709 ministers, 56,211 members; Lutheran, 965 chs., 203 ministers, 44,660 members; Reformed Ch., 280 chs., 289 ministers, 47,732 members; Congl., 253 chs., 258 ministers, 33,386 members; Jews, 51 synagogues, 40 rabbis, 3400 members (Heb. pop. about 80,000); and about 30 other denominations, having from 10,000 down to 50 members each.

**Population.**—In 1880, 3,880,735; 1870, 4,382,759; 1880, 5,082,871 (white 5,016,022, colored 66,849, including 909 Chl., 819 Indians, and 17 Japanese).

**Principal Cities and Towns, Pop. 1880.**—New York, 1,306,299; Brooklyn, 566,668; Buffalo, 155,134; Albany (cap.), 60,758; Rochester, 89,366; Troy, 56,747; Syracuse, 51,792; Utica, 33,914; Auburn, 21,924; Oswego, 21,116; Elmira, 20,541; Poughkeepsie, 20,207; Cohoes, 19,416; Yonkers, 18,892; Kingsburgh, 18,344; Newburg, 18,049; Binghamton, 17,317; Schenectady, 13,655; Lockport, 13,522; Rome, 12,194; Watertown, 10,697; Amsterdam, 9466; Jamestown, 9357; Ithaca, 9105; Saratoga Springs, 8421.



COUNTIES.	*Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
Albany.....	5-J	133,052	154,890	Albany.....	90,758
Allegany.....	6-D	40,914	41,810	Angelica.....	705
Bronx.....	6-G	44,103	48,483	Belmont.....	504
Cattaraugus.....	6-C	33,999	35,906	Binghamton.....	17,317
Cayuga.....	4-F	59,550	65,081	Little Valley.....	1,913
Chemung.....	6-F	35,227	35,342	Malone.....	362
Chenango.....	6-G	35,227	43,065	Elmira.....	20,541
Clinton.....	1-J	47,947	60,897	Norwich.....	tp. 5,756
Columbia.....	6-K	47,443	47,925	Plattsburg.....	5,242
Cortland.....	6-H	35,173	36,823	Cortland.....	8,670
Delaware.....	6-J	42,972	42,721	Delhi.....	1,384
Dutchess.....	6-K	74,041	79,184	Poughkeepsie.....	20,207
Erie.....	5-C	178,689	219,884	Buffalo.....	155,124
Essex.....	2-J	29,042	34,515	Elizabeth.....	445
Franklin.....	4-I	37,064	30,955	Johnstown.....	5,013
Fulton.....	4-D	31,606	32,306	Batavia.....	4,845
Genesee.....	6-J	31,332	32,695	Cattkill.....	4,320
Greene.....	4-I	2,950	3,223	Sageville.....	2,359
Hamilton.....	4-H	39,929	42,659	Herkimer.....	10,697
Herkimer.....	2-G	65,415	66,103	Watertown.....	568,663
King.....	8-B	419,921	599,465	Brooklyn.....	tp. 3,188
Lewis.....	3-H	38,689	31,416	Lovell.....	1,925
Livingston.....	6-D	39,582	39,582	Greene.....	711
Madison.....	4-D	117,468	144,903	Rochester.....	89,366
Monroe.....	4-I	34,457	38,315	Fonda.....	944
Montgomery.....	8-J	942,292	1,096,799	New York.....	1,906,299
New York.....	4-H	50,437	51,752	Rockport.....	13,622
Niagara.....	4-F	110,098	115,475	Utica.....	38,914
Oneida.....	4-F	104,183	117,593	Syracuse.....	51,792
Orangetown.....	5-E	45,108	49,541	Cannadaga.....	5,726
Ontario.....	7-J	80,902	88,220	Watkins.....	2,557
Orange.....	4-D	97,689	100,128	Newburgh.....	18,049
Orleans.....	3-G	77,941	77,911	Albion.....	tp. 5,147
Oswego.....	5-H	48,967	51,397	Oswego.....	21,116
Otsego.....	7-K	15,430	15,181	Cooperstown.....	2,199
Putnam.....	5-K	73,303	90,574	Cooperstown.....	571
Queens.....	5-K	99,549	115,328	Jamaica.....	3,922
Rensselaer.....	8-A	33,029	38,991	L. I. City.....	17,129
Richmond.....	8-J	55,213	72,680	Troy.....	56,747
Rockland.....	4-J	61,526	65,156	Richmond.....	88
Saratoga.....	4-J	21,247	23,588	New City.....	270
Schenectady.....	5-F	33,340	32,910	Ballston Spa.....	3,011
Schoharie.....	5-F	18,989	18,842	Schenectady.....	13,655
Schuyler.....	5-F	27,923	29,273	Schoharie.....	1,188
Seneca.....	6-E	67,717	77,586	Watkins.....	2,716
St. Lawrence.....	1-H	84,826	85,997	Ovid.....	705
Suffolk.....	8-K	46,923	53,885	Watertown.....	3,893
Sullivan.....	6-F	30,572	32,673	Bath.....	3,183
Tioga.....	5-F	33,175	34,445	Corning.....	4,802
Tompkins.....	7-J	84,078	85,338	Canton.....	2,049
Ulster.....	8-J	22,592	25,179	Liverpool.....	1,757
Warren.....	4-K	47,710	51,700	Monticello.....	941
Washington.....	8-J	181,348	108,988	Oswego.....	5,525
Wayne.....	5-D	29,164	30,907	Ithaca.....	9,105
Westchester.....	5-E	19,593	21,087	Kingston.....	18,344
Yates.....	5-E	19,593	21,087	Watkins.....	319
Total.....		4,382,759	5,083,871	Argyle.....	316

\* Reference for location of counties. See map of New York.

**History.**—The bay of New York was first discovered in 1524 by JUAN DE VERRAZANO. In September 1609 Hendrik (or Henry) Hudson, a navigator in the service of Hol., again discovered the bay, and ascended both it and the Hudson River to a point a little below Albany. On his return, landing in Eng., he despatched to Hol. an account of his discoveries. In 1610 some Amsterdam merchants sent a small vessel to the Hudson River to trade with the Indians for furs, etc. In 1613 2 small trading-forts were built on the river and 4 houses erected on Manhattan Island. These explorers ran along the whole length of L. I., ascended the strait now known as the E. River, entered the Sound, and also passed up the Hudson and along the Jersey coast to the Del. River, which they ascended for some distance. In 1614 an expedition consisting of 5 vessels was sent out by the States-General to explore this region. In Oct. 1614 the States-General granted to the explorers the exclusive right to trade between the Del. and Conn. rivers for 3 yrs. from that date. In 1615 a fort and trading-house were erected just below the present site of Albany, another on Manhattan Island. In 1623 or 1624, the Dut. W. I. Co. took possession. In 1623 they erected Ft. Nassau on the Del. River, and Ft. Orange on the site of Albany. In 1624 Peter Minuit was appointed director of the New Netherlands, and brought over colonists who settled on L. I. Up to 1629 the settlements were simply trading establishments. In that yr. the W. I. Co.'s council granted to certain individuals extensive seigniories or tracts of land with feudal rights over the lives and persons of their subjects. Under this grant Kiliaen van Rensselaer, a pearl-merchant of Amsterdam, secured in 1630 and subsequently a tract of land 24 by 48 m. in extent, composing the present cos. of Albany, Rensselaer, and part of Columbia; Michael Pauw purchased Staten Island, Jersey City and Harsimus; and others other tracts of great extent. Minuit's administration came to an end in 1632, and he was succeeded by Wouter van Twiller. Van Twiller extended the colonies, planted a new one on the Conn. River on the site of Hartford, erected a fort there, and furthered the interests of the co. He was succeeded in 1637 by Willem Kieft, whose administration of 8 yrs. was one of constant turbulence and trouble with the colonists, with the Indians, and with the Eng. settlers on L. I. and in Conn. In 1645 Petrus Stuyvesant was appointed director in Kieft's place. In Sept. 1664 the colony of New Netherlands, which, in violation of all national comity, Charles II. had granted to his brother, the duke of York, was conquered by the capitulation of New Amsterdam, and its name changed to New York. In Aug. 1673 the colony was recaptured by the Dut., and remained in their possession until the following Feb., when it was restored to

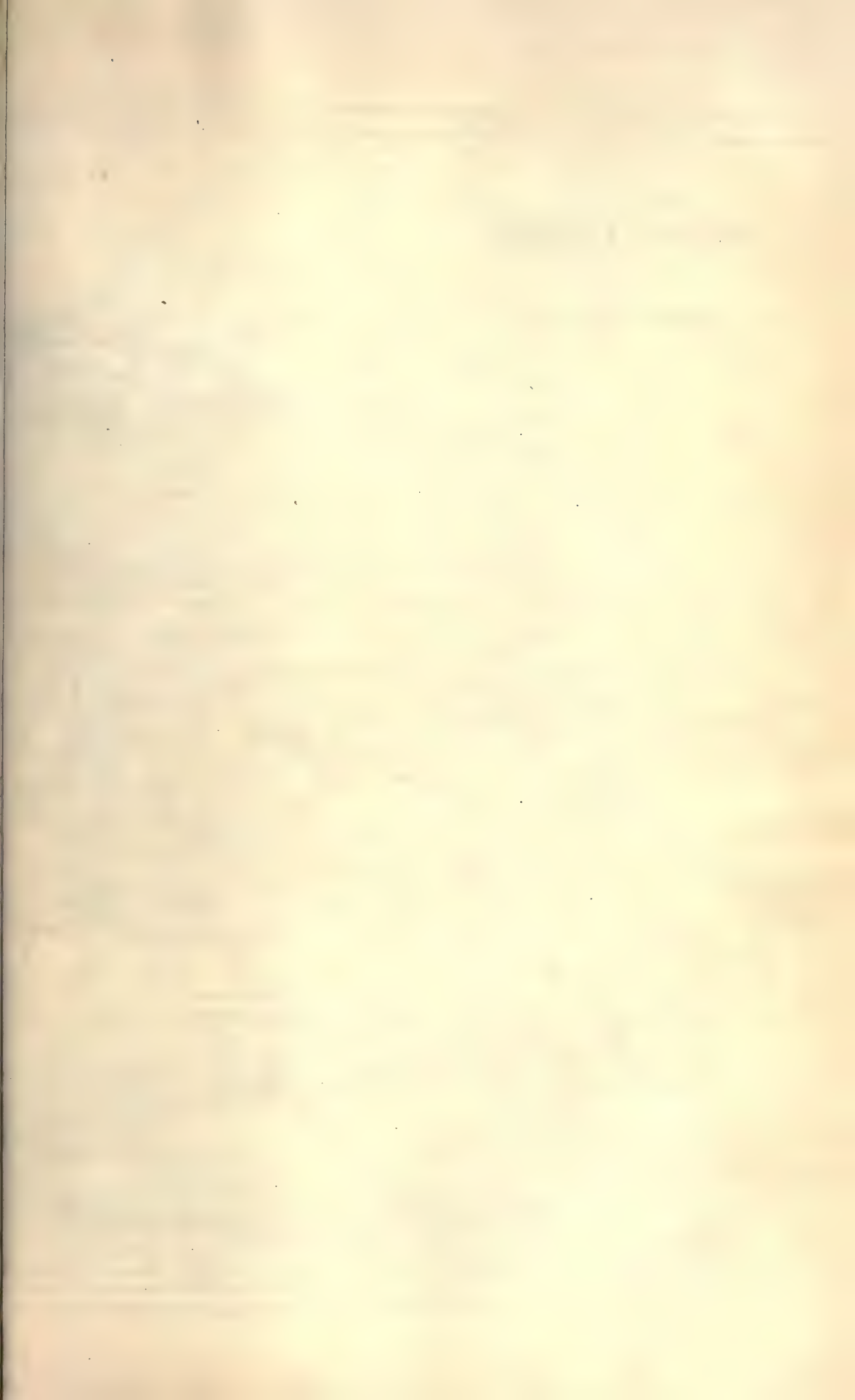
the Eng. by treaty. The feudal relations of the patroons or seigneurs and their tenants and subjects were not materially changed during this period. On July 9, 1776, the provincial cong., which had been organized in May 1775, re-assembled at White Plains and took the title of "The Representatives of the State of New York." At the same session they approved the Dec. of Ind. N. Y. had from the first taken an active part in the movements which led to the Revolution, though there were many Tories in the State. The earliest captures of Brit. forts, as Ticonderoga, Crown Point, and Skeneborough (Whitehall), were within her limits, while the disastrous battle of L. I., the minor actions of Harlem Heights, White Plains, and the capture of Ft. Washington and Lee were among the early misfortunes of the N. Y. patriots. New York city and the Hudson below Peekskill, as well as Staten Island and most of L. I., were occupied by the enemy, the N. border was held by Brit. troops from Canada, and the E. central cos., along the Mohawk, Schoharie Creek, and the Del., were ravaged by Tories and Indians under the leadership of Sir John and Sir Guy Johnson, the blood-thirsty Butlers, and the Indian chief Brant. Yet occasionally the patriots were cheered by success. Burgoyne was compelled to surrender Oct. 17, 1777, near Schuylerville, Saratoga co. The frequent incursions of Gen. Lord Howe up the Hudson and on L. I. were not productive of very serious losses, and even the treason of Arnold was discovered too soon to cause serious disaster. Its first State const. was adopted Apr. 20, 1777, and Gen. Clinton was elected its first gov., and continued in office till 1795. The Articles of Confederation for the States were approved by N. Y. in Feb. 1778. The const. was ratified by N. Y. July 26, 1788. In the war with G. Brit. (1812-15) N. Y. took an active part, and, aside from the victories gained by her heroes on the ocean, many of the minor conflicts and the important land and naval battle of Plattsburg were fought on its N. and N. W. frontier. The battle of Lundy's Lane, one of the most decisive of the war, was fought on the Canada side of Niagara River, less than 2 m. from the Falls. Soon after the war the project for a canal from Albany to Buffalo, which had been previously broached, was revived, and in 1817 both the Erie and the Champlain canals were commenced and pushed forward to completion, the latter in 1823, and the former, with great rejoicings, in 1825. A constitutional convention was held in 1821, and a new const. adopted and ratified by the people. The Anti-Masonic excitement in 1826 caused a great commotion and many political changes in the State. The popularity of the Erie and Champlain canals led to a great pressure upon the State for the construction of other canals, unwarranted by the business of the regions through which they were to pass. In an evil hour they were commenced, and have ever since been a constant source of loss to the State. The enlargement of the Erie Canal, begun in 1835, has increased the cost of that great work to \$100,000,000, but with advantages perhaps commensurate with its cost. In 1846 another constitutional convention was held, and a new const., differing materially from the preceding, adopted and ratified by the people. At the commencement of the war N. Y. took an active and prominent part in its aid, and her people were to a greater extent than those of most of the States united in sustaining the gov't. Her immense quotas were promptly filled, and the State paid \$40,000,000 in bounties to its volunteers. In 1867 another convention was held and a new const. promulgated, which was, however, rejected by the people, except the articles on the judiciary, which were incorporated into the const. of 1846, which is yet the governing law of the State, though some further amendments have been adopted.

#### Governors of the Colony and State.

(Those marked with a star (*) died in office.)		
<i>Under the Dutch.</i>		
Peter Minuit.....	1624-33	Sir Henry Moore*..... 1765-69
Wouter van Twiller.....	1633-37	Cadwallader Colden..... 1769-70
Willem Kieft.....	1637-47	John, Lord Dunmore..... 1770-71
Petrus Stuyvesant.....	1647-64	William Tryon..... 1771-77
<i>Under the English.</i>		<i>Governors of the State.</i>
Richard Nicolls.....	1664-67	George Clinton..... 1777-95
Francis Lovelace.....	1667-73	John Jay..... 1795-1801
<i>Dutch administration resumed.</i>		George Clinton..... 1801-04
Anthony Colve.....	1673-74	Morgan Lewis..... 1804-07
<i>Eng. administration resumed.</i>		Daniel D. Tompkins..... 1807-17
Edmond Andros.....	1674-83	De Witt Clinton..... 17-22
Thomas Dongan.....	1683-88	Joseph C. Yates..... 1822-24
Edmond Andros.....	1688-89	De Witt Clinton*..... 1824-28
Jacob Leisler.....	1689-91	Nathaniel Pitcher..... 1828-29
Henry Sloughter*.....	1691-92	Martin Van Buren..... 1829
Richard Ingoldsby.....	1692-98	Enos T. Throop..... 1829-33
Benjamin Fletcher.....	1692-98	William L. Marcy..... 1833-38
Rich. E. Bellomont*.....	1698-1701	William H. Seward..... 1838-42
John Nanfan.....	1701-02	William C. Bouck..... 1842-44
Lord Cornbury.....	1702-08	Silas Wright, Jr..... 1844-46
John, Lord Lovelace*.....	1708-09	John Young..... 1846-49
Richard Ingoldsby.....	1709-10	Hamilton Fish..... 1849-51
Gerardus Beekman.....	1710	Washington Hunt..... 1851-53
Robert Hunter.....	1710-19	Horatio Seymour..... 1853-55
Peter Schuyler.....	1719-20	Myron H. Clark..... 1855-57
William Burnet*.....	1720-28	John A. King..... 1857-59
John Montgomerie*.....	1728-31	Edwin D. Morgan..... 1859-63
Rip van Dam.....	1731-32	Horatio Seymour..... 1863-65
William Cosby*.....	1732-36	Reuben E. Fenton..... 1865-69
George Clarke.....	1736-43	John T. Hoffman..... 1869-73
George Clinton.....	1743-53	John Adams Dix..... 1873-75
Sir Danvers Osborne*.....	1753	Samuel J. Tilden..... 1875-77
James de Lancey.....	1753-55	Lucius Robinson..... 1877-80
Sir Charles Hardy.....	1755-57	Alonzo B. Cornell..... 1880-85
James de Lancey*.....	1757-60	Grover Cleveland..... 1885-88
Cadwallader Colden.....	1760-61	David B. Hill..... 1885-86
Robert Markton.....	1761	
Cadwallader Colden.....	1761-65	

REVISED BY A. R. SPOFFORD.







MAP OF  
**NEW YORK**  
Drawn and Engraved on Copper-Plate  
EXPRESSLY  
FOR  
**JOHNSON'S CYCLOPEDIA**

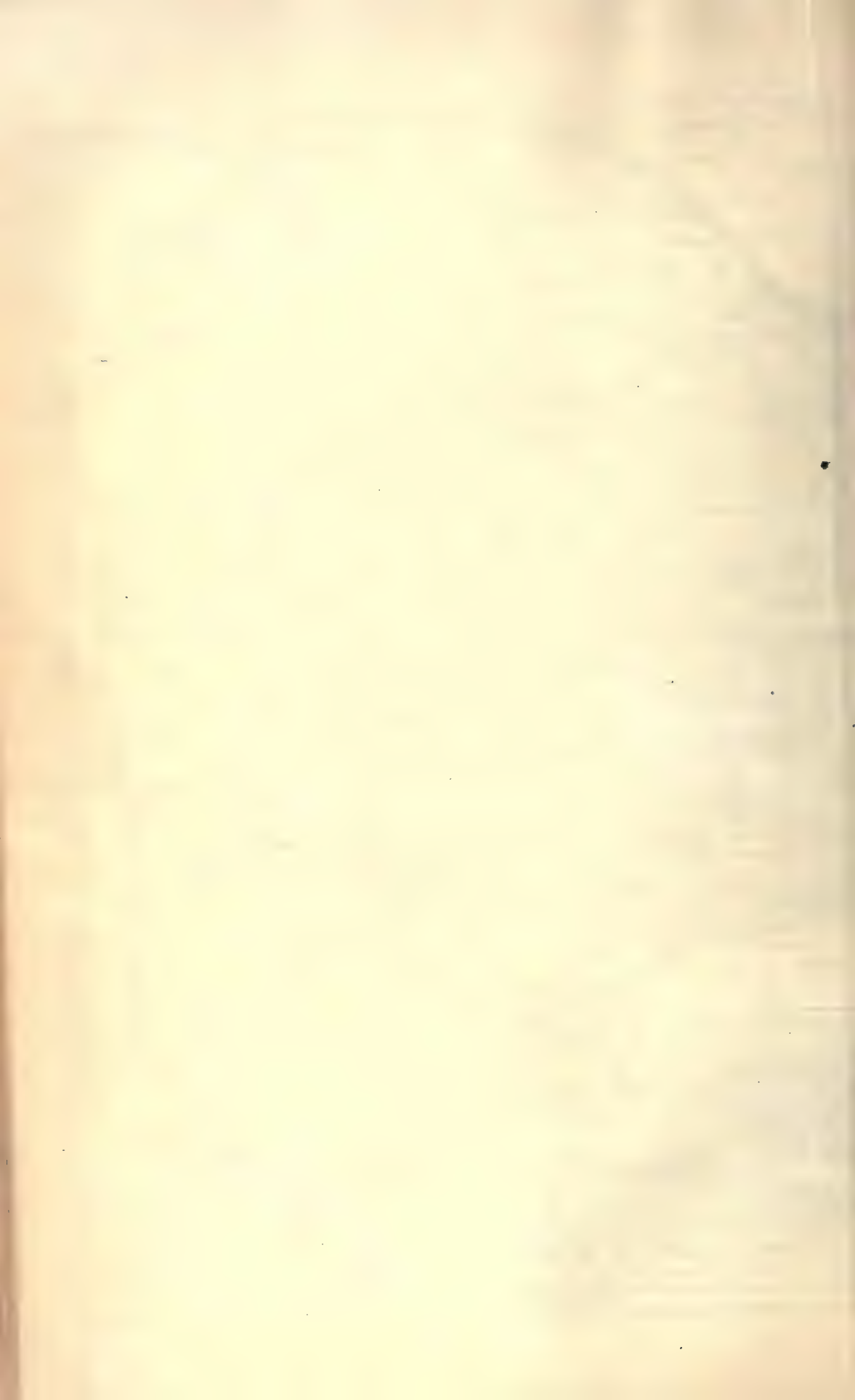
Scale of Miles  
10 20 30 40 50













**New York** (the *New Amsterdam* of the Dutch), lat. of City Hall, 40° 42' N., lon. 74° 01' W. from Greenwich, the chief commercial city in the U. S., and the most populous, is situated at the junction of the Hudson or North River and the extension of L. I. Sound known as the East River. The limits of the city and county (of the same name) are identical, and include the S. part of the former co. of Westchester, together with Manhattan, Blackwell's, Ward's, Randall's, Bedloe's, Ellis, and Governor's islands, of which the last 3 have been ceded for federal purposes to the U. S. gov't.

**Area.**—The total area of the city before the recent additions from Westchester co. was 22 sq. m. or 14,080 acres. The additions amount to 13,000 acres. That of Manhattan Island, the seat of pop., and divided from the mainland by the Harlem River, is 22 sq. m. and 20,424 sq. yards. Of this, 8,712,000 yards are devoted to public parks. The length of the island is 13½ m., its width averages 1¼ m. The outlying islands are set aside for public purposes, almshouses, penitentiaries, etc. They contain about 300 acres; those ceded to the gov't., 100 acres.

**Commerce and Immigration.**—Nearly 60 per cent. of the foreign trade of this country passes through this port, the total aggregate of inward and outward trade being, for all the U. S., for the fiscal yr. 1889-90, \$1,567,071,700, of which N. Y. had \$907,936,465. Of this, the imports, exclusive of specie and bullion, amounted to \$521,275,897, and the exports \$386,660,568. The importation of sugar at N. Y. for the same fiscal yr. was valued at \$59,355,519; of coffee, valued at \$84,601,176; of tea, \$14,624,283. Imports of silk manufactures, \$36,875,286; cotton, \$29,966,880; woollen, \$30,777,298; flax, \$14,183,017; iron and steel, \$20,539,581; hides and skins, \$19,586,465; tin, in bars and plates, \$13,877,495; tobacco, \$8,609,517; coin and bullion, \$28,215,006. The exports from N. Y. for same fiscal yr.: Breadstuffs, \$77,908,258; provisions, \$80,146,613; cotton, \$33,865,552; oils, \$37,349,125; tobacco, \$11,657,059. The number of vessels, steam and sail, engaged in the foreign trade of N. Y., was, in the fiscal yr. ending June 30, 1884, 6066, of which 4197 were foreign and 1869 American. The number of ocean steam-vessels was 1963, of which 1724 were foreign and 239 American. The whole number and tonnage of sailing-vessels, steam-vessels, barges and canal-boats belonging to the port of N. Y., June 30, 1884, was 5619, of 1,203,598 tons.

The transportation to tide-water on the canals from the Western States and from the interior of the State amounted in 1884 to 2,853,764 tons, and the returns to 1,298,500 tons. The canals were freed from tolls by late legislation. The arrivals of immigrants at the port were 330,030 in 1884.

**Manufactures.**—By the census of 1880 the number of manufacturing in the city of N. Y. was 11,339, with \$181,206,356 capital, producing a value of \$472,926,437.

**Finances.**—The official value of the property of the city for the purposes of taxation was, for 1884—real, \$1,119,761,597; personal, \$213,536,746; total, \$1,338,298,343.

**Banks.**—There are 61 banks in the city, with a capital of \$63,432,500, a circulation of \$11,939,600, and deposits of \$246,263,700. These banks are associated in a clearing-house for their daily exchanges, the transactions of which amounted in 1884 to \$34,000,000,000. There are also 25 savings banks, with deposits of \$225,522,914, from 580,333 depositors.

**Courts.**—The U. S. circuit court for the Southern district of N. Y. State has 10 counties under its jurisdiction, one of which is that of N. Y. This holds two general terms, one criminal and one equity term, each yr. The U. S. dist. court holds a general term monthly and a special term weekly. These courts have their chambers in the new P. O. building. The State courts are civil and criminal; the civil and the supreme, superior, common pleas, held in the county c-h.; the marine, held in the City Hall, and ten districts covering each a number of wards in jurisdiction. The criminal courts are the oyer and terminer, which sits twice in each yr. at the county c-h., the general sessions, held monthly at its chambers; the special sessions, at the Tombs. In addition to these there is a Court of Arbitration of the Chamber of Commerce, established by law in 1874, for adjudication of cases voluntarily submitted.

**Churches.**—There are 379 religious organizations, of which 72 are P. E., 55 M. E., 50 Presb., 38 Bap., 21 Lutheran, 20 Reformed Dutch, 5 Congl., 4 Univ't., 3 Unit., 3 Evangelical, 2 Friends, 58 R. Cath., 25 Jewish, and 23 miscellaneous. The oldest denomination is the Dutch Reformed, established by the Hol. settlers. The Ch. of Eng. and Presb. were founded by the Eng.; the Jews built a synagogue as early as 1730; the R. Caths. erected their first edifice in 1786. The chs. noted for their size, cost, and architectural beauty are Trinity, St. Paul's, St. George's, the Fifth Avenue Presb., the Reformed Collegiate, the Jewish Synagogue, and the R. Cath. Cathedral.

**Public Institutions and Charities.**—The municipal charities of N. Y. are intrusted to a board entitled the Commissioners of Public Charities and Correction, who have under their control 23 inst., viz.: Almshouse, Bellevue Hospital, Bureau of Medical and Surgical Relief for the Outdoor Poor, City Prison, Colored Home, Colored Orphan Asylum, Epileptic, Fever, and Incurable Hospitals, Blackwell's Island, Idiot, Homeopathic, Inebriate Hospitals, Lunatic Asylum, N. Y. City Asylum for Insane, Nursery Hospital, Outdoor Poor Dept., Penitentiary, Penitentiary and Charity Smallpox Hospitals, and Workhouse. The immigrants are under the care of the commissioners of emigration, by whom large numbers of them are relieved, forwarded, and provided with employment. The insts. incorporated by the State are subject to the visitation of the State Board of Charities, who render an annual report to the Legislature. Beside these there are numerous private insts., endowed and supported by voluntary contributions, and in some cases assisted by State or municipal appropriations. The oldest and most efficient of these is the Association for Improving the Condition of the Poor. Their expenditures for the yr. 1882 were about \$30,000; a new and commendable feature

in their work is the tenement-house inspection. Beside this central inst., there are numerous private and ch. charities and 74 dist. asylums and homes which give shelter. Independent of the city insts., 24 hospitals are maintained by subscription. Many of these are on an extensive scale, occupying large buildings, arranged in accordance with the best sanitary improvements, and giving relief to a large number of sick and injured. The Roosevelt Hospital, in its absolutely liberal and insectarian administration, is a model for universal imitation. The dispensaries, 28 in number, are of the highest value in their gratuitous supply of phys. and med. For these various forms of public benefactions N. Y. has been noted from her earliest history. She perhaps has no equal on this continent, certainly none on the other, in the extent and wisdom of her benevolence. The organized local charitable societies and insts. receive and distribute annually about \$3,000,000.

**Education.**—The public instruction is under charge of a board of education; the whole number of schools within their jurisdiction in 1881 was 299, with an attendance of 275,899 pupils. There are 1 female normal school, 1 normal school for teachers, and 1 model training school in connection with the normal coll. The Coll. of the City of N. Y., better known as the Free Acad., is a part of the gen. system of public instruction. There are 2 important literary colls., Columbia and the Univ. of the City of N. Y. Beside these, there are the coll. of St. Francis Xavier, Manhattan Coll., and many other insts. of learning; Peter Cooper established an inst. in this city for the education of the working classes, which is under the charge of a board of trustees, and to which he gave a building valued at \$500,000 and made other munificent donations. The instruction includes engineering, the arts of design and modelling. The tuition and lectures are free.

**Libraries.**—The oldest library in the city is that known as the Society Library, organized in 1754. The most important in number of vols., in its special wealth in technical information in all languages, is the Astor Library, the noblest individual contribution to the cause of education in the U. S., and free to all. This institution is increased by the continual care and endowment of each succeeding generation of the family whose name it bears. The next important library is that of the N. Y. Historical Society, a collection rich in Amer. history. The great circulating libraries are those of the Mercantile Library Association and the Apprentices' Library, the latter free to the working class. Among the special collections the most extensive are those of the Union Theol. Sem., the Amer. Inst., the Law Inst., the N. Y. Hospital and Acad. of Med. The Lenox Library is an amateur collection, rich in Amer. hist., Shakespeareana, and Bibles. The city possesses no great public library for circulation like the model inst. of Boston. The necessity is seriously felt by literary, professional, and working men, and by none more than the large class who provide material for the press. An inst. organized under the name of the Free Circulating Library was undertaken to supply reading matter to the poor in the different wards of the city, and has made in the last few yrs. a successful experiment on a small scale. It is a most deserving charity, but in no manner covers the general ground. A large public library is the one great want of the city.

**Newspapers.**—The leading morning newspapers are the *Herald*, *Times*, *Tribune*, *World*, *Sun*, *Journal of Commerce*, *Staats-Zeitung*, *Courrier des Etats Unis*; the evening papers are the *Evening Post*, *Mail and Express*, *Commercial Advertiser*, *Daily News*, and *Telegram*. Of the illustrated papers, the daily *Graphic*, *Harper's Weekly*, and *Frank Leslie's Illustrated News* are the most popular. There are also more than 400 minor sheets, devoted to literature, science, and art.

**Bartholdi Statue of Liberty.** See page 1524.  
**Principal Buildings.**—The most noted buildings are the City Hall, a graceful structure in City Hall park, built 1803;



City Hall.

adjoining is the new Court-House, a large edifice; the Custom-House, formerly the Merchants' Exchange, is an immense and massive building of Quincy granite; the new Post-Treasury occupies the old Custom-House; the new Post-Office, the finest public edifice in the city, was finished in 1875. The buildings erected during the last few yrs. are of an entirely new order, both in construction and style, and combine all the modern appliances of convenience and comfort. In the lower part of the city vast structures, many stories in height, have greatly extended the accommodations for the business community. In the upper part numerous



buildings not less extensive have been erected on what is known as the apartment plan, which unite the privacy of home to the advantages of a common light, heat, and general service. These have changed the appearance of the principal thoroughfares. In addition, a large number of private houses, palatial in their luxury and elegance, now appear in the avenues devoted to fashionable residences.

**Markets, Etc.**—The market system needs a radical change, but changes have been found difficult in view of the long habits and prejudices of the people. The great receptacles of country supply are Fulton for the products of L. I.; Washington and Clinton, for those of N. J. These are on or near the river-fronts. Besides these there are 10 others owned by the city and rented by stalls. The great body of the population, however, supply themselves daily from street shops or stands. Consumers and producers suffer from the want of system and regulation, both being at the mercy of the middleman. Hence with a supply abundant and various beyond that of any modern capital, food rarely reaches the consumer except in an imperfect condition and at an unreasonable price. Fulton and Washington markets have lately been excellently rebuilt.

The Fire Department is a well-organized and thoroughly disciplined corps under the control of a board of commissioners. Steam-engines stand ready to move at any moment, and the several stations are connected by telegraph with the headquarters of the department. The details of the alarm service are perfect.

**Parks and Cemeteries.**—The city is admirably provided with parks, the chief of which is the CENTRAL PARK (which see). The total area in acres, all included, is 1007. There are also the Battery, the Bowling Green, the City Hall Park—all historical grounds—Tompkins, Washington, Union, Madison, Reservoir, and Manhattan Squares, and to the N. of the island, Mount Morris, High Bridge, Morningside, and Riverside Parks. The superb drive along the margin of the latter, from 72d st. to 125th st., overlooking the Hudson, with a view of the Palisades, is of incomparable beauty.

The practice of burial in the city graveyards, with the exception of private vaults, has long been discontinued, for sanitary reasons. The only public cemeteries within the city limits are Trinity ch. cemetery on the banks of the Hudson at 155th st., and Woodlawn, 7 m. W. of the Harlem River in the recently annexed dist. Besides these, there are 13 which have offices in the city; of these, Greenwood, Cypress Hills, and Calvary, all on L. I., are the most noted.

**Streets and Avenues.**—The lower part of the city is irregularly built, but from Houston st., about 1 m. N. of the City Hall Park, the construction is regular, with long avenues running to the N. end of the island and laterally traversed by streets which, like the avenues, are designated by numbers. Broadway, the most famous of the avenues, is an exception to this rule, and its long extent of 6 m. crosses 5 of the avenues in a N. W. direction. Broadway is lined with shops and hotels, and is one of the gayest streets in the world. Fifth avenue, with its magnificent private residences, chs., and club-houses, is one unbroken series of architectural display from Washington Square to the Central Park. The natural advantages of this fine avenue, which runs along the ridge of the island, make it the favorite site for residence. There are broad and extensive boulevards in the upper part of the island, which extend from the Central Park into the territory beyond the Harlem River, and offer long and agreeable drives.

**Railways and Rapid-Transit Roads.**—The first city R. R. was chartered in 1852, since which the system of travel by horse-cars has reached an enormous development. There are now surface R. Rs. in all the longitudinal avenues except Fifth avenue, and there are also numerous transversal lines connecting the ferries of the E. and N. rivers. The first elevated R. Rs. were opened for travel in 1872, and the entire island is now girdled by these new structures. The number of passengers carried by them in 1882 was 86,361,029. The New York Central, Hudson River, Harlem, and New Haven R. Rs. have their terminus in this city at the Grand Central Depot.

**Ferries.**—There are 24 ferries connecting N. Y. with the W. shores of the Hudson, Hoboken, Jersey City, Staten Island, and L. I.

**Bridges.**—The Brooklyn or East River Bridge (see BROOKLYN), connecting N. Y. and Brooklyn, was commenced in 1870 and finished in 1883; cost, about \$15,500,000. There are several bridges across the Harlem River, the most noted of which is High Bridge, over which the Croton water is brought. (See AQUEDUCT.)

**Hudson River Tunnel.**—Among the important new enterprises is the proposed connection of the city of N. Y. with the mainland on the W. side of the Hudson, by means of the Hudson River Tunnel, by which the R. Rs. which now end at Jersey City will reach a convenient point in N. Y. city, and the delays occasioned by the passage of the river, sometimes serious because of fog and ice, will be avoided. The work is about half completed.

**Water-Works, Etc.**—The city is supplied with water drawn from the Croton River, a clear, pure stream in Westchester co., which is conducted to the city through an aqueduct of solid masonry 40½ m. long, opened in 1842. In over 40 yrs. which have ensued the city has outgrown even its enormous capacity, and an entire new system of supply must be devised or the old duplicated. Contracts have been made for a new aqueduct.

Five principal gas-light cos. supply the city. These are the Manhattan, New York, Metropolitan, Mutual, and Harlem. In addition to these the new system of electric lights is rapidly coming into use. The public squares, Broadway, and the Fifth ave. are in part lighted in this manner. Still another new feature in city progress is the heating of houses by steam, conveyed from reservoirs through street mains, and distributed in the same manner as water or gas. The system of paving has greatly improved; the old cobble-stone

has almost wholly disappeared; wood has been abandoned; asphalt has been found unsuitable to a climate of such extremes in heat and cold; trap-block has superseded all others nearly. The system of sewerage is totally unworthy of a metropolitan city, with unequalled opportunities for drainage to the rivers on either side.

**History.**—Immediately after the discovery of Hudson in 1609, the Dutch undertook the occupation and settlement of Manhattan Island, and in 1614 erected a fort and trading-house at the S. W. extremity of the island, to which they gave the name of New Amsterdam. In 1652 the city of New Amsterdam was incorporated. It remained under the peaceful rule of the Dutch for about a half century, when, Charles II. coming to the Eng. throne, the terr. occupied by the Dutch was granted by royal charter to his brother, the duke of York, Mar. 12, 1664, and an Eng. fleet took possession in Aug. of the same yr. Cols. Nicoll and Lovelace ruled the settlement for 10 yrs. in the name of the duke, and the name of the city was changed, in his honor, to New York. In Aug. 1673 a Dutch fleet recaptured the city, which it held in the name of the States-General of Hol., changing the name again to New Orange, in compliment to the prince of Orange. It was again restored to Eng. rule by treaty in 1674, and resumed its name. The most important events in the hist. of the city since the Eng. occupation have been the usurpation of the govt. by Leisler in 1689, and his trial and execution in 1691. The same yr. the laws of the duke of York and provincial laws were framed. The first assembly met in the city Apr. 9. In 1666 the first Trinity ch. was built; in 1725 Bradford established the New York Gazette; in 1729 a city library was founded; in 1754 King's (now Columbia) Coll. was chartered; in 1765 the famous cong. known as the Stamp Act Cong. met in the city; the Sons of Liberty were organized, with affiliations throughout the colonies; the Stamp Act was burned, and an agreement not to import goods from G. Brit. until the repeal of the obnoxious act, signed by a large concourse of merchants; in 1768 the Chamber of Commerce, the first inst. of its kind in Amer., was organized at the Queen's Head tavern. The Colonial Assembly finally adjourned Apr. 3, 1775. On the news of the battle of Lexington reaching the city, the Committee of Safety took control in the name of the citizens, and the royal govt. sought refuge on board of an Eng. man-of-war in the harbor. Delegates were elected to the Continental Cong. July 25, 1775. Aug. 22, Cong. having ordered the withdrawal of the cannon to the interior, the Asia man-of-war fired upon the city. In Jan. 1776 a detachment of militia took possession of the city, and in the spring the Amer. army followed. On July 8 the Dec. of Ind. was proclaimed and read to the army. Aug. 26, after the battle of L. I., the city fell into the hands of the Brit. On Nov. 25, 1783, the Brit. evacuated the city, and Gen. Washington entered at the head of the Amer. army. In Jan. 1785 Cong. removed from Phila. to N. Y., and met in the City Hall, corner of Wall and Nassau sts., now the site of the U. S. Sub-Treasury. The Bank of N. Y. was organized this yr., and a manumission society was established. On July 26, 1788, the new const. of the U. S. was adopted by the legislature. On Apr. 30, 1789, Gen. Washington was inaugurated Pres. of the U. S. on the gallery in front of the old City Hall, facing Broad st. In 1805 the New York Free School was incorporated; in 1806 steam navigation was first successfully inaugurated on the Hudson by Robert Fulton; in 1807 the city was surveyed and laid out by a commission of the city legislature, upon a plan which has been substantially adhered to; in June 1812, declaration of war with Gr. Brit., a large number of privateers sailing from the port; this yr. the first steam ferry was established to Jersey City. Aug. 15, 1824, Gen. La Fayette arrived in the city. In Oct. 1826 the Erie Canal was opened, and on Nov. 11 the first canal-boat arrived at N. Y. from Buffalo. In 1832 the Asiatic cholera ravaged the city. In Dec. 1835 a disastrous conflagration raged for 3 days, and destroyed more than 600 buildings and property worth over \$30,000,000. The Croton Aqueduct was completed in 1842. In 1844 began the enormous immigration to this country, the greater part of which has passed through this port. In 1851 Kossuth, the Hungarian patriot, received an enthusiastic public welcome. In 1853 there was an exhibition, on Reservoir square, of the industry of all nations. In 1858 the successful laying of the Atlantic cable was celebrated. In 1860 the first Japanese embassy was entertained with great splendor; in the same yr. the Prince of Wales was received with a grand military display. In Apr. 1861 the attack upon Ft. Sumter by the secessionists caused intense excitement, and was responded to by a spontaneous uprising of the loyal element. In July 1863, an attempt being made to enforce the military draft ordered by the U. S. govt., a serious riot occurred, which, in the absence of the militia at the seat of war, was with difficulty repressed. During the war the city furnished 116,382 troops to the govt. In Apr. 1865 the remains of Lincoln, the murdered Pres., were escorted through the city by an enormous and imposing procession, the magnitude of which has never been equalled in its streets. In July 1871 there was a conflict in the streets between the Orangemen and Ribbonmen, Irish associations, and the riot was only suppressed by military force after the loss of many lives. In 1879 the successful resumption of specie payments gave a new impetus to the enterprise of the city, and its material growth and prosperity have been marvellous. In Sept. 1876 the battle of Harlem was celebrated on Bloomingdale Heights, the scene of the action, and in Oct. 1881 the delegation appointed by the Fr. govt. to represent our anc. allies at the Yorktown anniversary were received and entertained on their arrival and departure from this port with munificent hospitality. On May 24, 1883, the opening of the bridge to Brooklyn was the occasion of a grand celebration by day and an illumination in the evening. The Pres. of the U. S. was present.

**Population.**—In 1790, 33,131; 1870, 942,292; 1880, 1,206,399.

JOHN AUSTIN STEVENS.



**New York, University of the City of**, was opened for the reception of students in Oct. 1832. By its charter it is unsectarian, and therefore does not embrace in its corps of profs. a theological faculty. A chancellor is the head of its professorial corps, which was originally distributed into a faculty of science and letters, a faculty of law, and a faculty of med. Since 1871 the faculty of science and letters has been divided into a faculty of arts and a faculty of science, and parallel full courses of instruction have been given by the faculty of arts in the usual collegiate studies, and by the faculty of science in the subjects taught in the best scientific schools, together with civil engineering and analytical chem. In this dept. Fr. and Ger. also take the place of Gr. and Lat. In 1871-72 was first introduced the distinctive feature of the univ. by which its courses in the arts and sciences were made gratuitous. In the professional schools of med. and law the students pay an annual fee. This in the dept. of med. is \$185, including the matriculation and graduation fees and the fee for instruction by the demonstrator with material. In the dept. of law the fee for the yr. is \$100. By statute its graduates are admitted to the bar of New York without further examination.

**New Zealand**, a group of islands lying in the S. Pacific, between 34° and 48° S. lat. and 166° and 179° E. lon., and forming a colony of G. Brit. The group consists of 2 large islands (N. and Middle), the small S. Island, and many uninhabited islets. The entire group is nearly 1000 m. long and about 900 m. broad, with a coast-line of more than 3000 m., having several excellent harbors. Area estimated at 105,342 sq. m., 2% of which are fitted for agriculture and grazing, with a delightful climate. Pop. 1881, 489,933, of whom 44,099 were Maoris or natives, who until within less than half a century were ferocious cannibals, but are now partially civilized and wholly peaceful. The 2 main islands are separated by a strait 18 m. broad, and are of volcanic origin: Tongariro (6000 ft. high) is still an active volcano. A lofty chain of mts. traverses the main islands, of which Mt. Ruapahu on N. Island reaches the height of 9000 ft., and Mt. Cook on Middle Island 14,000 ft. On N. Island is the hot-spring region of Ohinemutu, covering a region of many hundred sq. m., and second only to the National Park in Wyo. for the number and magnitude of its boiling-springs and geysers. When Capt. Cook visited these islands in 1770 the only quadruped which he found was the rat, but since then pigs, dogs, cattle, horses, and sheep have been introduced, and are now very numerous. The staple article of export is wool, of which since 1875 the annual value has exceeded £3,000,000. Gold was discovered in 1857, and since 1875 the average annual product has been about £1,900,000; in 1882 it was £292,664. Prin. cities, Wellington (cap.), Auckland (former cap.), and Dunedin.

**Ney**, nâ (MICKEL), duke of Elchingen, prince of Moskva, marshal and peer of Fr., b. at Saarouis Jan. 10, 1769, in humble circumstances; entered the Fr. army in 1787; was made a capt. in 1794, brig.-gen. in 1797 after the battle of Neuwid, gen. of division in 1799 after the capture of Manheim, and marshal in 1804. His greatest exploits were the battle of Borodino while the grand army crossed the Moskva, his command of the rear-guard during the retreat from Moscow, and his exertions in order to organize a new army. After the abdication of Nap. he submitted to the Bourbons. When Nap. returned from Elba, N. repaired to Paris, and marched against the emp., purposing to capture him and carry him to Paris. But when he saw the enthusiasm with which Nap. was received everywhere he went over to the side of the emp. After the second restoration he fled from Paris, but was captured, condemned to death, and shot Dec. 7, 1815.

**N'gami**, n'gab'me, a lake in the interior of S. Afr., between 30° and 21° S. lat. and 22° 10' and 23° 30' E. lon., at an elevation of 2500 ft. It is mostly surrounded with sandbanks and salt flats, receives some few sluggish rivers, and is shallow.

**Niagara**, a river of N. Amer., forming the boundary between the State of N. Y. and the prov. of Ont., Canada, and connecting Lake Erie with Lake Ontario, is 36 m. long, and has a total fall of 333 ft. It is navigable in its upper course from its issue from Lake Erie to the commencement of the rapids at Niagara Falls, a distance of 16 m., during which its fall is only 20 ft.; and in its lower course from Lewiston to Lake Ontario, a distance of about 8 m., during which its fall is only 2 ft. Along its middle course, which contains Niagara Falls and is crossed by 2 suspension bridges, on the Canadian side is the Welland Canal, through which the navigation interrupted by the rapids and falls of the middle course of the river is carried on. In its upper course it forms many islands, and its average depth is 25 ft. In its lower course, from Lewiston to its mouth in Lake Ontario, its depth varies from 100 to 150 ft.

**Niagara Falls** received their name from the Iroquois, in whose lang. the word *Niagara* signifies "thunder of water." The surroundings of the falls are very tame. The interest is wholly confined to the river itself and the deep gorge, about 7 m. long, which it has formed through the solid rock. For the first 16 m. of its course the Niagara River is merely a contraction of Lake Erie, having a descent of only 20 ft. and a breadth of 2 or 3 m., with many islands. It then contracts its channel and becomes a series of rapids, with a descent of 52 ft. in a single mile to the verge of the precipice, over which it plunges to a depth of 150 ft. on the Canadian and 164 ft. on the Amer. side. Its width, measured along the curve, is about 4750 ft., but it is broken by Goat Island, 1000 ft. wide, and the smaller Luna Island. Between Goat Island and the Canadian shore the line curves inward, forming the "Horseshoe Fall," consisting of much the larger portion of the water; but a considerable part is deflected by Goat Island, and forms the Amer. Fall, whose gen. line is nearly at a right angle with the Horseshoe Fall. From the foot of the cataract for about 1 m. the surface of the river is almost motionless. Then begins another series

of rapids, the currents being very swift. About 3 m. below the cataract the gorge changes its direction, and the water being flung against the Canadian shore forms the "Whirlpool." For the remaining 3 m. to Lake Ontario the current is very rapid, although the descent is small. The entire descent from the brink of the cataract to Lake Ontario is about 254 feet. The width of the gorge varies considerably, the sides being almost perpendicular, although at the foot, reaching sometimes to nearly a third of the height, is a *talus* formed of débris which has fallen from above.



Niagara Falls, from the American side.

The Falls have undergone great changes since they were first seen by Europeans. Father Hennepin, the first white man who saw them (1678), describes and figures a third fall, occasioned by a huge rock on the Canadian side, which turned a portion of the water back, so that this fall was almost directly facing what is now the Horseshoe Fall, which then formed almost a straight line. Kalm, who was here in 1750, was told that this rock fell a few yrs. previously. Similar changes are still going on. The overhanging "Table Rock," which 30 yrs. ago formed a marked feature, has broken off piece by piece and no longer exists. At frequent intervals large masses, especially on the Amer. side, have fallen in, and in general the curve of the Horseshoe is growing larger.

The manner in which this gorge has been formed is apparent. Its floor is composed of a hard red sandstone slightly inclined. Above this is a stratum of friable shale about 80 ft. thick, upon which rests a stratum of hard gray sandstone of about the same thickness. Under the action of the elements this shale crumbles away, leaving unsupported an overhanging mass of the sandstone. In time the weight of this mass becomes too great for its strength to sustain, and it cracks off, and the fall recedes. Thus the river has eaten its way—back, not down—from Lake Ontario to the present cataract. Attempts have been made to estimate the time which it has taken to do this; but they are unsatisfactory, for the reason that the recession is not constant and uniform. For yrs. there will be no perceptible recession, but all the time the overhang is slowly increasing, and at any moment the undermined sandstone shelf may give way, so that the fall will recede several yards in an instant. It is only a question of time when the sandstone roof of the excavation behind the descent of the present Horseshoe Fall will give way, as Table Rock has given way. Then the curve of the cataract will become an almost equilateral triangle. Owing, however, to the dip of the strata, the shale will in a few miles have sunk to the bed of the river, and the process will cease. Instead of a single perpendicular fall, diminishing in height as it recedes, there will be a long series of rapids, with same aggregate descent. A. H. GUERNSEY.

**Niagara Falls**, R. R. centre, Niagara co., N. Y., 20 m. N. of Buffalo. The great falls bound the v. on the S., while above are the rapids with Goat, Luna, and other islands. The suspension carriage bridge is 50 rods below the Amer. Fall. Bath and Goat islands are reached by means of iron bridges. Near the centre of the lower end of Goat Island is a stairway, by which access is gained to the "Cave of the Winds," an irregular arch about 50 ft. wide, 70 ft. high, and 80 ft. deep, formed by the detrition of the perpendicular face of the rock at the foot of Luna Island. Pop. 1870, 3006; 1880, 3320.

**Niare**, **Zamouse**, or **Bush Cow**, the *Bos brachyceros*, a species, or probably a marked variety, of wild-ox, having a wide range in Afr. It has no dewlap, has sharp, crooked, and short horns, large and finely fringed ears, and a fierce disposition. It is of a rather small size.

**Nibelungen-Lied**, or **Lay of the Nibelungers**, an anonymous epic of the Old High Ger., and the longest, most complete, and most artistic of the ballads or popular songs of the Middle Ages. In its present form the poem dates from the latter part of the 13th or the beginning of the 14th century. The metrical form of the poem consists of strophes or stanzas, each of 4 iambic and trochaic lines in rhymed couplets, with a strongly marked feminine caesura in the middle. It contains nearly 6000 lines. It is



divided into 2 nearly equal parts, in the first of which the scene is laid on the Rhine, chiefly at Worms, the anc. cap. of Burgundy, but partly also in the Netherlands or Low Countries, toward the mouth of that river; in the other, on the Danube, at Vienna and Buda, chief cities of Attila, king of the Huns. The chief subject of the first part is the love, courtship, and marriage of Siegfried, prince of the Netherlands, to Kriemhild, a Burgundian princess, and of Günther, king of Burgundy and brother of Kriemhild, to Brunhild, a heroine of the fabulous North; together with the journeys, marches, and adventures, the festivities, tournaments, wars, and battles, which preceded or attended them, and the envy, jealousy, and contention which ensued first between the 2 brides, and consequently between the bridegrooms and among their friends and followers, and the tragical issue in the murder of Siegfried by Hagen, Kriemhild's uncle, at the instance of Brunhild and with the consent of Günther. The subject of the second part is the wrath and vengeance of Kriemhild; her marriage to Attila, simply that she may have the means of avenging herself on the murderers of her former husband; the chivalrous and romantic march of Günther with his younger brothers (Gernot and Giselher), his uncles (Hagen and Dankwart), and a retinue of 60 heroes, 1000 select warriors, and 9000 ordinary ones, from Worms to Vienna, at the invitation of Kriemhild and Attila, and the slaughter of them all to a man, with a still larger number of Huns and their allies, at a festival which ends in a *mêlée* and a battle or massacre; and, finally, the slaying of Kriemhild herself, leaving only Attila and his friend Dietrich (the Theodoric of history) to lament the dreadful catastrophe. The leading characters of the poem are all historical, and most of them appear again and again in the Eddas, in the Troubadours and Trouvères, in the mediæval myths and ballads of N. and S. as well as Middle Europe. (See GRIMM'S *Deutsche Heldensage*.) [From orig. art. in *J's Univ. Cyc.*, by PROF. W. S. TYLER, D. D., LL.D.]

**Nican'der**, a Gr. poet and phys., flourished about the middle of the 2d century B. C.; composed 2 poems, *Theriacæ* and *Alexipharmica*, in epic verse.

**Nicaragua**, nik-ar-ah'-gwah, republic of Central Amer., bounded N. by Honduras, E. by the Caribbean Sea, S. by Costa Rica, and W. by the Pacific. A branch of the Cordilleras traverses the central part of the country, sending numerous spurs toward the Caribbean Sea. Another range runs parallel with the Pacific at a distance of from 10 to 20 m. Between these 2 mt. ranges extend the basins of the lakes of Nicaragua and Managua, surrounded by high plains, which afford excellent pasturage; here large herds of cattle are reared. The soil of the low Pacific coast is very fertile. All tropical plants grow abundantly—cacao, one of the prin. products of the country; sugar, yielding 2 and even 3 crops annually; cotton, indigo, coffee, tobacco, rice, maize, vanilla, ginger, sarsaparilla, bread-fruits, bananas, citrons, etc. The Caribbean coast is also very low, and along the rivers is swampy and unhealthy. The prin. rivers are the Coco or Segovia, which forms the N. boundary, and the San Juan, which forms the S.; the mouth of the latter affords the only good harbor of the country on the Caribbean. The region between the E. coast and the Cordilleras is covered with vast forests, yielding excellent timber, fine cabinet woods, mahogany, and rosewood, dyewoods, and many medicinal trees. In the mts. of the N. part of the country gold, silver, and other metals are found, and coal, marble, alabaster, sulphur, alum, and other minerals are abundant. But the rich resources of the country are undeveloped. For the last 40 yrs. it has been distracted by revolutions and counter-revolutions. Area, 49,500 sq. m. Pop. 275,815. Cap. Managua.

**Nicaragua, Lake**, Central Amer., in the republic of Nicaragua, is about 100 m. long and 40 m. broad, separated from the Pacific only by a line of active volcanoes, and connected with the Caribbean Sea by the River San Juan de Nicaragua. It forms the basis of a great project of connecting the Atlantic with the Pacific by a canal. On an island, Pensacola, situated nearly in the centre of the lake, have been found some very interesting Indian antiquities.

**Niccolini**, nek-ko-lee-ne (GIAMBATTISTA), b. in 1782 at the Bagni di S. Giuliano, studied at the Univ. of Pisa. In 1804, on the occasion of the plague at Leghorn, N. wrote a beautiful poem entitled *La Pietà*; then followed his tragedies, *Polissena Medea*, *Edipo*, *Ino e Temisto*, *Matilda*, and the translations of the *Seven from Thebes* and of the *Agamemnon* of Æschylus. Under the govt. of Elise Bonaparte N. was made prof. of hist. and mythology. N.'s tragedy of *Nabucco*, an allegory of the fall of the Napoleonic empire, was printed at Lond. In 1827 his new tragedy, *Antonio Foscari*, was represented with great success in Florence. In 1830 he took a bolder step: his *Giovanni da Procida* was a revolutionary outcry. His highest fame was acquired by his bold and eloquent dramatic poem, *Arnaldo da Brescia*, in which he combated the Guelph ideas then prevalent in It. In 1847 he pub. his tragedy *Filippo Strozzi*; then his *Beatrice Cenci*, an imitation of Shelley, and a national tragedy, *Mario ed I Cimbri*. D. 1861.

**Nice**, or **Nicaea** [Gr. *Nikaea*, "city of victory;" now *İznik* = *eis Nikaia*], an anc. city of Bithynia, at the E. end of the Lake Ascanian (10 m. long and 4 m. wide), 44 m. S. E. of Byzantium. Its chief historic renown is due to the 2 ecumenical councils that were held there—the first in 325, which condemned Arianism; and the other (the 7th of 20 in all), in 787, which sanctioned the use of images. İznik, which contains about 100 families, occupies only a small portion of the old site.

R. D. HIRCHCOCK.

**Nice**, nees, town of Fr., cap. of the dept. of Alpes-Maritimes, is beautifully situated at the foot of the Alps, on climate yearly attracts thousands of foreigners who spend the winter here. It has several military magazines, tanneries, spinning and weaving factories, and manufactures of wax, essences, and preserved fruit. Its trade in wine, oil,

hemp, silk, and fruits is considerable. It belonged to the family of the duke of Savoy until 1858, but was in 1860 ceded to Fr. Pop. 66,279.

**Nice, Councils of.** See COUNCIL, ECUMENICAL, and NICE, OF NICAËA.

**Nicene Creed.** See CREED.

**Nich'olas I.**, POPE (858-888), a Rom. by birth, an imperious character; asserted the papal authority with great success against the metropolitan in his controversy with Hincmar of Rheims, and even against the royal and imperial power, compelling Lothaire, king of Lorraine, to abandon his mistress, Walrada, and reinstate his legitimate wife, Theutberga, in her rights as queen. Less successful was his contest with the patriarch of Constantinople, Photius. —NICHOLAS V., POPE (1447-55), b. at Pisa in 1398; reorganized the Vatican library and the Univ. of Rome, and gathered in Rome a great number of the most celebrated scholars of the age, among whom were many Græc. who fled to W. Europe on the downfall of the E. empire.—In 1388 Louis of Bavaria raised Peter de Corbario as anti-pope to John XXII., by name of NICOLAS V., but he d. shortly after.

**Nicholas I.** (NIKOLAI PAULOVICH), emp. of Rus. (1825-55), b. at St. Petersburg July 7, 1796, the third son of the emp. Paul. He put down a formidable military conspiracy with severity, and showed a similar hardness after the suppression of the Polish rebellion in 1830. He was cold and despotic, but within the narrow compass of his ideas he was just. During the reign of Alexander he travelled, visited Eng., married in 1817 the eldest daughter of Frederick William III. of Prus., and lived at St. Petersburg in domestic retirement, occupied by military studies. In the wars which Rus. carried on during his own govt. in Central Asia, the Caucasus, Tur., Hungary, Poland, and with the W. powers, he took no part personally, and military authorities found his ideas and views of military matters deficient. As an administrator he had a decided talent. That huge bureaucratic engine by which Rus. has been governed during the last 50 yrs. was entirely his fabric. Systematization was his great idea. Prots., Jews, etc. were persecuted, for there ought to be only one Ch. in Rus.; and after the suppression of the Polish rebellion he actually undertook to annihilate the Polish nationality and Russify the country. As a diplomat he had also some talent. For several yrs. after 1849 Rus. occupied the first place in the political system of Europe, and her plans with respect to Tur. were rapidly maturing when they received a sudden check by the Crimean war. D. Mar. 2, 1855.

**Nicholas** (GEORGE), son of the succeeding, b. at Hanover, Va., grad. in 1772 at William and Mary Coll.; served in the Revolutionary war; had a wide influence in the public affairs of Va.; removed in 1790 to Ky.; was the prin. author of its const. (1792) and its first atty.-gen. D. 1799.

**Nicholas** (ROBERT CARTER), b. in Va. in 1715, was ed. at William and Mary Coll.; became a lawyer of James City; was appointed in 1779 a chancery judge, and was the father of several prominent statesmen. D. 1780.

**Nicholas** (WILSON CARY), a son of Judge R. C. Nicholas, was ed. at William and Mary Coll.; served in the Revolution, in which he commanded Washington's body-guard; M. C. 1807-09, U. S. Senator 1799-1804, U. S. collector at Norfolk 1804-07, gov. of Va. 1814-17. D. Oct. 10, 1820.

**Nicholasville, Ky.** See APPENDIX.

**Nicholson** (ALFRED O. P.), b. in Williamson co., Tenn., Aug. 31, 1808, grad. at the Univ. of N. C. 1827; studied med., and afterward law, commencing practice 1833; was elected M. C. 1833, 1835, and 1837; upon the death of Felix Grundy, in 1840, was appointed by the gov. to fill the vacancy in the U. S. Senate; served until the meeting of the legislature; was not a candidate for election; in 1843 was elected to the State senate; in 1845 removed to Nashville and became ed. of the *Nashville Union*; in 1850 returned to Columbia, and was appointed a chancellor, but resigned at the end of a yr. Became in 1853 ed. of the *Wash. Union*, the proprietor of which was public printer, and upon his death was elected public printer; returned to Tenn. 1856; in 1857 was elected to the U. S. Senate, and remained a member of that body until the State seceded from the U.; took part in the proceedings of the extra session of the Senate called by Pres. Lincoln, but did not return to the Senate at the extra session, July 1861. He was twice arrested and imprisoned as a sympathizer with the Confederacy. In 1870 he was a member of the convention to revise the const. of the State, and in the same yr. was elected one of the 6 judges of its supreme court, and was by the judges chosen chief-justice. D. Mar. 1876.

**Nicholson** (Sir FRANCIS), an Eng. soldier, was lieut. (acting) gov. of N. Y. for Andros 1687-89, gov. of Va. 1690-92 and 1699-1705, of Md. 1694-99, of N. S. 1714-17, of S. C. 1721-25; commanded the Pt. Royal expedition 1710; was knighted 1720; returned to Eng. 1720; became a lieut.-gen. 1725. D. Mar. 5, 1728.

**Nicholson** (JAMES), b. at Chestertown, Md., in 1737, was trained to the sea with his brothers Samuel and John, afterward capt. in the navy; was engaged in the capture of Havana 1762; took command in 1775 of a small Md. vessel, with which he recaptured several prizes from the Brit.; was appointed, June 1776, to the command of the Virginia (26 guns), and in Jan. 1777 succeeded Com. Hopkins as commander-in-chief of the Continental navy; was engaged with his crew as volunteers in the battle of Trenton; fought an indecisive engagement with the Brit. ship Wyoming June 2, 1780, and was taken prisoner with his vessel, the Trumbull (38 guns), in Aug. 1781, by two Brit. vessels. After the war he became com. of loans in New York, where he d. Sept. 2, 1804.

**Nicholson** (Gen. JOHN), b. at Dublin, Ire., Dec. 11, 1821; entered the military service of the E. I. Co. in 1838; was engaged in the disastrous campaign of Afghanistan 1840-42, and for some months a prisoner to the Afghans; took part in the Sikh war of 1845; became assistant resident at



Lahore; rendered important services in the Sikh war of 1848, after which he became deputy com. of the Punjab. With Sir John Lawrence N. divides the honor of having saved the Punjab to Brit. allegiance during the great mutiny of 1857; raised the famous "movable column," with which he destroyed all the rebel forces between Lahore and Delhi, and was assigned the post of honor in the final assault upon Delhi, in which he was mortally wounded Sept. 14, and d. Sept. 23, 1857.

**Nicholson** (J. W. A.), b. Nov. 10, 1831, in Mass.; entered the navy as a midpn. Feb. 10, 1838; became a passed midpn. in 1844, a lieut. in 1852, a commander in 1863, a capt. in 1866, a com. in 1873; commanded the Isaac Newton at the battle of Pt. Royal, Nov. 7, 1861, and the monitor Manhattan at the battle of Mobile Bay, Aug. 5, 1864. Appointed rear-admiral May 1, 1880. Retired Mar. 10, 1883.

**Nicias**, nish'e-as, an Athenian statesman and gen. from the period of the Peloponnesian war; the leader of the aristocratic party after the death of Pericles, and opponent of Cleon; wary, cautious, and superstitious, but prudent and energetic. His military successes enabled him after the death of Cleon to negotiate a peace of 15 yrs. between Athens and Sparta in 421, which received his name. Neither of the parties, however, fulfilled the conditions, and in 415 Alcibiades induced the Athenians to make an expedition against Sic. N. tried to dissuade the people from the undertaking, but in vain. He then accepted the command, and laid siege to Syracuse. Reinforcements were sent to the city from Sparta. The Athenian fleet was destroyed and when N. retreated with his troops to the interior, he was soon compelled to surrender, and was put to death (413).

**Nick-el**, a metal allied to cobalt and to iron, but much less abundant than the latter, and of annually increasing importance in the arts. It is associated with iron and cobalt in terrestrial ores, and is found in considerable amount in almost all aerolites or meteoric stones, the percentage in these sometimes rising to from 9-12. Kupfer-nickel contains 43.5 per cent. of N.; chloantite, 27.8 per cent.; N. speissglance, 31.4 per cent.; N. glance, 35.1 per cent.; and antimonal N. glance, 27.6 per cent. of the metal. N. is tolerably widely diffused, and is worked in Eng., Ger., Aus., Rus., Swe., and the U. S., especially at Lancaster, Pa. The methods of smelting and working N. ores are various and complicated, and while some are well known, others are still kept a secret.

Metallic N. is usually sold in the form of small cubes, and these cubes are obtained in the following manner: Hydrated oxide of N. is made into a paste with 5 per cent. of flour, some beet-root-syrup, and water. From this stiff mass cubes of 1 inch or less are cut, and quickly dried. The dried cubes are packed in crucibles or clay tubes with coal-dust, and the metal reduced at a comparatively low temperature, and then caked together by a very high one.

Pure N., or the metal obtained by galvanic deposition, from a solution as pure as possible, is a silvery-white metal with a strong lustre, not tarnishing on exposure to the air. It can be polished so as to be deceptively like polished silver. It is very ductile, hard, and tenacious. A N. wire of a certain diameter will sustain  $1\frac{1}{4}$  times the weight required to break iron wire of the same size. The specific gravity of N. varies, according to different observers, between 8.27 and 8.93. Its malleability is diminished by an admixture of carbon or manganese. It is attracted by the magnet, and may be rendered magnetic by the same means as iron, its magnetic power compared with that of iron being given as 35 : 55, or as 8 : 9, or as 2 : 3. Repeated ignition destroys its magnetic property, and it loses this power at a lower temperature than iron. N. is very difficult of fusion. Adams succeeded in fusing pure N. in a sealed porcelain crucible lined with pure alumina and bedded in a Hessian crucible at a heat which fused platinum. Crookes and Rohrig put its melting point at 1900°-2100° C. N. is soluble in dilute sulphuric and hydrochloric acids, but it dissolves in these slowly and with comparative difficulty. Nitric acid attacks and dissolves it readily, as does aqua regia. Strong nitric acid renders it passive. It combines directly with chlorine, bromine, iodine, sulphur, phosphorus, fluorine, and arsenic, forming soluble compounds. The prevailing color of the hydrated salts of N., and of course of their solutions, is green; those containing an excess of ammonia are bluish or violet, while the anhydrous salts are yellowish. There are 2 oxides, the olive-green protoxide, obtained by heating the nitrate or the carbonate, and the black sesquioxide, obtained by heating the nitrate at a lower temperature. Of the crystallized soluble salts of N. the most familiar are the sulphate, nitrate, chloride, and the double sulphate of N. and ammonia, this latter being now prepared and sold in large quantities for the purposes of nickel-plating. N. is very closely allied to cobalt, but, while presenting many remarkable points of resemblance, is yet abundantly different. The 2 metals are sufficiently alike to form in modern chem. a group by themselves, with a general resemblance to iron and manganese.

**Uses.**—Until within a few yrs. the use of N. was confined to the purposes of coinage and the making of certain alloys. In Jamaica, Belg., Switz., and the U. S. small coins have been made with an alloy of N. with zinc and copper, pure N. being altogether too hard for this use. An alloy is made called *fers argent*, which consists in 100 parts of—silver, 27.56; copper, 59.06; zinc, 9.57; N., 3.42; total, 99.61. The U. S. cent, authorized by the act of Feb. 21, 1857, consisted of 88 parts of copper and 12 of N. Since 1850, in Switz., small coins (*monnaie billon*) have been issued of the following composition in 1000 parts:

	Silver.	Copper.	Zinc.	Nickel.
20-Kappen piece....	150	500	250	100
10- " " " " " " " "	100	550	250	100
5- " " " " " " " "	50	600	250	100

These coins do not turn red by wear, but become yellowish.

In Belg., 5, 10, and 20-centime pieces are made of an alloy of 25 parts of N. and 75 of copper.

N. has been, and is now, largely used in the preparation of Ger. silver or N. silver. This may be looked upon as a brass to which  $\frac{1}{16}$  to  $\frac{1}{8}$  of N. has been added. Ger. silver should be, approximately, 1 part of N., 1 of zinc, and 2 of copper. For casting purposes a little lead is sometimes added. A cheaper kind contains 8 parts of copper, 2 of N., and 3.5 of zinc. If the amount of N. fall below 2 parts in 11-12, the silver produced will be little better than brass; 8 parts of copper, 3 of N., and 3.5 of zinc make a beautiful alloy closely resembling silver. The preceding, with 4 parts of N., makes a very beautiful compound having a faint shade of blue. The color of good Ger. silver is nearly silver-white, its fracture small-grained, specific gravity 8.4 to 8.7. It is as ductile as ordinary brass, but harder and capable of being polished. The chief use of N., developed within a few yrs., is for N.-plating, or the electro deposition of N. upon other metals. For many yrs. the fact was well known that a brilliantly white deposit of metallic N. could be obtained by the electrolysis of a solution of any one of many N. salts, but no practical lesson was deduced from it, nor was the possibility of electro-plating with N. (as distinguished from the mere obtaining a brilliant deposit of metal) demonstrated, until Dr. Isaac Adams, Jr., solved the problem and created, in fact, a new art. The use and value of N., for its hardness, beauty, lustre, and the polish which it takes, were rapidly recognized as soon as N.-plated ware became common. [From orig. art. in *J's Univ. Cyc.*, by PROF. J. M. MERRICK.]

**Nickel-Plating.** See NICKEL.

**Nicodemus**, a member of the Sanhedrim, mentioned thrice in the Gospel of John—as coming to Jesus by night, as demanding that Jesus should be heard before being judged, and as assisting Joseph of Arimathea in laying out the body of Christ.

**Nicomedia**, the cap. of anc. Bithynia, at the head of the Gulf of Astacenus, founded by Nicomedes I. in 264 B. C. From 262 to 380 A. D. it was the cap. of the E. Roman empire, and contained many splendid buildings. The modern Tur. village of *Ismid*, which occupies the old site, has a pop. of about 3000. R. D. HIRCHCOCK.

**Nicopolis** [Gr. Νικόπολις, "city of victory"], the name of 10 anc. cities (1 in Egypt, 4 in Asia, and 5 in Europe), the most important of which was the one in Epirus, founded by Augustus to commemorate his great naval victory at Actium, Sept. 2, 31 B. C. St. Paul wintered here (Tit. iii. 12), perhaps in the yr. 60-67 A. D. R. D. HIRCHCOCK.

**Nicosia.** See LEFKOSIA.

**Nicotine, or Nicotia.** See TOBACCO.

**Niebuhr**, nee'boor (BARTHOLO GEORG), b. at Copenhagen Aug. 27, 1776, studied law and philos. at Kiel and Göttingen; visited Eng. in 1798; entered the civil service of the Dan. govt. in 1799; in 1806 removed to Berlin, where from this yr. till 1809 he held various offices in the financial dept. of the Prus. govt. Having been appointed historiographer to the king of Prus., he delivered in 1810-11 a course of lectures on the hist. of Rome at the newly established Univ. of Berlin. From 1816 to 1822 he resided in Rome as Prus. ambassador to the papal court, and in the latter yr. he removed to Bonn as prof. at the univ. Here he developed a great literary activity, and continued his great work, *Römische Geschichte*. But under the violent impression which the Fr. revolution of 1830 made on him he broke down, and d. Jan. 2, 1831. His *Römische Geschichte* is, so far as it goes—viz. to the first Punic war—a complete reconstruction of the hist. of Rome. All those legends which composed the first chapters of the Rom. hist. he discarded after a thorough critical analysis as myths and fables; and from mostly new materials he built up the true course of the hist. of Rome. His book was a reconstruction of historical study in gen.

**Niel-to-work**, a kind of ornamental work in which plates of gold or silver are first engraved by cutting ornamental figures upon them. The lines are then filled with a black alloy, and the whole is burnished. Some of the earliest niello are Byzantine; the finest are It.

**Nie'mann** (AUGUST), b. in Hanover June 27, 1839; entered the Hanoverian army in 1857 as a lieut., and fought against Prus. in 1866; settled at Geneva as a teacher of hist., geog., and langs. after the annexation of Hanover to Prus., but returned in 1868 to Ger. as ed. of the *Almanach de Gotha*; took part as a capt. in the Franco-Ger. war 1870-71, and pub. *Military Description of the Fr. Campaign*, *Spezial Supplement zu Meyers Konversations-Lexikon*, art. in *J's Cyc.*, etc.

**Niemcewicz**, ne-em-tsa'vitch (JULIAN URSIN), b. at Skoki, in Lithuania, in 1757; received a military education, but left the service in 1788, and entered into Polish politics as a deputy from Lithuania; fought in 1794 at the side of Kosciusko; was carried, together with him, as a prisoner to St. Petersburg; accompanied him to the U. S.; lived for some time in Washington's house, and married an Amer. lady. In 1807 he returned to Poland and was prominent in the politics of his native country till 1830. Wrote *Historical Songs of the Poles*, *Reign of Sigismund III.*, etc. D. May 21, 1841.

**Nie'men** (Ger. *Memel*), a river of Prus., rises in Rus., becomes navigable at Grodno, and divides at Winge into the Russ and the Gilge, both of which fall into the Kurisches Haff. It is 640 m. long, navigable 400 m. from its mouth.

**Niger**, ni'jer, a great river of W. Afr., also called **Joliba** or **Quorra**, which different names are only different expressions of the same idea, "the river," applied to the stream in the different regions it traverses. It rises in the Kong Mts., and flows first in a N. E. direction, passing Timbuctoo, and then in a S. E. direction, until it enters the Gulf of Guinea through a large delta between the Bights of Benin and Biafra, after a course of about 2500 m.

**Night-Hawk**, a name applied in N. Amer. to the species of *Chordeiles*, a genus of the family Caprimulgidae or goatsuckers. The eggs are laid upon the bare ground without a nest.

**Night-Heron**, the *Nyctiardea Gardeni*, a common



wading bird of the heron family, found in both the Old and New Worlds. The birds build their nests in groups, called heronries. In the U. S. the N.-H. is often called *quail* or *quack*, from its hoarse nocturnal cry. The yellow-crowned N.-H. of the S. States is *Nyctherodius violaceus*.

**Nightingale**, the *Philomela lusciniæ*, the finest of European song-birds, common in favored localities in a large part of Asia and Europe. It belongs to the family *Sylviidae*. It is a homely bird, not larger than the Amer. bluebird. Its delightful song is heard chiefly in still nights of May and June, but also during the day.

**Nightingale** (FLORENCE), b. in May 1820, at Florence, It., of wealthy Eng. parents. Prompted by philanthropic instincts, she early turned her attention to the relief of humanity, and in 1851 went to the Kaiserswerth inst. on the Rhine for practical instruction. During the Crimean war she was sent by the Brit. war dept. at the head of a band of select nurses, to the relief of the sick and wounded, and in this position displayed marvellous ability; £250,000 subscribed for her by a grateful public she devoted to the founding of a training-school for nurses. Wrote *Notes on Hospitals, Notes on Nursing*, etc.

**Nightmare** (*Ephialtes*, *Hypnophobia*, *Incubus*, *Succubus*), a terrific dream in which there appears to be a disagreeable object present, accompanied by the inability to cry out, move, or call for help. Some patients have merely a sense of terror without any dream. It is often ascribable to heart-disease or asthma, more frequently to obstruction in the circulation caused by the pressure of food or flatulency in the alimentary canal, especially when the sleeper lies upon his back. The suspension of the effort to think will usually prevent these attacks, which seem to be due to the performance of the function of thinking at a time when the supply of blood to the brain is deficient.

**Nightshade**, a popular name for many plants, mostly solanaceous and often poisonous. (See *BELLADONNA* and *BITHERSWEET*.)

**Nihilists**, a term first employed by the novelist Ivan Turgenev, and commonly used to designate the active members of the revolutionary party in Rus., especially those supposed to be acting under the direction of a secret revolutionary committee. Michael Bakunin (b. in 1814 of a rich family of high rank; founded in 1868 the "International Alliance of the European Revolution," d. at Geneva 1876) is regarded as the founder and the earliest advocate of the doctrines of the party. He announced himself the bearer of a new gospel, the mission of which was to destroy the *Le*, the beginning of which was God, and *Right*, a fiction invented by *Might* in order to strengthen her reign; and he advocated destruction and annihilation of everything as it now exists, the good with the bad, "for the new will never be created if but an atom of this old world remains."

In 1853 Alexander Herzen (b. in Moscow 1812, d. in Paris 1870) founded in Lond. his "Free Russian Press," from which he issued a great number of Rus. works, all levelled against the system of govt. prevailing in Rus. After the death of the emp. Nicholas in 1855 his writings were smuggled wholesale into Rus., and their influence became overwhelming. His vigorous lang. expressed the thoughts which had long been secretly stirring Rus. minds, and were now beginning to find a timid utterance at home. For some yrs. his influence in Rus. was a living force. At length the changes introduced by Alexander II. diminished the appreciation of Herzen's assistance in the work of reform. The freedom he had demanded for the serfs was granted, the law-courts he had denounced were remodelled, trial by jury was established, liberty was to a great extent conceded to the press: Herzen's occupation was gone. But soon the beneficial reform proved abortive. Demands were made for representative assemblies, for chartered provincial assemblies, for the responsibility of officers to the law, and other features of constitutional and representative govt. But the govt. refused to entertain any of these demands, and every attempt to obtain a representative body, or to secure liberty to discuss administrative questions, was put down. Thus, persons of the higher and more intelligent classes, interested in such questions, were driven to associate with those who sought to accomplish by revolutionary methods what they had found it impracticable to bring about legally.

The existence of a revolutionary conspiracy was established in 1877, and in 1878, soon after the trial of Vera Sasulitch for shooting at Gen. Trepoft, chief of the secret police, and her acquittal after she had avowed the offence, the N. began to attract attention as a really formidable organization. The assassinations of Gen. Mezentzoff, who succeeded Gen. Trepoft, of Prince Krapotkin, gov. of Kharkoff, and of Gen. Drenteln, chief of the gendarmarie, followed. Finally, on Mar. 13, 1881, the crimes culminated, as the Czar Alexander II., after several unsuccessful attempts, was assassinated in the streets of St. Petersburg.

**Nikolai**, ne-ko-lee'y', or **Nikolaï**, town of European Rus., in the govt. of Kherson, at the confluence of the Bug and Ingul, was founded in 1790. It is fortified, and has an excellent harbor, in which the Rus. fleet of the Black Sea is stationed. It contains a school of navigation and an observatory. Pop. 82,805.

**Nile**, *The*, one of the most celebrated rivers of the globe, and the most remarkable of the 4 great streams of Afr. It flows from the equatorial regions along and inside the E. axis of the continent of Afr., and after a course of nearly 4000 m. reaches the Mediterranean. In 31° 30' N. lat., by 2 prin. mouths, forming a delta which begins near Cairo, 100 m. from the sea, and extends 150 m. along the shores. The upper half of the N. drains vast tropical regions abundantly watered, and receives many tributaries; the lower or N. half traverses the rainless portion of the great desert regions, where its valley, bordered by bare rocky bluffs, appears like a band of verdure in the midst of this desolate country.

The mystery of the sources of the N., which from antiquity to the present time was the greatest geographical

problem, has been solved at last by the efforts of such explorers as Speke and Grant, Baker and Stanley. They were discovered in great lakes, on high plateaux, under the equator, at 3000 to 4000 ft. above the sea. The largest and highest of these basins, 4058 ft. in altitude, the Ukerewe, or Victoria Nyanza, a little less in extent than Lake Superior, gathers the waters from all the surrounding highlands. From the Unyamwezi plateau, on the S., flows the Shimiyu, the most remote source of the N.; on the W. the Kagera, draining high mt.-land; on the E. descend the waters of the plateaux from which rise the snowy peaks of Kenia and Kilimanjaro. The waters issue from the N. end of the lake as a powerful and rapid stream—the true N.—flowing down toward the N. W. into another great sheet of water, Lake Mwanat, Albert Nyanza, of 2500 ft. elevation. Thence it runs with rapid course, and leaves the plateau regions to enter the great plains of central Soudan. Here it receives from the W. the waters of a vast net-work of rivers collected by the Bhar-el-Arab and the Bhar-el-Gazal, and those of the E. plateaux through the Sobat. After the junction of these rivers, under the name of Bhar-el-Abiad, or White N., it follows again a N. course through Nubia, between the table-lands of Kordofan and the plains of Sennar to Khartoum, lat. 17°, where the Blue N., or Bhar-el-Azrek, brings to it the united waters of the Abyssinian plateau and its snowy mts. Lower down, about N. lat. 17° 40', another powerful stream, the Atbara, or Black N., pours in the waters of N. Abyssinia. From this point to the Mediterranean, along its course of nearly 1500 m., it receives not a single tributary of importance. Thence making a great bend it forms a series of rapids, the so-called cataracts of the N., the last of which is at Assuan, at its entrance into Egypt.

Like all streams fed by the periodical rains of the tropics, the N. has its regular season of freshets overflowing its broad valley, transforming Egypt into a wide spreading lake, from which the cities rise like islands. At Khartoum the river begins to rise early in Apr., but in Egypt generally on the 25th of June. The waters then gradually increase until the 27th of Sept. At Thebes the flood reaches 40 ft., at Cairo 27, and at Rosetta, at the mouth of the river, 46 ft. After their retreat the waters leave behind them mud and moisture, in which seeds deposited produce a most luxuriant vegetation and a succession of rich crops. Egypt's proverbial fertility thus entirely depends upon this annual inundation of the N., which renews the manure of its soil and provides the necessary moisture in this rainless climate. A rise of only 20 ft. at Cairo causes a scarcity; more than 27 ft. is unfavorable. No wonder that the anc. Egyptians adored the N. as a god.

**Niles**, city and R. R. centre, Berrien co., Mich., 90 m. E. of Chicago, has iron foundries, flour mills, and ample water-power. Pop. 1870, 4630; 1880, 4197; 1884, 4606.

**Niles**, R. R. junc., Trumbull co., O., on Mahoning and Musketto rivers. Pop. 1880, 3879.

**Niles** (JOHN MILTON), b. at Windsor, Conn., Aug. 20, 1787; became a lawyer and an active Dem. politician; founded the Hartford *Times*, for which he wrote during 30 yrs.; was for several yrs. a judge of the Hartford co. court; P. M. at Hartford 1829, U. S. Senator 1835-39 and 1843-49, and P. M. gen. from May 1840 to Mar. 6, 1841. Wrote a *Gazetteer of Conn.* and *E. L. Lives of Perry, Lawrence, Pike, and Harrison*, a *Hist. of the Revolution in Mex. and S. Amer.*, etc. He bequeathed his valuable library to the Conn. Historical Society, and left \$20,000 to be held in trust for the poor of Hartford. D. May 31, 1856.

**Niles** (NATHANIEL), b. at S. Kingston, R. I., Apr. 3, 1741, grad. at Princeton 1766; studied med., law, and theol., and was licensed to preach, but was never pastor of a ch.; settled at Norwich, Conn.; invented a process of making wire from bar iron by water-power. After the Revolution he settled at W. Fairlee, Vt.; was speaker of the lower house of the legislature 1784, several yrs. judge of the supreme court, M. C. 1791-97, a censor for the revision of the State const., and 6 times Presidential elector; was author of religious treatises and of *The Amer. Hero*, a popular war-song. D. Oct. 31, 1828.

**Nil-Ghau**, or **Nyl-Ghau** [Hind. "blue cow;" *nîl* being "blue" and *ghau*, "cow"], a large antelope of the jungles of India. It is of a blue-gray color when full grown. The flesh is very poor, but the hides have a limited use in the arts. The N.-G. is the *Portia tragocamelus* of authors.

**Nilsson**, nil'son (CHRISTINE), b. at Hussaby, S. Swe., Aug. 3, 1843, of a peasant family; attracted the attention of Count Tornérhjelm, and went by his aid to Halmstad, Stockholm, and Paris, where she finished her musical education by 3 yrs. study under Wartel, and made her début at the Théâtre Lyrique Oct. 24, 1864, in *La Traviata*. In 1867 she visited Lond. for the first time, and in the following season made a great sensation in Paris by her representation of Ophelia in Ambroise Thomas's *Hamlet*. In 1870 and 1871 she visited Amer. In 1872 she was married to a Paris banker, Mr. Rouzard, who d. 1882.

**Nimes**, neem [anc. *Nemausus*], city of Fr., cap. of the dept. of Gard, beautifully situated in a valley between hills covered with vineyards and orchards, is the seat of a bp., has many excellent educational insts., and its manufactures of cottons, lace, vinegar, brandy, and especially of silks, belong to the most important in Fr. Its architectural monuments from the Rom. period are of the highest interest. Pop. 63,552.

**Nim'rod**, a son of Cush, a grandson of Ham, founded an empire in Shinar, whose prin. towns were Babel, Erech, Accad, and Calneh, and extended this empire along the Tigris over Assyria, where he built the towns of Nineveh, Rehoboth, Calah, and Resen.

**Nimroud**, the modern Arabic name of the site of an anc. Assyrian city on the E. bank of the Tigris about 20 m. below Mosul. The ruins of N. are situated on the fork formed by the junction of the Zab with the Tigris, and consist of the remains of a city about 5 m. in circumference.



The prin. ruins lay at the S. W. of the city, on the palace platform, which is about 600 yards from N. to S. and 400 yards from E. to W. Here are situated the sites of the various palaces and temples of the city and the ruins of the zigurrat or tower, now forming a cone 140 ft. high. The whole city was inclosed by a wall with towers at intervals and gates; remains of these defences lie round nearly all the city. Excavations were made at N. by Mr. Layard, Mr. Hormuzd Rassam, Mr. Loftus, and Mr. George Smith.

**Ninet** (JEAN), the only European in Arabi Pasha's camp during the Egyptian war of 1882, b. about 1810. He managed the state farm at Tautah, on the Delta of the Nile, where Arabi was born, and through his influence Arabi was promoted to the rank of lieutenant. N. was dismissed by the late khedive, Ismail Pasha, because he was known to favor Halim Pasha, the only surviving son of Mehemet Ali, and from whom Ismail had practically usurped the throne. N. had protested against the wrong done to Halim, and actually went to Constantinople in the hope of persuading the sultan to reinstate him, but to no effect. He then returned to Egypt and acted as Halim Pasha's secret agent, and the eventful period through which Egypt is now going is due very largely to his intrigues. He saw that if anything was to be done it could only be done through the army, and the only way of getting at the army was through Arabi. He therefore not only persuaded Arabi to espouse Halim Pasha's cause, but used him also as an intermediary in getting other officers to do the same. When in Alexandria he lived with Mr. Douglas Gibbs, the agent of the E. Telegraph Co., but when in Cairo he was the guest of the Prince Toussoum, who favored Halim. Through him Arabi was introduced to the prince, and her palace soon became the rendezvous of the revolutionary party. As, on the advice of the foreign consuls, the khedive arrested Arabi Pasha, N. surrounded the palace with a mob, who threatened to murder the khedive and every European in Cairo if their leader was not liberated. N. is known and respected by the majority of the natives, over whom he has an enormous influence; and he was, after Arabi Pasha, the most noteworthy man of the revolutionary party.

**Ninveh**, the greatest city in Assyria, and for some time the cap. of the country, was situated on the E. bank of the Tigris at its junction with the stream of the Khosr. It is now represented by the mounds of Kouyunjik or Telarmush, Nebbi Yunas, and some surrounding remains. The circuit of the walls measures about 8 m.; on the side next the Tigris, opposite the modern town of Mosul, stand the palace-mounds, the prin. of which is Kouyunjik. Excavations were made here by M. Botta, Mr. Layard, Mr. Hormuzd Rassam, Mr. Loftus, and Mr. George Smith.

N. was one of the most anc. cities in Assyria, and was an important place in the 19th century B. C. According to Gr. writers, N. was founded by Ninus, whom they represent as the first king of Assyria. Nothing has been discovered of Ninus in the inscriptions; Samsivul was the first Assyrian monarch known to have built at N.

**Ningpo**, city of Chi, in the prov. of Chi-Kiang, situated on the Ningpo River, 12 m. from its mouth, in a fertile and densely peopled plain. It is surrounded with a wall nearly 6 m. in circumference and 25 ft. high, is generally well built, and contains many handsome public buildings and temples. The manufactures of silk, cotton, woollens, and salt are extensive, and the traffic with the interior considerable. N. was one of the 5 ports opened to foreigners by the treaty of Aug. 26, 1842. Pop. 260,000.

**Niño**, *niñ'yo* (PEDRO ALONZO), known as EL NEGRO ("the black"), b. in Andalusia, Sp., in 1468; companion of Columbus in his third voyage, and afterward conducted explorations of the coasts of S. Amer. D. about 1505.

**Ninon de l'Enclos**. See L'ENCLOS.

**Niobe** (Νιόβη), in the old Gr. legend, was the mother of 6 sons and 6 daughters. For triumphing over Leto, who had but 3 children, Apollo and Artemis, all her offspring were slain by these deities, and she was transformed by grief into a stone. Her myth is told in many ways, and is the subject of a celebrated group now at Florence in the Uffizi Gallery.

**Nipon**, or **Nippon**, the largest of the Japan Islands, bounded by the Japan Sea and the Pacific, and separated N. from Yesso by the Strait of Matsumai, and S. from Kiusiu by the Sea of Suonada. It is 900 m. long; greatest breadth, 284 m.; area estimated at 42,000 sq. m. It is mountainous, with deeply indented coasts. It contains the volcano Foo-see, and earthquakes are almost daily occurrences. Prin. towns, Yedo and Miako.

**Nirvāṇa** [Sans. *nir*, "out," and *vāna*, "blown," literally meaning "extinction"] is the term employed by the Buddhist philos. to signify the highest good attainable by mortals. It is probable that the "extinction" proposed by Sakya Muni to his followers as the goal of their aspirations was not an absolute extinction of being, but a release from the "law of continual births."

**Nisbet** (EUGENIUS ARISTIDES), LL.D., b. near Union Point, Greene co., Ga., Dec. 7, 1803, grad. in 1821 at the Univ. of Ga.; was admitted to the bar before he was 21, and represented his co. in the house and senate of the State legislature for several yrs.; M. C. from 1838 to 1841; in 1845 was appointed justice of the supreme court of the State. In politics was a strict constructionist, but supported Harrison in 1840 and Clay in 1844. In 1855 was a leader of the Amer. party, and in 1860 supported the Bell-Everett ticket; in 1861 was a member of the State secession convention, of the Confed. provisional cong., and after the suspension of the writ of *habeas corpus* in the Confed. States was appointed com. under that act. In 1859 moved his residence to Macon, and here d. Mar. 18, 1871. A. H. STEPHENS.

**Nitrate of Silver**. See NITRIC ACID.

**Nitrates**. See NITRIC ACID; also NITRE.

**Nitre** [synonyms, *niter*, *saltpetre*, *nitrate of potash*; Gr. *νίτρον*, which, however, means, properly, carbonate of soda,

whence *natron*; the Lat. *nitrum* was used by Pliny to designate true saltpetre]. The word *saltpetre* means "salt of stone," and was doubtless derived from the fact that it sometimes forms an efflorescence on porous stones containing alkaline matters which are exposed to the agency of decomposing nitrogeniferous organic matters like urine, etc. (For nitre see *Nitrates*, under NITRIC ACID.)

**Nitric Acid** [Fr. *acide nitrique*, *acide azotique*; Ger. *Salpetersäure*; synonym, *agua fortis*]. To Glauber is attributed the highly important invention of our present method of making N. A. by distilling saltpetre with sulphuric acid. Instead of common saltpetre, at the present day the so called "Chili saltpetre" (nitrate of soda) is generally employed, being both cheaper and much richer in N. A. than the nitrate of potash. N. A., although made up of the most common and universally diffused substances, the nitrogen, oxygen, and water of the air, is not, strictly speaking, as yet a product of human art. The nitrates found in nature, its only sources, are engendered by processes which, so far from being imitated by man, are not yet clearly understood, and remain still, in the present state of chemical science, subjects of investigation and of controversy. No practicable mode of obtaining N. A. from its elements, which are literally as free as air, has yet been discovered or is even hinted at up to this day. (For the occurrence of N. A. as *nitrates* in nature, see below; also under NITRUS.) In decomposing nitrate of potash by distillation with sulphuric acid in earthenware or iron retorts it is found advantageous to use enough of the latter to form *bisulphate* of potash, it being thus possible to obtain the whole of the N. A. at so low a temperature that little or none of it is decomposed into nitrous acid and free oxygen. More acid, of a lighter color and better quality, thus results. When pure saltpetre is employed, pure N. A. may thus be made fit for all uses. With Chili saltpetre, however, the complete decomposition takes place at a lower temperature, and hence but half the sulphuric acid is needed. Hence another reason for the employment of the sodic nitrate. As this, however, is liable to be contaminated with common salt, the N. A. made from it will contain muriatic acid as an impurity, which unfits it for most chemical uses. The Chili saltpetre also contains *iodate of potash*, and the N. A. made from it is hence contaminated with iodic acid. Pure N. A., fit for use in the laboratory, should be colorless, and after dilution with distilled water should give no opalescence with a solution of silver. It should always be kept in a dark closet, as light decomposes it, causing it to turn red from the formation of lower oxides of nitrogen. When as free as possible from water its density = 1.550. When long boiled its density always reaches 1.443, a stronger acid growing weaker and a weaker acid stronger.

N. A., when strong, is a liquid intensely caustic and corrosive. It produces upon the skin, by the most transient contact, a bright yellow stain of the most indelible character, due to the formation of a curious and little-known compound called *xantho-proctic acid*, whose color is indestructible by any other known agent, short of actual solution or removal of the cuticle. N. A. is one of the most convenient and powerful agents of oxidation in the laboratory, having the power to oxidize many metallic sulphides, to dissolve silver, and to make, in admixture with muriatic acid, a liquid which will dissolve gold and platinum. When hot it destroys cellulose, sugar, starch, and other vegetable matters, with the formation chiefly, with some other minor products, of *oxalic acid*. When cold and concentrated, however, it acts upon cellulose to form nitro-cellulose or *gun-cotton*, and with glycerine it forms the still more valuable explosive *nitro-glycerine*. For preparing these explosive agents its energy is usually exalted by mixing with oil of vitriol, which, through its affinity for water, virtually concentrates the N. A. to the condition of pure nitric hydrate.

**Nitrates**.—The nitrates of *potash* (see NITRE), *soda*, *lime*, and *magnesia* occur as native minerals, that of *soda* being the most abundant and important. It is imported from Peru into N. Amer. and Europe in enormous quantities, being known by the misnomer of "Chili saltpetre." It is also called *cubic nitre*. In other parts of the world the soil is found in many places to contain ordinary saltpetre and other nitrates in sufficient quantity to make its luviation profitable. Earth is found abundantly in some limestone caves, as in the Mammoth Cave in Ky., and multitudes of others, which yields on luviation nitrates, generally of lime. Few of the nitrates, except those of potash and soda, are of much practical importance. Nitrate of *silver*, or "lunar caustic," is one of considerable value in the arts and in med.; nitrate of *lead* is largely sold to dyers and calico-printers; nitrates of *baryta* and *strontia* are used in pyrotechny, nitrate of *bismuth* in med., and nitrate of *cobalt* in the laboratory. [From orig. art. in *J.'s Unit. Cyc.*, by PROF. HENRY WERTZ, Ph. D.]

**Nitrite of Amyl**, an amber-colored, highly volatile liquid, smelling like ripe bananas, insoluble in water, but soluble in alcohol. It is obtained by the action of nitric acid on amyl alcohol or "fusel oil." If 2 or 3 drops of amyl be poured on a handkerchief and the vapor inhaled, almost immediately the blood-vessels of the head, face, and neck are felt to throb rapidly and violently; the face becomes crimson and hot, and the head aches from the sensation of fulness. Simultaneously there is felt an indescribable commotion within the chest, with a feeling of breathlessness and oppression. These effects come on within a few seconds after breathing the fumes of the amyl nitrite, and disappear entirely within a few minutes, unless an overdose be taken. EDWARD CURTIS.

See NITROUS ACID AND NITRITES.

**Nitrobenzol**, **Nitrobenzene**, or **Essence of Mirbane**, produced by treating benzol with strong nitric acid. It appears as a heavy yellow liquid, smelling like bitter almonds, whence it is often called improperly artificial oil of bitter almonds. It is extensively used as a perfume



for soap. Its chief importance is due, however, to the fact that it is converted by reducing agents into aniline. (See ANILINE and BENZOLE.)

**Nitro-cellulose**, a gen. term for the product resulting from the treatment of cellulose, as cotton, wood-fibre, etc., with a mixture of strong nitric and sulphuric acids, whereby one or more atoms of hydrogen are replaced by an equal number of molecules of nitril. Several varieties are known. One is called trinitro-cellulose, and is chiefly used as an explosive. The gun-cotton for photographers' collodion consists of mixtures of 2, probably of lower degrees of nitration.

**Nitrogen** [Gr. *nitron*, "nitre," and *γεννάειν*, to "engender."] Synonyms, *azote*, a Fr. name conferred by Lavoisier, derived from the Gr. *a*, priv., and *ζωή*, "life," because it is destitute of life-sustaining power when breathed; Ger. *Stickstoff*, "suffocating matter," a name similar in origin to *azote*. This is one of the elements of matter, forming  $\frac{1}{8}$ , or, more closely, from 79.1 to 79.2 per cent., by vol., of the atmosphere of the earth. It is also found, in small but essential proportion, in the bodies of all living beings, animals and plants, and hence in all their remains, and in those constituents of the solid earth which are formed from their remains, such as coal and other apozole mineral matter. In the earth and waters it occurs also, though in relatively very minute proportion, in nitrates and ammonia.

**Preparation.**—Nitrogen gas, nearly pure, may be prepared by separating from atmospheric air its other constituents, which are oxygen, carbonic acid, and water. It is much easier and cheaper to obtain it from a nitrite, *nitrite of potash* being generally used. This is mixed in solution with sal-ammoniac and boiled, when pure nitrogen gas comes off.

N. when pure is a gas, colorless, inodorous, and tasteless, of density = .97 (air = 1). It is dissolved by 5000 times its vol. of ice-cold water. Chemically, N. has an exceptional inertness toward most other substances. By the electric spark it may be made to combine with oxygen directly to form nitric acid. During electric storms nitric acid is believed to be formed in the air in small proportion. N. and carbon may be made to combine directly to form *cyanogen*, by heat in the presence of an alkaline substance. In nature, the most important function of N. is merely negative or passive, as a *diluent* of the oxygen of the air to make it fit to sustain life. It performs, however, other functions in living nature of the greatest importance. The so called "plastic" constituents of animal bodies, which form their solid tissues, including what are called the *proteids* (see ALBUMINOIDS), also the important substance *gelatine*, and others, contain N. as an essential element, this being so characteristic a fact that these bodies are often classed together as the *nitrogenous* constituents of living bodies. In plants they occur also, as well as in animals, but in the former they are not entitled to the term "plastic." N. combines with hydrogen to form the important gas ammonia, and with oxygen to form a series of oxides, of which **NITRIC** and **NITROUS ACIDS** are described by us under other heads. **NITROUS OXIDE**, also called "laughing-gas," is another familiar compound of oxygen and N. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. HENRY WURTZ, Ph. D.]

**Nitro-glycerine**, or **Glonoin Oil**, was discovered in 1847 by Ascaigne Sobrero, but remained unapplied to practical uses until 1864, when Alfred Nobel, a Swed. engineer, began to develop its industrial value. Since then it has been largely employed in Europe and Amer. It is prepared by the action of a mixture of concentrated nitric and sulphuric acids upon glycerine introduced drop by drop. At ordinary temperatures it is an oily liquid, usually colorless if made from good glycerine. It has no odor, and is of a sweet and slightly pungent taste. It is highly poisonous, even short contact with the skin being sufficient to produce severe headache. Its specific gravity is 1.6. N.-G. incompletely freed from the acids undergoes spontaneous decomposition, is dangerous to handle, and ultimately may lose its explosive properties. When pure it congeals at from 40° to 45° F., and is then nearly or quite incapable of explosion. At 212° F. it begins to decompose; at 365° F. it throws off yellow or reddish fumes; at 423° F. it deflagrates violently. When uncongealed, N.-G. may readily be exploded by concussion, which renders it quite unfit for transportation in that state. In store it should be kept in a cool place, under pure water, in open vessels, and, if practicable, in a frozen condition. For use, it should be thawed very gradually, by placing the can in warm water raised to a temperature not exceeding blood heat.

**Nitro-Muriatic Acid** [syn. *aqua regia*; Fr. *eau régale*; Ger. *Königswasser*, *Goldscheidewasser*, *Salpetersalzsäure*]. This name is applied to the product of mixing together strong nitric and muriatic acids. The name *aqua regia*, "royal water," refers to the power of such mixture to dissolve gold, the "king of metals"—a power which neither of the acids possesses alone. *Aqua regia* fumes in the air, has a deep yellow or red color, and evolves 2 gaseous substances when heated, known as chloro-nitrous oxide and chloro-nitric acid. Chlorine gas also appears, at least at certain stages of the operation. *Aqua regia* is highly valuable in the arts and in the laboratory in operations with gold and platinum. A somewhat cheaper substitute for the ordinary *aqua regia* may be made by dissolving nitrate of soda in strong muriatic acid.

**Nitro-Prussides**, a peculiar class of compounds, formed by the action of nitric acid upon the "prussiates" of potash, red and yellow. Special interest is conferred upon the N.-P. by the fact that they have for soluble sulphides a very delicate and characteristic reaction, producing a most beautiful violet tint, the cause of which is not clearly known. It furnishes, however, the most delicate test yet discovered for sulphur in minute traces.

**Nitrous Acid and Nitrites.** According to the prevailing nomenclature, nitrous acid, properly so called,

which would be the hydrate of nitrous anhydride, is but doubtfully known. Nitrites of potash or soda, in solution, may be formed by passing nitrous anhydride gas into solutions of caustic potash or soda. Impure nitrites may be obtained also by fusing the alkaline nitrates, with certain precautions, with metals, as copper and iron. Nitrites sometimes occur in natural waters, particularly in well-waters, doubtless as products of putrefactive processes; and it has been recently announced that they occur, in proportions by no means trifling, as normal ingredients of the circulating fluids of certain plants.

**Nitrous Oxide, Nitrogen Monoxide, or Laughing-Gas**, a colorless, transparent, nearly odorless gas, having a sweet taste, and freely soluble in cold water. It is obtained from ammonium nitrate, which by being heated in a retort breaks up into water and nitrogen monoxide. This gas supports combustion nearly as energetically as pure oxygen, but its most interesting and important property is its anæsthetic effect on the animal system when breathed instead of ordinary atmospheric air. The advantages of N. O. as an anæsthetic in surgery are its great swiftness of action and entire freedom from all unpleasant effects upon the patient.

**Nitzsch**, nitsch (GREGOR WILHELM), a celebrated philologist, b. in 1790 at Wittenberg; became (1837) prof. of anc. lit. at Kiel. Wrote works relating to Homer, especially an elaborate commentary on 12 books of the *Odyssey*.

**Nix**, or **Nixie** (Ger. *nix*), in the popular mythology of the Teutonic races, a water-spirit, usually malignant, and often assuming the human form, though able to take any other shape at will. From the same etymological root we have "Old Nick" as a name for the devil.

**Nizam's Dominions**, the largest native state of Hindostan, subsidiary to G. Brit., occupies the centre of the Deccan, between the presidencies of Bombay and Madras. Area, 81,807 sq. m. Pop. 9,845,594. Cap. Hyderabad.

**Nizhnee- (or Nijni)-Novgorod**, town of Rus., cap. of the gov. of N.-N., on the right bank of the Volga, at its confluence with the Oka. The town is divided into 2 parts, the prin. one being situated on the steep promontory, triangular in shape, and 400 ft. high, at the apex of which, on the highest point, stands the Kremlin or citadel, surrounded by a wall 80 ft. in height. The whole town is built of wood, and has few attractions. It is remarkable, however, for the great fairs held here in July and Aug. of each yr., on a triangular space formed by the junction of the left bank of the Oka with right bank of the Volga. The ground is laid out for streets. As the time for the fair approaches a great town springs up, with chs., theatres, hospitals, etc., all built of wood and in a substantial manner. Hundreds of thousands of people flock here on these occasions. But the extension of R. Rs. through Rus. and contiguous portions of Asia does away with the motive for "fairs" of this kind, and this at N.-N. is diminishing. Pop. 12,441.

**No'ah**, the patriarch who was saved by God from the Deluge, and thus became the second founder of the human race, was a son of Lamech and the father of Shem, Ham, and Japheth.

**Noah** (MORDECAI MANTEL), b. in Phila. July 19, 1785; became a lawyer at Charleston, S. C.; engaged actively in politics; went as consul to Riga, 1811, to Morocco and Algiers 1813-15; settled in New York, and was connected as ed., or proprietor successively with 7 newspapers. Soon after his return from Morocco he unsuccessfully endeavored to form a Jewish colony upon Grand Island in the Niagara River, where they were to build a "New Jerusalem" under his administration as "judge in Israel." He was elected sheriff of New York, and subsequently appointed surveyor of the port and judge of the court of sessions. He wrote several dramas, a translation of a spurious *Book of Jasher*, a *Discourse on the Restoration of the Jews*, etc. D. Mar. 22, 1851.

**Noailles**, no-ahl', de (LOUIS MARIE), VISCOUNT, b. in Fr. Apr. 17, 1756; was second son of the Marshal de Mouchy and a brother-in-law of La Fayette, with whom he served in the Amer. war of independence; was a good tactician; commanded the Solisonnais regiment at the siege of Yorktown, and was one of the coms. to receive the capitulation of Cornwallis. He bore a patriotic part in the National Assembly of 1789, enjoying great influence; received an important command in the army, but resigned in May 1792, and came to the U. S., while the viscountess, remaining in Paris, became a yr. later a victim to the Revolutionary tribunal. In 1803 N. re-entered the Fr. army, went to St. Domingo, was mortally wounded in an engagement with an Eng. vessel, and d. at Havana Jan. 9, 1804.

**No'blesville**, R. R. June, cap. of Hamilton co., Ind., on White River. Pop. 1870, 1495; 1880, 2221.

**Noddy**, the *Megalopterus stolidus*, a sea-bird of the tern family, approaching the character of the gulls. It is found in nearly all parts of the world, often alights on ships, and lets itself be captured without resistance.

**Nodes** [Lat. *nodus*, a "knot"; Fr. *nœud*], the points in which the path of any planetary or cometary body intersects the plane of the ecliptic; also the points in which the orbit of any satellite intersects the plane of the orbit of its primary. N. are distinguished as *ascending* and *descending*. The ascending N. is that through which the body passes from the S. to the N. side of the plane of reference; the descending, that through which it passes from N. to S. The first is denoted by the sign ♈, the second by the sign ♎. From the definition it is evident that the earth's orbit has no N. The N. of every other member of the solar system undergo gradual displacement in the heavens, making, in a period of time longer or shorter, a complete revolution. The period for the moon is short, being but about 18½ yrs., but for the planets it reaches many thousands of yrs., being nearly 180,000 for Mercury and 36,000 for Uranus. The direction of nodal movement is generally retrograde, or from E. to W.

F. A. P. BARNARD.



**Noëtians**, followers of Noëtus, a Patristian who flourished probably about 200 A. D. (instead of 230, the date formerly given). All we know of him is derived from Hippolytus (d. 236), Epiphanius (d. 403), and Theodoret (d. 457, 8), and they do not quite agree in their statements, Hippolytus and Theodoret saying he was b. at Smyrna, and Epiphanius calling him an Ephesian. Perhaps he was b. at Smyrna and lived at Ephesus. He was excommunicated for his heresy, which Hippolytus connects with the pantheism of Heraclitus. Through his disciples, Epigonos and Cleomenes, the Rom. bps. Zephyrinus (202-218 A. D.) and Callistus (218-223 A. D.) were carried over into the same heresy. (See PATRISTIANISM.) R. D. HITCHCOCK.

**Nokomis**, Ill. See APPENDIX.

**Nominalists**, those Schoolmen who held the doctrine that universals (general notions, such as those of man, animal) have no real existences corresponding to them, but are mere names or words (*Natus vocis*). (See REALISM and PHILOSOPHY, HISTORY OF.) WILLIAM T. HARRIS.

**Nonconformists**, or **Dissenters**, a name applied to those not connected with the Ch. of Eng. It is said that there are between 30 and 40 denominations in Eng. The larger and more important may be traced back to the Presbys, Brownists, Anabaptists, and Romanists of the 16th century, or to the Meths., who arose a little more than 100 yrs. ago. The stringent penal laws by which (from a real or imaginary political necessity) the N. were formerly restrained have been one by one repealed, and they are now in the full enjoyment of civil and religious liberty. The number of dissenters in Eng. is about 10,000,000.

**Nonjurors**, those members of the Ch. of Eng. who refused to take the oath of allegiance to William and Mary. When it was tendered to Sancroft, abp. of Canterbury, he, with several of the bps. and about 400 priests, declined to take it, upon the ground that they were already bound by their oath of allegiance to King James II. In consequence of their refusal they were deprived by act of Parl. in 1691 of their ecclesiastical preferments. The deprived bps. were Sancroft, Turner, Frampton, White, Ken, and Lloyd. Many of the laity, regarding the deprivations as unlawful, adhered to these prelates and formed a religious communion, which they called the faithful remnant of the Ch. of Eng. Some of the chief men in the kingdom in influence and learning were N. The motives of the first N. appear to have been strictly religious; those of their successors were political.

**Nonnus**, a Gr. poet of the 5th century after Christ, b. at Panopolis in Egypt. The details of his life are unknown, but two of his works are still extant—viz. a huge epic, *Dionysiac*, in 48 books, and a transcription of St. John in Gr. hexameters.

**Nootka Dog**, a large dog found among the Indians of Vancouver's Island, Brit. Columbia. Its long woolly hair is spun and woven into cloth by the natives.

**Nordenskjöld** (ADOLF ERIC), b. at Helsingfors, Finland, Nov. 18, 1832; accompanied Torell on his Arctic expeditions in 1859 and 1861; led similar expeditions himself in 1864, 1868, and 1872, and discovered a N. E. passage to the Pacific through the Arctic Ocean in 1879.

**Nordhausen Sulphuric Acid**. See SULPHURIC ACID.  
**Nordhoff** (CHARLES), b. at Erwitte, in Westphalia, Aug. 31, 1830, brought to the U. S. at the age of 4; at 14 went to sea, and was a sailor for 9 yrs. Between 1861 and 1871 he was editorially connected with the New York *Evening Post*, subsequently a correspondent of the New York *Tribune* and an editor of New York *Herald*. He has written *Man of War Life, Cal. for Health, Pleasure, and Residence; The Communitistic Societies of the U. S.; Politics for Young Americans*, etc.

**Norfolk**, Neb. See APPENDIX.

**Norfolk**, city and R. R. centre, Norfolk co., Va., on the Elizabeth River, an arm of Chesapeake Bay, about 18 miles from Fortress Monroe, has several lines of steamers and a fine harbor, of sufficient depth to admit the largest vessels. It is the largest naval station in the U. S. Pop. 1870, 19,229; 1880, 21,966; 1883, 26,324.

**Norfolk**, DUKES OF (1483), earls of Arundel (1139), of Surrey (1483), and of Norfolk (1644), a family of the Eng. nobility, which enjoys the distinction of hereditary earl-marshall, premier duke, and premier earl of Eng. The earldom of the East-Angles was conferred by Henry I. (1135) upon Hugh Bigod, who lost that title by rebellion against Stephen and Henry II., but was reconciled to the latter monarch and made earl of Norfolk 1167. His grandson, Roger, was made earl-marshall on the failure of the male line of the earls of Pembroke 1225, but both titles became extinct on the death of his nephew, of the same name, 1307. After having been held by Thomas of Brotherton, brother of Edward II. (1313-38), and by Thomas Mowbray (1366-1413), both titles were granted by Richard III., June 28, 1483, to JOHN HOWARD, lord admiral of Eng., Fr., and Aquitaine, who was killed at the battle of Bosworth Field, Aug. 22, 1485, and attained shortly afterward.—His son, THOMAS HOWARD, who had been ennobled (as earl of Surrey) at the same time as his father, whose attainder he also shared, was restored to his original title 1488; was made earl-marshall 1510, and second duke of Norfolk Feb. 1, 1514, as a reward for having gained the battle of Flodden Field, and d. at Framlingham May 21, 1534.—His son, THOMAS HOWARD, third duke, b. about 1474, repeatedly commanded armies of invasion against Scot.; presided over the court which sentenced Queen Anne Boleyn to death, May 19, 1536; suppressed the rebellion known as the "Pilgrimage of Grace" 1537; was thrown into the Tower Dec. 1546, sentenced to death and attainted Jan. 27, 1547, but escaped through the death of Henry VIII.; had his title restored by Queen Mary, and d. Aug. 25, 1554.—His brother, lord EDWARD HOWARD, had been lord high admiral of Eng., and was killed in an attempt to destroy the Fr. fleet 1513; while his eldest son, HENRY HOWARD, aspired to the hand of the Princess Mary, and was beheaded on Tower Hill Jan. 19, 1547.—Surrey's son, THOMAS HOWARD, b. about 1536, became fourth duke;

intrigued for the hand of Mary, queen of Scots, and was beheaded at Lond. June 2, 1572.—His grandson, THOMAS HOWARD, b. 1592, was restored in blood by act of Parl. as earl of Arundel and of Surrey 1603; was distinguished in the service of Charles I.; was restored to the earldom of Norfolk 1644. The title of duke was restored to his son, and is now enjoyed by HENRY HOWARD, the 15th duke, b. 1847, who, like his ancestors, is a R. Cath.

PORTER C. BLISS.

**Normal** [Lat. *normalis*], in mathematics. A N. to a plane curve is a straight line in that plane perpendicular to a tangent at the point of contact. A N. to a curve of double curvature is a straight line lying in the osculatory plane and perpendicular to the tangent at the point of contact. In this case the length of the N. is the same as the length of the radius of the osculatory circle to the curve at the point of contact. A plane is said to be N. to a curve at any point when it is perpendicular to the tangent at that point. A N. line to a surface is a straight line perpendicular to a tangent plane to the surface at the point of contact. Any plane through a N. line to a surface is a *normal plane*.

**Normal**, city and R. R. junc., McLean co., Ill., 2 m. N. of Bloomington, is the seat of the State Normal Univ. and the Soldiers' Orphans' Home. Pop. 1870, 1116; 1880, 2470.

**Normal School** [Lat. *normalis*, from *norma*, "rule," "pattern"], an inst. for the training of teachers, a teachers' sem.; originally, a pattern or model school, an elementary inst. in which the best methods of instruction and discipline were practised, and to which candidates for the office of teacher resorted for the purpose of learning by observation the most approved modes of conducting the education of children and youth. According to the present acceptation of the term, as used in many European countries, it denotes an establishment composed of young men or women who have passed through an elementary or even superior school, and who are preparing to be teachers by making additional attainments and acquiring a knowledge of the human mind, of the principles of education as a science, and its methods as an art. The N. S. of the present day generally include the model or pattern school of earlier times.

The N. S. of the U. S. usually comprehend—(1) the model or pattern school of the former period; (2) the professional characteristics of the European establishments of the present day, so far as circumstances will permit; (3) the academic features of the ordinary school. They are compelled, by reason of the superficial instruction imparted in too many of the elementary schools, to assume, to a considerable extent, the work of the latter.

The conditions of admission to Amer. N. S. do not greatly vary in the different States, and may be thus summarily stated: (1) The candidate to be not less than 16 yrs. of age; (2) to possess sound health and a good moral character; (3) to be able to pass a satisfactory examination in reading, spelling, writing, arith., and the elements of Eng. grammar; (4) to sign a declaration of intention to teach for a certain specified time, generally 2 yrs., in the common schools of the State. The courses of study are principally limited to the branches required to be taught in the public schools, together with a thorough theoretical and practical preparation for the special duties of the teacher. In some cases the classics and modern langs. are admitted into the course. The best schools have provided an elementary (2 yrs.) and a higher course (2 yrs.), in order to meet the wants of the several grades of the public-school system. [From *orig. art. in J.'s Univ. Cyc.*, by PRES. WILLIAM F. PHELPS.]

**Normanby** (CONSTANTINE HENRY PHIPPS), MARQUIS OF, b. at Mulgrave Castle, Eng., May 15, 1797, ed. at Harrow and Cambridge; entered Parl. 1818; advocated R. Cath. emancipation and Parliamentary reform; succeeded his father as Earl Mulgrave Apr. 1831; was gov. of Jamaica 1832-33, where he carried into effect the recent legislation for the abolition of slavery; became lord privy seal 1833, lord lieut. of Ire. 1835-39; created marquis of Normanby June 25, 1839; was for a short time sec. of state for the colonies 1839, home sec. 1839-41, ambassador at Paris 1846-52; made a knight of the Garter 1851; was envoy to Florence 1854-58; became a privy councillor, and a constant opponent of the foreign policy of Lord Palmerston. Wrote political pamphlets, several novels, and *A Year of Revolution*, criticising the Fr. republic of 1848. D. July 28, 1863.

**Normandy**, an old prov. of Fr., bordering on the Eng. Channel, and comprising an area of 10,534 sq. m., is now divided into the depts. of Seine-Inférieure, Eure, Orne, Calvados, and Manche. The ground is naturally fertile, and the inhabs., descendants of the old Normans, have made the land a garden, raising rich crops of corn, hemp, fruits, and vegetables. They have also built up an important cattle-rearing, fishing, and manufacturing industry.

**Norman French** is a dialect of old Fr. which has exercised great influence upon Eng., and which became the Anglo-Norman of Eng. The Conquest dates from the yr. 1066, and the subsequent fusion of Norman with the existing Eng. has produced a lang. which deserves to become the universal medium of communication in learning, lit., and commerce. The presence of N. opened the way to Fr. and Lat., and there are now 5000 words common to Fr. and Eng., most of which, under a slight disguise, are recognizable as Lat. also; consequently, Eng. has advantages over langs. the vocabularies of which were not Latinized at the revival of learning. There is much in Eng. for which literary Fr. cannot account, and for which we must go to N.

**Normans**, 1. *The Northern*.—Toward the end of the 8th century W. Europe began to be scourged by the inroads of Scandinavian pirates. About the middle of the 9th century these raids assumed a new character. The consolidation of the 3 great Scandinavian kingdoms broke the power of the independent nobles, and drove many a Jarl forth to seek a freer life in some new home. Northmen threw themselves in larger bands upon Eng. and the Frankish kingdoms, and by the end of the century had wrested from Alfred half his



kingdom, and had begun to plant colonies upon the coasts of Fr. Northmen ravaged Sp. and the shores of the Mediterranean, fell upon W. It., and penetrated Gr. and Asia Minor. In the Russia of that day, under the name of Varangians, Northmen had become the ruling class, while those who made their way still farther S. had formed the famous Varangian body-guard of the Byzantine emps. During the latter half of the 9th century also, Scandinavians, sailing westward, colonized and settled Iceland, whence Greenland was visited and colonized; whence also navigators made their way farther down the N. Amer. coast to a "Vinland" where settlements were attempted. With the establishment, early in the 10th century, of settlements upon the Continent, with the occupation Scandinavian energy now found at home in wars between the 3 new kingdoms, and with the gradual triumph of Christianity in the N., Europe gained comparative rest. Eng.'s period of misery and humiliation under Ethelred the Unready (979-1016), ended by the establishment of a Dan. dynasty (1017-42), marks the last great outburst of the pent-up heathenism.

**II. Normandy.**—By the treaty of Claire-sur-Epte (912) Charles the Simple enfeoffed a viking, Rolf or Rollo, with the lands upon either side of the Seine. Duke Rolf remained loyal to his Carolingian lord, and, fighting in his cause, won for himself the Bessin. William "Longsword" (927-943) added to his domains the Cotentin. The third duke, Richard "the Fearless" (943-996), became the "man" of Hugh the Great of Paris, and, later, of his son "Capet." The alliance with Romanic Fr. brought the Northmen fully under the influence of Fr. lang., law, and custom, which made them "Normans." To Robert "the Devil" (1028-35) succeeded the "Bastard of Falaise," William the Conqueror. The duchy of Normandy he left at his death (1087) to his first-born Robert, from whom it was wrested (1106) by his brother, Henry I. of Eng., and held thenceforth by the Eng. kings until its seizure by the Fr. crown in 1203.

**III. The Normans in the Sicilies.**—The Sicilies at the beginning of the 11th century was disputed between Longobards, Grs., and Saracens. A band of Norman knights lent their aid to the former in an attempt to expel the Grs. This enterprise miscarried, but the courage of the N. brought their assistance into great demand. In 1030 they built the city of Aversa; 8 yrs. later their leader Rainulf received from Conrad II. of Ger. the title of count. Such beginnings drew from overcrowded Normandy fresh swarms of adventurers, with whose aid the Gr. viceroy won from the Moslems (1038) the greater part of the island of Sic. Swindled in the sharing of the booty, the N. attacked the Gr. possessions in S. It., and their leader, William "Iron-arm," son of Tancred d'Hauteville, soon styled himself count of Apulia. With the third Apulian count, Humphrey, Pope Leo IX. came into strife over Benevent. Defeated and captured in the battle of Civitate (1053), the pontiff was fain to strike a peace upon the condition of Norman vassalage to the Holy See. Still another son of Tancred, the famous Robert Guiscard, succeeded his brother Humphrey (1056). His younger brother, Roger, passing into Sic., made himself master of the island. In 1081 Robert defeated the E. Rom. emp. at Durazzo. The repeated summons of the pope, in hot strife with Henry V., drew the Guiscard back to It. Bursting into the Campagna, he pressed back the Ger. emp., delivered Gregory, and sacked Rome (1084). His first-born, Boemund, won great fame in the first Crusade and established an independent principality in Antioch. In 1127 the Guiscard line became extinct, and Roger, second count of Sic., united the conquests of the house of Tancred, reigning as king of Sic. and Naples. In 1186, through the marriage of Henry VI. of Ger. with Constance, aunt and heiress of the childless William II. (1166-89), the succession of the Sic. throne passed over to the imperial house of Hohenstaufen. Henry's son by Constance, Frederick II. united and ruled both realms. The island sprang into new life and bloom. Sic. and Sp. became the centres from which the reawakening of scientific study spread throughout Europe. In 1266 Charles of Anjou defeated King Manfred, Frederick's son, and made himself master of the Sic.

**IV. "The Norman Conquest of England is the great turning-point in the hist. of the Eng. nation."** Landless freemen and little freeholders were slowly forced into a sort of feudal dependence upon a warlike, land-and-office-holding nobility, the "thaneship." The state tended steadily toward oligarchy. The arrest of this process was the problem to be solved by the Eng. kingship: the thorough redistribution of state burdens according to actual ability to bear the same was the one possible solution; and to that the Ch., allied by rich endowments with the landed interest, made successful resistance. The accession of the half-Norman "Confessor" was the beginning of the Conquest. Norman adventurers filled and ruled court, Ch., and state. At length the Eng. party won the upper hand, and upon the death of the childless king (Jan. 5, 1066) placed upon the throne their leader, Earl Harold Godwinsson. William of Normandy at once protested, declaring himself Edward's legal successor. On Sept. 28 the N. troops disembarked at Pevensey, encountering no resistance. Harold met the duke on Oct. 14 upon the slope of Senlac, near Hastings. His defeat and death decided the fate of Eng. William was crowned in Westminster the following Christmas. Claiming to reign as the Confessor's heir, he pledged the retention of the laws of Edward—i. e. of A.-S. precedents. Branding Harold's reign as usurpation, all support thereof as treason, it gave the Crown legal pretext for wide-reaching confiscation of land, whose reassignment, upon military tenure, made state and kingship for the first time thoroughly feudal. The *Domesday Book*, William's property-inventory, divides the land into 60,215 "knight-fees," each feudally pledged to knight service and to all the precedented feudal tributes, liable also to forfeiture. These feoffs are held from the Crown (1) by great secular vassals, magnates of Normandy, leaders of the conquering army, invested

with large but scattered "complexes;" (2) by several hundred lesser chief-tenants or crown-vassals, nearly all N.; and (3) by the higher clergy, N. and Sax. From these held by re-enfeoffment 7871 after-vassals—half Sax. thanes, left in possession under N. overlords, half N. soldiers, sharing with their leaders the lands they had helped to win. These, too, are sworn "men of the king," levied and led, not by their lords, but by the royal viscounts, constables, and marshals. Into the forms of legal administration drew at first less change. The thanes still sat, dispensing justice, amid the remnant of the common freemen, in the courts of the co., still held manorial jurisdiction over their serfs and villeins. But among these "law-giving thanes" were now some thousands of foreign soldiers, and in the old folk-courts, instead of the Sax. sheriff, presided the revenue-farming, army-and-police-administering royal viscount. N. arrogance and native jealousy, confusion of lang., contradictions of Sax. and feudal law and process, made the whole system an engine of injustice and oppression. In Eng., centuries earlier than upon the Continent, was established the determination of law at the court of the king, and its administration throughout the land by royal judges. With the folk remained the settling of the question of fact, and out of this right grew the jury trial. To the police power of the N. kings, also, race-hate and resultant lawlessness gave an extraordinary development. To the Eng. Ch. the Conqueror made certain concessions. The Ch. gained rich endowments, received separate ecclesiastical jurisdiction, and was brought into closer conformity with Romish usage. On the other hand, royal supremacy over Rome itself on Eng. soil was held fast, and the clergy were fully subjected to all feudal burdens and to the power of the throne. Out of the antagonism of two races, by which both were weakened, the Crown thus won a practically unlimited authority in army, court, and Ch. [From orig. art. in *J.'s Univ. Cyc.*, by E. McNOR SMITH.]

**NORNÆ** [Icelandic, *Nornir*], in Scandinavian mythology, the goddesses of fate. Their number was originally 3—Urðr (Past), Verðandi (Present), and Skuld (Future).

**NORRISTOWN**, R. R. centre, cap. of Montgomery co., Pa., about 16 m. from Phila., is in a rich farming and mineral dist. Pop. 1870, 10,753; 1880, 13,068.

**NORTH** (CHRISTOPHER). See WILSON, JOHN.

**NORTH** (EDWARD), L. H. D., b. at Berlin, Conn., Mar. 9, 1820, grad. at Hamilton Coll. 1841; elected prof. of anc. langs. in that inst. 1843; has occupied the chair of Gr. since 1863; visited Gr. 1871-72; was pres. of the N. Y. State Teachers' Association; chairman of the executive committee of the Univ. Convocation of the State of N. Y.; has been for 30 yrs. chairman and necrologist of the alumni association of Hamilton Coll.; has edited during nearly the same period the triennial catalogue; has been a contributor to periodicals; is known as a lecturer on literary themes. In 1859 the Univ. of the State of N. Y. conferred upon him the honorary degree of "Doctor of Literature" (L. H. D.), the first ever granted in Amer.

**NORTH** (FREDERIC), earl of Guilford, best known as LORD NORTH, eldest son of Francis, the first earl, b. in Eng. Apr. 18, 1733; became a lord of the treas. 1768; supported the Amer. Stamp Act 1765; became chancellor of the exchequer and leader of the House of Commons on the death of Charles Townshend 1767; first lord of the treas. and prime minister 1770; proposed the colonial tea-duty 1773; and the Boston Port Bill Mar. 1774; retired from office Mar. 20, 1782, on the adoption of a policy of peace with the U. S.; became joint sec. of state with Fox in the "coalition ministry" 1783; became blind 1787; succeeded to the earldom 1790, and d. Aug. 5, 1792.

**NORTH** (SIMEON), D. D., LL.D., b. at Berlin, Conn., about 1802, grad. at Yale Coll. 1825; was a tutor there 1827-29, prof. of langs., Hamilton Coll., 1829-39, and its pres. 1839-57.

**NORTH** (WILLIAM), b. at Ft. Frederick, Pemquid, Me., in 1755; entered the Revolutionary army 1775; became aide to Baron Steuben 1779; was conspicuous as a Federal politician, speaker of the N. Y. assembly, and U. S. Senator 1798. D. Jan. 3, 1856.

**NORTH ADAMS**, R. R. centre, Berkshire co., Mass. It is the W. terminus of the Hoosac Tunnel, and has extensive manufactures. Pop. tp. 1880, 10,191.

**NORTH AMERICA.** See AMERICA.

**NORTHAMPTON**, R. E. centre, cap. of Hampshire co., Mass. 17 m. N. of Springfield, on the Conn. River. Here are a high school, female sem., public library, the Smith Charities, Smith Coll. for women, the Clarke Inst. for deaf mutes, and the State lunatic asylum. It has various manufactures. Pop. tp. 1870, 10,160; 1880, 12,172.

**NORTH ATTLEBOROUGH**, on R. R., Bristol co., Mass., is part of Attleborough tp., and has large manufactures of jewelry, etc. Pop. of tp. 1870, 6769; 1880, 11,111.

**NORTH BEND**, Neb. See APPENDIX.

**NORTH BEND**, Hamilton co., O., on R. R. and the O. River, was the residence of Pres. Harrison.

**NORTHBROOK** (FRANCIS THORNHILL Baring), FIRST BARON, b. at Winchester, Eng., in 1796, founder of the banking-house of Baring Brothers; entered Parl. as borough member for Portsmouth 1828; was a lord of the treas. under Earl Grey (1830), joint sec. of the treas. under Lord Melbourne, chancellor of the exchequer 1839-41, first lord of the admiralty 1849. D. Sept. 6, 1866.

**NORTHBROOK** (THOMAS GEORGE Baring), eldest son of the first baron, b. at Stratton Park, near Winchester, in 1826, grad. at Christ Ch., Ox., 1846; entered Parl. in the liberal interest 1857; was a lord of the admiralty 1857-58, under sec. of state for India June 1859-Jan. 1861, for war from the latter date to June 1866, and again on the accession of Mr. Gladstone, Dec. 1868 till Feb. 1872, when he was appointed viceroy and gov.-gen. of India.

**NORTH BROOKFIELD**, on R. R., Worcester co., Mass., has boot and shoe manufactures. Pop. tp. 1870, 3943; 1880, 4459.

**NORTH CAPE.** See CAPE NORTH.



# North Carolina, one of the S. Atlantic States and

one of the original 13, is bounded N. by Va., W. by Tenn., S. by S. C. and Ga., and E. by the Atlantic; embraced between 33° 45' and 36° 33' N. lat., and 75° 25' and 84° 30' W. lon.; greatest width from N. to S., 180 m.; greatest length from E. to W., 480 m.; area, 52,250 sq. m. or 33,440,000 acres.



**Face of the Country, Soil, Etc.**—A fringe of narrow, low sand-islands, or "banks," stretch southward along the whole seaboard, with 3 dangerous promontories jutting into the Atlantic—Cape Hatteras, Cape Lookout, and Cape Fear. Separating these "banks" from the main is a chain of sounds, affording sheltered interior water-communication, with occasional outlets to the sea. The State falls into 3 natural subdivisions—the E., middle, and W. E. N. C., deeply indented at the coast-line, is low and level, a broad expanse of from 40 to 60 m. toward the interior of pine forests, intersected by cypress morasses, embracing an area of 3,000,000 acres. The middle division extends back to the mts., a broad area of undulating country, either cultivated or covered with deciduous trees, affording well-watered, rich, arable land—the region of corn, cotton, and tobacco, and of wheat toward the mts. W. N. C. embraces the mts. and high table-land. The Appalachian Mts. here reach their greatest elevation, several of the peaks being the loftiest E. of the Miss. River. The range nearest the coast is known as the Blue Ridge, while the other is designated in different sections as the Black, Smoky, Iron, and Unaka mts. The lowest points or gaps in the Black Mts. are nearly as elevated as Mt. Washington, while Mt. Mitchell is 400 ft. higher, or 6707 ft. above the sea; 5 other peaks of the same range are also higher than Mt. Washington. All these mts., fertile to their summits, are clothed with magnificent forests. The table-land between the ridges is broken into a series of separate well-watered valleys of great fertility. It is one of the most salubrious and picturesque sections of the U. S.

**Rivers, Lakes, Etc.**—N. C. is well watered, but, owing to shifting sand-bars at their mouths, and rapids and waterfalls in their descent from the hills to the lowlands, few of her rivers are navigable except for small craft. The Cape Fear River is the largest in the State—250 m. in length, navigable 34 m., and for sloops and small boats 86 m. farther; the Roanoke is 150 m. long, navigable for 90 m., and for small steamers 90 m. farther; the Neuse and Tar rivers are each navigable for small steamboats 100 m. or more; the Chowan has about 75 m. of similar navigation; the Yadkin, Catawba, and French Broad, traversing S. C. on their way to the Atlantic, are not navigable in N. C. Large tracts of the lowlands are covered with swamps, and most of them inclose lakes of greater or less extent.

**Mineral Resources.**—These are enormous. The richest gold-mine known in the U. S. before the acquisition of Cal. was in Rowan co. In 1799 a nugget found in Cabarrus co. weighed 78 lbs. For 1799 a number of gold-veins and placers, or gravel deposits, were extensively worked over a large tract on both sides of the Blue Ridge. Silver, lead, and zinc occur in association, notably in Davidson co. Silver ores, intermixed with lead or copper, are found in Burke, Caldwell, Gaston, Wilkes, and other interior cos. Copper ores, chiefly pyrites, are spread over a wide field. Mica of a very superior quality is mined among the coarse-grained granites of Cleveland, Mitchell, and Yancey cos. Diamonds of fine water, of from ¼ to 2 carats, have been found in Franklin, Lincoln, Mecklenburg, and Rutherford cos., and fine detached crystals of zircon, garnets, and graphite occur in the gneissoid rocks. N. C. is a chief source of supply of granular or crystalline corundum or emery. Arsenic, antimony, bismuth, cobalt, and nickel are also met with. But the chief mineral wealth of the State is in its coal and iron. The coal, mostly bituminous, of the Triassic not Carboniferous formation, is of the same age as that near Richmond, Va. There are 2 fields—that of Dan River, in Stokes and Rockingham cos., with an area of 90 sq. m., and that of Deep River, in Chatham and Moore cos., with an area of 40 sq. m., of which each sq. m. is estimated to contain 6,000,000 tons of coal of the best quality. These coal-measures consist of strata of slate, calcareous shales, alternating with beds of argillaceous carbonate of iron and seams of coal, the whole inclosed between 2 beds of red sandstone. The slate associated with it yields from 30 to 40 gals. of crude petroleum per ton.

The climate varies with the physical diversities of the country. In the mts. buckwheat flourishes, while oranges grow at Wilmington. The temperature of the lowlands is hot and humid, but in the interior the air is singularly pure, dry, and elastic. The heat of the summer day is succeeded by cool, refreshing evenings and nights; the winters are mild and genial. The average rainfall is about 45 inches.

**Vegetation.**—Relatively, the forests are in their primitive condition. The vegetable growth ranges from the balsam, from 4000 to 6500 ft. above tide-water, to the tropical palm

on the lower Cape Fear River, with the cypress, juniper, white and red cedars, evergreen oaks, and the long-leaf pine in the coast zone, the swamp-lands of which abound with undergrowth of cane, affording succulent food for cattle in winter: grape-vines and other trailing plants and a parasitic moss drape the trees of that region. In the interior there are white and yellow pines, black, chestnut, red, Spanish, and white oaks, ash, birch, chestnut, dogwood, elm, black and white gum, hickory, laurel, locust, maple (sugar), black, red, and white mulberry, sycamore, and other deciduous trees and shrubs. The State is prolific of indigenous grapes, and 3 of the native species in highest repute in the U. S., the Catawba, Isabella, and Scuppernon, had their origin in N. C. Several varieties of the honeysuckle, the fragrant yellow jessamine, and scarlet trumpet-vine are among the varied flora, while the mts. are full of medicinal plants, particularly ginseng and gentian.

**Zoology.**—The swamps afford haunts for bears, the otter, beaver, and muskrat; the extensive forests and mts. have preserved the wolf, deer, opossum, squirrel, raccoon, gray, black, and red fox, with several species of rabbits. The sounds, swamps, and streams of the coast-belt abound in turtles, terrapins, and water-snakes, with large flocks of swans, geese, brant, a great variety of ducks, the pelican, and other aquatic birds, as well as immense numbers of valuable fish, such as Sp. mackerel, shad, sheephead, blue, red, and black fish, bass, flounders, soles, mullet, and herring. Serpents, such as the rattlesnake, king, green, chicken, and cow snakes, with the viper and others, are numerous. The bald and gray eagle, fish-hawks, and several species of falcons, the buzzard, raven, crow, and blackbird, pheasant and quail, woodcock, snipe, plover, curlew, dove, pigeon, whippoorwill, lark, mocking-bird and other genera and species of birds are widely spread.

**Agricultural Productions.**—By the census of 1880 the cereal crops of N. C. aggregated—Indian corn, 28,019,839 bushels; wheat, 3,397,393 bushels; oats, 3,838,068 bushels; rye, 285,160 bushels; buckwheat, 44,668 bushels. The wool clip of 1880 yielded 917,756 lbs. Of tobacco there were raised 26,986,213 lbs.; in this staple N. C. ranks sixth among the States. The yield of cotton in 1880 was 389,598 bales or 92,530 tons. Of rice there were raised, in 1879, 5,609,191 lbs. Turpentine and peanuts are extensively produced for export.

**Farm Animals.**—By census of 1880 N. C. had 133,686 horses, 81,871 mules, 657,426 cattle, 461,638 sheep, 1,453,541 swine.

**Manufactures.**—N. C. is not largely a manufacturing State, its main interest being agriculture. Formerly her mines of iron ore were considerably worked, but, not proving very profitable, were allowed to rest. The total production of iron and steel manufactures by the census of 1880 was only \$41,085. There were several cotton factories, numbering 1960 looms, 102,767 spindles, employing 3428 hands, and using 27,508 bales of cotton. Lumber is a considerable article of manufacture.

**Railroads.**—There were in operation, Jan. 1, 1882, in N. C., 1619 m. of railway, costing \$30,185,049, with net earnings of \$1,253,530, and paying interest and dividends to the amount of \$540,489. The Carolina Central, the Wilmington and Weldon, and the Western N. C. R. R. are the more prominent of these for length and traffic.

**Finances.**—The assessed valuation of property in 1881 was—real estate, \$102,348,216; personal, \$67,568,691; total, \$169,916,907. Rate of State tax, 32½ cents on \$100, yielding \$420,000 in 1880; total raised by taxation, State, co., and town, \$1,916,132. Amount of State debt, Oct. 1, 1881—principal, \$16,690,045; interest unpaid, \$10,160,183; total \$26,850,228. The debt, however, has been "scaled" by the legislature at from 15 to 40 per cent. of its face value (except about \$13,000,000 of State bonds, unprovided for in this compromise of the debt), reducing the amount of acknowledged State debt to \$5,708,716. The aggregate indebtedness, State and local, is returned at \$8,194,606.

**Commerce.**—The direct foreign trade of N. C. is pretty large, consisting principally of cotton exported. The imports at her 3 ports of entry (Beaufort, New Bern, and Wilmington) amounted to \$157,431 in 1881, and the exports to \$5,603,852. The interior commerce is considerable, both by R. R. and rivers. The shipping of N. C. in 1881 aggregated 289 sailing and 41 steam vessels, measuring 12,669 tons.

**Banks, Etc.**—There were in operation, Oct. 1, 1881, in N. C., 15 national banks, with capital of \$2,501,000; circulation, \$1,676,990; U. S. bonds to secure circulation, \$1,868,000; deposits, \$3,244,682. There were beside 9 State banks and trust cos., with \$463,907 capital and \$1,063,523 deposits, and 4 private bankers, with \$40,833 capital and \$102,240 deposits. Of insurance cos. there was 1 local company reported in 1881; amount of losses paid same year, \$312,200.

**Education, Etc.**—The number of children of school age (6-21 yrs.) in 1880 was 459,324, of whom 256,422 were enrolled in public schools, with average daily attendance of 164,570. Aggregate expenditure for public schools in 1880, \$383,709, of which salaries of teachers required \$328,717. There are 8 colls. or univs., employing 80 instructors, with 1222 students, paying tuition fees in 1880 of \$37,500. There were pub. in N. C. in 1882, 123 newspapers and periodicals, 9 of which were daily.

**Churches.**—The Baps. are in the majority, having 1809 chs., 1065 ministers, and 167,699 members; M. E. South, 218 ministers, 73,802 members; Presbs. South, 228 chs., 116 ministers, 18,471 members; Christians (Disciples of Christ), 100 chs., 79 ministers, 14,700 members; Prot. Meths., 165 chs., 109 ministers, 12,400 members; M. E., 173 chs., 55 ministers, 12,228 members; Lutherans, 61 chs., 34 ministers, 7000 members; P. E., 78 chs., 68 ministers, 5294 members; Presbs., 83 chs., 30 ministers, 4782 members; R. Caths., 11 chs., 8 priests, and about 1800 Catholic pop.; and 15 other denominations, having from 4000 to 75 members each.

**Population.**—In 1860, 992,622; 1870, 1,071,361; 1880, 1,399,750 (white 867,242, colored 532,508, including 1230 Indians and 1 Japanese).



*Principal Cities and Towns, Pop. 1880.*—Wilmington, 17,350; Raleigh (cap.), 9,265; Charlotte, 7,041; New Bern, 6,443; Fayetteville, 3,485; Goldsborough, 3,221; Winston, 2,854; Asheville, 2,616; Greensborough, 2,105; Beaufort, 2,009.

COUNTIES.	*Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
Alamance	2-G	11,874	14,613	Graham	379
Alexander	2-D	8,908	8,355	Taylorsville	180
Alleghany	2-D	3,891	5,486	Sparta	800
Anson	2-F	12,428	17,994	Wadesborough	196
Ashe	2-D	9,573	14,437	Jackson	2,462
Beaufort	3-J	13,011	17,474	Washington	461
Bertie	2-J	12,950	16,399	Windsor	212
Bladen	4-H	12,831	16,138	Elizabethtown	1,008
Brunswick	5-H	7,534	9,389	Smithville	2,616
Buncombe	2-J	15,412	21,909	Edenton	861
Burke	3-C	9,777	12,909	Morganton	1,264
Caharra	3-E	11,954	14,964	Concord	422
Caldwell	2-D	8,476	10,291	Lenoir	1,987
Camden	2-K	5,361	6,274	Camden C. H.	2,009
Carver	2-G	9,010	9,784	Beaufort	337
Caswell	2-G	16,051	17,325	Yanceyville	583
Catawba	3-D	10,984	14,946	Newton	170
Chatham	3-G	19,723	22,453	Pittsborough	730
Cherokee	3-A	8,090	8,182	Murphy	1,382
Chowan	2-J	6,450	7,900	Wintons	111
Clay	3-A	2,461	3,316	Hayesville	890
Cleveland	3-D	12,696	16,571	Shelby	1,270
Columbus	5-G	8,474	14,439	Whiteville	3,485
Craven	4-I	20,515	26,729	New Bern	47
Cumberland	4-G	17,035	23,826	Fayetteville	1,349
Currituck	2-K	5,131	6,407	Currituck C. H.	2,105
Dare	3-F	2,778	3,243	Manteo	376
Davidson	3-D	17,414	20,333	Lexington	2,041
Davis	2-E	9,630	11,095	Rockwell	1,600
Duplin	4-I	15,542	18,773	Kennansville	750
Durham	2-G	...	...	Durham	417
Edgecombe	2-I	22,970	26,181	Tarborough	187
Forsyth	2-F	13,050	18,070	Winston	47
Franklin	2-H	14,194	20,339	Louisburg	1,349
Gaston	3-D	12,607	14,254	Galilee	293
Gates	2-J	7,734	8,897	Gatesville	1,062
Graham	3-A	...	2,835	Robbinsville	107
Granville	2-H	24,831	31,286	Oxford	485
Greene	3-I	8,887	10,037	Snow Hill	149
Guilford	2-F	21,736	25,585	Greensboro	1,216
Halifax	2-I	20,408	30,300	Halifax	708
Harnett	3-G	8,995	10,862	Lillington	372
Haywood	3-B	7,921	10,271	Waynesville	297
Henderson	3-C	7,705	10,281	Hendersonville	366
Hertford	3-I	8,273	11,845	Salisbury	212
Hyde	2-K	6,445	7,765	Swan Quarter	17,350
Iredell	3-E	16,931	22,675	Statesville	255
Jackson	3-B	6,863	7,343	Webster	781
Johnston	4-H	16,897	22,461	Smithfield	2,315
Jones	4-I	5,002	7,491	Trenton	661
Lenoir	4-I	10,434	15,344	Lincolnton	912
Lincoln	3-D	9,573	11,061	Lincolnton	71
McDowell	3-C	7,592	9,836	Marion	299
Macon	3-B	6,615	8,004	Franklin	533
Martin	2-C	8,192	12,810	Marshall	242
Matheson	3-I	9,647	13,140	Williamston	7,094
Mecklenburg	3-E	24,999	34,175	Charlotte	476
Mitchell	3-C	4,705	5,435	Bakersville	120
Montgomery	3-F	8,487	9,524	Froy	385
Moore	3-G	12,040	16,821	Catawba	212
Nash	2-H	11,077	17,781	Nashville	255
New Hanover	5-H	27,978	31,376	Wilmington	781
Northampton	4-I	14,749	20,032	Jackson	2,315
Onslow	6-I	9,587	12,845	Columbia	299
Orange	2-J	17,507	23,698	Hillsborough	1,442
Pamlico	4-G	...	6,323	Bayborough	1,421
Pasquotank	4-J	8,131	10,369	Elizabeth City	9,965
Pender	5-H	...	12,468	Burgaw	816
Perquimans	2-J	7,945	9,466	Hertford	167
Person	2-G	11,170	13,719	Reidsborough	3,286
Pitt	3-I	17,276	21,794	Greenville	200
Polk	3-C	4,319	5,062	Columbus	1,475
Randolph	2-F	17,551	20,836	Asheboro	1,229
Richmond	4-F	12,852	15,245	Rockingham	1,475
Roanoke	4-G	16,262	22,890	Albemarle	1,666
Rockingham	2-F	15,708	21,744	Wentworth	1,564
Rowan	3-E	16,810	19,965	Salisbury	1,421
Rutherford	3-C	13,121	16,198	Rutherford	9,965
Sampson	2-F	16,438	22,984	Citron	816
Stanley	3-F	8,315	10,505	Albemarle	1,666
Stokes	2-F	11,206	15,353	Danbury	1,564
Surry	2-E	11,252	15,302	Dobson	1,421
Swain	3-B	...	3,784	Charleston	1,421
Transylvania	3-C	2,856	3,540	Waynesville	297
Tyrell	3-K	4,173	4,545	Columbia	299
Union	4-E	12,217	18,056	Monroe	1,564
Vance	2-H	...	...	Henderson	1,421
Wake	3-H	35,617	47,339	Raleigh	9,965
Warren	2-H	17,768	22,619	Warrenton	816
Washington	3-J	6,516	8,928	Plymouth	1,421
Watauga	2-D	5,287	8,160	Boone	167
Wayne	3-H	18,144	24,951	Goldsborough	3,286
Wilkes	2-D	15,539	19,181	Wilkessborough	200
Wilson	3-H	12,258	16,064	Wilson	1,475
Yadkin	2-E	10,697	12,430	Yadkinville	1,229
Yancey	2-C	8,909	7,694	Burkeville	107
Total		1,071,361	1,399,750		

\* Reference for location of counties. See map of North and South Carolina in article SOUTH CAROLINA.  
† Organized since census of 1880.

**History.**—The coast of N. C. was explored in 1584 by 2 vessels sent out by Sir Walter Raleigh. In Apr. 1585 Raleigh sent out a colony of 108 persons. This expedition began a settlement at Roanoke Island, but the colonists returned the next yr. In 1587 Sir Walter sent out a second colony of about the same number, but he neglected it, and when he sought for it some yrs. later, it had disappeared. In 1662 Charles II. made a grant to the duke of Albemarle (Gen. Monk), the earl of Clarendon, Sir H. Berkeley (then gov. of Va.), and five others, of all lands lying between the 31st and 36th degrees of N. lat., westward to the Pacific. The grantees, organized as "Lords Proprietors of the Province of Carolina," were to have political control over the colonies which should be planted there. Great efforts were made by the lords proprietors to draw colonists to Carolina. Colonies of Fr., Ger., and Swiss Prots. were sent over, and New Bern was founded by the latter. There was a war with the Tuscaroras and other Indians (1711-13): for 60 yrs. the colonists had no further trouble from the Indians. About 1700 the colony was divided into N. and S. Carolina, and

separate govts. were organized. In 1729 the rights, interests, and franchises of the lords proprietors were purchased by the Crown, and the colony passed under royal control. Large bodies of emigrants from the N. of Ire, from the Scottish Highlands, and a band of Moravians settled in the colony. The last legislature which recognized the royal authority was that of Mar. 1774. The following Aug. a provincial cong. was called by the people, and appointed delegates to the Continental Cong. to meet at Phila. In Apr. 1775 a second provincial cong. was called to meet in the following Aug. The cong. met and organized a provisional govt. for the colony and a committee of safety, and provided for raising several regiments for public defence. In May 1775 a few inha. of Mecklenburg co. formed an association for the assertion of political rights in the colony, and in an address delivered on the occasion renounced allegiance to the Brit. crown; this movement was called the "Mecklenburg Declaration of Independence," but did not receive general support. On April 12, 1776, the colonial cong. empowered its delegates to the Continental Cong. at Phila. to concur with those of other colonies in declaring independence and forming foreign alliances. The Dec. of Ind. was ratified by N. C. Aug. 1, 1776. On Dec. 18, 1776, a convention met at Halifax and framed a const. for the State, which remained the organic law of the State until 1835. The const. of the U. S., framed by the convention of 1787, was rejected by N. C. in 1788, but the following yr. it was ratified by the State. During the war of 1812 N. C. had no battles or serious losses on her own terr. After the election of Pres. Lincoln in Nov. 1860 many of the citizens sympathized with the secession movement. The gen. assembly which met in Jan. 1861 called a convention to meet in the following May to consider the question of secession. On the 20th of May the convention passed an ordinance of secession, and adopted and ratified the const. of the Confed. States framed at Montgomery, Ala. Provision was made soon after for the representation of the State in the Confed. Cong. at Richmond. On April 28, 1865, Gov. Vance issued a proclamation announcing that the war was at an end. W. W. Holden was appointed provisional gov. of the State in June 1865, and in Aug. an election of delegates to a constitutional convention at Raleigh was ordered. This convention met on Oct. 2, 1865, repealed the ordinance of secession, and formally declared that slavery and involuntary servitude should be and were forever prohibited within the State. In May 1866 the constitutional convention was again convened, and made some radical changes in the State const., which were rejected by the people. At the annual election in Aug. 1866 the legislature refused to ratify the 14th amendment to the const. of the U. S. By the Reconstruction act of Cong. of Mar. 1867 N. C. was declared to be still under military authority, and all existing govts. to be provisional till the State, by adopting the course prescribed by the act, should be qualified for readmission to the Union. Another convention was called, and delegates elected to it in accordance with the provisions of the Reconstruction act, Nov. 30, 1867. The convention met at Raleigh Feb. 14, 1868, and adopted a const., which was ratified by the people. This was approved by Cong. June 23, 1868, and the 14th amendment being ratified by the legislature, the State was restored to the U. in July 1868.

#### Governors of the Colony and State.

Under the Lords Proprietors.		Under the Crown.	
George Drummond	1663-67	James Turner	1799-1802
Samuel Stevens	1667-74	Nathaniel Alexander	1802-05
Cartwright	1674-77	Benjamin Williams	1805-07
Miller	1677-78	David Stone	1807-10
John Culpepper	1678-80	Benjamin Smith	1810-11
John Harvey	1680-81	William Hawkins	1811-14
John Jenkins	1681-83	William Miller	1814-17
Seth Sothel	1683-89	John Branch	1817-20
Philip Ludwell	1689-93	Jesse Franklin	1820-22
Alexander Livingston	1693-95	Gabriel Holmes	1822-27
Thomas Harvey	1695-1705	Hutchings G. Burton	1827-28
Henderson Walker	1705-09	James Iredell	1828-30
William Grover	1709-10	John Owen	1830-32
Edward Hyde	1710-22	Montfort Stokes	1832-35
Thomas Collock	1722	David L. Swain	1835-39
William Reed	1722-24	Richard D. Spaight	1839-41
George Burrington	1724-25	Edward B. Dudley	1841-45
Sir Richard Everhard	1725-30	John M. Morehead	1845-49
Under the Crown.		William A. Graham	1849-51
George Burrington	1730-34	Charles Manly	1851-55
Gabriel Johnston	1734-53	David S. Reid	1855-59
Nathaniel Rice	1753-54	Thomas Bragg	1859-61
Matthew Rowan	1754	John W. Ellis	1861-62
Arthur Dobbs	1754-65	H. T. Clark (acting)	1862-63
William Tryon	1765-65	Zebulon B. Vance	1863-65
Josiah Martin	1771-75	W. W. Holden (prov.)	1865-68
Governors of the State.		Jonathan Worth	1868-71
Richard Caswell	1777-79	William W. Holden	1871-74
Abner Nash	1779-81	Tod R. Caldwell	1874-77
Alexander Martin	1782-84	Curtis H. Brogden	1877-79
Richard Caswell	1784-87	Zebulon B. Vance	1879-85
Samuel Johnston	1787-89	Thomas J. Jarvis	1885-89
Alexander Martin	1789-92	Alfred M. Scales	1889-91
Richard D. Spaight	1792-95		
Samuel Ashe	1795-98		
William R. Davie	1798-99		

REVISED BY A. R. SPOFFORD.

#### North Clarendon, Pa. See APPENDIX.

**Northcote** (Sir STAFFORD HENRY, BART., F. R. S., b. in Lond., Eng., Oct. 27, 1818; entered Parl. as a Conservative 1855; sec. of state for India Mar. 1867-Dec. 1868; member of commission which drew up treaty of Washington 1871, and became chancellor of exchequer in Disraeli's cabinet Feb. 1874. On the death of Earl Beaconsfield, 1881, he succeeded to the leadership of the Conservative party.

\* Died in office.

† Impeached and deposed.







from the Atlantic, and Porsang and Warangerfjords from the Arctic Ocean. N. Cape forms its N. extremity, Cape Lindesnes its S. Area, 122,860 sq. m. Pop. 1,806,900. The Scandinavian peninsula is one continuous mass of mts., the main axis of which is the Kjøll, which, running in a nearly S. direction, forms the boundary between N. and Swe., until in lat. 63° N. it turns into N., in a nearly W. direction, under the name of Dovrefjell. In lat. 62° N. the Dovrefjell resumes the S. direction, and under different names, Lange-fjell, Fillefjell, Sognefjell, Hardangerfjell, etc., it covers the whole S. part of N., ending in Cape Lindesnes. The average height of the plateaux in the Kjøll is 2000 ft., and in the Dovrefjell and Langefjell 4000 ft. The highest peaks are—Dovrefjell and Suleitima, 6342 ft.; in the Dovrefjell, Sneslåtten, 8115 ft.; in the Langefjell, Skagstøistind, 8390 ft., and in the Fillefjell, Gousta, 6000 ft. The chief river, Glommen, after joining the Lougen is called Stor-Elven, forms the beautiful fall Sarpfossen, and falls into the Skagerrak.

Although agriculture, the rearing of cattle, sheep, and goats, and dairy-farming are carried on with great industry and perseverance, the chief sources of wealth which N. possesses are its timber, fisheries, and mines. The annual export of timber amounts to 300,000 lasts, having a value of nearly \$2,000,000. Still more important are the fisheries. They yield an annual revenue of \$3,000,000 or \$4,000,000. All the rivers teem with salmon and salmon-trout; rich oyster-beds are found all along the coasts; lobsters of the finest quality abound; the cod-fisheries of Lofoden give an annual return of 9000 tons of dried fish, beside 22,000 barrels of oil and 6000 barrels of roe, and the herring-fisheries along the S. W. coast yield annually between 500,000 and 600,000 tons of fish. Of the mines, the copper-works at Røraas, the iron-works at Laurvig, and the silver-mines at Kongsberg are the most remarkable; a return valued at from \$600,000 to \$800,000 is annually obtained from them. The only branch of manufacturing industry which is developed to some degree of perfection and extensively carried on is ship-building. The Nor. merchant fleet consisted in 1881 of 7977 ships, with a tonnage of 1,520,404, and manned by 60,064 sailors.

The earliest hist. of the Nor. people has 2 salient points—the colonization of Iceland in 974, with the visits to Vinland, and the conquest of Normandy in 912; but beside these 2 great and striking events its domestic hist. and the hist. of its daily intercourse with its neighbors have no gen. interest. From 1387 to 1814 it was united to Den., from which it received very little attention. In 1814 Den. was compelled to cede N. to Swe., thus paying Eng.'s and Rus.'s debt to Bernadotte for his treachery to Napoleon. The Nors. protested in a dignified and determined manner against being disposed of in such a summary manner, the result of which protest was that N. to-day is not a prov. of Swe. but an independent kingdom, enjoying a free and liberal const. The lang. differs from the Dan., partly in its vocabulary, which is purer, more powerful, and more impressive; partly in its style, which is shorter, more compact, and more emphatic; but the difference is very slight. The dramas of Bjørnson and Ibsen have been performed in Dan. theatres by Dan. actors, without the alteration of a word.

**Norway**, on R. R., Oxford co., Me., 42 m. from Portland. Pop. 1870, 916; 1880, 1467.

**Norwich**, a large, old, and prosperous, but rather indifferently built town of Eng., the cap. of the co. of Norfolk, on the Wensum, near its junction with the Yare. It has several interesting buildings, among which is the cathedral, built in 1094; large manufactures of worsted, silk, and cotton fabrics, and a lively export and import trade. Pop. 87,843.

**Norwich**, city and R. R. centre, one of the caps. of New London co., Conn., at the head of the Thames River, 15 m. from L. I. Sound; has immense water-power, furnished by 3 streams which make up the Thames, and extensive manufactures. In 1870 the city included the tp. Pop. 1870, 16,653; 1880, tp. 21,143, including 15,112 in city.

**Norwich**, R. R. centre, cap. of Chenango co., N. Y., on the Chenango River and Canal, has extensive manufactures. Pop. tp. 1870, 5601; 1880, 5756.

**Norwood** (THOMAS MASON), b. in Talbot co., Ga., Apr. 26, 1830; received an academic education at Culoden, Monroe co., and grad. at Emory Coll., Oxford, Ga., in 1850; was admitted to the bar in Feb. 1852; opened an office at Savannah in Mar. 1857; was a member of the State legislature from Chatham co. in 1861-62; was alternate elector for the State at large on the Seymour and Blair ticket in 1868, and was elected to the U. S. Senate for 6 yrs. from Mar. 4, 1871. His seat was contested by Foster Blodgett, but was finally awarded to Mr. N. Dec. 19, 1871.

**Nose-Bleed** (technically, *epistaxis*). It is usually due to a ruptured vessel of small size on the mucous surfaces of the nostrils. It may occur where the nostrils have been thinned or eroded by the bad habit of picking the nose, by the erosion of the surface by catarrhal ulceration, or by a determination of blood to the head, inducing rupture of a vessel. The latter occurrence is the result of a too full habit, an excited circulation as in active children, or from excitement, violent exercise, or overheating by the sun, and of hypertrophy and dilatation of the heart. N.-B. also results from blows on the nose. It occurs in typhoid fever and other low diseases, where the blood is depraved. N.-B. is to be checked by rest on the back, cold to the nose, the use of cold water, tannin and cotton in the nostrils; when severe a physician should be called to plug the nostrils from the mouth.

**Nostradamus**, whose true name was MICHEL DE NOTREDAME, was b. Dec. 14, 1503, at St. Rémi, in Provence, of Jewish parents; studied med. at Avignon and Montpellier, and settled as a phys. first at Agen, in the present dept. of Lot-et-Garonne, and afterward at Salon, near Aix, where he d. July 2, 1566. He was a good phys., but his immense fame was built on his capacity as an astrologer. In 1555 he pub. his *Prophéties*, written in quatrains, and giving

in an obscure and enigmatical manner prophecies concerning the coming centuries.

**Nostrils, Discharges of.** The most common is catarrh. Nasal catarrh is produced by cold air, by insuflating dust, or by irritants. It is the beginning of many cases of laryngitis and bronchitis. It is the chief catarrhal condition in influenza, in which disease catarrh extends through the nasal ducts to the eyes, the Eustachian tubes to the ears, and into the frontal sinuses. Simple recent nasal catarrh produces a watery, alkaline serum. When more pronounced the catarrhal flow is less serous, contains mucous corpuscles, and is viscid or even tenacious—is yellowish and purulent in color. Chronic catarrh may result in constriction of the anterior nares, in the development of exuberant granulations, and polypus. In the posterior nares, by extension to the throat, it more often results in permanent or obstinate naso-pharyngeal catarrh. Such chronic catarrh may give rise only to habitual coughing and hawking of mucus, but it often impairs the hearing by tumefaction at the aperture of the Eustachian ducts or by extension to the middle ear. Nasal polypus is an attached tumor in the nostrils, originally a small projecting mass of granulations or enlarged glandular tissue. When chronic nasal catarrh has resulted in ulceration and death of the cartilages or bones of the nose, the discharge is often offensive, and is known as *ozæna*. Close examination will discover particles of necrosed matter. *Ozæna* is more often the result of nasal catarrh in strumous, tubercular and syphilitic persons. Epistaxis or nose-bleed (see NOSE-BLEED) is the result of local causes. The catarrhal diseases of the nostrils are treated by topical applications, inhalations, and sprays. *Ozæna* demands the insuflation or injection of antiseptic washes, or the surgical removal of dead bone. Polypus is removed by cutting or tearing. E. DARWIN HUDSON.

**Notary Public.** This is an officer known to all civilized nations, and who existed under the rules of the civil or Rom. law. His prin. duties are to protest bills of exchange and to make such other protests or declarations as accord with the usage of merchants. Other duties are frequently added by statute, such as to demand payment of promissory notes and to make protests in case of non-payment, so as to charge indorsers, to administer oaths or affirmations, and to take acknowledgments of deeds or other instruments. The term "protest," as here used, means an official declaration by the N. of the existence of a fact connected with the performance of his duties. This certificate, when authorized by law, is in gen. presumptive evidence that the facts certified to took place. Thus, a "protest" of a foreign bill of exchange for non-acceptance or non-payment is sufficient evidence on the trial of an action to charge the drawer or indorsers.

**Notation** [Lat. *notatio*], **Mathematical**, is a conventional method of representing quantities and operations by means of symbols. It explains the meaning of individual symbols, both of operation and of quantity, and shows how to combine them so as to express in the simplest manner every mathematical operation. A simple and comprehensive system of N. is essential to the progress of every science, but in no branch is a complete system more necessary than in math., and in no branch has there been a greater diversity of systems proposed. Our present system is the result of the labors of many men, living in different ages, speaking different langs., and possessing different habits of thought; from these diverse sources a mathematical lang. has sprung up, defective in many respects, but yet sufficiently simple and copious for most of the purposes of analysis and investigation. The advantage of a judicious method of N. may be seen from a comparison of the 3 systems of arithmetical N. explained in the extended original article on this subject in *J.'s Univ. Cyc.*

W. G. PECK.

**Note Engraving.** See ENGRAVING, BANK-NOTE.

**Notornis.** Among the bones of extinct birds found in New Zealand by Mr. Mantell were some of a bird of about the size of a fowl, which Prof. Owen named *Notornis*. Subsequently Mr. Mantell obtained the skin and bones of a bird recently killed, which proved to belong to the same species as the semi-fossil bones. The N. appears to belong to the Rallidæ or rall family, approaching nearest to the coots, but differing from all its known relatives, and singularly agreeing with the other anc. birds of New Zealand in the feeble structure and small dimensions of the wings. When shown to the natives, Mr. Mantell says, "No one had seen such a bird, but all agreed that it was the traditional *moho*, or *takahé*, which they had believed utterly extinct."

**Notre Dame**, on R. R., St. Joseph co., Ind., 1 m. N. of S. Bend, contains the Univ. of Notre Dame du Lac, the St. Joseph's Manual Labor School, and St. Mary's Acad. Pop. about 800.

**Notre Dame, School Sisters of**, founded in 1597 by Peter Fourier (1565-1640) and Alice Leclerc (1576-1622). In 1832 the order was restored; introduced in 1847 to the U. S., and received new papal confirmation.

**Notre Dame, Sisters of**, a R. Cath. sisterhood founded in 1804 by Julie Billiart (1751-1816) and by J. D. Varin, a Fr. Jesuit; have houses in the U. S. Another congregation of this name has its mother-house at Namur, and has houses in the Pacific States.

**Notre Dame, Sisters of the Congregation of**, or **Congregational Nuns**, founded at Montreal in 1653 by Margaret Bourgeoys; found in Canada and the U. S.

**Nott** (ABRAHAM), b. at Saybrook, Conn., in 1767, grad. at Yale 1787; studied theol.; taught school in Ga.; was admitted to the bar at Camden, S. C., 1791; settled on a plantation on the Pacolet River; was M. C. 1799-1801; practised law at Charleston 1804-10, when he was elected a judge of the court of appeals, and retained that post until his death, June 19, 1830.

**Nott** (ELIPHALET), D. D., LL.D., b. at Ashford, Conn., June 25, 1773, grad. at Brown Univ. 1795, when he was



licensed to preach, and settled at Cherry Valley, N. Y., uniting the duties of pastor of a Ch. ch. with those of prin. of an acad.; was pastor of a Ch. ch. at Albany 1798-1804, acquiring celebrity as a pulpit-orator, especially by a sermon on the death of Alexander Hamilton; was elected pres. of Union Coll., Schenectady, N. Y., 1804, retaining that post more than 60 yrs., until his death. He acquired a considerable fortune by several inventions in stoves and other apparatus for warming buildings, and gave large sums for the endowment of Union Coll. and the foundation of scholarships for poor students. Among his writings are *Counsels to Young Men* and *Lectures on Temperance*. D. Jan. 29, 1866.

**NOTT** (GUSTAVUS ADOLPHUS), M. D., b. in Columbia, S. C., was a younger brother of Josiah C. Nott; received the degree of M. D. from the med. coll. of S. C.; in 1839 was elected prof. of anat. in the med. dept. of the Univ. of La.; in 1848 was transferred to that of materia medica and therapeutics, and in 1849 made dean of the faculty; was a surgeon in the Confed. army. D. June 6, 1875.

**NOTT** (HENRY JUNIUS), son of Judge Abraham, b. in Union dist., S. C., Nov. 4, 1797, grad. at S. C. Coll. 1812; visited Europe; was admitted to the bar 1818; went again to Europe for his health 1821; was elected during his absence prof. of criticism and logic in S. C. Coll.; filled that post until 1834; wrote essays for the *S. Review*, and a series of humorous sketches, collected under the title *Nonelettes of a Traveller*; visited New York in 1837, where with his wife he embarked for Charleston, and both perished by shipwreck on the coast of N. C. Oct. 13, 1837.

**NOTT** (JOSIAH CLARE), M. D., brother of the preceding, b. at Columbia, S. C., Mar. 31, 1804, grad. at S. C. Coll. 1824, and in med. at Phila. 1827; was 2 yrs. demonstrator of anat. to Dr. Physick; commenced practice at Columbia; spent 2 yrs. in Europe studying med. and nat. hist. 1835-36; settled as a phys. at Mobile, Ala., where he established a med. coll.; was for a short time prof. of anat. in the Univ. of La. (1857), and removed to New York in 1868. Beside articles in med. journals and other periodicals, wrote *The Phys. Hist. of the Jewish Race*, *Types of Mankind*, and *Indigenous Races of the Earth*. D. Mar. 31, 1873.

**NOTT** (SAMUEL), D. D., brother of Dr. Eliphalet, b. at Saybrook, Conn., Jan. 23, 1754, grad. at Yale 1780; became pastor of the Congl. ch. at Franklin, Conn., Mar. 18, 1782, and filled that pulpit 70 yrs. until his death. He was prominent as a theological instructor, and was long the patriarch of the clergy of N. Eng. D. May 26, 1852.

**NOTT** (SAMUEL), son of the preceding, b. at Franklin, Conn., in 1788, grad. at Union Coll. in 1808 and at Andover Theological Sem. 1810; was ordained Feb. 6, 1812, as one of the first band of missionaries sent to India by the A. B. C. F. M.; returned on account of ill-health 1816; was a teacher in New York until 1822; pastor of a ch. at Galway, N. Y., 1823-29, at Wareham, Mass., 1829-49, after which he established and conducted until 1858 a private acad. at Wareham. The last 11 yrs. of his life were passed at Hartford, Conn. Author of *Sixteen Years' Preaching and Procedure at Wareham* and of *Slavery and the Remedy*. D. June 1, 1869.

**Nottingham**, town of Eng., the cap. of the co. of Notts, on the Leen, near its junction with the Trent. It has a large and handsome market-place, but is otherwise indifferently built. It has good educational and benevolent insts., and its manufactures of cotton and silk hosiery and of bobbinet and lace are most important. Its iron and brass works, its malting business, and its trade in corn and cattle are extensive. Pop. 186,656.

**Nottingham** (HENEAGE FINCH), D. C. L., FIRST EARL OR, son of Sir Heneage Finch, recorder of Lond., b. in Kent Dec. 23, 1621, ed. at Westminster School and Christ Ch., Ox.; studied law, and was called to the bar at the Inner Temple 1645; became atty.-gen. May 1670; lord keeper of the privy seal, with the title of Baron Finch of Davenport, Nov. 1673; lord high chancellor of Eng. Dec. 19, 1675; presided at the trial of Lord Stafford 1680; was created earl of Nottingham May 12, 1681, and d. in Lond. Dec. 18, 1682.

**Novaculite**, an argillaceous slate containing a large proportion of silica, compact and homogeneous, with a splintery fracture. It is valued for sharpening tools, and is known as whetstone, whetstone, honestone, and oilstone.

**NOVA SCOTIA** [Lat. for "New Scotland"], a prov. of the Dominion of Canada, consisting of the peninsula of N. S. with the island of Cape Breton and numerous small islands adjacent to the mainland; also Sable Island, 85 m. from the mainland. N. S. proper extends 280 m. from N. E. to S. W., is from 50 to 120 m. wide, and is joined to N. B. by an isthmus, which at its W. extremity is only 13 m. wide. The coast-line measures over 1200 m., and is everywhere broken into deep bays and noble harbors. Total area, 20,907 sq. m.

The formations from the Laurentian to the Carboniferous prevail, but are much broken by dikes of unstratified rock. Ranges of low hills extend lengthwise through the country. The valleys are fertile, the hill-country is often rocky and poor. Among the mineral products are bituminous coal, oil-shales, iron, gold, gypsum, and fine sandstone for building purposes and for grindstones. The N. S. gold-field occupies fully  $\frac{1}{4}$  of the area of the prov. The country is heavily timbered, and forest products are shipped extensively to G. Brit. Ship-building is an important industry. The waters, salt and fresh, teem with fish. The influence of the Gulf Stream renders the winters rather milder than those of Que., but the coasts in winter are often enveloped in fogs and rain-clouds.

The people are in part descendants of the old Acadian or Fr. colonists. Another part are descended from early colonists from G. Brit. and Ire. At the time of the Amer. Revolution a great number of loyalists emigrated to the prov. from the U. S. There are some 1400 Micmac and other Indians, who are peaceable and partly civilized.

N. S., with N. B. and a part of Me., once constituted the Fr. colony of Acadia (*Acadie*). During the wars between

the Fr. and Eng. the Acadians were more than once mostly expatriated. The final cession of N. S. to G. Brit. occurred in 1718, and the third and most nearly complete expatriation of the Fr.-speaking colonists took place in 1755. In 1763 Cape Breton, taken from the Fr., was annexed to N. S. It was detached in 1784, and reannexed in 1819. Prince Edward Island was separated in 1770, and N. B. in 1784. N. S. joined the Dominion in 1867, though a strong party opposed the union. Pop. 1881, 440,572.

**Novatian** [Lat. *Novatianus*], sometimes called the first false pope, founder of the rigorous Puritanic sect called Novatians. In 251 he was persuaded by Novatus from Carthage to be made bp. in opposition to Cornelius. Socrates (*Hist. iv*, 28) says he suffered martyrdom in the reign of Valerian (253-260 A. D.). The sect spread E. and W., and continued till after 450 A. D.

**NOVA ZEMBLA**, a group of islands situated in the Arctic Ocean in lon. 52° E. and lat. 71° N., and belonging to Rus. They are uninhabited, but visited during the summer by whalers and hunters of bears and reindeer.

**Novel**, in the Eng. lang., means any fictitious prose narrative which pretends to describe real life, past or present, while "romance" is generally applied only to narratives of a more or less fantastic character. In the other European langs. the distinction between the 2 terms is another, "novel" meaning simply a small romance, a short, light tale of an every-day character.

**November** [Lat. from *novem*, "nine"] was formerly the 9th month in the yr., but in the present or Gregorian yr. (N. S.) it is the 11th month.

**Novi-Bazar**, one of the 7 sanjaks of prov. of Bosnia.

**NOVUM ORGANUM** (i. e. "new instrument" or "new method"), the name given by Bacon to his great work treating of the proper mode of studying nature in order to extend the dominion of man over the inanimate world. Bacon's great aim was to recall the minds of men from what he deemed the vain and useless speculations of the anc. philos. to the pursuit of the practical and useful. In order to present the different points of his subject in a manner at once comprehensive and striking, he has given them in the form of aphorisms.

**NOYES**, noiz (EDWARD FOLLANSBEE), b. at Haverhill, Mass., Oct. 3, 1832, grad. at Dartmouth in 1857, and removed to Cin., graduating in 1858 from the law school there. The outbreak of war in 1861 found him successfully engaged in the practice of his profession, but abandoning law he turned his office into a recruiting head-quarters, and in July 1861 the 39th O. Inf. was organized with N. as its major; a yr. later he was promoted lieutenant-col., and Oct. 1, 1862, became col. of his regiment, which he led until July 1864, when he was incapacitated from further active field-service by the loss of a leg; was assigned to the command of Camp Denison, which position he held until Apr. 22, 1865, when he resigned. The brevet of brig.-gen. was bestowed upon him for gallantry. In Oct. 1866 he was elected probate judge of Hamilton co., and in 1871 gov. of O. on the Rep. ticket. Minister to Fr. 1877-81.

**NOYES** (JOHN HUMPHREY), b. at Brattleboro', Vt., Sept. 3, 1811, grad. at Dartmouth in 1830; studied theol. at New Haven; founded in 1838 a community at E. Poultney, Vt.; removed in 1847 to Lenox, Madison co., N. Y., where he established the Oneida Community, and subsequently a branch at Wallingford, Conn.; author of various works sustaining his peculiar views.

**NOYES** (JOSIAH), M. D., b. in N. H. about 1780, grad. at Dartmouth 1801; was tutor there 1801-03; studied med.; became prof. of chem. and pharmacy at Fairfield Coll., and on the organization of Hamilton Coll. became prof. of chem. and natural science till 1830. D. Nov. 1, 1863.

**NOYES** (WILLIAM CURTIS), LL.D., b. at Schodack, N. Y., Aug. 19, 1805, was admitted to the bar 1827; practised in Oneida co.; removed to New York 1838; was engaged in codifying the laws of the State of N. Y.; was prominent as a Whig and as a Rep.; was a member of the Peace convention of 1861, and chosen pres. of the N. Eng. Society the day before his death. He bequeathed his valuable law library to Hamilton Coll. D. Dec. 25, 1864.

**Nubia**, the *Ethiopia* of the Romans, and the *Cush* of the Bible, a terr. of N. E. Afr., bounded N. by Egypt, E. by the Red Sea, S. by Abyssinia, and W. by Darfour and the desert of Sahara, and belonging to Egypt since 1821, when it was conquered by Ibrahim Pasha. The surface presents a series of elevated plains, forming terraces on which the Nile descends from Abyssinia to Egypt, and which on both sides are framed in by low mt.-ranges, which respectively separate N. from the Red Sea and from the desert of Sahara. The soil is not very rich, the climate is extremely hot, though not unhealthy, and the ground is cultivable only in the valley of the Nile, which here is considerably narrower than in Egypt. The products are the same as in Egypt, only that here the giraffe and several species of antelopes and birds which belong to the central plateau of Afr. are found. The inhabs. form a mixed pop. of negroes, Arabs, and descendants of the old Ethiopians. The transit trade in the products of Central Afr. is very important.

**NUGENT** (GEORGE NUGENT GRENVILLE), BARON, b. at Buckingham Castle, Eng., Dec. 30, 1788, ed. at Ox.; entered Parl. in 1812; pub. a poem on the Eng. campaigns in Port.; was an active promoter of the Reform Bill for yrs. before its passage; became a junior lord of the treas. in the Whig administration of 1830; lord high com. of the Ionian Islands 1839-35; pub. *Memorials of Hampton and Lands Classical and Sacred*; was again in Parl. in 1847. D. Nov. 26, 1851.

**Nullification** [from the Lat. *nullifico*, used with *mutatio* by Tertullian]. This word acquired no settled rights in the Eng. lang., I believe, until it was applied to denote the so called right of a State or group of States in our Union to declare a law of Cong. unconstitutional, and to refuse to be bound by it. An act of Cong., passed with the President's assent, or by  $\frac{2}{3}$  of both houses without his as-



sent, is a law of the U. S., unless the supreme court decides it to be unconstitutional. Thus, there are 4 constitutional powers which can possibly act on a law—the House of Reps., the Senate, the President, and the court. To these the doctrine of nullification added a fifth—namely, a State or group of States, opposed to the law thus passed and confirmed under the const. And yet this instrument the judges in every State are bound to obey, anything in their const. and laws to the contrary notwithstanding. And not only this, but all executive and judicial officers of the several States are bound by oath to support the const.—that is, the const. as interpreted by the supreme court of the U. S.

As early as 1798 the Ky. resolutions declared that the gov't. created by compact between the States was not made the exclusive or final judge of the powers delegated to itself, but that each party in a compact has an equal right to judge for itself, as well of infractions as of the mode and measure of redress.

In Nov. 1832, in Gen. Jackson's second term of Presidency, a convention in S. C. declared the existing tariff null and void, and "no law, nor binding on this State, its officers and citizens." Gen. Jackson responded to this and subsequent measures by giving orders to the collector at Charleston to employ revenue cutters to protect against the State authorities vessels with cargoes liable to pay duties. In Dec. 1832 he sent to the houses his long State paper against N. The position taken in this paper crushed for the time the doctrine of N., which blossomed, after nearly a generation, into secession. "The constitution," he says, "forms a government, not a league. Each State has parted with so many powers as to constitute, jointly with the other States, a single nation, and cannot from that time possess a power to secede, because such secession does not break a league, but destroys the unity of a nation"—words which, if fully believed, would have saved the nation, and above all the South, from untold evils.

**Numantia**, an anc. city of Sp., the cap. of the Celtiberian Arevaci, was situated on the Douro, near the present Soria in Old Castile, and became celebrated on account of the valor with which it defended its independence against the Romans. It was taken 134 b. c. by Scipio the Younger.

**Numa Pompilius**, the successor of Romulus, reigned from 715 to 672 b. c. All the ecclesiastical insts. of the Romans were ascribed to him, and he also improved the social and political insts. of Rome.

**Number** [Lat. *numerus*]. Abstractly considered, number is the measure of the relation between quantities of the same kind; in this sense it is identical with the term *ratio* or *quotient*. Technically considered, it is a single thing, or a collection of things of the same kind; it is in this sense that the term is generally employed in math. By an extension of meaning always permissible in mathematical terms, the term *number* is made to include 0,  $\infty$ , and also all *surd*s; we use the term in its extended signification in this article.

The thing taken as the basis of the collection is called a *unit*. If the logical character of the unit is specified, the N. is said to be concrete; if the nature of the unit is not specified, the N. is said to be abstract; thus, 7 *feet* is a concrete N., and 7 is an abstract N. So far as arithmetical computation is concerned, there is no difference between concrete and abstract N., provided we omit the name of the unit. The only difference in the final result is one of interpretation. Thus, if we have to multiply 7 *feet* by 5 *feet*, we neglect the name of the unit and multiply 7 by 5; we then take into account the nature of the concrete factors and interpret the result as 35 *square feet*. As the value of the unit of a N. is in a measure arbitrary, we may, if we please, transform any given N. into an equivalent one having a different unit; thus, the number 200 may be regarded as 20 *tens*, 2 *hundreds*, or as 400 *halves*. A great portion of arithmetical operations is concerned with such transformations, which are known under the gen. name of "reduction." In treating of N. we regard the unit 1 as the primary base of the collection, in which case fractions are to be regarded as collections of equal parts of that base; thus, the fraction  $\frac{2}{3}$  may be regarded as a collection of 3 units, each equal to  $\frac{1}{3}$ , and  $\frac{4}{5}$  lb. may be regarded as a collection of 5 units, each equal to  $\frac{1}{5}$  lb. The same principle enables us to express a number partly in terms of one unit and partly in terms of another, giving rise to compound and mixed N.; thus, the expression £4 12s. is a compound N. made up of 4 units, each equal to £1, and 12 units, each equal to 1s.; the mixed N.  $83\frac{1}{2}$  is composed of 3 units, each equal to \$1, and 2 units each equal to  $\frac{1}{2}$ . From this point of view we may regard every simple N., whether abstract or concrete, as a species of monomial in which the unit of the N. corresponds to the literal part of the monomial; we may also regard compound and mixed N. as species of polynomials. Thus regarded, all kinds of N. become subject to the algebraic rules for treating monomial and polynomial expressions.

**Numbers, Book of**, so called because it contains an account of the second census of the Hebs. It also contains an account of a third census, 38 yrs. later, and portions of the Mosaic Law. It is the fourth book of the Pentateuch and of the O. T. Its contents treat largely of the hist. of the tribes in the journey through the wilderness.

**Numerals** (Lat. *numerus*), the characters by means of which we express numbers. In the common system the N. are 1, 2, 3, etc.; in the Rom. system the N. are I, V, X, etc.

**Numerator**, that term of a fraction which indicates the number of fractional units that are to be taken. In a common or vulgar fraction the N. is the number written above the horizontal line; in a decimal fraction it is the number that follows the decimal point.

**Numerical**. The term *numerical* in analysis stands opposed to the term *literal*; it implies that the quantities considered are expressed by figures and not by letters. A *N. equation* is an equation in which all the quantities except the unknown or the variable quantities are N. The *N. value*

of an expression is the result obtained by assigning N. values to all the quantities which enter it, and then performing the indicated operations.

**Numidia**, numid'ea, a part of the N. coast of Afr., corresponding nearly to the modern Algeria. It was inhabited by the Moors, the ancestors of the modern Berbers, and it was divided between many different tribes. By the help of the Romans, as a reward for his support in the wars against Carthage, Massinissa united the tribes and established an empire, several of whose rulers became famous in the Rom. hist. In 46 b. c. N. was made a Rom. prov.

**Numismatics** [Gr. *νόμισμα*, "coin"] comprehends all about coins; as such it deals with stamped pieces of metal of known weight and authoritative issue. It has been usual to divide coins for purposes of study into—(1) *Ancient*, from their earliest existence in the 7th century b. c. to the deposition of Romulus Augustulus (A. d. 476); (2) *Medieval*, from this period to the Ref. (A. d. 1517); (3) *Modern*, from the Ref. to the present time. *Ancient* coins are classed under (1) Gr., (2) Rom., (3) Græco-Oriental or Byzantine. The Gr. are unquestionably the most important. Gr. coins are found in Europe in Sp., Gaul, Brit., It., Sic., Thrace, Macedonia, Thessalia, Attica, Bœotia, and the Peloponnesus; and in Asia in Ionia, Phrygia, Lydia, Caria, Cilicia, Phœnicia, and Egypt. Maritime states are often denoted by dolphins and other fish; rivers, like the Achelous, by bulls with human heads. The material of coins is gold, silver, bronze, electrum, an alloy (sometimes natural) of silver with gold, or potin or billon, bronze or copper washed with silver. Inscriptions on Gr. coins are generally in the genitive, on Rom. and Oriental in the nominative, the word *νόμισμα* ("coin") being in the first case understood. The finest period of Gr. art scarcely lasts longer than from b. c. 460 to b. c. 390, and is nearly coincident with the best period of sculpture. In weight, Gr. coins are generally very accurate, but different countries and towns preferred the different standards of the Phœnician, Agineta, or Attic talent.

In point of art there is nothing noticeable in those of Sp., Gaul, or Brit.; but in the first the elder have some interest, as retaining the old Celtiberian alphabet and a few words of the Basque lang. British coins are copied from those of Gaul, and these again from the types of Philip of Macedon, but none of these are probably earlier than b. c. 250. In It. we find magnificent specimens of the Gr. colonial coinage at Heraclea, Metapontum, Neapolis, Pandosia, Tarentum, Terina, Thurium, and Rhegium; of very early types at Caulonia, Croton, Pæstum, Populonia, and Sybaris; of the anc. mode of writing, from right to left, on some of the earliest; and of the use of the digamma at Heraclea. The Samnite coins point to a confederacy of states and give examples of Oscan characters. The finest coins of Sic. are in like manner colonial, with some resemblance to those of It., the earliest ascending in date to b. c. 490 or 480. The most usual type is that of the chariot. Connected with Sic. are some very fine coins bearing Phœnician inscriptions, sometimes attributed to Carthage.

Proceeding to Gr. proper, we find very early and beautiful specimens of Gr. art at Abdera, Egnos, and Thasos, and in various towns of Macedonia and its neighborhood. The types in many cases refer to old and well-known myths. Two remarkable coins exist of Geta, king of the Edoni. Of Philip and Alexander the Great coins abound in gold and silver, but are less frequent in bronze, the former being of good art, and the latter confirming the extent of his conquests; while those of Lysimachus, king of Thrace, are noteworthy for the portrait they exhibit of Alexander himself, with the symbols of the Young Ammon. Thessaly exhibits some good specimens in the money of Larissa, with some resemblance in fabric to those of Sic., and Epirus offers the beautiful series from Ambracia, with the noble head of its king, Pyrrhus, treated as the Jupiter of Dodona. Corcyra, Acarnania, Ætolia, and Locri are also well represented, and in Bœotia we find a series of remarkable archaic coins. Athens naturally affords the largest series of Gr. coins, but her money has no artistic merit; some specimens are as early as b. c. 500. Those of the adjacent island of Ægina are very interesting from their antiquity. In the Peloponnesus the series of the money of Corinth claims especial attention from its great extent and long-preserved excellence. Achaia records its celebrated league, and Sicyon is justly famous for the beauty of its money. At Elis we find the digamma on early types, and a magnificent series of the finest period. With these may be ranged scarcely less noble specimens from Trazene, Arcadia, and Stymphalus. Sparta naturally records her famous ruler, Lycurgus, though on a late copper coin. Mantinea and Heræa have good archaic types. Of the islands, Crete takes the lead. Over the islands of the Archipelago we need not linger, though some of the coins of Tenos are fine, while Cyprus has an Oriental alphabet only slowly yielding to the decipherer.

Asia Minor to the N. has little of interest, excepting one magnificent head of Mithridates VI. of Pontus; in Mysia, we have, however, a unique series of *electrum* coins, called *staters* of Cyzicus, with other splendid trophies of Gr. art, in the money of Cyzicus, Phocæa, and Pergamus. Ilium in Troas naturally records its local traditions. Lydia comes next, with its rude and archaic gold coins; then comes Ionia, with its great series of Smyrna and Ephesus, and the noble coins of Clazomenæ. Magnesia records its river by the type of a bull butting within the pattern, hence called "Meander." Early coins of Phocæa exhibit the seal, whence its name; and Chios, Samos, Calymna, and Cos many very early and curious specimens. The coins of Rhodes have an importance of their own, confirming the statements of hist. On the opposite coast Lycia and Pamphylia afford a remarkable series. In Pisidia we have curious locally inscribed coins. Phrygia offers several coins of interest of the imperial times with local myths, and Cilicia some remarkable coins inscribed with Phœnician characters. There are also some interesting types at Tarsus, bearing legends similarly

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written. These, and the types prevailing along the coast of Syria, might perhaps best be termed Græco-Oriental. With the well-known series of "Antiochia ad Orontem," of the Seleucid kings of Syria, of the Ptolemies in Egypt, and of Cyrene in Afr., we close our notice of the Gr. series. The native coins of Carthage and Judæa must be called Oriental.

The second great subdivision of N., the Rom., commences about 230 or 240 A. C. with a massive copper coinage, termed "as grave." The leading types of the Rom. as are the "Janus bifrons" and the prow of a galley. Other and similar coins were struck in the adjacent towns of Etruria and in Umbria and Apulia. All were on Gr. models. About A. C. 170 gold, silver, and copper coins were issued by various Rom. families, who were permitted by the state to strike coins, and with Julius Cæsar commenced the Imperial series, which lasted, as we have stated, till A. D. 476. The main characteristic of Rom. art is individuality as opposed to idealism; faithful portraiture, with a remarkable permanence of religious types on the reverses. Many historical events are recorded on them. Beside the regular coins, the Romans had also what are termed *medallions*, which in some degree resemble modern *medals*, and *contorniates*, which were probably tickets of admission to the theatres or games. Chr. types, as the *labarum* or standard bearing the cross, are found from Constantine downward, and on one of Vetrans are seen the celebrated words, "*Hoc signo victor eris*." The third, or Græco-Oriental series, mainly consists of the coinage of the Byzantine emps., to the capture of the city by the Turks in 1453. The Byzantine series is generally supposed to commence with Anastasius in A. D. 491. The inscriptions on it are at first in Lat., thence continuously in Gr., its varying orthography showing the change of lang.

Over the remaining leading divisions of N., the mediæval and the modern, it is not necessary to detain the reader very long. It is necessary to state, generally, that the early mediæval types are a barbaric imitation of the Rom., their art being progressively worse as they were removed farther and farther from It. In the middle of the 15th century medals, in our sense of the word, begin, and hold an important place in the art of It., and subsequently of Fr. and Hol. The art of engraving medals is strictly comparable with the painting and sculpture of the same period. The last great series of medals issued are those recording the victories and other achievements of Napoleon I. [From orig. art. in *J's Univ. Cyc.*, by W. S. W. VAUX, F. R. S.]

**Nunda**, on R. R., Livingston co., N. Y., 60 m. E. of Buffalo, has an acad. Pop. 1870, 1880; 1880, 1037.

**Nürnberg** [Ger. *Nürnberg*], town of Bavaria, on the Pegnitz, was once the wealthiest and most important of the free imperial cities of Ger. Of all Ger. cities, it is the most interesting and characteristic with respect to its arch.; its streets look like incarnations of mediæval legends. The houses face the street with their gables, and balconies profusely ornamented with carvings in stone or wood overhang the sidewalks. Of its many remarkable buildings, the most striking are the ch. of St. Sebald, a Gothic structure, with paintings by Albert Dürer, and the famous tomb of St. Sebald executed in bronze by Peter Vischer; the town-hall with subterranean dungeons and torture-chambers; the castle, and the ch. of St. Lawrence. The prin. manufactures of N. are carvings in wood, bone, and metals, children's toys and dolls, lead pencils, chemicals and ultramarine, looking-glasses, watches, carriages, and machinery. Its trade is very extensive. Pop. 99,519.

**Nurse**, a popular name for several sharks; e. g. on some parts of the N. Eng. and colonial coasts it is applied to the *Somniosus microcephalus*; in Fla., Jamaica, etc., to the *Ginglymostoma cirratum*; and in Australia to the *Cestracion Philippi*, the box or Pt. Jackson shark, a remarkable fish of the Pacific.

**Nusaliéh, Ansyeerh, or Ansonians**, the name of a Mohammedan sect which adopted various Jewish, Chr., and Pagan ideas. They inhabit the lower Ansyeeran mtn-range between Lebanon and Antioch in Syria. They are ignorant, superstitious, and thievish, but hospitable and communicative. Their prophet, Nusair, taught that God had appeared 11 times in human form—in Abraham, Moses, Jesus, Mohammed, Ali, and the other imams—and would appear once more in Mahdi or Messiah. He also taught the transmigration of souls. Those who neglect their religious duties, and especially those who betray their religious secrets, are transformed into Jews, Mohammedans, Chrs., or animals.

**Nutcracker**, a name applied to *Nucifraga columbiana*, a bird of the Pacific States, and to *N. caryocatactes*, its European and Asiatic representative. They are of the crow family, and approach the jays in habits. The Old-World species nests like the woodpecker.

**Nutgalls**. See GALL-NUTS, GALLS, GALL INSECTS, and GALLOTANIC ACID.

**Nuthatch**, a genus (*Sitta*) of birds of the family Paridae, of which there are many species found in various parts of the world. The typical species is *Sitta Europæa*. The U. S. have *S. carolinensis* (white-breasted N.), *S. canadensis* (red-bellied N.), etc.

**Nutmeg**, the kernel of the seed of *Myristica moschata*, and sometimes of *M. fatua*, trees which are natives of the E. Archipelago and belong to the order Myristicaceæ. The true N. is now successfully cultivated in India and tropical Amer. They are principally used as a spice in cooking, but are employed in med. They are aromatic and stimulant, with somewhat narcotic properties. The aril which surrounds the N. constitutes mace. They yield on pressure a half-solid fixed oil, called oil of mace from its peculiar flavor; they yield on distillation an abundant volatile oil which has exactly the flavor of the N.

**Nutria Fur**. See COYPE.

**Nut'tail** (THOMAS), b. in Yorkshire, Eng., in 1786; was brought up a printer; came to the U. S. in youth; devoted much time to botanical and ornithological studies; trav-

elled in nearly every State of the U.; explored the great lakes, the upper courses of the Mo. and Ark. rivers; crossed the country to Or., the S. I., and Cal.; wrote *The Genera of N. Amer. Plants*, *A Journal of Travels into the Ark. Terr.*, *A Manual of the Ornithology of the U. S. and Canada*, and *The N. Amer. Sylva*. N. was curator and lecturer at the botanic garden of Harvard Univ. at Cambridge 1822-28; returned to Eng. about 1841. D. Sept. 10, 1859.

**Nux Vom'ica** [Lat.], an important drug consisting of the seeds of the *Strychnos nux vomica*, a small tree of the natural order Loganiaceæ, growing in the coast-dists. of India. The seeds are gray, disk-shaped, a little less than an inch in diameter, and about a quarter of an inch in thickness. They have a very bitter taste and are exceedingly poisonous, both these qualities depending on the presence of 3 alkaloids—strychnine, brucine, and igasurine. Of these, strychnine is the most powerful and important.

**Nyack**, Rockland co., N. Y., on R. R. and the W. bank of the Hudson River, 28 m. from New York; has daily connection with New York by steamers, and with Tarrytown across the river by ferry. Pop. 1870, 3438; 1880, 3881.

**Nyan'za**, a gen. word in Afr. for large bodies of water, and especially applied to 2 great lakes in E. Equatorial Afr., the *Victoria N.*, or *Lake Kereia*, and the *Mwuta*, or *Albert N.* The *Victoria N.* is a large fresh-water lake between lat. 2° 31' S. and 0° 21' N. and E. lon. 31° 35' and 34° 45'. Its estimated area is 25,000 sq. m.; its height above the sea, 3808 ft., and its greatest depth, as far as known by soundings taken at its N. extremity, is 275 ft. About ¾ of its coastline has been explored, and is indented with small bays. Its prin. affluent is the river Shimiyy, which enters near the S. E. extremity. The source of the Shimiyy, and, as far as known, the remotest source both of the lake and of the Nile, is the Liwumba, a river which rises in a hilly country in about the 5th degree of S. lat., and a little E. of the 34th degree of E. lon. Eight other rivers flow into the *Victoria*, upon its E. side, and 5 enter it upon the W. and S. W. sides. The outlet of the lake is at its N. extremity. In about 33° 40' E. lon., and is known by the name of the White Nile. This outlet or river flows out of a bay called Napoleon Bay, and in the commencement of its course has a fall known as Ripon Falls, from whence it runs in a N. W. direction, entering a large sheet of water. From thence the river continues first N. E., thence N. W., and thence due E., until at Magunga it enters the Mwuta, or *Albert N.*, a large lake, the N. E. part of which is alone known. It is assumed that a river, the Bahr-el-Gebel, which is one of the W. branches of the Nile, is the outlet of this lake at its N. extremity.

The *Victoria N.* was discovered by Capt. J. H. Speke in 1858, upon the return of the expedition in which he and Col. R. Burton discovered Lake Tanganyika. In 1861 and 1862 Speke, together with Major J. A. Grant, explored the country lying W. of the lake until they reached the cap. of M'tesa, the king of Uganda, the country surrounding the N. W. part. They found the country W. of the lake hilly, well wooded, healthy, and exceedingly fertile, with low, swampy plains stretching as far as the eye could reach to the lake, interspersed with patches of water. In 1874 Col. Long reached the N. shore of the *Victoria*, and made a partial exploration of that vicinity. He afterward descended the White Nile, finding the large body of water or lake before referred to, and explored the river to the Karuma Falls, thereby proving its connection with Lake Mwuta (Albert N.). In 1875 H. M. Stanley succeeded in reaching the S. E. extremity of the *Victoria N.* from Zanzibar in the short space of 90 days, more than ¾ of the journey being through a country wholly unknown. He found the country E. of the lake in some parts mountainous, but consisting chiefly of level, well-watered, and fertile plains, stretching far inland, and in parts densely populated. The present opinion is that these 2 lakes are the prin. reservoirs of the Nile, and that the remotest source of that river is the Liwumba, before referred to, in 5° S. lat. [From orig. art. in *J's Univ. Cyc.*, by JUDGE CHARLES P. DALY, LL.D.]

**Nye** (JAMES W.), b. in Madison co., N. Y., June 10, 1815; became a lawyer and political speaker; was gov. of Nev. Terr. 1861-65, U. S. Senator 1865-73. D. Dec. 25, 1876.

**Nymphs** [Gr. *νύμφη*], in Gr. and Rom. mythology, a numerous class of inferior divinities, imagined as beautiful maidens, not immortal, but always young, inhabiting rivers and streams (naiads), forests and groves (dryads), etc.

## O.

**O**, a vowel, stands in Eng. for not less than 4 distinct sounds—those heard in *rove*, *nor*, *more*, *lore*; while *o* has as many as 3 sounds, as in *moon*, *book*, *blood*. In the digraphs *o* has various powers. As an abbreviation, *O*, stands for Ohio; *O* in chemical notation is the symbol of oxygen; on the mariner's compass it stands for east (orient).

**Oajaca**, wah-hah'kah, or **Oaxaca**, a state of the Mex. confederation, bordering on the Pacific and the Gulf of Tehuantepec. Area, 35,591 sq. m. Pop. 744,000, chiefly Indians. The surface is mountainous and the soil very fertile. Sugar, coffee, cotton, indigo, tobacco, and many varieties of fruits are grown. The forests yield excellent timber and different kinds of dyewoods. Minerals are found, especially gold and silver, and cochineal is produced. The climate is delicious and healthful.

**Oajaca**, or **Oaxaca**, town of Mex., the cap. of the state of Oajaca, is beautifully situated and well built. Its trade and manufactures are not important, but it has several good educational insts. Pop. 27,000.

**Oahu**. See HAWAIIAN ISLANDS.

**Oak** [A. S. *ac*; Ger. *Eiche*]. The oak family, or order Cupulifera (a part of the great order Amentacea), comprises the oak, the chestnut, the beech, and the hazel. Most of the trees are remarkable for their thick and rugged bark and



for the great abundance of tannin which it contains. They have large roots, penetrating deeply or extending far horizontally. The trunks are distinguished for their massiveness, and for the weight, strength, and, in most cases, the durability of their wood. Their branches are strong and irregular, and form a broad head. The buds are fitted for a climate with severe winters. The leaves are plane and alternate, and usually supported by a footstalk, at the base of which are 2 slender scales or stipules, which for the most part fall off as the leaf expands. The oak (*Quercus*) is found growing naturally in all parts of the N. temperate zone, and in all contributes to the subsistence of a great variety of animals. De Candolle, in 1868, described more than 280 oaks, of which 33 or 34 are found within the limits of the U. S. Several have since been found on the Pacific slope within the U. S.; Dr. Gray finds 16 in the N. U. S.

The oak is subject to the attacks of insects, causing a variety of galls, some kind being found in almost every part of the tree. The most important, known in commerce as gall-nuts, are exported in large quantities from Aleppo and other parts in the Levant. They are among the most powerful vegetable astringents known, and form the basis of many styptic and astringent meds. Galls contain a peculiar astringent principle called gallic acid, which strikes a deep purple color, gradually becoming black, with the soluble salts of iron. This property renders them a valuable dyestuff. They also form the basis of the common black ink. The bark of most species of oak contains abundance of tannin. That of the common black (*Quercus tinctoria*) is used for tanning and for dyeing. The bark of the cork oak of Sp. (*Quercus suber*) furnishes cork. Yet the great value of the oak is for its wood. With the exception of the teak tree, it makes the best ship-timber known, and for this purpose the Amer. white oak is perhaps equal to the Eng. oak, and surpassed only by the live-oak. It is almost indispensable in the manufacture of implements of husbandry and all kinds of wheel-work.

The oak is distinguished from all other trees by the acorn, for which the fruit of no other tree can be mistaken. The leaves of the commoner species are larger toward the extreme end; in some they are more or less deeply lobed, with rounded or blunt lobes; in others, toothed with large round teeth; in others, deeply cut, with the divisions terminating in a long, bristle-like point. The flowers of both sexes are on one plant; the sterile, disposed in long, slender, pendulous catkins, which are in groups; the fertile flowers, in a bud-like, scaly cup. The seed-vessel of the fertile flower is divided into 3 compartments or cells, in each of which are 2 embryo seeds; but only one in one of the cells comes to perfection, whence the acorn is a one-celled, one-seeded nut, surrounded at the base by the enlarged scaly cup. The acorns of some species come to maturity in a single season, but many of the Amer. species require 2 seasons to ripen. Few of them will germinate after having been kept a yr.

The rate of growth of the oak is very different in the different species. Slow in the early stages of its growth, it continues to make steady progress for many yrs., and requires 100 or 150 yrs. to come to perfection. Those species of oak most analogous to our white oak are known in Europe to continue to grow and flourish for centuries. Some are supposed to be 1000 yrs. old. For planting, the largest acorns should be selected. They should be sown as soon as possible and covered in light soil to the depth of an inch. The largest and most thriving plants alone should be selected for transplanting. They should be planted out at the age of 3, 4, or 5 yrs. It is safest to have pines, larches, or other trees intermingled among the oaks. [From orig. art. in *J's Univ. Cyc.*, by GEORGE B. EMERSON, LL.D.]

**Oak Apple.** See GALL INSECTS and GALL-NUTS.  
**Oakland,** city, cap. of Alameda co., Cal., 6 m. E. of San Francisco, with which it is connected by steamboat and rail. The city is divided into E. and W. O. by an estuary of San Francisco Bay. Pop. 1870, 10,500; 1880, 34,555.

**Oakland, Me.** See APPENDIX.  
**Oakley** (THOMAS JACKSON), LL.D., b. in Duchess co., N. Y., 1783, grad. at Yale 1801; became a lawyer at Poughkeepsie, N. Y., surrogate of Duchess co. 1810, M. C. 1813-15 and 1827-29, member of the N. Y. assembly 1815-16, atty.-gen. of the State 1819, judge of the superior court of New York 1828, and chief-justice 1846. D. May 12, 1857.

**Oak Park,** Ill. See APPENDIX.  
**Oan'nes,** the man-fish god of Babylonians, resembling Dagon of Philistines. He is said to have issued from Per. Gulf, and to have founded civilization of Lower Chaldaea. As represented by art. a man's head was under that of the fish, and a woman's feet were joined to its tail.

**Oasis** [from the Coptic word *ouahe*, a "resting-place," or simply an "inhabited place"] is a word now used as a gen. term denoting any cultivated or cultivable spot in a desert, but was by the anc. applied only to the 4 spots of this character found in the Libyan desert, along the Egyptian frontier. These 4 O. are—(1) O. Ammonia, the modern *El Siwah*, the first discovered, though the most distant from the Nile, 6 m. long, 3 m. broad, and containing the ruins of the temple and oracle of Ammon, and the Fountain of the Sun, whose waters are "warm in the morning and evening, but cool at noon." (2) O. Magna, the modern *El Kargeh*, 80 abounding in ruins of the Gr. Rom., and early Chr. period. (3) O. Parva, the modern *El Kargh*, 5 days' journey S. E. of *El Siwah*. (4) O. Trinytheos, the modern *El Dakleh*, containing several artesian wells. The hist. of these O. is very show that they must have been inhabited very early, and they are possessed by a vigorous tribe of Arabs subject to most noticeable. They are always formed by depressions in the surface, in which a layer of sand and clay is capable of retaining the water gathering at the bottom. Their soil

is often rich, and produces wheat, rice, maize, millet, dates, and other fruits, but as often it has a swampy character.

**Oat, or Oats** [from the A.-S. *ata*, "food"], a genus of grasses, *Avena*, containing many species, and generally characterized by having the spikelets in loose panicles, the glumes as long as the florets, the palea firm and almost cartilaginous, and the outer one of each floret provided with an awn, which is twisted at the base. The cultivated oat (*Avena sativa*) is an annual, and is characterized by a loose panicle, spreading on all sides, having 2 or 3 fertile florets in each spikelet, but not more than 1 floret awned. It is probably a development of the wild oat (*Avena fatua*) found in Europe, where it is considered a weed, and now wild in Cal., where it often spreads over large tracts of land and yields a good hay. The wild oat is characterized by having the inner palea and the grain covered with hair, and the outer palea provided with a very long awn, twisted near the base and bent in the middle. The oat is decidedly a N. plant, though it does not reach so far to the N. as barley. It succeeds best in the N. part of the temperate zone; when brought farther S. and raised under a hotter summer, it degenerates very rapidly. The weight of a bushel of Amer. oats varies between 30 and 35 lbs.; that of a bushel of Scotch oats, between 40 and 50 lbs. The awn or beard of all species of oat twists or untwists hygrometrically with varying humidity or dryness. This in some long-awned species, such as *Avena sterilis* (the animated oat), produces such free and active movement that it seems as if alive.

**Oates** (TITUS, alias AMBROSE), b. at Lond., Eng., about 1620; took orders in the Ch. of Eng.; professed conversion to Rom. Catholicism; became a Jesuit; resided some months in the colls. at Valladolid and St. Omer; returned to Eng. 1678, and gave information to the authorities of the existence of a "Popish plot" for the extirpation of Protestantism in Eng. The admitted zeal for Rom. Catholicism displayed by James, duke of York, and the suspected inclination of King Charles II. to the same faith, gave color to the charge. O. developed his testimony into a circumstantial account of the intended burning of Lond. and the shipping in the Thames, a massacre of Protts., and a landing of a Fr. army in Ire., adding that the pope had intrusted the govt. of Eng. to the Jesuits, that the chief offices of state had already been parcelled out among the great R. Cath. lords, that the king was to be assassinated, and that the queen was privy to the plot. An unexampled excitement was the result. The accused R. Caths. were put on trial Nov. 1678, and several were executed. After the execution of Lord Stafford, Dec. 1680, there was a revulsion of public sentiment. O. was convicted of perjury, sentenced to stand in the pillory 5 times a yr. in as many different towns during his life, to be whipped from Aldgate to Newgate, and thence to Tyburn, and imprisoned for life. After accession of William and Mary he was pardoned. D. July 23, 1705.

**Oaxaca.** See OAJACA.

**Ob, or Obi,** a river of W. Siberia, rises in the Altai Mts. within the Chi. dominions, and flows in a N. and N. W. direction, with a tortuous course of 2000 m., into the Gulf of Obi, an inlet of the Arctic Ocean on the N. shore of Siberia. The Ob receives from the left the Irtysh, which also rises in the Altai Mts. and joins the Ob 200 m. below Tobolsk. The Ob, navigable for more than 1600 m., forms the commercial highway between Chi. and European Rus.

**Obadiah,** one of the minor Heb. prophets, of whom we know absolutely nothing. His book, the shortest in the O. T., is a fragment denouncing the Edomites.

**Obelisk** [from the Gr. *obeliskos*, a "spit," applied to square monolith columns terminating in a pyramidal apex and placed on a pedestal before Egyptian doorways]. O. were called in Egyptian *tesen*, and capped (*ben-ben*) with gold, copper, or iron. The material of which they were made was limestone, basalt, red granite, or syenite, and their 4 sides inscribed with vertical lines of incised hieroglyphs recording the titles and merits of the person by whom dedicated and of the deity to whom they were sacred. Occasionally they were uninscribed, but they generally have 1, and often 3, lines of hieroglyphs on each side, beside pictures of the monarch adoring the deity on the apex and sides. O. were the prototypes of the triumphal columns of the Romans, and used for the same purposes, erected, it appears, at the temples only in honor of illustrious monarchs. None of the great O. are older than the 13th dynasty. From that period (1800 B. C.) to the time of Hadrian (A. D. 138) O. were in use. The proportions of these monuments were that the base was  $\frac{1}{10}$ th the breadth of the elevation up to the top of the apex, and the pyramid at the summit had the same height. They were placed upon bases also tapering from below and stood in pairs, one before each jamb of a doorway. The tallest remaining, that of the Lateran at Rome, is 105 ft. 7 inches high, and the shortest, that of the Florence Museum, 5 ft. 10 inches.

**Obelisk, in Central Park, N. Y.** The O. adorning our Central Park was quarried at Assouan, in Nubia, and brought down the Nile on immense rafts and set up at the famous city of Heliopolis, in Lower Egypt. It is of syenite, or, as the Fr. call it, rose granite, an exceedingly durable stone. From Heliopolis the Cleopatra monoliths were removed to Alexandria, after having stood before the Temple of the Sun at the former city for over 1000 yrs. So the queen had nothing to do with the O. that bear her name. "Cleopatra's needles" are a misnomer; they were set up at Alexandria in the 8th yr. of the reign of Augustus, or 23 B. C., 7 yrs. after the death of Cleopatra.

Heliopolis seems to have been literally a city of O., for it has furnished nearly all that were transported to Europe, and only one is now remaining where once stood this mighty city. These O. were usually erected to commemorate some important event in the life of the ruling king, and were always dedicated to the gods, so that their sacredness would prevent their overthrow. The park O. is dedicated to the Egyptian god Ra, or the Sun, as the hawk hieroglyphs at the



pyramidion, or the top of the shaft, indicate. The hawk, as flying the highest, and consequently nearest to the sun, and believed to have the faculty of gazing on the orb, was especially dedicated to the sun-god, or Ra, in the anc. Egyptian. The observer will notice, at intervals among the hieroglyphs, long oval figures, inclosing various hieroglyphical characters. These are the names of certain kings of Egypt. These ovals are called by Egyptologists "royal cartouches." They gave the first clue to the deciphering of the hieroglyphs, the name of Ptolemy Epiphanes being the first king's name that was phonetically made out. Now the names of all the kings or "pharaohs" of Egypt are known a long way back, anterior to the time of Moses, or before Abraham entered the land.

In 1877 the khedive of Egypt signified his wish to present an O. to the U. S. The cost of transporting it was about \$105,000, the whole of which was defrayed by Mr. William H. Vanderbilt. The entire control of the operation attending its removal was intrusted to Lieut. Commander Henry H. Goringe, U. S. N., who conducted the affair to a most successful termination from the moment he found the O. in a stonecutter's yard in Alexandria to its re-erection on its present site, a slight elevation in front of the Metropolitan Museum in Central Park in 1880.

ALFRED FLINCH.

**Ober-Ammergau**, a v. of Bavaria, beautifully situated on the Ammer, 46 m. S. W. of Munich, is celebrated for the performance, every 10 yrs., of a mystery representing the passion and death of Christ. The custom originated in 1634, when the pop. made a vow to this effect if the village escaped from the plague, which prevailed in the vicinity.

**Oberlin**, on R. R., Lorain co., O., 35 m. S. S. W. of Cleveland, is the seat of Oberlin Coll. Pop. 1870, 2888; 1880, 3242.

**Oberlin** (JEAN FRÉDÉRIC), b. at Strasbourg Aug. 31, 1740; early evinced a remarkable degree of benevolence; was ed. at the Strasbourg Univ.; was ordained to the Lutheran ministry; became in 1767 pastor of Steintal or the Ban de la Roche, a wild dist. in the Vosges Mts. Here, under his care, the desert soon began to blossom; deep ignorance was succeeded by general intelligence; moral darkness gave place to piety, pure morals, and improvement in industry and thrift. D. June 1, 1836.

**Oberlin College**, at Oberlin, O., was chartered Feb. 28, 1834, as Oberlin Collegiate Inst., which name it retained until 1850, when it was changed to Oberlin College. The plan was to establish a school for the liberal education of both sexes, encouraging students to assist themselves by manual labor. By 1835 there were theological, college, ladies', and preparatory depts., with the addition, since 1867, of a conservatory of music. In the dept. of philos. and the arts there are (1) the classical and scientific, or "college," course, and (2) the literary. The studies of the former are so arranged that after the freshman yr. the student can give a classical or a scientific character to his course by a system of elections. The literary course omits all the Gr. and part of the Lat. and math. The dept. of preparatory instruction embraces (1) a classical school with a 3 yrs.' course, and (2) an Eng. school. The productive endowment for the theological dept. is \$30,000; for the other depts. \$115,000. The long vacation has always been in the winter, to accommodate the large number of teachers among the students. Since 1835 no student has been rejected on account of his color.

**Obesity** [Lat. *obesitas*; synonyms, *Polysarcia*, *Corpulence*], an abnormal deposit of adipose tissue under the integument and around the viscera. The term should only be applied to those cases where the deposit of fat is so great as to incommode the patient. Among the causes of O. is *hereditary susceptibility*. Inactivity and sedentary occupations exert a very material influence over the production of fat, especially when combined with a rich diet. In women the predisposition to corpulence exists in the first yrs. of child-bearing, and again after the "change of life;" in men, between the ages of 40 and 60. The exciting cause is generally found to be malassimilation, due to some derangement of the digestive organs. We mostly find it in individuals who indulge in a rich diet, and especially if it contains fatty matters. Articles abounding in sugar and starch and alcoholic and malt liquors seem to favor the production of fat to no inconsiderable extent. Often fatty degeneration of the heart or liver coexists, and we then have the symptoms of these maladies superadded. In the treatment of O. alkalies internally and alkaline baths have long occupied a prominent place, and even now we hear phys. prescribing small doses of soda, potassa, etc., with a view to procure a saponification of the fat in the interior of the body. Such a course of treatment is simply ridiculous. The case of corpulence treated successfully which has gained the greatest notoriety is that of Mr. Banting. He adopted a regular course of dieting, in which there was an absence of fatty, starchy, and saccharine matters. This should be rigidly adhered to, and in addition no alcoholic or malt liquors should be partaken of. Above all other things, both body and mind should be exercised daily. [From orig. art. in *J.'s Univ. Cyc.*, by EDWARD J. BIRMINGHAM, M. D.]

**Oblates of Mary Immaculate**, a congregation of regular clerks, founded in 1815 by Bp. Mazenod of Marseilles. They visit the poor and the prisons.

**Oblate Sisters of Providence**, a sisterhood of the R. Cath. Ch., founded in 1825 at Baltimore.

**Obligation**. The ordinary meaning of this term in the common law is a bond containing a penalty; with a condition annexed for the payment of money or the performance of covenants. It is an instrument under seal, whereby a person binds himself under a penalty to do something. The meaning of the word *obligatio* ("obligation") in the Rom. law is much more comprehensive. In that system of jurisprudence it refers to the legal tie or bond which obliges to the performance of some act. According to Justinian, *Obligatio est juris vinculum quod necessitate adstringitur alterius solvenda rei, secundum nostre civitatis jura*. In other

words, it is the legal bond by force of which we are bound to perform an act according to the laws of the state. Such an obligation might arise either from the assent of parties according to prescribed forms, and constituting a contract, or from a delict (or wrong). This last signification of the word "obligation" sheds light upon an expression in the U. S. const., "the obligation of contracts." T. W. DWIGHT.

**Obligation of contracts**. The U. S. const. (Art. I. Sec. 10) contains a clause that "No State shall pass any law impairing the obligation of contracts."

I. *What are the Contracts embraced within the Prohibition?*—It has been decided that the following contracts are protected: All executory contracts between private individuals, whether express or implied; all grants, conveyances, and other executed contracts, whether of the State or of individuals, and charters of private corporations. The following conditions, relations, and arrangements are not contracts within the constitutional prohibition: Marriage; all arrangements which are political in their nature, and to which the State is a party; of these the most important are the charters of municipal corporations, public offices, licenses to carry on particular trades, statutory permission to sue the State, grants of authority to establish lotteries, and the like. It should be observed, however, that when the prior power to do so has been reserved by a State, it may to a certain extent interfere with contracts made while such reservation is in force.

II. *What is the Obligation of Contracts?*—The doctrine is now decided that the obligation includes the remedy given by law to enforce a contract, as well as the rights and duties of performance. The obligation is not simply what the parties have in terms agreed; it is the legal effect given to those agreements by the existing law applicable to the contract.

III. *What State Laws impair the Obligation of Contracts?*—All laws which can impair the O. of C. must apply either to the very terms of the agreements, or to the remedy by which they may be enforced. With the first class there is no difficulty. They are so plainly prohibited that they have seldom been enacted. In relation to the second class of laws, the following fundamental principles are now settled: Statutes which deal simply with the modes of procedure whereby the real remedy is obtained do not affect the obligation. Statutes which act upon the remedy itself and take away, diminish, or render it of substantially less value, do impair the obligation; but they are valid so far as they apply to contracts made after their passage. The franchises conferred upon a private corporation may be revoked or changed, provided the power to do so has been reserved in the charters or in the State const. or statutes.

JOHN NORTON POMEROY.

**Obolus** (Eichwald) and **Obolula** (Billings), small discoidal shells of the family Lingulidae among the Brachiopoda, so named from their resemblance in form to a small Gr. coin.

**Obolus** [Gr. ὀβολός, fr. ὀβεός, a "spit"], a Gr. coin, first made of iron and copper in the form of the head of a spit, but afterward struck of silver and in the ordinary round shape. The O. was 1/6 of a drachm, equal to 1/6d.

**O'Brien** (WILLIAM SMITH), b. at Dromeland, co. Clare, Ire., Oct. 17, 1803, son of a baronet of anc. lineage; ed. at Harrow and at Trinity Coll., Cambridge; entered Parl. for the borough of Ennis 1836. Though at first a Tory, he was returned in 1832 as an advanced Liberal for the co. Limerick; became a prominent leader in the agitation for the repeal of the legislative union between G. Brit. and Ire.; became identified with the revolutionary party in Ire.; went to Paris Apr. 1848 as a representative of the Irish Confederation to solicit aid from the Fr. republic; aided in convoking an Irish national convention (May), which was not allowed to meet; attempted a rising among the peasantry at Mullinohone, in the S. of Ire., July, but was compelled to flee; was captured at Thurles Aug. 5; sentenced for life to Tasmania, July 1849; was pardoned 1856; travelled in the U. S. 1859; published a manifesto to the Irish in Amer. in favor of the seceding States 1861. D. June 17, 1884.

**Obsequens** (JULIUS), a Lat. writer, of whose personal hist. nothing is known. To him is ascribed a work, *De Prodigis*.

**Obseques**. See FUNERAL.

**Observant Friars and Nuns** [*Fratres strictioris observantie*]. The primitive rule of St. Francis, having been modified by various popes, there arose within the order a new party desirous of returning to the austere rule of former days. Certain followers of the severe rule in 1368, under Paoletto di Foligno, were organized as a separate congregation, called "Brethren of the Stricter Observance," or Observantines; these are now far more influential than the followers of the mitigated rule.

**Observatory** [Lat. *observare*]. **Astronomical**. By observation, in the scientific sense, is to be understood an attentive notice of phenomena; and an observatory is a place fitted for making such observations. As astron. is the oldest of the phys. sciences, so astronomical observations have been early in use, previously even to the device or the arrangement of any special place for making them.

The telescope was invented in 1609, and in 1640 Gascoigne applied the telescope to the quadrant and the micrometer to the telescope. The Royal O. of Paris was constructed in 1667-71. The Greenwich Royal O. was established in 1675, and it began its operations in 1676. The Tuscan O. in Copenhagen was built in 1704 for Römer, the discoverer of the velocity of light. Peter the Great caused an O. to be constructed at his cap. in 1725; the O. at Dorpat was in active operation in 1811; and in 1839 the O. at Pulkowa, near St. Petersburg, was erected by the order of the emp. Nicholas. The O. at Königsberg dates about 1813, and that at Berlin about 1834. The O. at the Cape of Good Hope was in existence in 1821. Not to mention others here, the Royal O.



of Edinburgh was in use about 1825; the O. at Sydney (formerly at Paramatta) in Australia dates from 1820; the U. S. Naval O. dates from 1842. Extensive lists of public and private O., with their geographical positions, are annually pub. in the *Eng. Nautical Almanac* and in the *Amer. Ephemeris and Nautical Almanac*. Among the most useful instruments employed in the modern O. are the transit instrument, the equatorial, and, as timekeepers, the clock keeping sidereal and that keeping mean solar time.

Of the various astronomical O., that of Greenwich, as it is one of the oldest, is also one of the most, if not the most, memorable. The observations of its astron.-royal, Bradley (1750-82), furnished Bessel with the material which he made use of in the determination of his *Fundamenta Astronomiæ pro Anno 1755*. For more than half a century Dr. Maskelyne was astron.-royal at Greenwich. His observations were mainly those of the sun, moon, and planets, and a select number of stars. When the Fr. astrons. issued new tables of the sun and moon, a number of copies were sent to Dr. Maskelyne, who in the note of presentation was characterized as being the author of the most precious collection of observations then existing. Dr. Maskelyne d. in 1811. Quite recently, M. Leverrier, in his communication to the Fr. Acad. on a comparison of the theory of Saturn with observations, makes the statement that the tabular comparison which he gives is entirely based upon the Greenwich observations, the only O. at which a series is found extending without interruption for 120 yrs.—from 1751 to 1869.

Our limits do not permit us to speak of the labors of Struve at Dorpat, of Bessel at Königsberg, and those of other astrons. But mention should be made of the observations of Sir William Herschel at his own O. at Slough, where he discovered the planet Uranus in 1781, and of his extended observations of planets, their satellites, the binary stars, and nebulae, as also of the labors of his even more distinguished son at his station for 8 yrs. at the Cape of Good Hope, the results of which appear in his vol. of *Cape Observations*. The observations of the late earl of Rosse at his O. (now located at Birr Castle, Ire.) with his great reflector—viz. observations of clusters and nebulae—deserve more than a passing notice. On the night of Sept. 19, 1848, an 8th satellite of Saturn was detected simultaneously (within the same hour) by Mr. William C. Bond at the Cambridge (U. S.) O. and Messrs. Dawes and Lassell, observing together, in Mr. Lassell's O. at Starfield, Eng.; and at the Cambridge (U. S.) O. Nov. 11, 1850, Prof. George P. Bond discovered the dusky ring of Saturn. The planet Neptune was discovered at the National O. at Berlin by M. Galle, Sept. 23, 1846.

The U. S. Naval O. at Wash. has always shown great activity, and the results of its labors are not only to be learned from its published observations, but also from the publications with which it has enriched the vols. of the *Smithsonian Contributions to Knowledge*. The O. at Hamilton Coll., Clinton, N. Y., and that at the Univ. of Mich. at Ann Arbor, have become noted for the discovery of minor planets, Prof. Peters being the observer at Clinton, and Prof. Watson at Ann Arbor. [From orig. art. in *J.'s Univ. Cyc.*, by Prof. S. ALEXANDER, LL.D.]

**Observatory, Meteorological.** The usefulness of automatic meteorological instruments cannot be overestimated, since it is only from the study of continuous and minute changes that the meteorologist can ever hope to discover the laws appertaining to the ever-changing phenomena of the atmosphere. A M. O. should be provided with instruments capable of registering the following: Pressure, temperature, moisture, direction of the wind, velocity of the wind, rainfall, evaporation.

**Methods.**—The methods of registration employed by meteorologists may be divided into 4 gen. classes: (1) Records made mechanically by force derived directly from the changing medium; (2) continuous records made photographically on a moving sheet of paper; (3) discontinuous records made at stated intervals by means of electro-magnetism; (4) continuous records similarly made, together with results printed in ordinary numbers at definite intervals. For the mechanical registration of the barometer numerous devices have been contrived. The mechanical registration of temperature has been accomplished by the use of a metallic thermometer, consisting of a combination of brass and steel rods, a spiral composed of 2 metals, or a single wire of considerable length.

Prof. Hough has devised a variety of meteorological instruments designed to print periodically, in common type, records of the barometer, the thermometer, the anemometer, and the evaporator and rain-gauge. The printing barometer gives hourly the barometric pressure to a thousandth of an inch. It gives also a record of the total disturbance or fluctuation of the column for 2 entire days and for each hour successively, and curves of pressure, showing the changes in the height of the column continuously. The printing thermometer prints hourly the thermometric record to the tenth of a degree F., and gives also a continuous curve of temperature. The evaporator gives hourly the height of the water in the evaporating vessel, and indicates changes to one thousandth of an inch in its height. The anemograph gives the direction and the velocity of the wind for every hour. [From orig. art. in *J.'s Univ. Cyc.*, by Prof. GEORGE W. HOUGH, LL.D.]

**Obsidian** [Gr. *ὀψιδας*], a volcanic rock belonging to the trachyte group, and composed of alumina and 80 per cent. of silica. When pure it is a perfect volcanic glass of dark color, and in this form is much used by savage races for the manufacture of stone implements; it also occurs porphyritic from an admixture of crystals of minerals. When the same kind of lava from which O. is formed becomes very vesicular, it gives rise to *pumice*.

**Obstetrics, Obstetric, Tocology, or Midwifery** [Lat. *obsteria*, *ob* and *stare*, to "stand before"; Gr. *maia*; Fr. *art des accouchements*, *science obstétricale*;

Ger. *Geburtshilfe*, *Entbindungskunst*], the branch of med. science embracing the knowledge of the processes accompanying the reproduction of the human species, the assistance to be rendered the mother before, during, and after labor, both natural and irregular, and the care to be taken of the child during the first weeks of its life. Although nature has adapted woman to bring forth children without any other assistance than that afforded her by her own inherent powers, still, from the very earliest ages, it has been found agreeable and beneficial to a woman in labor to offer her sundry more or less important services in her hour of need, by which present discomforts might in a measure be removed or possible future accidents averted. Naegele the elder (1819) was the first to give a clear, systematic, and tolerably correct explanation of the mechanism of labor; that is, of the manner of passage of the various parts of the child through the pelvic canal. From him dates, in a great degree, the present elevated condition of obstetrical science; for on the accurate comprehension of this mechanism depends in a large measure the correct appreciation of the means to be employed in abnormal cases. At the present time an obstetrician, in the true sense of the word, can no longer be a simple looker-on at a process which Nature is entirely competent to complete herself, or a mere mechanical assistant to that process; he must be a man of scientific education, well endowed with phys. and moral power, patience, and determination, thoroughly conversant with the physiology and pathology of the function which he is called upon to superintend. On his wisdom alone often rest the lives of 2 persons and the happiness of a family; he must be both phys. and surgeon, and his intellectual culture and ability must be on a par with the important relation which his dept. holds to society.

The study of O. is divided into 3 chapters: 1. The anat. of the organs taking part in the process of reproduction in the female; 2. the functions of those organs during reproduction; their physiology; 3. the disorders and diseases affecting these and other organs during the same period; their pathology.

Labor is either natural or preternatural—natural when nothing occurs to mar the progress of the unaided birth of the child and appendages, preternatural when the assistance of art, either manual or instrumental, is required. The causes of preternatural labor may lie either in the mother or the child. The operations which may become necessary during pregnancy or labor are: The induction of abortion, when the preservation of the life of the mother renders it imperatively necessary that the pregnancy be interrupted, and of premature delivery, when the birth of a fully-developed child at term is impossible on account of pelvic deformity; Cæsarean section, the removal of the child and appendages through an incision in the abdomen and uterus, in cases where the pelvic deformity is so aggravated as to preclude the natural or instrumental delivery of even a mutilated child by the natural passages; the child is generally born alive, the mother usually succumbs (62 per cent.), but cases are on record in which the operation has been successfully performed on the same woman as often as four times; the extraction of the child with the forceps; version or turning, and manual extraction by the feet, when it is desired to change the position of the child and accomplish rapid delivery; craniotomy, the perforation of the head and removal of the brain of the living or dead child to enable the passage of the diminished head through the contracted pelvis, thus sacrificing the child for the sake of the mother, etc. Of the dangers which assail the woman after delivery the most frequent are sore nipples and inflammation of the breasts—the most dangerous and fatal, childbed or puerperal fever. The latter is an inflammatory, infectious disease, the exact nature of which is still a matter of dispute. [From orig. art. in *J.'s Univ. Cyc.*, by PAUL F. MUNDÉ, M. D.]

**Ocala, Fla.** See APPENDIX.

**O'Callaghan** (EDMUND B.), M. D., LL.D., b. at Mallow, Ire., about 1804; studied 2 years at Paris; went to Que. 1823; was admitted to the practice of med. 1827; member of the provincial assembly of Lower Canada 1836; ed. of the *Montreal Vindicator* 1834-37; figured in the revolutionary movement of 1837, in consequence of which he removed to New York; became a student of the early hist. of N. Y., especially of Dut. and Fr. sources; wrote a *Hist. of New Netherlands*, edited the *Documentary Hist. of N. Y.* D. May 29, 1880.

**O'cam** (or **Ockham**), WILLIAM OF, a Scholastic philos., b. at Ocam in the co. of Surrey, Eng.; d. in Munich, Bavaria, in 1347, at an advanced age. He was ed. first at Ox., and, after he became a Franciscan, in 1319, at Paris under the famous Duns Scotus. He rejected the realism of his master, and became the most eminent of Nominalists. His skill in handling logical weapons, his acuteness in making distinctions, his fertility in inventing reasons, gave him the name of *Doctor invincibilis*. He wrote *Tractatus Logice*, *Quodlibeta Septem*, *Super quatuor libros Sententiarum*, *Expositio Aurea Super totam Artem Veterum*. WILLIAM T. HARRIS.

**O'com, or Occum** (REV. SAMSON), a celebrated Presb. Indian preacher of the Mohegan tribe, b. in New London, Conn., ed. at the Rev. Ebenezer Wheelock's Indian school at Lebanon; in 1766 accompanied Rev. Nathaniel Whitaker, D. D., who was sent on a mission to Scot., Eng., and Wales, to raise funds for the establishment of schools for the education and christianization of the N. Amer. Indian. Being the first preacher of these aboriginal tribes who had visited G. Brit., he created a sensation, and greatly contributed to the success of Dr. Whitaker's mission. The projected school subsequently became Dartmouth Coll., N. H. After his return to Amer. he continued in the ministry, preaching chiefly to the Indians, until his death, probably in 1792. He wrote an account of the Montauk Indians, and the Hymn, *Awaked by Sinai's Awful Sound*. A. H. STEPHENS.

**Occlusion** [Lat. *occludere*, "to conceal"]. So far as its etymology would indicate, the word occlusion might



be applied astronomically to designate the concealment of any heavenly body, but usage has confined its application to the eclipse of planets or of fixed stars, the moon being in most cases the eclipsing body. Very rarely a planet occults a star; and the O. of a planet by another planet is almost unexampled in the hist. of astron. Yet Mercury was occulted (or, we might rather say, eclipsed) by Venus, May 17, 1737, and we have reports of similar concealments of Mars by Venus Oct. 3, 1590, and of Jupiter by Mars Jan. 9, 1591; but as these were before the invention of the telescope, the supposed eclipses may have been only near appulses. No little interest attaches to the careful observation of O., whether of stars or planets, by the moon, inasmuch as from the phenomena presented at the immersion or emersion of the star or the planet some indication may be looked for either of the existence or else of the absence of a lunar atmosphere—i. e. of an atmosphere of sufficient density or extent either to refract or to absorb light. With respect to a *diminution of light*, Mr. Ramage of Aberdeen says that "previously to his observation of the O. of Jupiter, Apr. 5, 1824, there were several O. of fixed stars of the 7th and smaller magnitudes, which instantly disappeared on coming into contact with the dark limb of the moon; one of them, however, on entering upon the extreme edge of the cusp, very near to the juncture of light and darkness, and on reappearing twice from between the tops of lunar acclivities, presented an evident diminution of light." (*Memoirs of the Royal Astronomical Society*, vol. II, p. 87.) The effect of the glare of moonlight would seem in this instance to have been nearly excluded, so that there is some probability of the diminution of light being real. When the time of immersion or that of emersion has been carefully observed, and the corrections dependent on the moon's distance and the hour of the day applied (for parallax), the difference of that time and that by computation, for the first meridian, gives the lon. of the place of observation. [*From orig. art. in J.'s Univ. Cyc.*, by PROF. S. ALEXANDER, LL.D.]

**Occupation** (military). Occupation is a word of Rom. law, denoting the act of taking possession. This we pass over, and speak only of military O., with which international law is concerned. What does such O. by an invading force signify? It implies the cessation of all previous political or municipal authority, except so far as the occupant invader allows it to exist. The O. is a fact. But the definition must not be pressed too far. Just as an effective blockade may be evaded, so an effective O. may not put down all guerrilla or other scattered forces. It is enough if the region where the forces are stationed is controlled by troops which have unobstructed communications with one another. An occupied dist. is under a military officer as its supreme gov., but he may allow the ordinary laws of the land to take their course. What manifestations of discontent in the dist. may demand punishment it is not easy to decide. T. D. WOOLSEY.

**Ocean**, ō'shan [Lat. *oceanus*; Gr. *Ωκεανος*]. The waters of the sea are divided by the solid lands into a few large basins or oceans, which are the counterpart of the continents. The Pacific, the Atlantic, and the Indian O. correspond to the 3 pairs of continents, and separate them from one another. Each is again subdivided into a N. and S. basin, except the Indian O., which, on this account, is only a half O. The Arctic O. is properly a continuation of the Atlantic, but, surrounded as it is by the coasts of the 3 N. continents, it has a physiognomy of its own. As to the Antarctic O., being bounded by no lands, it may be considered less as an O. by itself than as the common root from which they all radiate. The 3 great O. have a wide opening toward the S., and become gradually narrower toward the N., just the reverse of the continents. But they differ in gen. form. The Pacific O. is an oval, nearly shut up in the N., where the opposite coasts approach each other, so as to leave between Asia and Amer. only the narrow passage of Bering Strait, by which it communicates with the Arctic O. The Atlantic O. has been likened by Humboldt to a long valley with parallel sides, the projecting body of Afr. fitting into the vast recess of the Gulf of Mex. and the Caribbean Sea, as S. Amer. and Cape St. Roque into the Gulf of Guinea. It is the only O. widely open at the N., stretching from pole to pole, the only ready channel for the exchange of the polar and equatorial waters. The Indian O. has the form of a triangle, the vertex of which is turned to the N., but without communication with the N. waters. The Pacific O. contains more than  $\frac{1}{2}$  of all the waters of the sea. It is pre-eminently the great O. Its extent, its compact form, the direction of its longer axis from E. to W., make it the counterpart of the Old World. The Atlantic has only half the size of the Pacific, and  $\frac{1}{4}$  of all the water-surface; by its narrow and slender form, its direction from N. to S., it corresponds to the New World, as the Indian O. to Afr.

**The Bed of the Ocean.**—The basins of the O. are depressed below the face of their waters as the continents are elevated above the same surface level. As they form nearly  $\frac{3}{4}$  of the relief of the earth's crust, a knowledge of their configuration is of great interest. Numerous soundings made in the shallow seas along the coasts of the continents for the wants of navigation, deep-sea soundings taken recently in the heart of the O. for laying of telegraphic cables and for purely scientific purposes, have given us an approximate idea of the nature of the beds of the 3 great O.

The main feature of the Atlantic basin seems to be its division into 2 valleys, 16,000 to 20,000 ft. deep, parallel to the neighboring continents, separated by a broad swell, rising from 7000 to 10,000 ft. above their bottom; the W. valley along the coast of the New World being on the whole deeper than the E. In the S. Atlantic this swell, from which rise the islands of Tristan da Cunha and Ascension, runs from the S. nearly N. as far as the equator, where it bends

FIG. 1.—Sections across the Basin of the Atlantic Ocean.

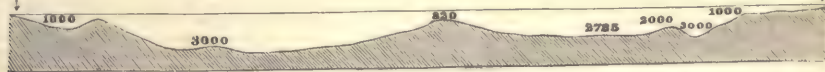
Depth in fathoms.

a. From Cape St. Roque, Brazil, to Cape Palmas, Western Africa.

Length, 1860 miles.

Cape Palmas.

Cape St. Roque.

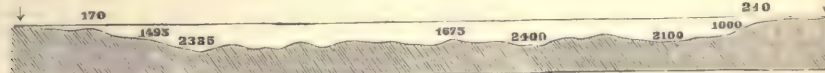


b. From Newfoundland to Valentia Island on the line of the Telegraph Cables.

Length, 1850 miles.

Valentia Island.

Newfoundland.



westward toward S. Amer.; the W. valley reaching the depth of 20,000 ft., and the E. 18,000. After an interruption between the Lesser Antilles and Cape Verde Islands, it begins again beyond the N. tropic, running N. E. to the Azores, beyond which it grows gradually less. Both valleys on either side become shallower northward, and in the parallel of Newfoundland are confounded in one basin, in the so called telegraph plateau between Newfoundland and Ire., whose average depth is about 12,000 ft., and the greatest 14,000 ft. (Fig. 1, a). Toward the N. the depth is gradually reduced to 8000 and 9000 ft., and continues so between Greenland and Iceland, while on the European side, between Iceland and Nor., the depth averages hardly 1500 ft. The greatest depth from which specimens of the bottom have been secured was not found in mid-ocean, but 80 m. N. of St. Thomas in the Small Antilles.

In the neighborhood of the continents the seas are often shallow for a long distance, and their bottom seems only the continuation, by gentle slopes, of the continents which border them. Thus, from Newfoundland, along the line of the cables (Fig. 1, b), the submarine plain extends for 140 m. before reaching the depth of 1000 ft., but beyond it falls rapidly within a few miles to a lower terrace of 9000 ft. By another rapid step a still lower plain is attained, having a depth varying from 12,000 to 14,000 ft., and stretching with inconsiderable variations through 1700 m., across the whole basin of the Atlantic. At about 230 m. from the coast of Ire. it ascends again, by similar steps, to the border of the submarine plateau on which rest the Brit. Isles.

The bed of the Pacific is still imperfectly known. The central basin, almost deprived of islands, extends slantingly E. S. E. from S. coast of Chi. to N. coast of Peru. It may be considered as a long trough between 2 swells of land bearing on their top groups of volcanic and coralline islands, and marked on the N. by the line of the Sandwich I., continued W. by a succession of submarine volcanoes,

and on the S. by long series of the Polynesian islands, which rest on a base of 10,000 to 12,000 ft. The bottom of this trough, as far as known, is irregular in the W., and its greatest depth in the centre of the O. is but little above 18,000 ft. The N. Pacific, between the Hawaiian and Aleutian islands and the coast of Cal. and Japan, forms a vast oval basin with a general depth of 17,000 to 18,000 ft., descending from the Amer. coast by very gradual terraces, but attaining its greatest depth close to the coast of Japan and the Kurile Islands. It seems that a great chasm from 30,000 to 25,000 ft. deep extends along this volcanic coast as far as the Aleutian Islands, reaching, even under the 45th parallel, the greatest depth measured anywhere in the oceans—viz. 27,930 ft. The next greatest depth was measured farther S., about 11° of lat., where the Challenger found 27,438 ft. The S. Pacific basin seems to be more uniform, 2 lines of soundings by the Challenger and the Prus. ship *Gazelle* indicating depths of 14,000 to 17,000 ft. The basin of the Indian O., according to the cable soundings, both in the Ar. Sea and the Gulf of Bengal, shows a general depth of 12,000 ft., which reaches 14,000 ft. in mid-ocean. Toward the S. it becomes shallower, but deepens again around Australia, where depths of 13,000 ft. are found along the S. coast, and a deep trough of 18,000 ft. along the N. W. coast.

The inland and border seas properly belong to the continents. Around the Brit. Isles and in the Ger. Sea the depth rarely exceeds 600 ft., and is often much less. The continent of Europe is here prolonged in the form of a submarine plateau, the Baltic Sea, being a simple depression on the continent, is only a few hundred ft. deep. The border-seas of Asia, inside of the chains of continental islands, hardly exceed a few hundred ft. in the S. and a few thousand in the N., while outside, the rapid slopes and deep O. begin. The Mediterranean and Gulf of Mex., being in the zone of broken lands, are much deeper. The first is divided into 2 basins by a high neck stretching between Sic. and the



Afr. shore, at the slight depth of 50 to 500 ft. The W. basin has a depth of over 9000 ft., and the E. 10,000 to 12,000 ft. The Gulf of Mex. and the main Caribbean Sea are 12,000 ft. deep, according to the U. S. Coast Survey, and, in the latter, a long chasm running S. of Cuba goes even down to 18,000 ft. Bering Sea, the Sea of Okhotsk, the Japanese Sea, bordering the continent, are all comparatively shallow. The N. Chi. Sea, however, the Sulu, Celebes, and Banda seas have depths of 12,000 to 16,000 ft., while the bottoms of the S. Chi. Sea and Java Sea are but a few hundred ft. below the surface.

The above facts seem to warrant these conclusions:

1. The predominant forms of relief of the O. basins are extensive uniform plains and huge plateaux. True mt. chains are only found near the continents, as parts of their structure, and when reaching above the surface form chains of continental islands. The mts. in mid-ocean are all isolated volcanic peaks, with a crown of corals when within the tropics.

2. On the whole the O. depth is greatest in the tropical regions, and diminishes toward both poles, this feature being a counterpart of the continental reliefs.

3. The deepest points are local spots in chasms on the W. side of the Atlantic and Pacific, and their depth is equal to the altitude of the highest mts.

4. These 2 oceanic basins are the great original depressions resulting from the gradual contraction of the cooling globe, the counterpart of which is found in the emergence of the main continental masses: Asia and Europe on one side, and the continents of the New World on the other. Like these land masses, the O. extend in 2 opposite directions, at right angles to each other. They are thus the 2 great original synclinal folds of the globe to which these 2 groups of continents are the corresponding anticlines.

5. These fundamental geographical features existed throughout all the geological ages, the relative situation of the continents and O. remaining always the same, while their variations affected only their boundaries and extent.

A. GUYOT.

**Ocean Grove, N. J.** See APPENDIX.

**Ocean/ica**, the name given by modern geogs. to all the islands, or groups of islands, situated between the S. E. shore of Asia and the W. shore of Amer., and consisting of the Malay Archipelago, Australasia, and Polynesia.

**Ocean Navigation.** See NAVIGATION.

**Ocean Steam Navigation.** See NAVIGATION, OCEAN STEAM.

**Ocel/ius Lucanus**, a Gr. philos., b. in Lucania, It., probably in the 5th century B. C. Of his life nothing is known, but the treatise *Ἡ περὶ τῆς τοῦ Παντός φύσεως* ("On the Nature of the Whole"), written in the Ionic dialect, is ascribed to him.

**O'celot** [*ἰκετε*, *ocelotl*, from *oca*, "to paint"], a name applied to the *Felis pardalis*, one of the handsomest of the cat family, found in Amer. from La. and Tex. S. to Patagonia. It is some 3 ft. long, extremely agile and graceful, nocturnal in its habits, and a good climber of trees. It is easily tamed. Its skin is prized in commerce. It is gray, marked with black and fawn-colored lines.

**Ochre**, o'ker. Clays colored by hydrated peroxide of iron in variable proportions, and thus yielding shades of yellow from pale yellow to deep orange, are used as pigments under the name of ochre, but the term is also more broadly applied to any clay richly colored by peroxide of iron. "Reddle," or "red chalk," is a variety of O. consisting of decomposed hematite.

**O'Connell** (DANIEL), the Irish agitator, b. at Carhen, co. Kerry, Aug. 6, 1775, the son of a gentleman of small estate but of anc. family, was ed. at St. Omer and Douay, and in 1794 began to study law at Lincoln's Inn; in 1798 was called to the bar; became prominent in Irish politics, addressing himself to the work of the emancipation of the R. Caths. and of Ire. In 1828 he was chosen to Parl. from co. Clare, but was excluded by the Test oath, but in 1829 the R. Cath. emancipation took place, and O'C. entered the House of Commons. In 1842 he began to hold "monster meetings" in Ire., and in 1843 he was arrested and fined heavily; but the Lords reversed the judgment Sept. 7, 1844. In 1845, when it was shown that O'C., who received a large yearly income from a popular subscription, was also acting as a middleman and collecting money from the tenants of another, his influence began to decline. In 1847, enfeebled by overwork and by anxiety for Ire., where the famine had broken out, he started to make a pilgrimage to Rome, but d. at Genoa May 15, 1847.

**O'Connor** (Gen. ARTHUR), b. at Brandon, near Cork, Ire., July 4, 1787, was admitted to the bar 1788; sat in the Irish Parl. 1789-96; entered into the conspiracy of the United Irishmen; became one of the 5 members of their directory; was imprisoned; went to Fr. with Lord Edward Fitzgerald to negotiate an alliance for Ire. against Eng.; concerted with Hoche the Fr. invasion of Ire.; was arrested in Eng., tried, but acquitted May 22; rearrested, and kept 5 yrs. a prisoner; was released June 1803, on condition of perpetual exile from Ire.; went to Paris; was appointed by Nap. gen. of division Feb. 29, 1804; sent to coast of Scot. in command of the Irish brigade; married, in 1807, Elisa de Condorcet, only daughter of the philos.; withdrew from the Fr. army 1815; was naturalized as a Fr. citizen 1818; edited with Arago the works of Condorcet. D. Apr. 25, 1852.

**O'Connor** (MICHAEL), D. D., b. at Cork, Ire., Sept. 27, 1810, studied at Queenstown; in 1824 entered the Propaganda, and in 1835 received the doctorate; became in 1838 pres. of the R. Cath. sem. of St. Charles Borromeo, Phila.; was consecrated b. of Pittsburg in 1848; translated to the see of Erie, Pa., in 1853, but was referred to his former diocese in 1854. In 1880 he resigned the bp.'s office and entered the Society of Jesus. D. Oct. 18, 1872.

**O'Connor** (RODERICK), popularly called RORY, the last independent king of Ire., b. in Connaught in 1116; succeeded

to the throne of Connaught on the death of his father, Turlogh O'Connor, 1156; disputed the supremacy for several yrs. with the O'Neals and the O'Briens; assumed the title of king of Ire. 1166; assembled a parl. of lords and clergy at Athboy 1167; aided in the expulsion of Dermot, king of Leinster, 1168; defeated the Eng. invaders under Strongbow in several engagements, but subsequently came to terms with them and reinstated Dermot in his kingdom; afterward carried on war with the Eng. with varying success, until in 1175, after an interview with Henry II. of Eng., he acknowledged that monarch as lord paramount of Ire., retaining for himself his ancestral kingdom of Connaught. His sons having revolted against him, Roderick retired in 1186 to a monastery, where he d. in 1198.

**Oconomowoc**, city, on R. R., Waukesha co., Wis., 30 m. W. of Milwaukee, noted for its numerous lakes, and called "Saratoga of the West." Pop. 1870, 1408; 1880, 2174.

**O'Connor** (CHARLES), LL.D., b. in New York in 1804; received a common-school education; was admitted to the bar 1824, and made his way to the leadership of the legal profession in that city. He never held office except that of dist. atty. for a few months during the administration of Pres. Pierce, and that of member of the constitutional convention of 1864. In 1868 he was nominated for the Presidency by the extreme Dems., and received complimentary votes in several States. D. May 12, 1884.

**Oconto**, city, on R. R., cap. of Oconto co., Wis., 30 m. N. of Ft. Howard. It has a large lumber trade. Pop. 1870, 2855; 1880, 4171.

**Octa/via**, sister to Augustus, was first married to C. Marcellus, and after his death to Mark Antony. She bore to Marcellus 2 daughters and a son, and to Antony 2 daughters. Of the latter, the elder was married to L. Domitius Ahenobarbus, and became the grandmother of Nero; the younger was married to Drusus, and became the mother of Claudius and the grandmother of Caligula. D. in 11 B. C.

**Octo/ber** [Lat. from *octo*, "eight"], the 8th month of the old style or Julian yr., and the 10th in the Gregorian yr.

**O'Cur'ry** (EUGENE), b. at Dunahy, near Carrigaholt, co. Clare, Ire., in 1796; received a liberal education; was employed in the archaeological dept. of the ordnance survey of Ire. 1834-41; was then engaged by the Royal Irish Acad. and the corporation of Trinity Coll., Dublin, in cataloguing their anc. Gaelic MSS.; discovered and deciphered valuable remnants of the anc. Brehon laws; became prof. of Irish hist. in the newly established R. Cath. univ. at Dublin 1854; contributed to the *Transactions* of learned societies; edited works for the Celtic Society and the Irish Archaeological Society, and pub. *Lectures on the Manuscript Materials of Anc. Irish Hist.* D. July 30, 1862.

**Odd Fellows, Independent Order of**, a secret benevolent association which had its origin in Lond. about 1745. The character attributed to the earliest societies or lodges of O. F. is that of assemblages mainly for social purposes, having an initiation ceremony, and a collection being made to aid needy members. About 1800 the lodges in Lond. and Liverpool were known as "The London Order." In 1809 a member of a Lond. lodge removed to Manchester and introduced the order into that city, where several lodges were speedily organized, and in 1814 the lodges in Manchester and vicinity were consolidated under the title of "The Independent Order of Odd Fellows of the Manchester Unity." The other lodges refused to acknowledge the authority of this organization, but the Manchester adherents attained greater prosperity than any of their rivals.

Societies or lodges of O. F. were organized in New York and other cities in the U. S. as early as 1806, but had a brief existence. On Apr. 26, 1819, Thomas Wildey and 4 others, who had been members of O. F. lodges in Eng., organized a lodge in Baltimore, calling it Washington Lodge No. 1, which was formally recognized by the Manchester Unity under the title of "No. 1, Washington Lodge, the Grand Lodge of Maryland and of the U. S. of Amer." On Feb. 22, 1821, Washington Lodge surrendered the Eng. charter to a "body of past grands," and "the Grand Lodge of Maryland and the U. S." was regularly organized; and in 1823 lodges were chartered by it in Pa., N. Y., and Mass. On Apr. 15, 1824, it was deemed advisable to separate the powers of the national from the State organization, and the project was consummated Feb. 22, 1825, when the first meeting of the Grand Lodge of the U. S. was held. For several yrs. intimate relations existed between the Eng. and Amer. orders, but disputes arose which in 1843 resulted in an entire severance of these relations.

The objects of American Odd Fellowship are "to visit the sick, relieve the distressed, bury the dead, and educate the orphan." It seeks "to improve and elevate the character of man, imbue him with proper conceptions of his capabilities for good, enlighten his mind, enlarge the sphere of his affections, and lead him to a cultivation of the true fraternal relation designed by the great Author of his being." The motto "Friendship, Love, and Truth" was known and used in connection with the order in 1775. The organization for attaining these objects has 2 branches, closely connected, yet entirely distinct—lodges and encampments. To become a member of a lodge under the jurisdiction of the Grand Lodge of the U. S. the applicant must be a free white male of good moral character, who has arrived at the age of 21 yrs., and who believes in a Supreme Being, the Creator and Preserver of the universe.

The Grand Lodge of the U. S. has organized grand lodges in every State and in most of the Terrs. of the U. S., the provs. of Canada, Switz., Australia, Chili, and a grand lodge of the Ger. empire, which has 5 grand lodges under its jurisdiction. Subordinate lodges have been organized in the S. I., Peru, and Lond.

**Ode.** See APPENDIX.

**O'debolt**, on R. R., Sac co., Ia. Pop. 1880, 637.

**Odell**, on R. R., Livingston co., Ill., 82 m. from Chicago. Pop. 1870, 739; 1880, 908.



**Odenheimer** (WILLIAM HENRY), D. D., b. at Phila. Aug. 11, 1817, grad. at the Univ. of Pa. 1835; took orders in the P. E. Ch. 1838; became rector of St. Peter's, Phila., 1840, and bp. of N. J., Oct. 13, 1859. Author of *Jerusalem and Vicinity* and liturgical and theological works. D. Aug. 14, 1879.

**Oder**, a river of Ger., rises in Moravia at an elevation of 1000 ft. above the sea, enters Prus. Silesia, where it becomes navigable at Ratibor, traverses the provs. of Brandenburg and Pomerania, and, after a course of 550 m., empties through the Stettiner Haff into the Baltic.

**Odesa**, town of Rus., gov't. of Kherson, is situated on a bay of the Black Sea, midway between the mouths of the Dnieper and Dniester. The city ranks now as the third commercial town of the Rus. empire, and as the first port of the Black Sea. The city is generally well built, with broad and straight streets, and the immediate neighborhood contains many orchards and vineyards, while the plateau farther behind is a sterile steppe. Its benevolent and educational insts. are numerous and good. It has also important breweries, woollen-mills, and manufactories of sail-cloth, cordage, soap, candles, etc. But it is especially as a commercial place that the town has acquired importance. The prin. articles of exportation are grain, timber, tallow, and wool. Pop. 193,513.

**Odin**, the Old Ger. *Wuotan*, the Sax. *Wotan*, is, in the Scandinavian mythology, the creator of the world, the father of the gods, and, being possessed of the deepest wisdom, he holds the highest power. In battle he gives the victory and sends forth the Valkyries; in council he gives the decision and the expedient; in every-day life he makes the field fertile, the wind and the waves favorable, etc. Behind and above the special gods he is the supreme ruler.

**Odoacer**, king of It. from 476 to 488 A. D., was ed. in the camp of Attila, but entered afterward the service of the W. Rom. empire, and held a high position in the imperial guard when (in 475) Orestes, commander-in-chief of the army, deposed the emp., Julius Nepos, and placed his own son, Romulus Augustulus, on the throne. The army, consisting of barbarian mercenaries, now demanded of Orestes that  $\frac{1}{2}$  of the soil of It. should be given up to them for permanent settlement, and when Orestes refused, the soldiers chose O. for their leader, and a war broke out which ended with the defeat and death of Orestes and the abdication of Romulus. Aug. 25, 476, the Rom. senate declared the W. Rom. empire dissolved, constituted the kingdom of It., and gave the crown to O., the first barbarian who wore it. Meanwhile, Theodoric, the king of the Ostrogoths, crossed the Alps, and in 3 battles O. was defeated, and shut up in Ravenna. Here he held out for more than 2 yrs., but capitulated on the condition that he and Theodoric should rule as joint kings. The agreement was confirmed by a solemn oath, but a few days afterward Theodoric had O. put to death, Mar. 5, 488.

**O'Donovan** (JOHN), LL.D., b. at Atateamore co., Kilkenny, Ire., July 9, 1809, son of a small farmer; was employed about 1830 in the historical dept. of the ordinance survey of Ire. with the object of settling the orthography of places on the ordinance maps by the testimony of Gaelic MSS. and local traditions; repeatedly visited every co. in Ire. in executing this commission; was called to the bar 1847, but never practised law; pub. a *Gram. of the Irish Lang.*; edited *The Book of Rights*, *The Annals of Ire. by the Four Masters, from the Earliest Historic Period to A. D. 1616*; became prof. of the Irish lang., hist., and archæology at Queen's Coll., Belfast; aided Prof. Eugene O'Curry in editing the Brehon laws. D. Dec. 9, 1861.

**Odontology** [from *ὀδὸν* *ōdōnos*, "tooth," and *λόγος*, "discourse"], that branch of zoology which treats of the structure and development of the teeth arming the mouth of vertebrate animals.

**Odontopteris** [Gr. *ὀδὸν*, "tooth," and *πτερίς*, "fern"], a genus of fossil ferns occurring in the Carboniferous rocks, so called from the tooth-like form of their pinules.

**Oelampadius** (JOHANNES), whose true name was HANS HUSSGEN, b. at Weinsberg, Ger., in 1483; studied jurisprudence at Bologna, then theol. at Heidelberg, subsequently Gr. at Stuttgart, where he also learned Heb.; became teacher in 1516 at Bâle, where he assisted Erasmus in his *Annotations* on the N. T. Luther's writings made a deep impression on him, and for some time he was chaplain to Franz von Sickingen. In 1522 he returned to Bâle as preacher and prof. in theol., and succeeded in introducing the Ref. in Bâle and Ulm. In the controversy concerning the Lord's Supper he gradually adopted the views of Zwingle. D. Nov. 24, 1531.

**Ecumenical Council**. See COUNCIL, ECUMENICAL.

**Edipus**, in Gr. mythology, a son of Laius, king of Thebes, and Jocasta, was exposed by his father on account of an ill-boding oracle, but was saved by a shepherd and brought to Corinth. Misunderstanding another oracle, he left Corinth and went to Thebes; on the way he unawares slew his father, and at Thebes he married his mother. She bore him 2 sons, Eteocles and Polyneices, and 2 daughters, Antigone and Ismene; but the horrors of his life were revealed to him. Jocasta hanged herself; Eteocles and Polyneices slew each other; O. put out his own eyes and wandered blind, guided by Antigone, from Thebes to Colonus in Attica, where he d. in the grove of the Eumenides.

**Ægir**, in Scandinavian mythology, the god of the ocean, descended from the dark ages before Odin slew Ymer, and was a jotun himself, but he was friendly to Odin.

**Ehrlensläger** (ADAM GOTTLÖB), b. Nov. 14, 1779, at Frederiksberg, a suburb of Copenhagen. With his first publications, *St. Hans Aften Spil*, *Vaulundurs Saga*, and *Aladdin*, a new period was inaugurated in Dan. lit. He travelled from 1805 to 1809 in Ger., Fr., Switz., and It.; wrote some of his finest tragedies, *Hakon Jarl*, *Painatoko*, and *Correggio*. On his return to Copenhagen he was appointed prof. in æsthetics at the univ. in 1810. Meanwhile a controversy between the old rationalism of the 18th century

and the new romantic school broke out, and formed itself into a contest between Baggesen and G., which lasted till Baggesen left Den. in 1830. G. wrote during this period *Hjelpe*, *Hamns Saga*, and *Nordens Gæder*. D. Jan. 30, 1856.

**Enopides** (*Ἐνόπιος*), a Gr. astr. and philos. of Chios, who is commonly supposed to have been a contemporary of Anaxagoras; is said to have claimed the discovery of the obliquity of the ecliptic; invented a cycle for bringing into agreement the solar and lunar yr.

**Oersted** (HANS CHRISTIAN), b. at Rudkjøbing, in the Dan. island of Langeland, Aug. 14, 1777. His father was an apothecary, and in the shop he made his first studies and experiments. In 1794 he repaired to the Univ. of Copenhagen. In 1799 he took the degree of Ph. D.; was appointed extraordinary prof. in natural philos. at the univ. at Copenhagen in 1806, and succeeded in establishing a polytechnic school in Copenhagen. During a scientific journey in Ger. in 1812 and 1813 he wrote an essay on the identity of chemical and electrical forces. But his great discovery on this point was not made until 1819, and was communicated to the world in a little pamphlet in 1820: *Experimenta circa efficaciam Conflictus electrici in Acum magneticum*. His other writings comprise a large number of minor essays, and 2 larger works, *Naturlærens mekaniske Deel* and *Aanden i Naturen*. D. Mar. 9, 1851.

**Offa**, king of Mercia, succeeded Ethelbald 757, after defeating his rival Beornred; defeated Cynewulf, king of Wessex; conquered the "Welsh march-land," between the Severn and the Wye, 779; established an undisputed suzerainty over the Heptarchy; murdered Ethelbert, king of E. Anglia, and took possession of his kingdom 792; founded the abbey of St. Alban's; drew up a code of laws. D. July 29, 796.

**Offenbach**, off-en-bakh (JACQUES), b. at Cologne June 21, 1819, of Jewish parentage; studied 1835-37 at Conservatory of Paris; established, 1855, Bouffes Parisiens, and composed many burlesque operas and scenes, of which *Barbe bleue*, *Opéra aux Enfants*, *La Belle Hélène*, and *La Grande Duchesse* were the most applauded. D. Oct. 4, 1880.

**Ogden**, Ia. See APPENDIX.

**Ogden** (OGDEN CITY P. O.), R. R. centre, cap. of Weber co., Ut., at the junction of Weber and Ogden rivers, at the mouth of Ogden Cañon, has large agricultural and mining interests. Pop. 1870, 3127; 1880, 6069.

**Ogden** (AARON), LL.D., b. at Elizabethtown, N. J., Dec. 3, 1756, grad. at Princeton 1773; served through the Revolution, being successively aide-de-camp to Lord Stirling and to Gen. Maxwell, and was distinguished at Yorktown; became a lawyer; was boundary com. for N. J., U. S. Senator 1801-03, gov. 1812-13; commanded the N. J. militia during the war of 1812, and became pres.-gen. of the Society of Cincinnati. D. Apr. 19, 1839.

**Ogden** (JOHN), b. at Mount Vernon, O., in 1824; removed in childhood to what is now Crestline, O.; studied at Wesleyan Univ., Delaware, O., and, for 3 yrs., was prin. of its normal dept., and then for 3 yrs. of the McNeely (O.) State Normal School; prin. of the State Normal School, Winona, Minn., 1859-62; served in the U. S. volunteers 1862-65; founded Fisk Univ., Nashville, Tenn., and was its prin.; afterward connected with normal school at Worthington, O.; wrote *The Science of Education*.

**Ogdensburg**, city and R. R. centre, St. Lawrence co., N. Y., on the St. Lawrence River, at the mouth of the Oswegatchie, 72 m. below Lake Ontario; was incorporated 1868. It is a port of entry. Pop. 1870, 10,076; 1880, 10,341.

**Ogechee Lime**, the *Nyssa capitata*, a small tree of the order Cornaceæ, growing in wet places in the S. States. It has a soft wood and a sour edible red fruit.

**Ogham** is the name of a secret alphabet once in use by the Irish and other Celtic nations. It is often used on tombstones, and such stones are frequent in Ire.

**Ogle** (BENJAMIN), b. in Md. in 1749, was in the provincial council before the Revolution; was gov. of Md. 1798-1801. D. July 6, 1809.—SAMUEL OGLE, proprietary gov. of Md. 1735-42 and 1747-52, had held office in Ire. D. 1751.

**Oglesby** (RICHARD JAMES), b. in Oldham co., Ky., July 25, 1824; left an orphan at 8, he removed to Decatur, Ill., in 1836; learned the carpenter's trade, meanwhile studying law, and in 1845 commenced practice at Sullivan. In 1846 he returned to Decatur, and was commissioned first lieutenant in the 4th Ill. regiment, with which he participated at Vera Cruz and Cerro Gordo. Resuming his practice at Decatur in 1847, he pursued a course of study at the Louisville Law School, graduating in 1848; in 1849 went overland to Cal. and engaged in mining until 1851, when he again resumed practice at Decatur. In 1858 he was defeated for Cong., but was elected to the State senate in 1860; resigned, and became col. of the 8th Ill. Volunteers; commanded a brigade at capture of Ft. Henry and Donelson; made brig.-gen. Mar. 21, 1862, remaining in command of brigade until the battle of Corinth, where he was wounded, and disabled until Apr. 1863, when he returned to duty, having meanwhile (Nov. 1862) been promoted to be maj.-gen., and was assigned to the 16th corps. Resigned May 1864, and in Nov. was elected gov. of Ill. (1865-69); re-elected in 1873, but chosen U. S. Senator Jan. 1873.

**Oglethorpe** (JAMES EDWARD), b. in Lond. Dec. 22, 1696; entered the army 1710; went to Ox. 1714; served under Prince Eugene and Marlborough 1715-17; entered Parl. in 1722; obtained a charter in 1732 and a grant for the founding of Ga.; founded Savannah 1733; received the Prot. emigrants of Salzburg 1734, and soon after revisited Eng., but returned to Savannah with John and Charles Wesley in 1735; in 1736 he took a regiment of troops to Carolina and Ga.; in 1737 a col. and commander-in-chief in Carolina 1739-40, and made an unsuccessful attack on St. Augustine 1739-40, and in 1742 repelled by stratagem the attack of the Spaniards upon Ga.; returned finally to Eng. 1743; served as maj.-gen. against the Pretender 1745; was court-martialled for misconduct 1746, but acquitted; became lieutenant-gen. 1747, and gen. 1765, when he retired upon half pay. D. July 1, 1785.



**Ohio**, one of the central States of the U. S., between 38° 23' and 41° 38' N. lat. and 80° 31' and 84° 48' W. lon.; bounded on the N. by Mich. and Lake Erie, on the E. by Pa. and W. Va., on the S. by W. Va. and Ky., and W. by Ind.; greatest length from N. to S., about 210 m.; breadth, 195 m.; area, 41,000 sq. m. or 26,278,400 acres.



Face of the Country, Etc.

—The greater part of the surface is a table-land about 1000 ft. above the sea-level, rising to a height of 1300 or 1400 ft. on the watershed which separates the waters flowing into Lake Erie from the tributaries of O. River, and attaining nearly the same height in the line of hills which crosses the State just below the parallel of 40°. From this table-land there is a gentle descent to Lake Erie on the N., and a somewhat more rapid descent to O. River on the S. In the N. and N. W. parts of the State there are prairies of considerable extent. The lake-shore of the State is 230 m. in length, and O. River has a course of 436 m. of navigable waters along the S. and S. E. The rivers of the State are the Ohio, and its tributaries on the N. bank—viz. the Mahoning, the Muskingum (formed by the junction of Walhonding and Tuscarawas rivers), the Scioto and its prin. affluent, the Olentangy or Whetstone River, the Little Miami, and the Great Miami. The prin. rivers flowing into Lake Erie are the Maumee, Sandusky, Huron, Vermilion, Black, Rocky, Cuyahoga, Chagrin, Grand, Ashtabula, and Conneaut. The lake-shore has not many bays or indentations, but there are good harbors at Cleveland, Sandusky, and Maumee Bay.

**Mineralogy.**—The Carboniferous system as developed in O. is a portion of the great Appalachian coal-field. It occupies in O. about 12,000 sq. m. But though all the groups found in this area belong to the Carboniferous system, they are by no means all of them coal-bearing. Beginning with the W. border of the coal-field, a short distance E. of Portsmouth, and following a nearly N. N. E. line almost to Lake Erie, the strata are developed in the following order: the Waverley group, succeeding immediately to the Erie shale, and consisting of the Cuyahoga shale, the Berea grit, the Bedford, Cleveland, and other shales; next above this comes the Lower Carboniferous limestone, succeeded by a thick conglomerate; and next in order the lower coal-measures, in which, interstratified with fire-clays, sandstones, limestones, and shales, there are 7 distinct veins of coal of different qualities, but all or nearly all valuable either for combustion, smelting, or gas-producing purposes. The lower coal-measures have an average thickness of about 400 ft. Next to these succeed the lower barren measures, also about 400 ft. thick, in which there are local seams of coal occurring among the beds of limestones, sandstones, and shale. The upper coal-measures come next, about 350 ft. in thickness, and, like the lower coal-measures, containing, interstratified with sandstones, limestones, clays, and shale, 6 more coal-veins, some of them of great value. Still above this are found irregular deposits, in some places attaining a thickness of 300 ft., of what are known as the upper barren measures, containing thin local seams of coal. The amount of coal in this dist. is roughly calculated at 3,000,000,000 tons. The Devonian system comes to the surface in immediate connection with the Waverley group, which forms the rim of the coal-basin on its W. side. Here we have in descending order the Erie shales, the shales, flagstones, limestones, and water-lime of the Portage and Chemung groups; the slates, shales, and limestones of the Hamilton group, a narrow belt of the Utica shales; and the Silurian system comes to the surface with its limestone and sandstone strata of the Niagara group, underlain immediately by the Helderberg limestones. Iron ore of excellent quality extends over an area of nearly 12,000 m. in the S. part of the State, where the coal is readily accessible. The amount of iron ore mined annually exceed 600,000 tons. Salt is also largely produced from salt springs. Petroleum is produced to the extent of about 1,500,000 gals. in the State; lime is burned to the amount of 5,000,000 barrels, and water-cement to a moderate extent. There are numerous quarries of excellent sandstone and limestone for building, and grindstones and buhr or mill stones. There are numerous mineral springs in the State, and large deposits of marl in the Maumee Valley and elsewhere.

**Soil and Vegetation.**—In 1820 nearly  $\frac{4}{5}$  of the surface of the State was covered with forests; now there is but little more than  $\frac{1}{5}$ . The prin. forest trees are, among the evergreens, a few pines, hemlocks, tamaracks, cypresses, and spruce, mainly found in the N. portions of the State, and some of them only in the swamps; and of deciduous trees, white, red, Spanish, black, burr, swamp, jack, and swamp white oak, blue, white, and black ash, beech, black, sugar, and red or swamp maple, butternut, shagbark, thick shell-bark, mockernut, and pignut hickory, white, red or slippery, and water elm, sycamore, hackberry, dogwood, ironwood, hop hornbeam, black walnut, butternut, yellow poplar or tulip tree, buckeye, papaw, 5 species of poplar, including

the white poplar, quaking ash, cottonwood, balsam poplar or tacamahac, and balm of Gilead; red and wild or black cherry, linden, 5 species of thorn, honey locust, box elder, redbud, Jy. coffee tree, several species of mulberry, gum tree, sassafras, etc. The flora of the State includes most of the flowering plants common to the E. States and a large proportion of those peculiar to the Miss. Valley. Among the medicinal plants, ginseng, valerian, colombo, gentian, cohosh, mandrake, blood and snake roots are indigenous.

**Climate.**—There is a very marked difference between the climate of the N. and S. portions of the State: the former is characterized by rigorous winters and generally a heavy fall of snow, which lies long on the ground. The summers and autumns are temperate and agreeable. In the S. part the summers are long, and characterized often by intense heat. The winters are usually mild, with but little snow. The State is very healthful. Mean temperature of the yr.—Cleveland (lat. 41° 30', lon. 81° 47', elevation 685 ft.), 45.87°; Portsmouth (lat. 38° 45', lon. 82° 54', elevation 523 ft.), 55.83°. Mean annual rainfall—Cleveland, 38.43 inches; Portsmouth, 38.32 inches.

**Zoology.**—Very few of the larger wild animals are left in the State. The bear is nearly extinct; the large or gray wolf and the coyote or prairie wolf are rare; deer are occasionally seen, and the raccoon, opossum, skunk, weasel, ground-hog, as well as rabbits, hares, squirrels, and the smaller rodents are abundant in some parts of the State. Game-birds are plentiful in their season, and most of the birds of prey and song-birds found in N. Y. and Pa. are found in O. Of the reptiles, the number and species are those common to Pa. and the States of the Miss. Valley. Most of the streams are stocked with trout, black bass, perch, roach, and other fresh-water fish, considerable attention having been paid to fish-culture. Lake Erie has a bountiful supply of the lake white-fish, the salmon or lake trout, etc.

**Agricultural Productions.**—By the census of 1880 O. produced of the great cereals—Indian corn, 111,877,124 bushels (ranking fifth in order of production); wheat, 46,014,869 bushels (ranking third in production); oats, 28,664,505 bushels; barley, 1,707,129 bushels; rye, 389,221 bushels; buckwheat, 290,229 bushels. The wool clip of 1880 yielded 25,037,756 lbs. Of tobacco, there were raised in the census year 1879, 37,735,235 lbs., it being the 4th largest production among the States, the crop being valued at \$2,653,234.

**Farm Animals.**—By census of 1880 O. had 736,478 horses, 19,481 mules, 1,860,186 cattle, 4,902,486 sheep, 3,141,333 swine. The number of sheep is larger than in any other State.

**Fisheries.**—These are quite valuable, principally on Lake Erie, though the O. and other rivers have furnished important contributions to the food-supply. Total value of fish taken in 1880, \$518,430.

**Manufactures.**—O. is a great manufacturing State, producing furniture, textile fabrics, iron and steel manufactures, glassware, pottery, wooden-ware, agricultural implements, machinery, etc. In 1880 there were in all 30,699 manufacturing establishments, employing 183,069 hands, paying in wages \$62,163,800, with capital invested of \$188,939,614; aggregate products, \$348,238,330. The value of iron and steel fabrics produced was \$34,918,360, and of glassware \$1,549,330. The amount of coal mined in 1881 was 8,250,000 tons, ranking O. the second in the production of this staple. The salt industry in 1880 employed 25 establishments, with \$832,600 capital, producing 2,650,301 bushels, valued at \$363,791. The cotton factories in 1880 ran 42 looms, 14,328 spindles, employing 563 persons, and using 10,597 bales of cotton.

**Railroads, Etc.**—In Jan. 1882 there were in operation in O. 6664 m. of railway (this State ranking second in railroad mileage). Cost of railways and equipments, \$610,728,103; net earnings, \$24,414,142; paying interest and dividends, \$17,875,597. Several great trunk lines permeate the State, notably the O. Central, Lake Shore, N. Y. Chicago and St. Louis, Marietta and Cincinnati, Cleveland and Pittsburgh, Cleve., Col., Cin., and Indianapolis, and Pittsburgh, Ft. Wayne and Chicago. There are 736 m. of canals in O.

**Finances.**—The assessed valuation of property in 1881 was—real estate, \$1,097,509,830; personal, \$427,936,111; total, \$1,525,445,941. Rate of State tax, 29 cents on \$100, producing \$4,479,089; aggregate raised by taxation, 1880, State, co., and municipal, \$25,756,658, exceeding the taxation of any State except N. Y. and Pa. State debt, Nov. 1881, \$5,200,000; total indebtedness, State and local, \$48,753,954.

**Commerce.**—Direct foreign commerce is small, the imports of the 3 customs dists. in 1881 being \$234,958; domestic exports, \$5,042,007. The indirect exportation, however, is heavy, and the internal commerce is prodigious, both by R. R., rivers, and lakes. O.'s shipping in 1881 aggregated 222 steam vessels and 196 sailing vessels, having a total capacity of 139,509 tons.

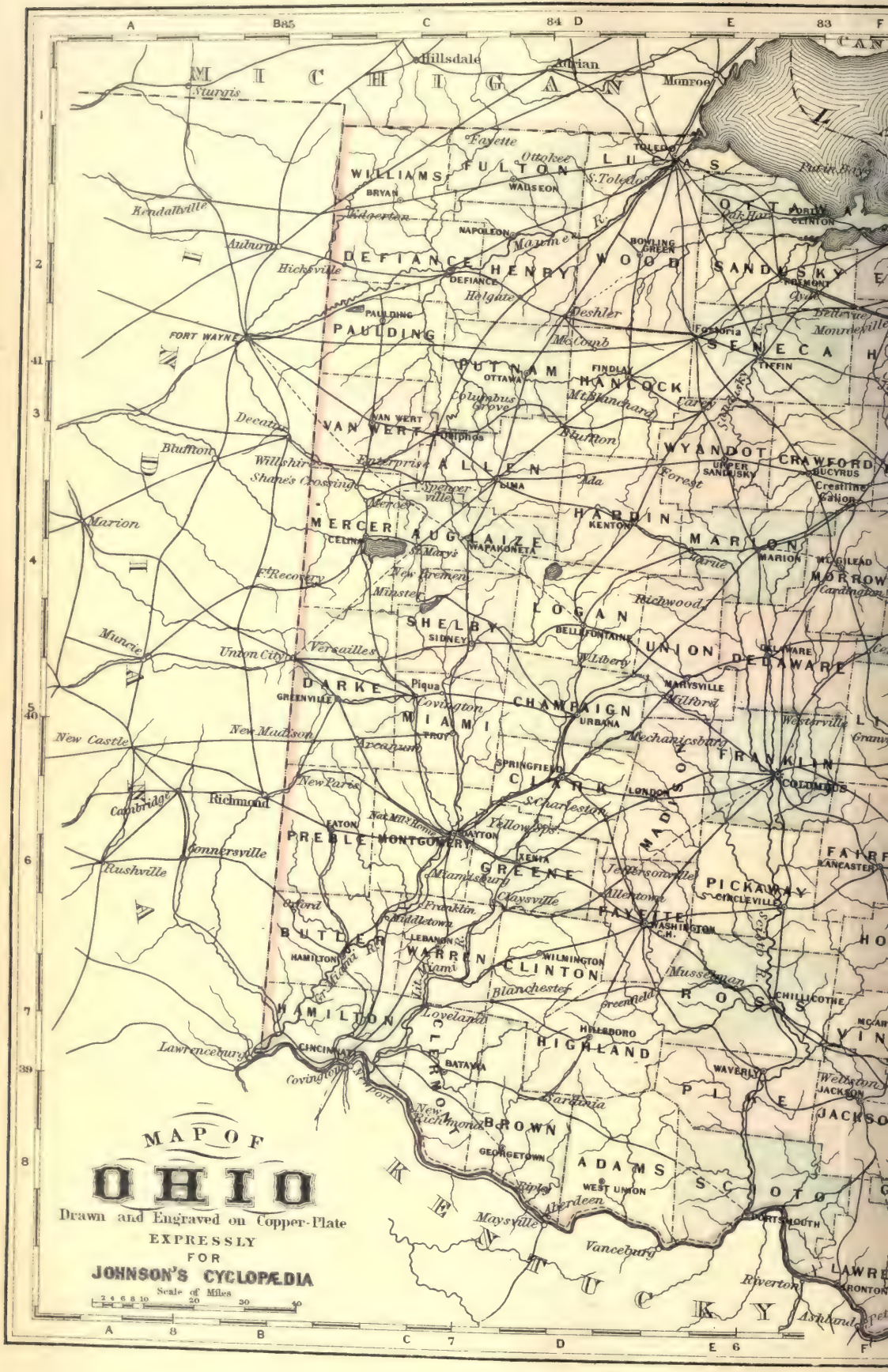
**Banking Institutions.**—There were in operation, Oct. 1881, in O. 171 national banks, with capital of \$25,689,000; circulation, \$19,413,343; U. S. bonds to secure circulation, \$22,187,300; aggregate deposits, \$53,991,092. There were also 35 State banks and trust cos., with \$2,792,180 capital and \$9,824,966 deposits; 235 private bankers, with \$4,996,387 capital and \$23,759,529 deposits; and 6 savings banks, with \$11,195,102 deposits. Of insurance cos. there were 38 reported in 1881, paying losses that yr. of \$2,353,400; risks written, 1880, \$382,178,150; premiums received, \$3,981,958.

**Education, Etc.**—The number of children of school age (6-21 yrs.) in 1879 was 1,043,320; number enrolled in public schools, 1880, 732,442, with average daily attendance of 495,924. Aggregate expenditure for public schools, 1880, \$7,707,630, of which teachers' salaries required \$4,972,541. There were 35 univs. and colls. in 1880, with 348 instructors and 5694 students, paying in tuition fees \$120,948. Normal schools, acads., and female sems. abound, and commercial colls. are found in all the larger cities. The law and med. schools of Cin. and Cleveland are largely attended. The O. Univ. at Athens, Marietta Coll., Miami Univ. at Oxford, Kenyon Coll. at Gambier, Antioch Coll. at Yellow Springs,



















and the Cincinnati Univ. are among the prin. There were published in O. in 1882, 692 newspapers and periodicals, of which 49 were daily.

**Churches.**—The M. E. takes the lead, having 2121 chs., 782 ministers, and 188,573 members; Lutherans, 572 chs., 320 ministers, 70,500 members; Presbys., 488 chs., 504 ministers, 68,898 members; Baps., 622 chs., 439 ministers, 49,040 members; R. Caths., 472 chs., 390 priests, and about 370,000 Catholic pop.; Christians (Disciples of Christ), 425 chs., 217 ministers, 45,500 members; and 30 other denominations, having from 40,000 to 100 members each.

**Population.**—In 1860, 2,339,511; 1870, 2,665,260; 1880, 3,198,062 (white 3,117,920, colored 80,142, including 109 Chl., 3 Japanese, and 130 Indians).

**Principal Cities and Towns.** Pop. 1880.—Cincinnati, 255,139; Cleveland, 160,146; Columbus (cap.), 51,647; Toledo, 50,137; Dayton, 38,678; Springfield, 20,730; Zanesville, 18,113; Akron, 16,512; Sandusky, 15,838; Youngstown, 15,435; Canton, 12,258; Hamilton, 12,122; Steubenville, 12,093; Portsmouth, 11,321; Chillicothe, 10,938; Mansfield, 9859; Newark, 9600; Ironton, 8887; Fremont, 8446; Bellaire, 8025; Tiffin, 7759; Lima, 7567; Xenia, 7026; Delaware, 6894; Massillon, 6836; Urbana, 6252; Circleville, 6046; Wooster, 5840; Norwalk, 5704; Gallon, 5635; Marietta, 5444.

COUNTIES.	*Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
Adams	A-D	20,750	24,005	West Union	626
Allen	3-D	23,633	31,314	Lima	7,587
Ashtabula	3-C	21,933	29,882	Ashland	2,904
Ashland	1-J	39,517	37,139	Jefferson	1,008
Athens	1-G	28,768	29,411	Athens	2,457
Auglaize	4-D	20,941	25,444	Wapakoneta	2,765
Bellmont	5-F	20,714	49,538	St. Clairsville	1,121
Brown	6-D	20,802	32,911	Georgetown	1,293
Butler	4-C	39,912	42,579	Hamilton	12,122
Carroll	4-E	14,491	16,416	Carrollton	1,136
Champaign	5-D	24,198	27,917	Urbana	6,952
Clark	5-D	34,298	41,948	Syringfield	20,730
Clermont	3-C	24,998	26,713	Batavia	1,015
Clinton	7-D	21,914	24,756	Wilmington	2,745
Columbiana	3-J	38,299	49,692	New Lisbon	2,028
Coshocton	4-G	29,600	26,642	Coshocton	3,034
Crawford	3-F	25,556	32,640	Bucyrus	3,385
Cuyahoga	2-H	139,010	196,943	Cleveland	160,146
Darke	3-C	32,274	40,496	Greenville	2,535
Defiance	2-C	15,719	22,515	Defiance	5,907
Delaware	4-E	25,175	27,381	Delaware	6,894
Erie	2-F	28,188	32,640	Sandusky	15,838
Fairfield	6-F	31,138	34,294	Lancaster	6,803
Fayette	6-E	17,170	20,364	Washington C.H.	3,798
Franklin	5-E	63,019	86,797	Columbus	51,647
Fulton	1-D	17,789	21,053	Wauseon	1,905
Gallia	8-G	25,545	28,124	Gallipolis	4,400
Geauga	2-I	14,190	14,321	Chardon	1,081
Greene	5-D	29,038	31,349	Xenia	7,026
Guernsey	5-H	29,828	27,197	Cambridge	2,883
Hamilton	7-C	960,370	313,374	Cincinnati	255,139
Hancock	2-D	29,847	27,784	Findlay	4,633
Hardin	3-D	27,114	27,023	Kenton	3,940
Harrison	4-I	18,862	20,458	Cadiz	1,817
Henry	2-D	14,028	20,585	Napoleon	3,032
Hickland	7-D	29,133	30,281	Hillsborough	3,234
Hocking	6-F	17,925	21,126	Logan	2,666
Holmes	4-G	20,717	21,023	Millersburg	1,514
Huron	2-E	29,652	31,609	Norwalk	5,704
Jackson	7-F	21,759	23,666	Jackson	3,021
Jefferson	4-J	29,188	33,018	Steubenville	12,093
Knox	4-F	26,333	27,431	Mt. Vernon	5,249
Lake	1-I	15,835	16,326	Painesville	3,541
Lawrence	3-F	31,280	39,062	Ironton	8,857
Licking	5-F	35,756	40,450	Newark	9,600
Logan	4-D	23,028	26,267	Bellefontaine	3,998
Lorain	2-G	30,308	35,526	Elyria	5,177
Lucas	1-E	46,622	67,377	Toledo	104,327
Mahoning	6-E	25,433	30,129	London	3,067
Marietta	3-J	31,001	42,871	Youngstown	15,435
Marion	4-E	16,184	20,565	Marion	3,899
Medina	2-G	20,092	21,453	Medina	1,464
Meigs	7-G	31,495	32,395	Pomeroy	5,590
Mercer	4-I	21,254	21,902	Mt. Pleasant	1,346
Miami	6-C	32,740	36,158	Troy	3,803
Monroe	6-I	25,719	26,496	Woodfield	861
Montgomery	6-C	64,008	78,550	Dayton	38,678
Morgan	6-H	20,363	20,074	McConnelsville	1,473
Morrow	5-G	23,483	24,972	Mt. Pleasant	1,219
Muskingum	5-G	44,886	49,774	Zanesville	18,113
Noble	6-H	19,949	21,138	Caldwell	602
Ontario	1-E	13,364	19,762	Port Clinton	1,600
Paulding	2-C	8,544	13,435	Paulding	484
Perry	6-E	28,453	29,218	New Lexington	1,357
Pickaway	6-E	24,875	27,415	Circleville	6,046
Pike	7-E	15,447	17,927	Waverly	1,539
Portage	3-I	24,583	27,500	Ravenna	3,255
Preble	6-C	21,809	24,333	Easton	2,143
Richland	3-H	17,081	22,712	Ottawa	1,293
Ross	7-E	37,097	40,307	Chillicothe	10,938
Sandusky	2-E	25,503	32,057	Fremont	8,446
Scioto	8-E	29,302	33,511	Portsmouth	11,321
Seneca	3-E	30,827	36,947	Tiffin	2,879
Shelby	4-C	29,748	34,137	Sidney	3,823
Stark	3-H	52,608	64,031	Canton	12,258
Summit	2-H	34,674	43,788	Akron	16,512
Trumbull	2-J	38,659	44,880	Warren	4,428
Tuscarawas	4-E	33,440	40,188	New Philadelphia	3,070
Union	3-F	18,730	22,375	Marysville	2,061
Van Wert	3-F	15,823	23,028	Van Wert	4,079
Vinton	7-F	15,027	17,293	McArthur	900
Warren	6-C	26,689	28,392	Lebanon	2,703
Washington	3-G	40,609	43,244	Marietta	5,440
Wayne	3-G	35,116	40,076	Wooster	5,844
Williams	1-C	20,391	23,821	Bryan	2,952
Wood	2-D	24,594	34,022	Bowling Green	1,539
Wyandot	3-E	18,553	22,395	Upper Sandusky	3,540
Total		2,665,260	3,198,062		

\* Reference for location of counties. See map of Ohio.

**History.**—The first explorations of the present terr. of O. were made by the Fr. under La Salle about 1680. Prior to La Salle's discovery the greater part of O. was inhabited by tribes of Indians superior in intelligence and civilization to the aborigines found here by the Fr. Their mounds and fortifications were constructed with an artistic skill to which the Indians of the last 2 or 3 centuries can lay no claim. But when the Fr. soldiers passed through the country they

found Indians differing in no respect from those of N. Y. or Pa. There do not seem to have been any white settlers within the limits of the State previous to Apr. 1788, when a colony from N. Eng. founded Marietta. In Dec. of the same yr. a settlement was made on the present site of Cin. Va., Mass., Conn., and N. Y., all laid claim to portions of the terr., but all eventually ceded the right of eminent domain to the U. S. Va. and Conn. reserving, however, the ownership of about 3,700,000 acres each—the Conn. lands forming what was called the Western Reserve, and the Va. the region about the Falls of the O., which eventually became a part of Ind. The Western Reserve began to be settled about 1800. Settlers suffered from Indian incursions from 1792 till about 1799. O. was admitted into the U. as a State Nov. 29, 1802, with nearly its present boundaries. During war of 1812 it suffered from repeated raids of Brit. and Indian bands. The most noteworthy action of that war, so far as O. was concerned, was the battle of Lake Erie, fought Sept. 10, 1813, at Put-in-Bay, in which Com. O. H. Perry defeated a superior Brit. squadron. The growth of the State since that time has been rapid but uneventful. From no other State was there so long or so grand a list of the foremost actors in the late c. war. During the war one of her most honored citizens was sec. of the treas. and subsequently chief-justice of the U. S.; another was sec. of war; another was the first gen.-in-chief. The State was twice subjected to raids from Confed. bands, the second time at the hands of the guerilla chief, Gen. John H. Morgan.

#### Governors.

TERRITORIAL.	William Bebb	1846-49
Arthur St. Clair	July 1788-1802	Seabury Ford
C. W. Byrd	(acting) 1802-03	Reuben Wood
STATE.	William Medill	1850-July '53
Edward Tiffin	1803-07	July 1853-Jan. '54
Thomas Kirker	(act.) 1807-08	William Medill
Samuel Huntington	1808-10	Salmon P. Chase
Return Jona. Meigs	1810-14	William Dennison
Obthiel Looker	(act.) 1814	David Tod
Thomas Worthington	1814-18	John Brough
Ethan Allen Brown	1818-22	C. Anderson
Allen Trimble	(act.) 1822	Jacob Dolson Cox
Jeremiah Morrow	1822-26	Rutherford B. Hayes
Allen Trimble	1826-30	Edward F. Noyes
Duncan McArthur	1830-32	William Allen
Robert Lucas	1832-36	Rutherford B. Hayes
Joseph Vance	1836-38	Thomas L. Young
Wilson Shannon	1838-40	Richard M. Bishop
Thomas Corwin	1840-42	Charles Foster
Wilson Shannon	1842-44	George Hoadly
T. W. Bartley	(acting) 1844	
Mordcael Bartley	1844-46	

REVISED BY A. R. SPOFFORD.

**Ohio River,** the largest of the affluents of the Miss. in respect to its discharge of water, which averages 158,000 cubic ft. per second, that of the Mo. being but 120,000 ft. It originates at Pittsburg, Pa., in the confluence of the Allegheny and Monongahela rivers. Its length below Pittsburg is 975 m.; total length to its ultimate source, 1265 m. A straight line from Pittsburg to Cairo, Ill., at its mouth, measures 615 m. Its drainage area is 202,400 sq. m. according to Ellet, 214,000 according to Humphreys. Its elevation at Cairo is 322 ft., at Pittsburg, 1021 ft.; mean fall, .72 ft. to the m.; mean rate of flow, about 3 m. an hour; mean rise in flood, some 30 ft. above extreme low water; maximum rise exceeds 60 ft. Above Cin. it is in many places fordable at low water, and is then for 6 or 8 weeks scarcely navigable. It has two classes of islands: one kind is fertile, and the other mere sand-banks called "tow-heads" by boatmen. With its numerous tributaries (some of them navigable the yr. through), it has fully 5000 m. of high-water navigation. It has no important rapids except at Louisville, Ky., where it falls 22½ ft. in 2 m. It was discovered in 1680 by the Fr. under La Salle, and was called by them *La Belle Rivière* ("the beautiful river").

**Ohio Wesleyan University,** at Delaware, O., was founded in 1843. The institution is liberally endowed. The grounds are planted with over 500 varieties of trees and shrubs, constituting an arboretum of rare excellence, which, when completed, is designed to contain a specimen of every species, native and foreign, which can be made to grow in the lat. of its location. The museum comprises 2 distinct cabinets: (1) the Prescott Cabinet, devoted to the gen. dept. of nat. hist.; (2) the Mann Cabinet, devoted to the illustration of geol.

**Ohm,** 5m (GEORG SMON), b. at Erlangen, Bavaria, Mar. 16, 1787; studied in his native city, and was appointed prof. in phys. in 1817 at the Jesuit coll. of Cologne, director of the Polytechnic School in Nuremberg in 1833, and prof. in 1849 at Munich, where he d. July 7, 1874. He discovered the so-called Ohm's Law. Wrote *Beiträge zur Molecularphysik und Bestimmung des Gesetzes, nach welchem die Metalle die Contact-Elektricität leiten*.

**Oil-Cake,** the residue left after the expression of fixed oils from crushed or ground seed of any kind. It is used both as food and as a direct fertilizer. The cake is frequently pulverized, and is then called *oil-meal*. Linseed O.-C. is valuable for fattening cattle. It is largely exported from the U. S. to G. Brit. Cotton-seed meal is used for feeding cattle, and is a valuable manure. Rape-cake and colza-cake are fed to sheep or applied directly to the land. Stale and rancid cakes are fit only for manure.

**Oil City,** R. R. centre, Venango co., Pa., on Allegheny River, in the centre of the oil dist. of Pa. Pop. 1870, 2276; 1880, 7315.

**Oil, Cod-Liver,** a fixed oil obtained from the liver of the common cod (*Gadus morhua*) and other species of *Gadus*. It is prepared on the coasts of Newfoundland, N. S., N. Eng., G. Brit., and Nor. The fish caught near the shore

\* Died in office



are promptly landed, and the oil is obtained from the fresh livers by various processes involving the application of heat and expression. Oil thus prepared is called "shore oil" and "pale oil." It is clear, light-yellow, thick, of a perfectly bland taste, but of a disagreeable fishy flavor and smell. Other varieties are called "straits" and "banks," or "light-brown" and "dark-brown," from their respective colors. They are prepared from livers which are not perfectly fresh or have actually begun to putrefy; they have a rancid, offensive flavor, and are unfit for use in food. It is a very complex substance, containing, beside the usual ingredients of fats, certain biliary principles and small quantities of iodine, bromine, chlorine, and phosphorus. It is used largely in the arts, especially in the preparation of leather. For over 100 yrs. it has been employed more or less for rheumatism, gout, scrofula, etc. It is now a staple remedy in consumption and the above-named diseases, and for all conditions where there seems to be dyspepsia for ordinary forms of fat, with emaciation and anemia. It may be taken in quantities of a tablespoonful 2 or 3 times a day, and its fishy taste is best disguised by enveloping the dose in the froth of porter.

**Oil from Coal.** See PETROLEUM.

**Oil from Shale.** See PETROLEUM.

**Oil Gas.** See GAS LIGHTING.

**Oil, Genesee,** a local name for petroleum.

**Oil, Mineral.** See PETROLEUM.

**Oil of Linseed** [*A.-S. līnseed*], the oil of flaxseed, is extensively used for all kinds of painting, for making oil-cloths, oil-silks, printer's ink, etc., its manufacture being among our most important industries, and the parent of many others. The seed is crushed and submitted to very great pressure in hydraulic presses, by which means the oil is for the most part removed. When the seed is not heated the oil is light colored, and is called *cold pressed oil*. When, however, the seed-paste is heated after grinding, and pressed while still hot, the oil is of a little darker color, but it is much more rapidly and thoroughly removed. (See OIL-CAKE.) Anderson found in linseed oil 24.44 per cent. of albuminous substance, 34.00 oil, 30.73 gum, sugar, and cellulose, 3.33 ash, and 7.50 water = 100. Linseed also contains much mucilage, which is in the outer layer of cells of the epidermis; 1 pint of linseed boiled in 16 of water gives a mucilage so thick as to draw out in threads and form a dark-colored mass when dry. (See OILS, OLEIC ACID.)

**Oil of Turpentine.** See TURPENTINE.

**Oil of Turpentine, Medicinal Uses of.** This oil is a powerful irritant, speedily producing redness and burning pain if kept too long in contact with the skin. Given internally, its most striking effect is a tendency in anything like overdose to cause great irritation, and even congestion, of the kidneys and urinary passages. Large doses act as an irritant poison, although death is rare. It is used externally as a rubefacient to relieve pain or spasm of internal parts. For this purpose flannels wrung out in hot water are dipped in the oil previously slightly warmed, and after being again wrung dry are laid upon the skin. They should not be applied longer than from 10 to 20 minutes. Internally it is given to control hemorrhages. It is especially useful in bleedings from the stomach and bowels and in the ulceration of the latter organs in typhoid fever. It is also used as a vermifuge and as an ingredient in cathartic enemata. The dose by the stomach ranges from a few drops to a fluidrachm, to be given in emulsion. Its fumes, volatilized by the heat of boiling water, are inhaled to check bleeding from the lungs.

EDWARD CURTIS.

**Oil, Olive,** is obtained from the fruit of the European olive (*Olea Europaea*), a tree grown for this purpose from the most ancient times, both in Europe and Asia Minor. "The mean produce of a tree in Fr. is about 10 lbs. of oil, and in It. 15 lbs., but single trees have been known in fruitful seasons to produce 300 lbs. of oil." (*Hillhouse*.) Even the purest virgin oil is turbid when first pressed. It clears itself by simply standing in the tanks, which on large estates are masonry cisterns under ground, where the oil is kept at an even temperature for a long time, air being excluded, the feculence settling. The color of the best oil of Aix and of Tuscany is greenish.

The adulteration of O. O. is made chiefly at Marseilles by adding colza, rape, sesame, cotton-seed, and above all ground-nut oil. The "sweet oil" of olives has a peculiar flavor, due to the fruit, not to be mistaken, and, like other acquired tastes, much in favor. In all S. Europe it replaces butter and other animal fats for table and culinary use, and its production is a very important industry. [*From orig. art. in J's Unte. Cyc.*, by PROF. B. SILLMAN, M. D.]

**Oil, Palm.** See ELÆIS and PALM OIL.

**Oils** [*Lat. oleum*; Gr. *elaion*]. The oils are liquid fats (see FATS) existing ready formed in nature. They are mostly fluid at ordinary temperatures, unctuous to the touch, stain paper with a permanent greasy spot, are insoluble in water, little soluble in alcohol (castor oil excepted), completely dissolved by ether, often, but not always, tasteless and odorless, and form soaps with alkaline bases, setting free glycerine. In short, the oils are glycerides, and fall under the general designation of fat-oils, including certain pasty sorts, like palm oil, cocoa oil, and other butter-like vegetal fats. The fat vegetal oils are all fixed, while the essential oils are all volatile. The essential or volatile oils mostly exist ready formed in plants, from which they are obtained by distillation. They are distinguished from the fat-oils not more by their volatility and odor than by their action with alkaline bases, not being capable of saponification.

**I. Vegetable Oils.**—In plants the fat-oils exist ready formed, secreted chiefly in the seeds, sometimes in the flesh or pulp about the seeds, as in the olive, dogberry, etc., and much more rarely in the roots, as in the early-almond. The vegetal oils are usually divided into 2 groups: (1) *The drying oils*, like linseed oil, which on exposure to air absorb oxygen and dry to a resinoid surface or varnish; and (2) *the*

*fatty or non-drying oils*, including olive oil. The latter class become rancid on exposure to air, but as a rule such oils do not dry up, although many thicken.

**Purification of Oils.**—The crude oils come from the press more or less changed by the heat employed, and contaminated by albumen, resinous and coloring matter, which must be removed to fit the oils for nice purposes. The treatment originally proposed by Thénard in 1801 is still in gen. use—mixing the oil with 2 or 3 per cent. of concentrated sulphuric acid in a lead-lined vat, stirring it until it assumes a greenish tint, and finally as the mucilage is carbonized the whole mass blackens. After 24 hours' repose about 2 per cent. of its volume of water, of about 170° F., is added, and the whole agitated vigorously until the liquid appears milky, when the mixture is transferred for rest to large reservoirs at a constant temperature of about 80° F. After some days' rest the clear oil is decanted and filtered either through cotton, carded wool, or flannel, sometimes through river-sand and branches of trees free of leaves. The saturation of the acid is accomplished after Dubrunfaut by chalk without so much water. Oils like cotton-seed and palm oil are treated in Eng. by a mixture of nitric acid and potassic chlorate, which rapidly oxidizes the coloring-matters.

**Physical Properties.**—All the oils are lighter than water, but their densities vary greatly with temperature; e. g. olive oil at 12° C. has sp. gr. .919; at 26°, .911; and at 94°, .862. The congealing points of the oils vary also greatly, being for olive oil 2° (C.); colza, -6.25°; ground-nut, -7°; almonds, -10°; grape, -16°; poppy and castor, -18°; linseed, -27.6°; pine, -30°.

**Chemical Properties.**—The effects of air upon the vegetable oils have already been given. In general, the non-drying, both vegetable and animal, become rancid by exposure to air, while the drying oils become gummy or resinous. This effect is quickened or intensified by boiling them with oxide of lead, peroxide of manganese, and borate or acetate of manganese—an operation attended with the production of a high color. For colorless varnishes drying oils are treated in the cold by oleate of lead prepared by acting on oleic acid by litharge. The same result is obtained by the use of protoxide of manganese, precipitated by an alkali from a protosalt of manganese, rapidly washed, and incorporated with the oil. On driving into the mixture a finely divided current of air the manganese is peroxidized in the midst of the oil, giving after washing with oil a colorless and very drying oil. The action of acids and alkalies upon oils is considered under OLEIC ACID, and also under SOAP. (For CASTOR OIL, LINSEED OIL, OIL, OLIVE, etc., see those articles.)

**II. Animal Oils.**—The animal oils and fats have a const. closely identical with the non-drying vegetal oils. They are in general propenyl ethers of the fatty acids (see FATS and GLYCERINE), so rich in oleic acid as to remain fluid at ordinary temperatures, while the corresponding glycerides of palmitic and stearic acids are more or less solid fats, as tallow, mutton suet, lard, etc. The animal oils have, as a class, a characteristic and very persistent odor, referable to their origin, which in some of the fish oils is peculiarly offensive. This animal odor adheres to the soaps made from even the sweetest animal oils with great obstinacy. The liquid animal oils are largely derived from marine animals. *Sperm oil* occurs in the cavity of the head of the sperm whale (*Physeter macrocephalus*), mixed with spermaceti, from which it is separated by crystallization and pressing in the cold. It is esteemed the most valuable of animal oils, and bears the highest price. *Whale or train oil* is obtained from the blubber of the right whale (*Balaena mysticetus*), from the black-fish, and from other species of whales. Its sp. gr. varies from .919 to .929. Dolphin oil and porpoise oil contain a peculiar fat called delphinine, phocénine, or dolphin fat. It is a neutral, very mobile oil, of sp. gr. 0.948-0.954, of a faint, peculiar, somewhat ethereal odor, like that of valeric acid. Phocénine is regarded as a mixture of valerians, and has been separated by Berthelot into valeric acid and glycerine. Seal oil, shark oil, sea-calf oil are fat oils obtained from the blubber of these animals, and having characteristics in common with whale oil. The menhaden of the Atlantic coast are extensively taken for the oil they furnish and the fish-guano produced from the compressed fish after boiling to separate the oil.

**Cod-liver Oil.** (See OIL, COD-LIVER.)

**III. Essential or Volatile Oils.**—The group or natural family of hydrocarbons which is known as the *aromatic group* embraces benzole and its homologues (see BENZOLE); hydrocarbons of the naphthalene series and the terpenes, of which turpentine oil and its isomers are members, including also caoutchouc and gutta-percha. The volatile oils form a sort of appendix to the aromatic group, and to this appendix are referred also, properly, the resins and balsams, the bitumens, and allied substances. We restrict our remarks here to the volatile oils and essences found already formed in plants. The essential oils of plants consist chiefly of mixtures of hydrocarbons with acid or oxygenized bodies of the same class. They are mostly isomeric or polymeric with oil of turpentine. Turpentine oil is the product of various species of Coniferae, and is obtained from wounds or incisions in the bark, from which it exudes in combination with the resin and other vegetable juices, and is separated from them by distillation. While all the volatile oils thus obtained from coniferous plants are alike in gen. properties, as of odor, solvent power, etc., they really differ much in density, and more especially in optical properties, some revolving the polarized beam to the right (dextrorotatory), while others revolve it to the left (laevo-rotatory), and in unlike degrees. Most kinds of turpentine oils are mixtures of 2 or more isomeric or polymeric hydrocarbons, differing in phys. and sometimes in chemical properties. The oxidized constituents of the essential oils are sometimes the direct products of the oxidation of the hydrocarbon itself, in which case they are usually viscid resins; while in other cases the 2 classes appear distinct—i. e. not



derivative of the same primary nucleus. The volatile oils generally absorb oxygen rapidly, rarefying and gaining color in the process, and sometimes forming crystals of camphor-like bodies. The oils of lemon, orange, etc. by exposure seem spontaneously to lose their delicate perfume and change to the odor of turpentine. The volatile oils are generally obtained by distilling the parts of plants in which they exist, as the leaves, bark, roots, and even wood. Many oils of delicate perfume, like oil of lemons, orange, etc., exist in cells in the skin of the fruit and leaves in a state sufficiently abundant to permit their separation by pressure, while heat would impair their delicacy. The *essences* are only the watery solutions of essential oils. Some of the volatile oils contain acids, aldehydes, etc., the study of which has shed important light on organic chem.—*a. g.* oil of wintergreen (*Gaultheria procumbens*) and meadow-sweet (*Spiraea ulmaria*) furnishing salicylate of methyl and salicylic aldehyde. Bitter almonds furnish benzoic aldehyde, and aldehydes of analogous const. are obtained from the essential oils of cinnamon (*Cinnamomum*), oil of cinnamon and cassia, etc. Sulphur exists in certain oils, as of garlic and mustard. The odors of volatile oils are by no means all agreeable. Many are pungent, irritating, and even repulsive; their taste is usually aromatic, often burning. Alcohol and ether are their proper solvents. Many volatile oils are the result of decomposition of other compounds by heat, fermentation, and the action of acids; such are eupione, creosote, naphthalene, fusel oil, oil of wine, etc.; while others which exist ready formed in plants, like those of *Spiraea ulmaria* and *Gaultheria procumbens*, may be formed artificially. There are some volatile oils of animal origin, as in ants, castoreum, skunk, etc. The adulteration of volatile oils is often practised with fixed oils, when it may be detected by a permanent greasy stain left on paper after evaporation and warming; by distilling off the volatile oil, leaving the fixed oil behind; or by dissolving the volatile oil in 3 or 4 volumes of 80 per cent. alcohol, when the greater part of the fixed oil remains behind. Alcohol is also a frequent adulterant, and may, when the quantity is large, be detected by dilution of the adulterated oil with water, when it becomes very turbid. Oil of turpentine is often used to adulterate the costly oils of the same series, as of orange, lemon, neroli, etc. It may often be detected by the smell, or after setting fire to it and then blowing it out. [From *orig. art. in J. A. Univ. Cyc.*, by PROF. B. SILLIMAN, M. D.]

**Oil, Seneca**, a local name for petroleum.

**Oils, Essential.** See OILS.

**Oils, Volatile.** See OILS.

**Ojeda**, o-há'dah, de (ALONSO), b. at Cuenca, Sp., about 1495; accompanied Columbus in his second voyage to Amer. 1498; led a party of exploration to Cibao and through the interior of San to Domingo; explored the Vega Real in a second expedition (Apr. 1494); discovered command of an independent exploring expedition; set sail May 20, 1499, accompanied by Amerigo Vesputius; discovered Venezuela in June, and returned to Sp.; in 1501, again accompanied by Vesputius, made another voyage and discovered the Gulf of Urubá; returning to Sp. in 1508, he obtained a royal grant of Nueva Andalucía (now Colombia); founded the town of San Sebastian on the Gulf of Darien; embarked for Hispaniola in quest of reinforcements; was put in irons and carried to Cuba; was for some time engaged in wars with the Indians of that island; ultimately reached Hispaniola in broken health and spirits, and d. there in 1510 or 1511.

**Okecho-bee, Lake**, the largest lake in the S. U. S., lies in S. Fla., mostly in Brevard co. It is 40 m. long, 25 m. wide, and 12 ft. in maximum depth. It receives several streams, of which Kissimmee River is the most important. A large part of the lake is grown up with grass and weeds. Its waters are discharged through the Everglades without any discoverable outlet. Nearly all the shores are impenetrable, swampy jungle, and the lake itself is nearly inaccessible. It contains a few low islands. The reports of ruined buildings upon these islands are false. It is now being drained. Area, 1200 sq. m.

**Okhotsk**, o-kots'k', **Sea of**, a large inlet of the Pacific Ocean on the E. shore of Asia, between the island of Saghalien, Siberia, Kamtehatka, and the Kurile Islands. Its N. part is frozen from Nov. to Apr.

**Okolo'na**, on R. R., Chickasaw co., Miss. Pop. 1870, 1410; 1880, 1858.

**Okra.** See GUMBO.

**O'laf**, SAINT, the patron saint of Nor., b. about 995, a son of Harald Grínske, a grandson of Harald the Fairhaired, commanded a viking fleet when 12 yrs. old, and was one of the most dreaded sea-kings of the N. before he was 19. In 1014 he returned from a pillaging jaunt along the coasts of Fr. and Sp., and installed himself in his patrimony, the throne of Nor. He now set about introducing Christianity among his countrymen, but the Nors. rose in rebellion against him, and when in 1028 Knud (Canute) the Great, king of Den. and Eng., who laid claim to Nor., landed with an army near Drontheim, O. was compelled to flee to Rus. Two yrs. afterward he returned with aid from Rus. and Swe., and gave battle at Stiklestad, near Drontheim, July 29, 1030, but his army was routed, and he himself slain and buried on the spot. In the following century he was canonized.

**Ola'the**, city and R. R. junc., cap. of Johnson co., Kan., 21 m. S. W. of Kansas city, has a commercial coll. and a deaf and dumb asylum. Pop. 1870, 1817; 1880, 2285.

**O'ibers** (HEINRICH WILHELM MATHIAS), b. at Arbergens, near Bremen, Oct. 11, 1758; studied med. at Göttingen, and practised as a phys. at Bremen, where he died, Mar. 2, 1840. He invented a new method of calculating the orbits of comets from 3 observations, and his observations of comets enjoy a great reputation. He discovered the planets Pallas, Mar. 28, 1802, and Vesta, Mar. 29, 1807.

**Old castle** (Sir JOHN), BARON COBHAM, b. in Eng. about the middle of the 14th century; fought with credit in the Fr. wars; obtained the title of baron by marriage; was an

early convert to the doctrines of Wycliffe; took part with John of Gaunt, duke of Lancaster, in his efforts to promote ecclesiastical reform, presenting a remonstrance on the subject in Parl., entitled *Twelve Conclusions addressed to the Part of Eng.*; wrote a number of discourses and satirical verses; declared the pope to be Antichrist; was accused of heresy, and thrown into the Tower (1413); escaped to Scot., and thence into Wales; was falsely accused of raising an army of 20,000 "Lollards" to overthrow the king; was thereupon outlawed by Parl. Being captured in Wales, he was hung in chains alive upon a gallows and burned to death by a slow fire at St. Giles's Fields, Lond., Dec. 25, 1417. (See his *Life*, by GURPIN, 1808.)

**Old Cath. oils**, a body of seceders from the R. Cath. Ch. under the lead of Dr. Dollinger and other distinguished scholars of that Ch. The O. C. movement dates from a protest against the papal infallibility decree of the Vatican Council in 1870, as being contrary to hist. and conscience. Dr. Dollinger, in an open letter to the abp. of Munich (formerly his pupil), declared (Mar. 28, 1871) that "as a Christian, as a theologian, as an historian, and as a citizen, he could not accept the Vatican decrees;" whereupon he was excommunicated, Apr. 17, 1871, as being guilty of "the crime of open and formal heresy." His colleague, Prof. Friedrich, incurred the same fate. The movement spread with considerable rapidity in Ger. and Switz. It professed to retain the whole Catholic system, with the exception only of the Vatican decrees, which were regarded as dangerous innovations. It never identified itself with Protestantism in any form, and continues to hold a medium position between Romanism and the chs. of the Ref. It was formally organized in 1873 by the election of Prof. Joseph Hubert Reinkens as bp. He was consecrated by the Jansenist bp. Heykamp at Rotterdam, Aug. 11, 1873, and recognized in this new dignity by the Prus. govt. He resides at Bonn on the Rhine. The O. C. or "Christian Catholics" of Switz. elected Edward Herzog, formerly a priest at Olten, their bp. He was consecrated by Bp. Reinkens at Rheinfelden, Sept. 18, 1876, and resides at Berne. In 1880 he visited the U. S. as a guest of the Gen. Convention of the P. E. Ch. then in session at New York. The O. C. are most in sympathy with the Epis. Ch. of Eng. and Amer., but still retain the mass and most of the doctrines and ceremonies of the Rom. Ch. They have a theological faculty at Bonn, and one at Berne. The movement never extended beyond Ger. and Switz., but Père Hyacinthe, the eloquent ex-priest of Notre Dame, occupies a similar position in Fr., and has a small congregation of admiring followers in Paris.

PHILIP SCHAFF.

**Oldenburg**, grand duchy of Ger., consists of O. proper, bordering N. on the Ger. Ocean and surrounded on the other sides by Hanover, and comprising an area of 2417 sq. m., with 337,478 inhabs.; the principality of Lubeck, wholly inclosed by Holstein, and comprising an area of 180 sq. m., with 35,145 inhabs.; and the principality of Birkenfeld, situated in Rhenish Pruss., and comprising an area of 143 sq. m., with 38,685 inhabs. O. proper is low and flat; large dikes have been erected along the shores of the ocean and the rivers Weser and Jahde. The soil is partly marshy, partly sandy, in some places covered with extensive forests, in other with heath. Agriculture and cattle-breeding are the chief occupations; there are no manufactures.

**Oldham**, town of Eng., co. of Lancaster, on the Medlock, 6 m. from Manchester. In 1760 it consisted of only 60 houses, but the discovery of rich coal-mines in its vicinity occasioned the establishment of large factories, and soon it became one of the leading manufacturing towns of Eng. Pop. 111,343.

**Oldhamia**, a peculiar organism having a branching, plant-like form, and thought by some to be a polyzoan, by others a vegetable; it is found in the Cambrian rocks of Ire., and is interesting as one of the first known forms of life; it was named after Dr. Oldham, late director of geological survey of India.

**Old Red Sandstone**, a name formerly used to designate the members of the Devonian system in Scot. and Wales. Here the most characteristic element in the formation is Red Sandstone, and the term Old Red was applied to this to distinguish it from the Tassiac red sandstones, which overlie the carboniferous system, and which received the name of the New Red sandstone. Later geological investigations have shown that the group of rocks which in other countries are the equivalents in age of the O. R. S. of Scot. sometimes contain no red sandstone, and consist of limestones, shale, etc. The O. R. S. series of Scot. consists mainly of mechanical sediments deposited in shallow water, and were formed by the wash from near and older land; Prof. Ramsey has suggested that they were formed in bodies of circumscribed and perhaps fresh water. The characteristic fossils of the formation are fishes and large crustaceans. (See GEOLOGY and FOSSIL FISHES.)

**Olea'cea**, [from *olea*, the "olive," one of the genera], a natural order of exogenous trees and shrubs, now extended so as to include the jessamine family, mostly natives of warm temperate and tropical climates, the ash alone having a higher N. range. The character of the order is that of having regular flowers, with the parts of the calyx and corolla 4 and hypogynous, while the stamens are only 2, and the ovary 2-celled; but some are apetalous. The olive tree is far the most important representative of the order, and next to it the ash trees with their excellent wood timber, one species also yielding manna.

A. GRAY.

**Olean**, R. R. junc., Cattaraugus co., N. Y., on the Alleghany River and the Genesee Valley Canal, has a large lumber and produce trade. Pop. 1870, 1327; 1880, 3036.

**Oleander** [Fr. *oléandre*], the *Verum oleander*, an evergreen shrub of the order Apocynaceae; a native of warm parts of the Old World. Its flowers are usually of a rich pale red, but are sometimes white. *N. odoratum*, the fragrant oleander, a native of India, is a more tender species, with sweet-scented flowers. The wood and all parts have a poi-



sonous action resembling that of digitalis, best treated by a judicious use of stimulants.

**Oleaster** [Lat.], *Eleagnus angustifolia*, a small tree of the order Eleagnaceae, a native of warm regions in the Old World, is planted as an ornamental tree for its silvery foliage. Its flowers are exceedingly fragrant.

**Ole Bull.** See BULL, OLE BORNEMANN.

**Oleant Gas.** See ETHYLENE.

**Olefines**, hydrocarbons homologous with ethylene, so called from their property of forming oily compounds with chlorine. They are found among the products of destructive distillation, and may be formed by the exposure of paraffines to high temperatures under pressure. (See ETHYLENE, HYDROCARBONS, and PARAFFINES.)

**Oleic Acid.** This monatomic acid is the most important of the group of fatty acids. It is obtained by treating olive oil, almond oil, or animal oils by a caustic alkali, decomposing the resulting soap by tartaric acid and heating the fatty acid, after first washing it with water in the water-bath with half its weight of oxide of lead in fine powder for some hours. The oleate of lead, separated by ether and filtration from the stearate, is decomposed by dilute hydrochloric acid in deficiency, and the ethereal solution of O. A. is then separated from the acid-water, washed, and the ether distilled from it. O. A. is soluble in alcohol, and crystallizes from it on cooling in brilliant crystals which melt at 57° F. to a clear, colorless oil. O. A. distils over unchanged in a vacuum, and is even soluble in strong sulphuric acid at ordinary temperatures without decomposition. It is without smell or taste when pure, and is insoluble in water. Alcohol and ether dissolve it in all proportions, and in solutions it reacts neutral. By air it is slowly oxidized at ordinary temperatures, but it rapidly absorbs oxygen when melted, becoming rancid both to smell and taste, and then develops a strong acid reaction.

Very large quantities of crude and high-colored O. A. are produced in the lime saponification of lard and tallow by Chevreul's method in the manufacture of stearine candles. This impure O. A., which is found in commerce under the name of *red oil*, yields pure O. A. after separation from its lead-salt, after a second saponification with an alkali, and is salted out with sodium chloride mixed with sodium carbonate, by which means only can it be freed from the associated coloring-matters. At 66° F. the sp. gr. of O. A. is 0.896.

**Linoleic Acid** (*Papeveroleic Acid*, *Trockenbläure*).—This monatomic acid of the fatty group exists in linseed and poppy oil. Linoleic acid is a limpid oil, more so than poppy oil, of sp. gr. 0.92 at 14° C., of a faint yellow color, a slight acid reaction, and a high refractive power. It absorbs 2 per cent. of oxygen by long standing, and thickens so that it will hardly flow, but remains colorless, and forms a varnish on wood, but on glass merely becomes tough. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. B. SILLIMAN, M. D.]

**Oleine.** See OLEIC ACID.

**Oleomargarine.** See BUTTER.

**Oleo-Phosphoric Acid**, a phosphuretted fatty acid found in the brain. It is a yellow, gummy body, containing 1.9 to 2.0 per cent. of phosphorus. By long boiling with water or alcohol, more quickly with acidulated water, it gradually forms a pure oleine, while the liquid becomes decidedly acid from the phosphoric acid set free. Alkalies form oleates and phosphates with free glycerine. All parts of vertebrate animals contain this body, and a similar substance is found in the yolk of the eggs of cartilaginous fishes and other animals. (See LECTHINE.)

**Oleo-Resins**, natural mixtures of fixed or volatile oil with resins. The most important are those of capsicum, cubeb, the male fern, lupuline, black pepper, and ginger. They are prepared by exhausting the portion of the plant containing them with ether, and subsequently evaporating off the solvent. (See OILS.)

C. F. CHANDLER.

**Olbanum** (*incense, frankincense*), a gum resin which exudes from a tree growing in Ar. and India. It melts with difficulty and imperfectly when heated, and burns with a bright flame. It has a balsamic, resinous smell and an acrid bitter taste. It is used for fumigation and in the preparation of plasters. It has been burned from antiquity in religious ceremonies.

**Oligoclase** [Gr. ὀλίγος, "brittle," and κλάσις, "fracture"], one of the feldspars, crystallizing in the triclinic system, and essentially a silicate of alumina and soda.

**Olin** (ABRAHAM B.), LL.D., b. at Shaftesbury, Vt., 1812, grad. at Williams Coll. 1835; became in 1838 a lawyer of Troy, N. Y., and was 3 yrs. city recorder; M. C. 1857-63; judge of the supreme court of D. C. 1863-78. D. July 7, 1879.

**Olin** (HENRY), b. in Vt. in 1737; was a member of the gen. assembly continuously from 1799 to 1825, except 4 yrs.; of the constitutional conventions of 1814, 1822, and 1828; associate judge of Addison co. 1801-06, chief-judge 1807 and 1810-24, M. C. 1824-25, lieut.-gov. 1827-29, and councillor 1820-29. D. 1837.

**Olin** (STEPHEN), D. D., LL.D., son of the preceding, b. at Leicester, Vt., Mar. 3, 1797, grad. at Middlebury Coll. 1820; entered the M. E. ministry 1824; labored 2 yrs. in Charleston, S. C.; was pres. of the Abbeville Sem.; held the chair of Eng. lit. in Franklin Coll., Ga., 1836-39; pres. of Randolph-Macon Coll. 1839-37; was in Europe 1837-41; a delegate to the Evangelical Alliance 1846; pres. of the Middletown Wesleyan Univ. from 1842 until his death; wrote *Travels in the East*. D. Aug. 16, 1851.

**Olin'da** (PEDRO DE ARAUJO LIMA), MARQUIS OF, b. at Pernambuco, Brazil, in 1790; was cabinet minister 1823, 1827, 1832, and 1837; twice regent of the empire during the minority of Dom Pedro II.; made Viscount Olin'da 1841, marquis 1854, and member of council of state 1842. D. June 7, 1870.

**Olp'phant** (LAURENCE), b. in Eng. in 1829, son of Sir Anthony Olphant; ed. in Eng.; went to Ceylon in youth; accompanied Jung-Bahadoor, the Nepalese ambassador in

London, on his return to his own country in 1850; wrote *A Journey to Katmandu, or the Nepalese Ambassador at Home*; studied law at the Univ. of Edinburgh; travelled in S. Rus. and the Crimea a few months previous to the Crimean war, and wrote *The Russian Shores of the Black Sea*; became private sec. to Lord Elgin, gov.-gen. of Canada; supt. of Indian affairs in Canada; travelled in the U. S.; pub. *Minnesota, or the Far West* (1855); wrote an anonymous pamphlet, *The Coming Campaign*; accompanied the army of Omar Pasha to the region in question; wrote *The Transcaucasian Campaign of Omar Pasha* (1856); accompanied Lord Elgin as private sec. on his mission to Chi. in 1857; wrote *A Narrative of the Earl of Elgin's Mission to Chi. and Japan* (1860); was chargé d'affaires in Japan 1861; entered Parl. 1865; joined the semi-religious community established in 1868 by Thomas L. Harris in Portland, Chautauque co., N. Y.; was correspondent of the *London Times* in Paris at the outbreak of the Franco-Ger. war (1870), and was manager of the Amer. interests of the Direct Cable Co., a submarine telegraphic enterprise, 1873-75. Wrote two novels, *Patrician and Filibuster*, and *Piccadilly*.

**Olive** [Lat. *olea*], an evergreen fruit and oil-producing tree, the *Olea Europea* (but not originally European), of which many varieties have been developed by cultivation and differences of soil and climate. The O. is supposed to be indigenous in N. India and in other temperate Asiatic regions. The tree and its oil were known in Pal. in very remote ages, and are spoken of by the O. T. writers, the oil being used for food, for anointing the hair and person, for sacrificial libations, and for illumination. They are also mentioned by Homer, in whose time, however, oil seems not to have been employed as food, but only for anointing and as an ingredient in unguents. The wood is fine-grained, hard, durable, and beautiful. The O.-branch was the symbol of peace, and the destruction of the tree by a public enemy was regarded as a violation of the usages of civilized warfare. For several centuries before the Chr. era the O. subserved a vast variety of uses in most of the countries subdued by Rome. Its berries were pickled for the table, and the oil was employed for all purposes for which it is now used, except for manufacture of soap, an article not known to anc. Rom. toilet or laundry. (See OIL, OLIVE.)

The O. is now extensively cultivated in Asia Minor, Syria, Tunisia, Algeria, and Morocco, where it is extremely productive; in all S. Europe, and even the Crimea. In Sp. and Port. the berry is large and superior to all others for the table. In Fr. its growth is confined to the S. depts. Fr. produces but a small proportion of the oil it consumes, importing it largely from Algeria and elsewhere. In It. the O. is cultivated extensively in all provs. not too far from the Mediterranean, except in those watered by the lower Po and those so elevated as to be much exposed to frost.

Of all fruit trees, the O. is doubtless the hardiest. The smallest strip of green wood or living bark, or, in the absence of that, the roots, throw out new shoots, and the stock becomes again productive. Such is its tenacity of life that it still survives for centuries after the heart and all but the outer layer of young wood are rotten and gone. The O. trees now standing in what is called the garden of Gethsemane at Jerusalem are alleged to be identified by tax-rolls as existing 1000 yrs. ago.

In Europe the O. does not often exceed 15, or at most 20 ft. in height, and for the convenience of gathering the fruit a low, spreading growth of the crown is preferred and promoted by pruning, but in Pal. and in some of the Mediterranean islands there are O. trees as lofty as the tallest oak. The O. is propagated by sowing the stone or kernel of the berry; by grafting or budding, generally on a wild stock; by slips, and by planting the knots or eyes found in the trunk near the surface of the ground. When the surface is not too rough it is usually cultivated for some annual field-crop. Under exceptionally favorable conditions a well-manured tree may yield 25 lbs. of oil, but the average product in Tuscany is said to be not above 2½ lbs. The O. prefers light, rich, warm ground; does not thrive on alluvial soils, but grows well on hilly and rocky surfaces. Hence, much land too rugged for other crops is turned to profitable account by O. plantations. The height to which these orchards can be carried is limited by the liability to frost.

For the table the berries are gathered when fully grown, but still quite green; steeped for 20 or 24 hours in weak lye or lime-water; then in fresh water changed every 12 or 24 hours for 4 or 5 days, or until they have lost their bitter flavor and the water runs off clear and tasteless. They are now salted or pickled in strong brine, in which they are kept for use in close vessels, though sometimes preserved in oil. The harvest of the berries for oil begins as soon as the skin has turned to a dark wine color, and good husbandry requires that it be finished in 2 or 3 months, but in ordinary practice it is continued through the whole winter, and even into spring.

GEORGE P. MARSH.

**Olive Oil.** See OIL, OLIVE.

**Oliver** (ANDREW), b. at Boston, Mass., Mar. 23, 1706, grad. at Harvard Coll. 1724; was a representative of Boston in the gen. court 1743-46, member of the council 1746-65, sec. of the prov. 1756-70, distributor of stamps 1765, but compelled to resign that post at the "Liberty Tree;" lieut.-gov. 1771. D. Mar. 3, 1774.

**Oliver** (PETER), LL.D., brother of Lieut.-Gov. Andrew, b. at Boston, Mass., Mar. 26, 1713, grad. at Harvard Coll. 1730; was appointed a justice of the supreme court Sept. 1756, chief-justice 1771; impeached by the house of representatives 1774 for refusing to subscribe an engagement to receive no pay or emolument except from the assembly; accompanied the Brit. troops on their retirement from Boston 1776; subsisted some yrs. in Eng. on a grant from the Crown, and d. at Birmingham Oct. 13, 1791.

**Oliver** (THOMAS), b. at Dorchester, Mass., Jan. 5, 1734, grad. at Harvard Coll. 1753; lieut.-gov. of Mass. and pres. of the council 1774. Compelled by the people to resign his



seat at the council board Sept. 1774. he took refuge with the Brit. troops at Boston, and accompanied them finally to Eng. D. at Bristol, Eng., Nov. 29, 1815.

**Olives, Mount of**, or **Mount Olivet**, now **Jebel et-Tûr**, is on the E. of Jerusalem, from which it is separated by the valley of Jehoshaphat, and rises 2786 ft. above the level of the sea, 453 ft. above the valley, and 190 ft. above the most elevated part of Jerusalem. It forms the middle summit of a ridge of hills which to the N. expands into a large elevated table-land, but which here contracts and terminates in a row of 3 hills. The southernmost of these hills is now called the "Mountain of Offence," because Solomon here instituted the pagan worship for his concubines. The N. hill was the place where Titus encamped when he came before Jerusalem. The middle summit is the proper M. of O. At its foot is the garden of Gethsemane.

**Olivet** (JOSEPH TROULIER, ARSE D., b. at Salins in 1682; entered the Society of the Jesuits; about 1714 abandoned them, and devoted himself to letters; was admitted a member of the Fr. Acad. in 1723. His devotion to Lat. lit. enrolled him on the side of the defenders of the study of the classics. Among his works are an ed. of Cicero with notes, translations of Cicero's *De Natura Deorum* and *Catilinariae Orationes*, of the *Philippics* of Demosthenes, *Poemata Didascalica*, and a hist. of the Fr. Acad. D. 1768.

**Olivetans**, **Brethren of our Lady of Mount Olivet**, a congregation of Benedictine monks, whose first gen. was John Tolomei, chosen in 1319 by authority of Pope John XXII.

**Olivine** [Lat. *olivâ*], a name given to an olive-green variety of chrysolite, a natural silicate of magnesia and protoxide of iron, glass-like in appearance. It occurs commonly in many basalts and lavas. O. has also been met with in meteorites.

**Olmsted** (DENISON), LL.D., b. at E. Hartford, Conn., June 18, 1791, grad. at Yale 1813; was a coll. tutor 1815-17; became in 1817 prof. of chemistry, mineralogy, and geol., and executed what is believed to have been the first State geological survey in this country (report pub. 1824-25; became in 1825 prof. of math. in Yale, and in 1836 prof. of astron. and natural philos.; wrote text-books on natural philos., astron., and a number of biographical memoirs; made observations on hall, on meteors, the aurora borealis, etc. D. May 13, 1859.

**Olmsted** (FREDERICK LAW), b. at Hartford, Conn., Apr. 26, 1822; studied agricultural science and engineering at Yale 1845-46; became a practical farmer, first in Central N. Y. and then on Staten Island; was appointed, with Calvert Vaux, to superintend the construction of Central Park, N. Y., a work upon which he was several yrs. employed. In 1874 he was appointed to superintend the reconstruction of the grounds about the capitol, Wash.; author of *Journey in the Seaboard Slave States*, *Journey through Texas*, the *Cotton Kingdom*, etc.

**Olney**, city and R. R. junc., cap. of Richland co., Ill. Pop. 1870, 2680; 1880, 3512.

**Olney** (JESSE), b. at Union, Tolland co., Conn., Oct. 12, 1798; was for 12 yrs. a teacher in the Hartford Gram. School, where he was the first Amer. teacher to introduce the method of separating geog. from astron., and beginning the former study by familiarizing the pupil with his own town, co., and State. To perfect himself in his favorite studies he visited Europe several times, residing at Paris for considerable periods. Residing at Southington 1834-54, and at Stratford for the remainder of his life, he served 10 terms in the Conn. legislature, and was elected State comptroller of public accounts in 1867. Author of a *School Geog.* and *Atlas*, an *Arith.*, a *Hist. of the U. S.*, and compiled the *National Preceptor*, a reading-book. D. July 30, 1872.

**Olneyville**, R. R. junc., Providence co., R. I. Pop. not given in census.

**Olozaga** (SALUSTIANO), b. at Logroño, Sp., in 1803, ed. for the bar; elected to the Cortes 1833; reporter of the constitutional commission 1837, when he insisted on the retention of the senate; proposed and carried laws providing for electoral reform, the suppression of monasteries, the abolition of ecclesiastical tithes, and a gen. amnesty; was ambassador to Fr. 3 times; was the chief author of the const. of 1855; retired from political life on the triumph of O'Donnell in 1856, but continued to reside in Fr.; pres. of the Cortes Mar. 1869 and Apr. 1871. D. at Enghien, Belg., Sept. 26, 1873.

**Olympia**, a plain in Elis, Peloponnesus, on the banks of the Alpheus, where the Olympic games were held, containing the Altis or sacred grove, which was said to have been inclosed by Hercules, and which contained the temple of the Olympian Zeus, with his statue by Phidias, and many other public buildings. Connected with the Altis were the stadium and the hippodrome. At time of the elder Pliny (23-79 A. D.) about 3000 statues were standing; now the space is occupied with a few scattered ruins, and of late important discoveries have been made by a Ger. commission.

**Olympia**, city, on R. R., cap. of Wash. Terr., and seat of justice of Thurston co., on the De Chutes River, at its entrance into Budd's Inlet, the S. projection of Puget Sound. Tumwater, on the opposite side of the river, is connected with the city by a bridge, and another bridge connects the city with the W. shore of the inlet. It has good water-power, and is the manufacturing and commercial centre for the surrounding country. Pop. 1880, 1232.

**Olympiad** [*Ὀλυμπιάς*], the period of 4 yrs. between any 2 celebrations of the Olympic games. The O. was early adopted as an era for the recording of the dates of events. The O. were designated by number, the first being reckoned from the victory of Coræbus in the foot-race, A. C. 776. Events are recorded as having happened in such and such an O., or in such a yr. of a certain O. A new era of O. was established in the Rom. empire in 131 A. D., which was sometimes used.

**Olympic Games**. See GRECIAN GAMES.

**Olympus**, the modern *Ellymbos*, was the anc. name of a

lofty range of mts. which separated Thessaly from Macedonia. Their sides are clad with beautiful forests, but the tops are covered with snow for 9 months of the yr. The highest peak rises 9754 ft.

**Omaha**, o'ma-haw, city and important R. R. centre, cap. of Douglas co., Neb., on the W. bank of the Mo. River, 950 ft. above sea-level, laid out in 1854, has a fine U. S. custom-house and P. O. building, extensive machine and car works, foundries, etc. Pop. 1870, 16,063; 1880, 30,518.

**Oman**, a terr. of S. E. Ar., extending from the Ar. Sea to the Per. Gulf along the Sea of Oman, and divided into several states, of which the most important is Muscat.

**O'mar** (ABU HAFSAH IBNUL-KHATTAB), the second caliph of the Moslems, a relative of Mohammed, b. about 581; was at first one of the bitterest adversaries of the Prophet, but became after his conversion one of the most zealous apostles of Islam. In 634 he succeeded Abubekr, and assumed the title of *Amir El-Mumenin* ("commander of the faithful"). In 637 Syria and Pal. were conquered, and a mosque was built on the spot where once stood Solomon's temple; in 639 Egypt was subdued, in 642 Per. Under his rule an internal consolidation of the empire went along with the conquests. In 644, while at prayer in the mosque of Medina, he was stabbed by a Per. slave.

**O'mar Pa'sha**, b. at Plaski, Croatia, in 1806, a son of an Aus. officer; was ed. at the military school of Thurn, but fled in 1833 to Bosnia, embraced Mohammedanism, and became tutor to the sons of Hussein Pasha. With them he went to Constantinople, became teacher in a military school, and writing-master to the heir-apparent, Abd-ul Medjid, and when, in 1839, Abd-ul Medjid ascended the throne, O. rose rapidly. In 1842 he was appointed military gov. of Lebanon; in 1843 he was made a pasha, and put down rebellions in Albania, Bosnia, Koordistan, and other places. In the war between Tur. and Rus. he commanded the army on the Danube, and compelled the Rus. to withdraw from the principalities. In the beginning of 1855 he transferred his army to Eupatoria and repelled a Rus. attack. After the peace he was appointed gov. of Bagdad, but having been accused of maladministration he was discharged, and even banished to Kharpoot in 1859. He was soon recalled, and sent to Bosnia in 1861, and to Crete in 1867, to put down rebellions. In 1869 he had charge for a short time of the ministry of war, and continued a member of the council of the sultan to his death, Apr. 18, 1871.

**O'men** [Lat.], among the anc. Roms., a sign by which the gods were believed to indicate their favor or opposition to any proposed public or private action. The O. were publicly observed by the magistrates, assisted by haruspices and augurs, the former observing signs of the first, the latter of secondary importance.

**Ommiyades** [from *Ommeyah*, one of their ancestors], the second dynasty of the Ar. caliphate. They were 14 in number, and reigned at Damascus from A. D. 661 (41 Hejira) till 750. There were, however, 27 Ommiyade caliphs in Sp. (755-1031), and others in the S. E. of Ar. In the latter region they maintained a limited authority until after 1500. After the final overthrow of the Damascus caliphate in 750 the seat of govt. was transferred to Bagdad.

**Omniscience**, om-nish'e-ens, an attribute of God, in consequence of which he knows of all that has been, all that is, and all that shall be. In its last phase, as FOREKNOWLEDGE (which see), it has occasioned several very subtle theological distinctions.

**Om'ro**, on R. R., Winnebago co., Wis., 10 m. W. of Oshkosh. Pop. 1870, 1838; 1880, 1476.

**Onagra-cææ** [from *Onagra*, a former genus], a natural order of exogenous herbs and shrubs which are found mainly in temperate climates, and especially in Amer. It is distinguished from related polypetalons with inferior ovary by having the lobes of the calyx valvate and the petals convolute in the bud, a single slender style, stamens only as many or twice as many as the calyx-lobes, and seeds without albumen. The leading genus is *Oenothera*, or evening primrose (the Eng. name alluding to the resemblance of the corolla of the earliest known and commonest species to a primrose, and to the time when it opens), a specially Amer. genus. *Fuchsia* is a well-known genus of shrubs, in which the calyx is as showy as the corolla. An aquatic form, *Trapa*, of Europe and Asia, produces a large fleshy embryo, which is used for food under name of water-chestnut.

**Onarga**, on R. R., Iroquois co., Ill., 85 m. S. of Chicago, was incorporated 1863. Pop. 1880, 1061.

**Onawa**, Ia. See APPENDIX.

**Onck'en** (JOHANN GERHARD), b. at Varel, Oldenburg, Ger., about 1800; was in early life a domestic servant; lived for a time in Eng., where he became a member of an Independent ch.; was appointed a missionary of the Amer. Bap. Convention 1835; visited many parts of Ger., Aus., Switz., and Den., founding chs., etc.; visited the U. S. in 1852 and established 76 chs., with a membership of more than 11,000, and nearly a hundred Sunday-schools.

**On'derdonk** (BENJAMIN TREDEWELL), D. D., LL.D., b. in New York 1791, grad. at Columbia Coll. in 1809; was ordained to the P. E. priesthood 1813; prof. in the General Theological Sem. 1830-30; bp. of New York 1830-45, when he was suspended by the House of Bps. D. April 30, 1861.

**Onderdonk** (HENRY USTICK), M. D., LL.D., b. in New York Mar. 1789, grad. at Columbia Coll. 1805; studied med. in Lond. and took his med. degree at Edinburgh 1810; was for a time associated with Dr. Valentine Mott in the editorship of the *N. Y. Med. Journal*; was ordained in 1815 as deacon in the P. E. Ch.; labored at Canandaigua, N. Y., 1816-20; rector of St. Ann's, Brooklyn, N. Y., 1820-27; consecrated assistant bp. of Pa. 1827; on the death of Bp. White became bp. of Pa. 1836; suspended 1844, restored 1856, but never resumed episcopal functions. D. Dec. 6, 1858.

**O'Neill** (JOHN BELTON), LL.D., b. at Bush River, S. C., Apr. 10, 1793, grad. at S. C. Coll. 1812; was a teacher in the acad. at Newberry, S. C.; served for a time in the war of



1812-15: came to the bar in 1814; was 4 times sent to the S. C. legislature, and twice chosen its speaker; became a judge 1828, a judge of the court of appeals 1830, presiding judge of the courts of errors and appeals 1850; later was chief-justice of S. C. Author of a *Digest of Negro Law*, *Annals of Newberry, S. C.* *Biographical Sketches of the Bench and Bar*, etc. D. Dec. 27, 1863.

**Onega**, a lake in the govt. of Olonetz in W. Rus. Next to Lake Ladoga, it is the largest lake of Europe, covering an area of 4830 sq. m. It is connected with the Volga and the Dwina by canals, and communicates with Lake Ladoga by the Sweer. It abounds in fish.

**Oneida**, o-n'ida, R. R. centre, Madison co., N. Y., in a great hop-raising region. The Oneida Community is in the immediate vicinity. Pop. 1870, 3262; 1880, 1649.

**Oneida Community**, a communistic society established on Oneida Creek, Lenox tp., N. Y., and constituting the chief establishment of the organization known as Bible Communists or Perfectionists. They are the disciples of John Humphrey Noyes, who founded the association at E. Poulney, Vt., 1838, and established it here in 1847. The Community has considerable landed property, and is largely engaged in the preservation of fruits, the manufacture of traps, etc. Another smaller community, with about 60 members, is settled at Wallingford, Conn. The cardinal principles are: I. Reconciliation to God. II. Salvation from sin. III. Recognition of the brotherhood and equality of man and woman. IV. Community of labor and its fruits. The latter item embraces a scheme of "pantagamy," by which all the male and all the female members of the community are held to be in a sense married to each other. They hold that the Mosaic law and ordinances were abrogated by the second coming of Christ (70 A. D.), at which time the reign of sin was concluded, and the true believers have since been free to follow the indications of the Holy Spirit in all things, nothing being good or bad in itself.

**Oneida Lake**, in Oneida, Oswego, Madison, and Onondaga cos., N. Y., is 20 m. long and 6 m. wide. Its surface is 369 ft. above the sea and 14½ above Lake Ontario. Its outlet, the Oneida River, which falls into Oswego River, is a deep, sluggish, tortuous stream, 18 m. long.

**O'Neill**, Neb. See APPENDIX.  
**O'Neill** (CHARLES), b. at Phila., Pa., Mar. 21, 1821, grad. at Dickinson Coll. 1840; was admitted to the bar 1843; was a member of the Pa. house of reps. 1850-52, of the State senate 1853; again a member of the lower house 1859-60; was a Rep. M. C. for 2d Phila. dist. 1863-71; again elected 1872, and re-elected 1874.

**Oncon'ta**, on R. R., Otsego co., N. Y., on the W. bank of the Susquehanna River. Pop. 1870, 1061; 1880, 3002.

**Onion**, un'yün (Lat. *cepa*; *unio*), a cultivated biennial herb and its bulbous foot, the latter composed of leaf-elements in a thickened condition; the *Allium cepa*, a plant of the order Liliaceae, cultivated in Egypt and Asia from immemorial time, and thence introduced into nearly all civilized countries. The O. differs from the garlic especially in having the elements of its bulb disposed in concentric layers and not in separate cloves. Ordinary O. are raised in the first season from seed, or in the second year from the small *sets* or imperfectly grown bulbs of the previous year's crop. The O. has an aromatic sulphur-oil containing allyl. The bulb is highly nutritious, and is eaten raw or cooked. The crop requires a mellow, fertile soil and clean culture. In med. it is a stimulating expectorant.

**Onondaga Lake**, in Onondaga co., N. Y., is 5 m. long, 1 m. wide, and has a maximum depth of 65 ft., but its S. part is very shallow. Its waters are stagnant, and the level is 361 ft. above tide. They flow into Seneca River. The lake was probably formed by the dissolving out of salt rock and the falling in of the roof of the cavern thus formed.

**Onosander**, or **Onesander** [*Όνoσάνδpος*, also *Όνi-σανδpος*], a Platonic philo., who wrote on tactics, military stratagems, and commentaries on the *Republic* of Plato. No one of these has come down to us, but there is a treatise extant, ascribed to O., much used by later military writers, no doubt a part of the *Tactica*. O. lived about the middle of the 1st century A. D. The treatise is divided into 42 parts, and gives instruction on the duties of a commander.

**Ontario**, a prov. of the Dominion of Canada, Brit. N. Amer., comprising all the Canadian part of the valley of the St. Lawrence lying W. of the river Ottawa, except the cos. of Vaudreuil and Soulanges, which belong to the prov. of Que. O. was formerly called Upper Canada or Canada West. Its E. boundary, the river Ottawa, and S. and W. the St. Lawrence and the great lakes, afford a great extent of navigable waters, and many of its lakes and rivers are also navigable. Area, 107,780 sq. m. Pop. 1881, 1,913,460.

A spur of the Laurentian hills N. of the prov. of Que. runs S. and joins the Adirondacs, dividing the valley of the St. Lawrence from that of the great lakes. From near Kingston these hills are continued W. to the S. W. angle of Georgian Bay (Lake Huron), constituting the great N. hill-region, rich in timber and minerals. Among these hills of hard Laurentian rock are belts of calcareous and fertile valley-land. The N. W. has a region of Huronian formation, much resembling the Laurentian. S. of these regions lies the Great Plain of Canada West, a fertile region. Excepting the prairie along Lake St. Clair, which is often overflowed, nearly all this region is naturally or very easily drained. Among the mineral products are gypsum, crystalline lime-phosphate, brick, pottery, and drain-tile clays, hydraulic lime, building-stones, marble, slate, iron ores, copper, silver, buhr-millstone, lithographic stones, etc. The lower Devonian limestones of the S. W. produce considerable petroleum.

Among the animals are the common deer, elk, caribou, beaver, musquash, mink, marten, raccoon, otter, fisher, wolverene, fox, wolf, hare, bear, porcupine, squirrels, mice, and other rodents. Among the food-fishes are trout, whitefish, black bass, the great Huron and other catfishes, the masacalonge and other pikes. The salmon and shad have

lately been introduced into the streams. Wild-turkeys, grouse, ducks, swans, geese, and partridges are among the game-birds. In gen. character the flora is much like that of the N. U. S., but in the N. hill-country it has sub-arctic elements. The coniferous trees grow most abundantly in the hill-country, the hard-wood in the plains. On the Laurentian hills the timber is often stunted except in the ravines and hollows.

O. was a part of Fr. Canada, and in 1760 passed with the rest of that prov. into Eng. possession. After 1760 the Indians, who had been generally friendly for many yrs. to the Fr., mostly accepted the friendship of the Eng., and in the war with the U. S., which soon followed, they generally joined the Eng. and Canadians. Upper Canada was the field of a number of engagements during the war of 1812-15 between the Brit. and the U. S. In 1837 the Canadian rebellion broke out, but was soon quelled. The provs. of Upper and Lower Canada were united in 1840. In 1867 they were separated as provs., but with N. B. and N. S. they were united into the new Dominion of Canada. Cap. Toronto. (See CANADA, DOMINION OF, and CANALS OF CANADA.)

**Ontario, Lake**, the E. and smallest of the great lakes of the St. Lawrence system, has the Canadian prov. of Ont. on the N. and W. and the State of N. Y. on the S. and E. It has an area of 7300 sq. m. Its mean elevation above tide is 233½ ft., which is 334 ft. below that of Lake Erie, although both are subject to variations of surface—a slight annual variation, due to rains and droughts, a larger secular variation, occurring in the course of several yrs., and certain sudden and unexplained changes, due perhaps to strong winds. The Niagara River is its prin. feeder, and from its lower extremity the St. Lawrence arises. It is 190 m. long, 55 m. in maximum breadth, and 606 ft. in maximum depth. It is, except in winter, the channel of an extensive commerce. It seldom freezes except near the shore. Its fisheries are of much importance.

**O'nyx** [from *ὄνυξ*, a "finger-nail"], a variety of chalcedonic quartz composed of parallel layers of chalcedony of different colors, generally some shade of brown, but sometimes shades of green or red, alternating with layers of white. When the red is a rich brownish-red chalcedony (*sard*) and the white bands pure and translucent, the variety is known as *sardonyx*. EDWARD C. H. DAY.

**O'olite** ["egg-stone," so called because it seems to resemble petrified fish-roe], (1) a variety of limestone, magnesian or otherwise, which appears to be composed of spherical granules, which are sometimes solid and sometimes hollow. (2) A name given in Europe to the Jurassic strata above the Lias and below the Wealden. There are 3 prin. groups of the O., called the Lower, Middle, and Upper groups. The strata yield lime, cement, building-stone, slate, fuller's earth, oil-shale, pyrites, etc. In N. Amer. the O. is but little developed.

**Opah**, or **Ura**, See ORFA.

**Opah**, See KINGFISH.

**O'pal** [Gr. *ὀπάλλω*], natural soluble silica, generally combined with water up to as much as 11 per cent. Several varieties of O. are recognized; of these *precious* O. is the most highly esteemed. Its value arises from the property it possesses of displaying within itself a remarkable and indescribable play of colors. This appearance is known as opalescence and is not seen in common O. *Fire O.* is a variety presenting hyacinth-red and yellow reflections. *Wood O.* is a variety of *semi-opal*, presenting a ligneous structure. Precious O. and common O. are met with in volcanic, amygdaloidal, and porphyritic rocks, the former being principally obtained from Hungary, Honduras, Mex., Ceylon, and the Faroe Islands. *Fire O.* has been obtained in the U. S. from Washington co., Ga. EDWARD C. H. DAY.

**Opelika**, city and R. R. centre, cap. of Lee co., Ala., 20 m. from W. Point, Ga. It has 2 sens., a large trade, and extensive cotton warehouses. Pop. 1880, 3245.

**Opelousas**, La. See APPENDIX.

**Op'era** [It.] is the name given to a drama which is sung with accompaniment of instrumental music. Dramas occasionally interspersed with songs to familiar airs are called vaudevilles; dramas occasionally accompanied by symphonic music are called melodramas.

To speak first of the vocal part of operatic music, the chief of the forms which serve to make up the composition are recitative, aria, duet, trio, and chorus. The recitative is the least elaborated musical form of the O., and is designed for the more rapid prose passages of the dialogue, as opposed to the finished lyrical parts. The aria is a theme for a solo voice, being a complete melodic subject, and having divisions of strophe, verse, etc. Duets and trios (*duetti*, *terzetti*) are combinations of 2 or 3 voices in a complete melodic subject. Lastly, there is the full mass of harmonized voices as given in the chorus. The instrumental part of operatic music is rendered by a band of musicians, the orchestra. Orchestral instruments include string and the several varieties of wind, both in wood and in metal. The orchestra furnishes a continuous accompaniment to the several vocal parts of the O., this accompaniment being highly finished in the case of the aria, the chorus, etc., and consisting of only a few leading chords in the case of the recitative. In addition to supplying an accompaniment to the vocal parts, the orchestra has to perform independent compositions, the principal of which is the overture.

The O. grew up in It. at the beginning of the 17th century. It was in Florence, about the yr. 1600, that the first O. appeared. This first O., the earliest known example of which is a piece entitled *Euridice*, consisted of recitative or, as its title called it, *aria parlante*, choruses, a few duets and trios, together with instrumental prelude and interludes. For 50 yrs. this O. remained the luxury of nobles, being performed only before courts during special festivities; after that it gradually became a popular entertainment. The instrumental part of the O. was greatly improved by Monteverde, who added the overture (*locata*). Later in the century the



melody of the aria was enriched by 2 composers' (Cavalli and Cesti). In the following (the 17th century) A. Searlatti clearly marked off the aria from the recitative, and gave it the triple division which it retained for nearly a century.

In Fr. the earliest O., those of Lulli (end of the 17th century) and of Rameau (beginning of the 18th century), were little more than imitations of the It. style. The basis of Fr. O. was laid by Gluck (1773-87), who set himself to rectify the evils of the existing It. O. by confining the exercise of the vocal art within due limits, and by bringing into greater prominence the dramatic character of O. The Fr. classic O. ("grand opera") after Gluck scarcely fulfils the expectations raised by such an admirable foundation. At the same time, it must be admitted that the Fr. school has always been faithful to the teaching of Gluck in seeking to do justice to the dramatic claims of O. Among those composers who have written for the Fr. stage are Méhul, Cherubini, Spontini, Meyerbeer, Rossini, and among contemporary composers Gounod and Thomas. Perhaps, however, it is in the lighter style of O. that the Fr. have excelled. The first composer of the O. comique, strictly so called, was A. F. Boieldieu.

In Ger. the O. has perhaps been marked by less of national originality than in Fr. Passing over the earliest writers, we come to Mozart as the first great O.-writer in Ger. Mozart united It. sweetness of melody with Ger. depth of harmony, and his operatic music, as pure music, has never been surpassed, or even equalled. The Ger. O. after Mozart sank for a while to a low ebb. The one worthy attempt to raise its character came from the Romantics — namely, Spohr, Weber, and Marschner — who sought to give a national tone to Ger. O. by taking half-legendary subjects from early Ger. hist. Wagner is, in a sense, a follower of the Romantics, since he selects his subjects from the legendary periods of Ger. hist. [From orig. art. in *J.'s Univ. Cyc.*, by JAMES SULLY.]

**Ophir**, o'fer, the name (in Gen. x. 29) of the eleventh of the 13 sons of Joktan, all of whom appear to have settled in Ar. Also the name of a place or region famous in the commercial hist. of the Hebs., from which, or perhaps only by way of which, came gold, almug-wood, and precious stones (1 Kings x. 11). The voyage thither and back, or perhaps the voyage which only took O. in its way, required 3 yrs. (1 Kings x. 22). O. can hardly have been a gen. name for remote S. countries, nor can it have been any such far-off place as Peru, but should be looked for either in Afr. or in India, or, more probably, in Ar.

**Ophites**, (Gr. ὄφεις, a "serpent"), or **Serpent-Worshippers**, a sect of Gnostics who honored the serpent because he tempted Eve to eat of the forbidden fruit. They kissed the serpent and fed it with the Eucharistic bread; but others rejected Christianity, and honored Cain, Judas Iscariot, and other wicked personages.

**Ophthalmia**. See STAR-FISH.

**Ophthalmia**, (Gr. ὀφθαλμία, "eye"), inflammation of the eye. This term, once widely comprehensive, is now usually restricted to inflammations of the membrane lining the eyelids and covering the exposed surface of the eyeball, the conjunctiva. It is divided into (1) catarrhal, (2) granular, (3) purulent.

**Catarrhal O.**, or conjunctivitis, is the mildest form of inflammation of the conjunctiva. It may be caused by overuse of the eyes, by the application of the catarrhal discharges of "sore eyes," by the contact of dust, smoke, or any irritating substance, by riding in the wind, or by "catching cold."

**Granular O.**, or granular lids, as it is popularly called, is a much more serious affection. It may be brought on by any of the causes which produce catarrhal O., and is also contagious, being carried from eye to eye through the medium of towels, wash-basins, etc. It is characterized by numerous small elevations or granulations upon the conjunctiva of the lids, producing a roughness.

**Purulent O.**, or conjunctivitis, is a more dangerous disease. About 10 per cent. of the eyes affected with it are lost. It is usually produced by contagion, but may come from "a cold."

The first of these affections—viz. catarrhal O.—usually demands very little treatment beyond simple cleansing of the eyes with tepid water. The "best eye-wash" in existence is water containing in solution common table-salt in the proportion of a teaspoonful to the pint. In granular O. long and careful treatment is required at skilful hands. In purulent O. the treatment must be prompt and vigorous from the start. In that of infants almost incessant cleansing is needed; and here the best wash is warm water followed once or twice a day by a solution of 1 or 2 grains of nitrate of silver dissolved in an ounce of pure water, or 5 or 10 grains of alum in the same quantity of water. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. C. R. AGNEW, M. D.]

**Ophthalmology** (Gr. ὀφθαλμός, "eye," and λόγος, "discourse"), the science of the eye. For the anatomical structure of the eye, and the functions of its different parts, see EYE. Some of the defects of this organ, and the means of remedying them, will here be presented.

**Refraction**.—The normal or emmetropic eye, in a state of rest, unites parallel rays upon its retina. An eye which in a state of rest would bring parallel rays to a focus posterior to the retina is said to be *hypermetropic*, while one whose focus for parallel rays is anterior to the retina is called *myopic*. An eye whose different meridians have different foci is said to be *astigmatic*. Persons under 40 with emmetropic eyes usually do not need spectacles. All persons with hypermetropic eyes should wear convex glasses sufficiently strong to correct the hypermetropia. The glasses selected for constant use should be the strongest with which the person can see distinctly in the distance. Persons with myopic eyes should select the weakest concave glasses with which they can see well in the distance. Persons with astigmatic eyes should be fitted with glasses after the most careful examination by an expert phys. Many

myopic eyes are diseased, and when the myopia becomes progressive it is a serious malady. When a young person discovers that his nearsightedness is increasing, he should cease all use of his eyes for near vision. A prolific and preventable cause of nearsightedness is too much eye-work by the young at the near point of vision.

**Accommodation**.—All eyes not diseased have the power of so increasing their refraction that the farthest point of distinct vision is brought nearer to the eye. This is called the power of accommodation. As we grow older our power of accommodation gradually diminishes, until at about 40 the nearest point of distinct vision in emmetropic eyes usually recedes to beyond 8 inches, and we need the aid of weak convex glasses for reading. Persons with hypermetropic eyes will then require stronger glasses for reading than for the distance, while persons with myopic eyes may need concave glasses for distant vision, and at the same time convex glasses for near vision. When old persons find it necessary to change their spectacles frequently, they should suspect some grave disease of the eye. Persons with "weak eyes" should suspect some error of refraction.

**Conjunctivitis**.—Persons who "catch cold in their eyes" frequently apply poultices, and the eyes are almost invariably made worse. The only application for such eyes until a phys. can be consulted is water, warm, tepid, or cold, according to the sensibilities of the patient. The water may be rendered more soothing by the addition of one teaspoonful of common salt to the pint. Proprietary eye-washes should be avoided.

**Foreign Bodies**.—If a cinder or speck of dirt lodge upon the eyeball or beneath the eyelid, the latter should be turned inside out and the irritating substance carefully removed by means of the corner of a handkerchief or a little flock of raw cotton twisted about the end of a small stick. "Eye-stones" should not be used. If a foreign body enter the eyeball, no time should be lost in consulting a phys., as it may be necessary to remove the eyeball containing the foreign body in order to avoid blindness from sympathetic inflammation of the fellow eye. The foreign body can sometimes be removed without destruction of the eye.

**Rules for the Use of the Eyes**.—(1) In reading, the book should be held at a distance of from 12 to 16 inches from the eye. (2) A stooping posture should be avoided in reading and writing. (3) The position should be such that the light may shine over the left shoulder upon the page. (4) Reading by insufficient light is bad. (5) Dark rooms and colored glasses should, as a rule, be avoided. (6) "Eye-sharpeners" and patent eye-salves should be eschewed as dangerous. (7) Blackboards, charts, diagrams, and large objects should be more constantly used in the machinery of schools, and thus the exercise of the eyes upon the printed or written page be greatly shortened. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. C. R. AGNEW, M. D.]

**Ophthalmoscope** (Gr. ὀφθαλμός, "eye," and σκοπεῖν, "to view"), an instrument for ascertaining the optical condition of the eye. In its simplest form it consists of a small circular mirror with a central perforation. That in most common use is a concave mirror of 8 inches focal length, with a central perforation about 1 line in diameter, mounted on a handle about 6 inches long. If we place back of this mirror a Rekoss disk, its margin set with numerous convex and concave lenses of suitable focal lengths, and so made to revolve that each of these lenses may be readily brought opposite to the central hole in the mirror, we have an O. of the most approved pattern.

In examining the eye with the O. the interior of the organ is illuminated by reflecting through the pupil, by means of the mirror, the rays from an argand-burner placed a little behind and to one side of the patient's head, in such a position that the light falls upon his temple, but not upon the eye. If the observer thus illuminates the eye, resting the rim of the O. against his brow and looking through the hole in its centre, the pupil of the illuminated eye will appear red. This is the reddish reflex from the bottom of the eye. Let the observer now approach to within one inch, or less, of the eye he is examining, keeping the red reflex in view, and he will distinctly see a small portion of the fundus under an enlargement of some 17 diameters. This is called the *direct method*. If the observer places his eye at a distance of 12 or 15 inches from the observed eye, and, having obtained the red reflex, interposes a 2-inch double convex lens at a little less than its focal distance from the eye, he will see a much larger portion of the fundus than by the method already described, but much less magnified, the enlargement being only about 3 diameters. This is called the *indirect method*, and the image seen is the *real, inverted aerial image*. By these methods we may examine the crystalline lens, the vitreous humor, the optic nerve, the retina, and the choroid, and any deviation from a condition of health may be readily detected. The optical condition of an eye may also be determined by means of the O. independently of the statements of the patient. In examining the interior of the eye for the causes of impairment of vision, we not infrequently find appearances which lead to the detection of grave diseases of other important organs, as, for instance, the kidneys and heart. Light may be thrown by the O. upon the diagnosis of cases of tumor of the base of the brain and of inflammatory changes at the base of the brain. But many of the statements of those who profess to determine questions of insanity by the use of the O. as a method of ascertaining the vascular condition of the brain are entirely destitute of scientific basis. [From orig. art. in *J.'s Univ. Cyc.*, by DAVID WEBSTER, M. D.]

**Opium** (Gr. ὀπιον, "poppy-juice"), the concrete juice obtained from the unripe capsules of the poppy (*Papaver somniferum*). It is obtained by making a shallow horizontal incision in the unripe poppy-head a few days after the fall of the petals. This is done in the afternoon, and the milky juice that oozes from the cuts is scraped off next morning and made into lumps of varying size. Good Tur. O. is a



hard, tenacious solid of compact texture and a reddish-brown or fawn color. It has a strong, peculiar odor and a rather bitter, somewhat acrid taste. O. is an exceedingly complex body. Its medicinal virtues reside in certain alkaloids, of which *morphine* is the most important. Pure morphine is in small, colorless, shining crystals—is inodorous, but of a bitter taste. It is almost wholly insoluble in water, but its salts are readily soluble, and hence are used in med. in preference to the pure alkaloid. The other alkaloids of O. known to affect the human system are *codeine*, *narcotine*, and *papaverine*, but beside these no less than 12 others have been obtained from the drug. For various reasons these seem to be only chemical and physiological curiosities.

In general, the influence of the drug falls upon the nervous system, the symptoms being all functional nerve-disturbances. The symptoms produced by O. under ordinary circumstances are briefly as follows: With a small dose there is little experienced beyond relief from any feelings of discomfort that may be present at the time of taking. Phys. fatigue, mental exhaustion or distress, small pains and aches, hunger, etc. all tend to disappear. When these effects have passed away there may be some little tendency to loss of appetite, coated tongue, slight headache, and constipation, as after-results. With larger quantities the feeling of relief from discomfort is speedily succeeded by a conscious intellectual dullness, accompanied by a drowsiness which casts the subject into a state of unconsciousness analogous to ordinary sleep in very many respects, but differing from it in certain others. After a number of hours, varying with the dose, the taker awakes to a feeling of general misery, with disordered stomach, dry coated tongue, headache, and constipated bowels. But all these symptoms vary widely according to many circumstances, most notable of which is the influence of temperament or idiosyncrasy. The influence of bodily state and habit upon the effects of the drug is truly astonishing. In severe pain, in the prostration from great loss of blood, and other morbid states, the relation between dose and effect changes so that quantities fatal in health may produce no more than a mild O. influence. Of the alkaloids, the effects of morphine differ only in minor points from those of crude O. Large doses of O. or morphine may be fatally poisonous, though many circumstances conspire to make the effects exceedingly uncertain, such as vomiting or non-absorption of the whole quantity taken. But generally 4 grains of O. or their equivalent are reckoned as a dangerous quantity, and 5 grains have killed. The salts of morphine are estimated as 6 times more powerful than the same quantity of O.

The prominent symptoms of O.-poisoning are deep coma, with flushed or pale and ghastly face, contracted pupils, slow, stertorous breathing, and slow, full pulse. Death occurs from stoppage of breathing through paralysis of the "respiratory centre" in the brain. The treatment, after evacuation of the poison left in the stomach through emetics or the stomach-pump, is especially directed toward keeping up the breathing. For this end the great desideratum is to keep the patient from sinking into stupor. If he can swallow, strong coffee is to be given freely. If in spite of all means he sink into coma and the respirations begin to fail, artificial breathing and hypodermic injections of atropine are to be cautiously employed. No case should be given up till actual death.

In med. O. and morphine fulfil a variety of purposes, some of which could hardly be divined from the effects of the drug on the healthy system. These may be summarized as the support of life, and invigoration and maintenance of the heart's action in circumstances of great prostration and where ordinary food cannot be digested; the cure or relief of pain, spasm, and general nervous irritability; the induction of sleep; repression of excessive secretion, as in diarrhoea, and curative influence of an unknown character in certain inflammatory diseases. In the fulfilment of most of these indications the induction of the physiological narcotic effects of O. is both unnecessary and harmful. [From *orig. art. in J's Univ. Cyc.*, by PROF. EDWARD CURTIS, M. D.]

**Opabalsamum.** See BECCA BALSAM.

**Opodeldoc** is compounded of common soap, camphor, oil of rosemary, oil of origanum, and alcohol. When cold it has the consistence of a soft ointment. It is essentially the same thing as "soap liniment," and may be used as an anodyne and gentle rubefacient application in sprains, bruises, etc.

**Opopanax** [Gr. *ὀπωναξ*], the inspissated juice of the *Pastinaca opopanax*, a plant closely resembling the common parsnip. It is a fetid gum-resin, like assafetida in its powers, but much feebler. It has a very limited use in med.

**Oporto**, an important commercial city and seaport of Port., cap. of the prov. of Entre Minho e Douro, is situated on both sides of the Douro, 2 m. from its mouth, and is 174 m. N. by E. of Lisbon, with which it is connected by R. R. O. has an excellent harbor, lined with elegant quays and crossed by many beautiful bridges. It is one of the most picturesque cities in the world, built on a steep acclivity, which it climbs through terraces covered with strikingly colored houses. Its manufactures of gold and silver ware, glass, pottery, leather, linen, woollen, silk, and cotton fabrics are not unimportant. But its chief importance O. derives from its commerce. Its trade is chiefly with Eng. and Brazil, and the prin. article of exportation is port wine, red and white. Pop. 105,888.

**Opossum** [a word derived from the Amer. Indians], the name of the *Didelphis Virginiana* and other animals of the same genus, N. and S. Amer. marsupial mammals of the family Didelphidae. The common O. of the U. S. is found in most of the States, except in N. Eng. The common Amer. O. has a pointed head, wide gape, many sharp teeth, a rough tongue, large and naked ears, small eyes, a long, tapering, flexible, and prehensile tail, and its toes are armed with sharp, strong, and curved claws. It has a well-develop-

ed pouch, and is about the size of a large cat, but its shape is low and squat; it is of a grayish-white color, the face, near the snout, pure white, and the ears black. It is mostly nocturnal and arboreal in its habits, and feeds alike on insects, eggs, small birds, and fruits. It is very prolific, producing from 6 to 15 at a birth, which, as soon as produced, are put into her pouch by the mother.



Opossum.

**Oppia'nus**, a Gr. poet, b. at Anazarba, Cilicia; flourished in the latter part of the 2d century of our era, and is the author of a didactic poem on fishing, *Ἀλιευτικά*, in hexameters. Another didactic poem on hunting, *Κυνήγετικά*, also in hexameters, much inferior in style, was for a long time ascribed to O., but is now generally believed to have been written by a younger poet who bore the same name.

**Optics** [Gr. *ὀπτική*; pl. *τὰ ὀπτικά*, "things relating to vision"], the science which treats of light and vision. The subject admits of being considered from 2 points of view. 1. The laws and properties of light as ascertained by observation, may, by applying the principles of pure geom., be employ-

ed to explain the phenomena; or, 2. A definite theory having been adopted in regard to the nature of the luminiferous medium, the phenomena may be expounded as the necessary consequences of their assumed phys. cause. In the first aspect, the several branches into which the subject naturally divides itself are REFRACTION, REFLECTION, DISPERSION, SPECTRUM, DIFFRACTION, RAINBOW, POLARIZATION; THIN PLATES, COLORS OF; DOUBLE REFRACTION, etc., and the titles of the several optical instruments; and in the second, LIGHT, INTERFERENCE, UNDULATION, UNDULATORY THEORY, VIBRATION, etc.

A notion was for a very long time prevalent among the anc. that vision is effected by means of rays proceeding from the eye to the object. This idea is not found in Aristotle, but it was introduced into the school of Plato, and continued to be received for many centuries. The persistency of the doctrine is remarkable, inasmuch as the light which is self-evidently indispensable to vision proceeds from sources foreign to the observer. The elementary phenomena of reflection and refraction suggest a natural division of the science of optics into 2 prin. branches; and this distinction is made by the earliest systematic writer on the subject whose works have descended to us. This was Euclid, supposed to have been the geometriean of that name who lived about 300 yrs. before our era. The gen. laws which govern the reflection of light, being comparatively easy of detection, were stated by him with tolerable correctness; but what he has written on refraction is of little value. Ptolemy, the astron. of Alexandria, who was b. about the yr. 70 of our era, attempted to discover the law of refraction by experiment. His apparatus was ingenious, and was not different in principle from that which has been employed by Silbermann, Soleil, and others, in our own time, for the same purpose. He measured the angles of refraction corresponding to various angles of incidence, between 0° and 90°, for both water and glass. We may judge of the degree of accuracy attained by him by comparing the indices of refraction (see REFRACTION, INDEX OF) deducible from his determinations with those of the same bodies fixed with severe exactness by more modern observers. The ascertained index of refraction for water is 1.33582. If we make a computation of its value from the measured angles of Ptolemy, we find a mean of 1.30147. But if we take his measurements at the incidence of 50°, where the relative variations of the angles of incidence and refraction are most marked and most easily measured, we obtain 1.33555, which is exceedingly near the truth. About half a century later than Ptolemy flourished Claudius Galen, the celebrated Gr. phys. In a treatise on the uses of the members of the human body he speaks at some length of the phenomena of vision, and lays down the fundamental law, on which the stereoscope has been very recently constructed, that the picture which we see of a solid body is made up of 2 pictures dissimilar to each other, one seen by each eye separately.

But it was impossible that optical science should make any important progress so long as the law which determines the path of a ray in passing from one medium to another remained unknown. We are compelled, therefore, to descend to the earlier portion of the 17th century before we find a practicable ground on which to build a systematic



science. In 1626 Willebrord Snellius, prof. of math. at Leyden, died at an early age, leaving behind him MSS., among which was contained a statement of the important law in question, which he expressed as follows: When a ray passing from one medium to another undergoes refraction at the common surface, the ratio of the co-secant of the angle of incidence, to the co-secant of the angle of refraction is constant. As the co-secants of angles are inversely as the sines of the same angles, the law may be more conveniently expressed by saying that, in the circumstances supposed, the sines of the angles mentioned are in a constant ratio. It was in this form that the law was first pub. by Descartes, 11 yrs. after the death of Snellius. It is, therefore, frequently referred to as the law of Descartes.

The next important step in the progress of optical discovery, after the detection of the gen. law of refraction, was made by the illustrious Newton, who in 1672 communicated to the Royal Society the experimental researches by which he established the compound nature of light and the unequal refrangibility of its component rays. He held that the common white light of the sun is made up of elementary rays differing at the same time in color and in refrangibility. The number of tints which he considered sufficiently distinct to be regarded as independent components is 7. This phenomenon of the separation of the component colors of light by refraction has been called *dispersion*. The dispersion of light by refraction furnishes an easy explanation of the interesting natural phenomenon of the rainbow. This beautiful meteor had before Newton's time been the subject of many unsatisfactory speculations; and though De Dominis, as early as 1611, had conceived a true theory of the manner of formation of the inner bow, he had not been able to account for its colors. Newton's discovery furnished the necessary supplement to his theory.

In 1665 there was pub. at Bologna a posthumous work by Francis Maria Grimaldi, an It. Jesuit, in which were for the first time described certain phenomena now very familiar under the name of *diffraction*. He stated that if any very small object be placed in a pencil of divergent light, admitted through a minute aperture into a dark room, its shadow will appear materially larger than it ought if light passes its edges in straight lines, and, moreover, that any opaque object, large or small, exhibits along the edges of its shadow a border of at least 3 distinctly tinted fringes, the brightest and broadest of which is next the shadow. He also observed that when 2 minute pencils of light are admitted through apertures very near to each other, the screen on which the blended pencils fall, and which, as he supposed, ought to be uniformly illuminated with a light equal to the sum of the 2 intensities, is streaked with lines absolutely dark. He was led by this observation to announce the paradoxical proposition that there are circumstances in which the union of 2 rays of light produces darkness. Bold as this announcement must have originally appeared, the progress of scientific discovery has fully confirmed its truth. This phenomenon was distinguished by the name *injection* or *diffraction*.

Not far from the time of the discovery of Grimaldi, the attention of the scientific world was called to a case of new and extraordinary refraction observed to take place in crystals of carbonate of lime—a species of refraction which, from the circumstance of its dividing an incident beam into 2 beams entirely distinct, or of presenting 2 images of any object seen through the crystal, has been called *double refraction*. The first publication on this subject was made by Erasmus Bartholinus, a phys. of Copenhagen, who gave to the mineral the name of Iceland spar, from the circumstance that his specimens had been obtained from that island. It is now known that this property of double refraction is exceedingly common, being possessed by most crystallized bodies, and capable of being produced, transiently or permanently, in any transparent solid whatever, whether organic or mineral, in which it does not naturally exist. It is only in Iceland spar, however, that it manifests itself in a degree remarkable enough to attract the attention of a casual observer, and in most cases it can only be detected by special arrangements. Soon after his announcement of the compound nature of light, Sir Isaac Newton made public the results of his ingenious investigations in regard to the colors exhibited by *thin plates* of transparent substances, such as soap-bubbles, films of moisture upon glass and upon polished opaque solids, laminae of air confined in fissures of transparent minerals, etc. He showed that the tints displayed by such thin plates, when viewed in common light, depend upon 3 conditions—viz. the thickness of the plate, its refracting power, and the obliquity under which it is viewed.

The next important step in the progress of optical science was the discovery of the progressive motion of light and the determination of its velocity. In 1675 Roemer, an astron. of Copenhagen, in his observations upon the eclipses of the first satellite of Jupiter, became perplexed by irregularities for which he could conceive no means of accounting. It was suggested by Dominic Cassini that these difficulties might perhaps be removed by supposing that the time occupied by light in passing through the vast distance between Jupiter and our planet may be large enough to be appreciable, and therefore that, as our distance varies, this time must vary also. Cassini, with whom the idea originated, seems to have abandoned it, but Roemer followed it up with such perseverance as at length conclusively to establish its truth. The velocity of light has, since the time of Roemer, been ascertained, with a probably near approximation to the truth, by other independent methods, and the results of all these are substantially in harmony—187,000 m. per second.

The next discovery of importance in the progress of optical science was made near the close of the last century by Dr. Wollaston in his observations upon the prismatic spectrum. He discovered that by employing a pencil of light

very narrow in the direction of the plane of refraction, but broad parallel to the axis of the prism, 5 well-defined dark straight lines could be distinguished crossing the spectrum at right angles, and maintaining invariably the same positions relatively to the colors. This number he afterward increased to 7. These lines may very easily be distinguished by holding a prism near the eye, parallel to any small fissure through which light makes its way into a dark room. By aiding the eye with a telescope the number discovered becomes surprisingly great. Fraunhofer of Munich enumerated 390, and Sir David Brewster afterward increased this number to 2000. The 8 prin. lines are distinguished by the letters A to H, of which the line A is at the beginning of the red, and the line H about the middle of the violet.

In the year 1808 the Fr. Acad. of Sciences proposed the problem of the double refraction of light as the subject of a prize to be awarded 2 yrs. thereafter. The successful competitor for this prize was Malus. To him is due the discovery of the polarization of light by reflection. He was led to this remarkable discovery by an accident. In observing, through a prism of Iceland spar, the light reflected to his windows from those of the palace of the Luxembourg, he was surprised to see that, as he turned the prism around the ray, one of the two images vanished at every quarter revolution. By following up the indication thus given, he arrived at the important law that when light is reflected from glass at an angle of  $54^{\circ} 35'$ , or from water at an angle of  $53^{\circ} 45'$ , it possesses all the properties which belong to the pencils into which a ray of ordinary light is divided by a double refracting crystal. This remarkable condition of light was distinguished by the name *polarization*.

In 1811 M. Arago communicated to the Acad. of Sciences of Paris one of the most remarkable and beautiful discoveries which has ever been made in the hist. of optics. Upon examining thin plates of certain transparent crystals, such as mica, selenite, or quartz, by means of transmitted polarized light, he found that when the light was received upon the eye through a prism formed of Iceland spar, the richest conceivable colors made their appearance, which were complementary to each other in the two images, and which varied in intensity with the azimuth of the laminae or of the prism. The colors thus seen in crystalline laminae recur in several successive series as the thickness of the laminae is increased. Another class of chromatic effects produced by crystalline plates viewed in polarized light was first observed by Dr. Wollaston in Iceland spar, in which the display is perhaps the most brilliant. In these cases the crystal is cut perpendicularly across the axis. In examining plates of quartz cut across the axis as above described, M. Arago observed a peculiarity of a remarkable kind, which is scarcely found in any other natural crystal. The centre of the field was not dark in any position of the analyzer, but was deeply and uniformly colored with a tint which varied as the analyzer was turned. When a bi-refracting prism was employed as an analyzer, the two images seen were constantly complementary in color, and as the analyzer was turned they ascended in tint, in the order of Newton's scale, from red to violet. M. Biot in subsequent experiments discovered that in some crystals the ascent of the tints in the scale is produced by a right-hand rotation (the ordinary direction of a screw), and in others by a left-hand rotation. These classes of crystals have been distinguished by the names right-handed and left-handed crystals, or *dextrogyre* and *levogyre*. The peculiar kind of polarization produced by quartz has on this account been called *rotatory polarization*. The physical cause of rotatory polarization is unknown. In the prosecution of his investigations, Sir David Brewster arrived at the discovery that the polarizing structure could be artificially produced in glass by heat or by rapid cooling; that this effect is transient when the heat is below the point of softening or fusing the substance; but that when it is carried beyond that point, and cooling rapidly follows, as in glass which is not annealed, the structure is permanent. He found that the same structure could be produced by pressure, by torsion, by tension, or by flexure, and traced the transient condition of the same kind produced by heat to the mechanical effects of unequal expansion.

In 1815 M. Biot made the remarkable discovery that many liquids possess the power of rotatory polarization—a discovery which was independently made by Mr. Seebeck; the effect was first observed in oil of turpentine, but has since been found in most essential oils, in solutions of sugar, dextrose, the vegetable alkaloids, camphoric and tartaric acids, and the tartrates. In some of these substances the plane of polarization is turned to the right and in others to the left. M. Arago early made the discovery that the light which comes to us from the atmosphere is polarized. Regarding atmospheric reflection of the sun's rays as the cause of atmospheric polarization, it will follow that every plane passing through the sun (in the superior portions of the atmosphere at least) must be a plane of polarization. This will, therefore, be true of the *hour-circle*, or meridian, in which the sun happens at any time to be; and as all hour-circles pass through the pole of the heavens, it results that a delicate polariscope, directed toward the pole, may follow the horary motion of this plane. Such a polariscope, furnished with a dial and index, becomes a chronometer. This is the principle of an elegant little instrument invented by Wheatstone, called the *polar clock*.

In the foregoing very succinct outline of the hist. of optical discovery, the object kept in view has been to present simply facts, without entering into any discussion of the phys. causes to which they are to be attributed. These are considered elsewhere in this volume. F. A. P. BARNARD.

**Optimates** and **Populares** were the 2 party names under which the old opposition in the Rom. commonwealth between patricians and plebeians took a new form and kindled into a deadly struggle in the time of the Gracchi. *Optimates* denoted the conservative party, *populares* denoted



the progressive party. Caius Gracchus at the head of the *populares* was victorious, but with Sulla the *optimates* once more came into power. In the struggle between Pompey and Cæsar the latter succeeded in fully overthrowing the old constitution.

**Optimism** [Lat. *optimus*, "best," in contrast with *pestimum*, "worst"], the doctrine that the world is the best possible, or that evil is only relative and contingent, being incident to the evolution of good—that good is substantial, evil only temporary. Opposed to this is the emanation-theory of the Orient, in which God is abstract unity, and finite beings are radically evil. European thought quite generally embraces O.; from the doctrine of Plato, that God is the absolute good, and "the Good possesses not evil, and on this account has made the world most similar to itself," down to the doctrine of Hegel, that all nature and hist. are the celebration of God's personality. Leibnitz, the best-known defender of O., distinguished 3 kinds of evil: (a) metaphysical, owing to the finiteness of things; this is unavoidable; (b) phys. evil or pain, which is conditional good, being a monitor to warn us against error; (c) moral evil or wickedness, for which man alone is responsible, being incident to freedom, which is its highest gift. "God, therefore, out of the infinite number of possible worlds which he saw, chose the one which is actually the best."

WILLIAM T. HARRIS.

**Oracanthus** [Gr. *ὄρακος*, "beautiful," and *ἀκανθα*, "spine"], a genus of defensive fin-spines worn by sharks which lived in the Carboniferous age. They are usually conical in form, broad at the base, and ornamented with numerous pustular tubercles.

**Oracle** [Lat. *oraculum*, from *orare*, to "entreat," derived from *os, oris*, "mouth," corresponding to the Sans. *ośa*], a term applied to answers given by the anc. Egyptian and Gr. deities when solemnly consulted by their votaries, and also to the places where they spoke. O. spoke in different ways—in some cases through a human being, who uttered words of inspiration; in others by signs, which the priests watched and interpreted. Gr. and Egypt had O. of both these kinds, while in It. the latter only existed. The anc. consulted O. on all important affairs, whether public or private. If, as often happened, an enterprise failed even though the gods had seemed to favor it, the O. still lost no credit, for their answers were so ambiguous that it was no easy matter to interpret them clearly. Zeus (Jupiter) was immediately consulted less often than the minor gods, who acted as mediators between him and mankind. His O. at Dodona, the most anc. in Gr., spoke by sounds of the wind rustling through groves of oaks and beeches, in the branches of which were hung brazen vessels: these, striking against each other as the wind blew, rendered the god's lang. more intelligible. At first men were its interpreters, but in later times old women officiated. That of Zeus Ammon, situated in a Libyan oasis, was greatly venerated, and was much consulted by the Grs.: here men gave the answers. The chief O. of Apollo was at Delphi or Pytho, on the S. slope of Mt. Parnassus, and near the Castalian Spring.

While the oracles of Zeus and Apollo pronounced on all important matters, the other gods and heroes were questioned on those subjects only over which they were supposed to preside. Thus Æsculapius was consulted only by the sick. The O. of Ceres, in Achæa, was also consulted only by sick persons, who, after performing various ceremonies, were shown in a mirror either dead or restored to health. At Nysa, in Caria, was an O. of Pluto, where priests cured the sick with remedies revealed to them in dreams by the god. Hermes (Mercury) had an O. in the market-place of Phære, in Achæa: the question was whispered in the god's ear, and the applicant went out of the temple and took the first chance remark he heard as a divine reply. The O. of Trophonius, at Lebadeia, was very famous. The votary, after purification and prayer, entered the hero's cave, where he saw visions, from which, he having described them to the priests, an answer was deduced. Among lesser forms of O. were those "of the dead," by which departed spirits were consulted.

**Orange** [Fr.], the fruit of many varieties of the genus *Citrus*, which, although much confused, are probably all referable to *Citrus aurantium*. *Citrus* is a genus formerly placed in the order Aurantiaceæ, but now included in Rutaceæ. It embraces trees and shrubs, all exotic, and in our N. climate unable to cope with winter cold. The foliage is fragrant, and the pure white flowers are odorless and beautiful. These flowers have from 20 to 60 or more stamens, sometimes in sets, and have 1 style. There are from 4 to 8, usually 5, petals. The fruit is a juicy and luscious berry with a leathery rind, usually of that color known as orange. This rind contains little cysts or cells filled with a fragrant and volatile oil which is easily inflammable. The branches are spiny and the leaves compound.

It is supposed that the original of the O. came from the E. I. or from Chl. It has now spread over all the warmer regions of the earth. One tree sometimes yields as many as 20,000 marketable O. No cultivated fruit is more liable to degeneration, and for this reason it is seldom grown from seed. The leaves are fragrant and have a limited use in med. in cases of hysteria. Oil of neroli is prepared from O. flowers, and is the basis of eau de cologne. The fruit contains citric acid, but not in so large proportion as the lemon. Sic., Malta, Sp., the Azores, Port., and Cuba furnish most of the O. of commerce. Of late yrs. Fla. has begun to export fine fruit, and the cultivation is profitably conducted in Cal. The rind enters into various articles of confectionery, and is used for flavoring. An O. tree will live to a very great age. [From orig. art. in *J.'s Univ. Cyc.*, by W. W. BAILEY.]

**Orange, or Gariep**, a river of S. Afr., rises in the mts. which separate Natal from the Orange River Free State, flows in a nearly W. direction and with a tortuous course, and falls into the S. Atlantic Ocean. Its shores are covered

with extensive forests, and rich copper ores have been found in its vicinity.

**Orange**, on R. R. Franklin co., Mass. Pop. 1880, 2124. **Orange**, city and R. R. centre, Essex co., N. J., 13 m. W. of New York, on rolling ground 190 ft. above tidewater. The chief industry is hatching. Llewellyn Park extends from the base to the brow of Orange Mt., comprising 750 acres. Pop. 1870, 9348; 1880, 13,307.

**Orange**, on R. R., cap. of Orange co., Tex., on the Sabine River, 103 m. E. of Houston. Pop. not given in census.

**Orangeburg Court-house**, on R. R., cap. of Orangeburg co., S. C., 80 m. from Charleston, contains the S. C. Agricultural Coll., Claflin Univ., and several acads. Pop. 1870, 246; 1880, 2140.

**Orangemen**, a political association, whose official name is **The Loyal Orange Institution**, formed in 1795 in N. Ire. in honor of King William III., prince of Orange, in opposition to the R. Cath. association of the Ribbonmen, and for the purpose of defending the Prot. religion in Ire., the legislative union between G. Brit. and Ire., etc. It soon came to bloody conflicts with the R. Cath. association. In 1836 the association was dissolved.

**Orange Oil**, an essential oil, consisting chiefly of hesperidene, is extracted by pressure or distillation with water from orange-peel. The flowers of the orange yield, on distillation with water, a fragrant oil, called oil of neroli.

**Orange, Prince of**. See WILLIAM of Nassau.

**Orange, Prince of**, son of William of Nassau. See MAURICE, Count, of Nassau.

**Orange River Free State**, terr. of E. S. Afr., bounded E. by Natal, S. by the Cape Colony, and N. by the Transvaal Republic. It comprises an area of 43,088 sq. m., and consists of elevated flats around the Orange and the Vaal, suited for the breeding of cattle and sheep. Pop. 75,000, half of whom are Dnt. settlers, who left Natal on its being declared an Eng. colony.

**Orange Valley**, N. J. See APPENDIX.

**Orange Outang** [properly *orang-utan*, Malayan for "man of the woods"], the *Simia satyrus* of Borneo and the neighboring islands, one of the most highly developed of the anthropoid apes. It is about 4½ ft. in height, and usually is covered with reddish hair. It is strictly arboreal, and is a fierce and dangerous animal. The male is rendered hideous by great cheek-callosities, and has large tracheal pouches. The creature is omnivorous, and builds a rude shelter of branches.

**Oratorio** [Lat. *oratorium*], an elevated form of musical composition in which voices and instruments combine to represent scenes, passages, or themes from biblical or sacred history, the text consisting of verses from the Scriptures, arranged with a view to moral and spiritual effect, the music comprising all the recognized combinations of harmony and melody, with organ and orchestral accompaniment, as in opera. It differs from opera principally in being sacred instead of secular, and in being unsuited to stage or scenic representation. The great master in this style of composition—the creator he may justly be called of the O.—was Handel (1740-51). His best known works were *Saul*, *Messiah*, *Samson*, *Judas Maccabeus*, *Jephthah*. The greatest, *Messiah*, is considered the masterpiece of its kind. *The Creation*, by Haydn, ranks next to it in popular repute. They have but one peer, Mendelssohn, whose *St. Paul* and *Elijah* are brilliant and beautiful examples of the capacity of this species of composition.

O. B. FROTHINGHAM.

**Oratory, Congregation of the**, a monastic order in the R. Cath. Ch., founded in 1560 by St. Philip de Neri; established in Fr. in 1611. Its first rule was oral, but was afterward written out, and received papal approval in 1612. The fathers are mostly devoted to the spread of learning; they assume no vows.

**Orbitus Pupilus**, a somewhat celebrated grammarian and teacher at Rome in Horace's boyhood, b. at Beneventum. He served at first as an attendant on the magistrates of his native place, then in the army in Macedonia. In his fiftieth year he removed to Rome, where he taught school for many years, and had among his pupils the poet Horace. He seems to have been the prototype of Dr. Busby, and could boast of the distinguished men he had flogged in their youth. His teaching brought him more fame than profit, for he died poor at a very advanced age.

**Orbit** [Lat. *orbitus*], in astron., the relative path of one body with respect to another body around which it revolves. The actual paths followed by the satellites in revolving about the planets, and by the planets in revolving about the sun, are exceedingly complicated curves, but the relative path of any body with respect to its primary is comparatively simple. Kepler showed that the O. of the planets are ellipses having the sun in one of their foci. This principle, known as Kepler's second law, was shown by Newton to be a logical consequence of the law of gravitation; it was further shown that the law is not rigorously exact, the O. being subject to slight irregularities in consequence of the mutual attractions of the planets on each other. These irregularities or perturbations are so small that we may neglect them in taking a gen. view of the motions of the bodies of the planetary system. Taking this view of the case, it may be shown that the O. of a body projected into space with a certain velocity, and then acted upon by a central body in accordance with the Newtonian law, will be some one of the conic sections. The nature of the conic section is dependent upon the velocity of the body at some particular point of its path. The O. of the planets, as we have seen, are ellipses; the orbits of the satellites are also ellipses; but the orbits of the comets and of the streams of meteors with which they are so closely connected may be ellipses, parabolas, or even hyperbolas. The character of the O. of a planet or of a comet may be determined by 3 observations of its right ascension and declination separated by a suitable interval of time, say 2 or 3 days. The position of the O. of a planet with respect to the ecliptic is known



when we know its inclination and the lon. of its ascending node; its shape and size are known when we know its eccentricity, the mean distance of the planet, and the lon. of its perihelion. These elements being known, we may locate the planet in its O. at any time if we have given the epoch (that is, the time when the planet is in perihelion) and the periodic time (that is, the time required for the planet to make a sidereal revolution about the sun). W. G. PECK.

**Orcagna**, or *Kahn'yah* (ANDREA), (ANDREA ARCAGNUOLO DI CIONE, Orcagna being a contraction of Arcagnuolo), an It. painter, sculptor, designer, arch., goldsmith, and worker in mosaic, one of the great names in the hist. of art, b. at Florence 1399; d. probably in 1378. The frescoes of *Hell* and *Paradise* in the Strozzi palace are his work. The splendid tabernacle of the main altar of Or San Michele in Florence was executed by him; also the "Loggia de' Lanzi."

**Orcin** (*Lichen-red*, *Flichenroth*), the chief ingredient of the red and purple dyestuffs known under the name ARCHIL (which see). It is found by the action of ammonia and oxygen on orcin.

**Orcel'la Weeds**, certain lichens which are made to furnish, by a species of fermentation, very valuable dyes. (See ARCHIL.)

**Orchids**, or *kids*, or **Orchidaceæ** [from *Orchis*, the typical genus], an interesting natural order of perennial endogenous herbs, found all over the world except in very cold and very dry climates. In the cooler regions they are terrestrial, while in hot countries they are oftener air-plants. They have irregular, often beautiful, sometimes very grotesque flowers. Fertilization is almost always effected by the aid of insects. Many of the species have flowers singularly resembling insects in form. Not a few have very fragrant blossoms. This vast order affords few useful plants. Among these are vanilla, faham, salep, and several medicinal products.

**Orchil**. See ARCHIL.

**Orcine**, or *sin*, a diatonic phenol or oxyphenol. It appears to exist ready formed in all the lichens which are used for the preparation of ARCHIL, LITMUS, and CUDBEAR (which see), and is the product of the decomposition of certain acids present in the lichens. Ammonia converts it into the beautiful red coloring-matter orcin.

**Ord** (EDWARD O. C.), b. in Columbia, Md., Oct. 19, 1818, grad. at W. P. 1839; served in Fla. till 1842, and subsequently on frontier duty; at the outbreak of the c. war was stationed in Cal.; appointed brig.-gen. of volunteers in Sept. 1861, and assigned in Nov. to command a brigade of Pa. Reserves. Promoted to maj.-gen. of volunteers in May 1862, he was in June transferred to the W., and commanded the left wing of Grant's army in Miss. Aug.-Sept., participating in the battle of Iuka, Sept. 19-20, and while in command at the action on the Hatchie, Oct. 5, 1862, was severely wounded. Commanded the 13th army corps during the siege of Vicksburg and capture of Jackson, when transferred with his corps to the dept. of the Gulf; commanded 8th corps and middle dept. July 9-21, 1864; the 18th corps before Richmond, July 21-Sept. 29, when again wounded in the assault and capture of Ft. Harrison. On Jan. 2, 1865, he relieved Gen. Butler in command of the dept. of Va. and N. C. and of the Army of the James, with which army he remained throughout the siege of Petersburg and subsequent pursuit of the Confed. army of N. Va. At the close of the war he had attained the rank of lieut.-col. of artill., but continued to hold his volunteer rank of maj.-gen., and commanded various dists. and depts. until Sept. 1866, when mustered out of the volunteer service, having been appointed a brig.-gen. (July 1866) in the regular army; has since commanded the depts. of Cal., the Platte, and Tex.

**Ordeal**, or *de-al*, denotes an appeal to the immediate judgment of God, and forms one of the most peculiar features of the jurisprudence of the Dark Ages. In difficult cases, in which the common means of evidence, such as witnesses and oath, were lacking or insufficient, it was believed that God himself would reveal the truth in order to protect the innocent and punish the guilty, and accordingly trials were instituted for this purpose. There are traces of such insts. with the Jews and the Grs. With the Germanic nations they were very common, and consisted principally in trials by battle and by lot. Of the different O. introduced by the Chr. clergy, the trial by fire or iron was considered the most decisive. The accused carried a piece of red-hot iron in his hand, or put on a red-hot iron glove, or walked barefoot and blindfolded over bars of red-hot iron, or passed through a blazing fire with nothing but a thin shirt covering his body. If unhurt, he was declared innocent; if hurt, guilty. Much more common was the trial by water, hot or cold. The accused thrust his hand and arm into a vessel filled with boiling water to take up some small object placed at the bottom. The arm was then bound up, sealed, and examined after the lapse of 3 days. The cold-water ordeal, which consisted in throwing the accused, with the arms and legs tied together, into a pond or river, was generally used in cases of witchcraft, and applied to women; she that floated on the water was a witch and was burned; she that sank and was drowned was innocent and became a saint. These witches' ordeals did not disappear till the middle of the 18th century.

**Order** [Lat. *ordo*], in arch., refers to the column, and comprises such differences in construction and ornamentation as constitute an individual character. As in anc. arch. the column forms the most characteristic element of the construction, its O. is decisive for the style of the whole building; but in modern arch., in which it is only of subordinate importance, the O. of the columns has no influence on the style of the building. The Grs. distinguished between 3 different O.—the Doric, Ionic, and Corinthian—to which the Romans added 2, the Tuscan and the Composite.

**Orders, Religious**. See MONASTISM.

**Ordinance of 1787**. After the terr. at the W. claimed by the States under their charters, was chiefly sur-

rendered by them to the U. S. under the old confederation, the question arose how it should be governed. In 1784 Mr. Jefferson's act was passed, the original form of which contained the provision that after 1800 there should be neither slavery nor involuntary servitude in any of the States to be created upon this soil. The act, however, was passed with this provision struck out.

In 1787 the O. called after this yr. was submitted to Cong. July 11, and became a law. It contained 2 important provisions—one prohibiting slavery and involuntary servitude except in punishment for crimes, and the other providing that the navigable waters running into the St. Lawrence and the Miss., with the carrying-places between them, should be *highways* free to all citizens. But for this act all the States E. of the Miss., N. of the O., and W. of Pa. and N. Y. would have been slave States. The authorship of the act has been imputed to Nathan Dane of Mass., then in Cong., but the real first mover in it was the Rev. Manasseh Cutler, a clergyman of Mass. (See art. by W. F. POOLE in the *N. Amer. Review* of Apr. 1876.) T. D. WOOLSEY.

**Ordinance**. See ARTILLERY.

**Ordinance Survey, British**. The Ordinance Survey, so called from having been originally under the control of the board of ordinance, may be said to have had its commencement in the operations conducted by Gen. Roy in 1784 for the determination of the difference of lon. of the observatories of Greenwich and Paris, though it was only in 1791 that the systematic survey of the country with the view of producing a military map of the whole kingdom on the scale of 1 inch to a mile was commenced. At the present moment the 1-inch map of Eng. with hills engraved, is complete; that of Scot. is about half completed, with hills; that of Ire. is completed and pub. in outline, and about  $\frac{1}{2}$  is engraved with hills. The S. E. cos. of Eng. are partly finished and partly in progress on the large scale, and the survey is now being prosecuted principally in the mineral dists. of the country. The survey of Scot. is completed on the large scale, with the exception of the Shetland Islands, which are in progress, and some of the S. cos., which are only on the 6-inch scale.

The prin. triangulation of G. Brit. and Ire. consists of some 250 stations, the triangle sides being in some cases upward of 100 m. in length. The angles were measured with theodolites of 36, 24, and 18 inches diameter. The lats. of 32 stations were determined by observation, and the direction of the meridian observed at 60 stations. The triangulation was reduced by the method of least squares—a most laborious operation. Six base-lines were measured in the course of the work, but the final results are made to depend on the 2 lines—one in the N. of Ire. (8 m. long), and the other in the S. of Eng. (7 m. long)—which were measured with Colby's "compensation bars." The lats. of the stations were determined with the zenith sector, but the superiority of the zenith telescope for such observations has since been proved. The prin. triangulation is reduced to a secondary triangulation having sides about 6 m. long, by means of theodolites of 12 inches diameter; this triangulation is again reduced by 7-inch theodolites to sides of 1 or 2 m. in length, according to the nature of the country. The trigonometrically computed lengths of these sides form a check on the chain measurements and prevent effectually any errors. The nature of the projection used for the 6-inch co. maps will be sufficiently explained by saying that the edges of the sheets are parallel and perpendicular to the central meridian of the co. The sheets measure 36 inches by 24, each showing a rectangle of 6 m. by 4. The projection of the 1-inch map of Scot. is a modification of Flamstead's. Beside the ordinary steady work of surveying the country, special surveys have been and are made from time to time for the war dept. and other services.

The organization of the O. S. has been steadily preserved, having been found to produce results certainly of the highest quality at moderate cost. Its essential feature is the combination of military and civil elements. The sum voted annually by Parl. for the prosecution of the survey varies from time to time; it is at present about £130,000. [From *orig. art. in J. S. Univ. Cyc.*, by Col. A. R. CLARKE, F. R. S.]

**Ordogno**, the name of several kings of Asturias and Leon, of whom the first 2 became celebrated for their wars with the Moors. ORDOGNO I. (850-66) conquered Salamanca in 862. ORDOGNO II. (913-23) defeated the Moors in 916 at St. Etienne de Gormaz, and took from them Talaveyra de la Reyna.

**Ore**, a metal chemically combined, or in a native state, mechanically mixed with other substances, which render treatment necessary to separate it. In a strictly technical sense, only those substances are ores which contain the metal in sufficient quantity and of sufficient purity to make the treatment profitable.

**Ore Deposits**. An O. D. is any natural occurrence of metalliferous minerals from which one or more of the heavy metals can be profitably extracted. The ore may be a single native metal, or a chemical or mechanical mixture of metals, or a single mineral consisting of a metallic oxide or a metallic salt, or it may be a mechanical mixture of several of these minerals. Generally, the ore is associated more or less intimately with other minerals, which are called the gangue. The ore and the gangue together form the deposit.

**Texture**.—Metalliferous deposits sometimes consist solely of one ore, more often of two or more ores, with one or more minerals forming the gangue. Varieties are—

**Compact**, when the texture is so fine that the separate particles are not visible to the naked eye.

**Granular**, when the particles are visible in grains.

**Micaceous** or finely laminated, when the particles are in thin laminae or scales.

**Disseminated**, when the ore is distributed through the gangue in grains or laminae.

**Porphyritic**, when the ore is distributed as integral crystals through the gangue.



*Banded or combed*, when the constituents are arranged in parallel layers. Deposits having this structure were formed in cavities, fissures, caves, chimneys, and the layers indicate gradual growth under more or less varying conditions. The oldest members or layers (*a a*) formed on the opposite walls (Fig. 1), then *b b*, *c c*, till finally the 2 youngest members, *d d*, filled the narrowed space. Frequently 2 contemporaneous layers, which may alone fill the vein or may form the two youngest members, consist of crystals set perpendicularly to the walls of the vein, and with their terminal faces bristling toward each other from opposite sides or interlacing (*d d* in the sketch). This symmetrical repetition is sometimes interfered with by the interposition of other layers when the vein has reopened and formed a new vein between the walls of an older one. Fig. 2 represents 3 distinct veins, A, B, C, between the same walls.

*Concentric banded Cordilleran, or Ringerze*, when the bands are arranged symmetrically around a nucleus, which is often a fragment, as in Fig. 3.

*Brecciated*.—The deposits very often contain fragments of the enclosing rock or "country." When these are very numerous the texture is brecciated. Very often, especially in veins, the highly altered fragments of the wall-rock form nearly the entire filling, in which the minerals of the ore and gangue are distributed in thin threads and seams. (See Fig. 4.)

*Drusy*, when the deposit contains many cavities lined with crystals. The boundaries of a deposit are called walls; when these are well defined, the plane between the deposit and the wall-rock is called the selvage.

#### Succession of Minerals.

—The formation of any deposit was due to slowly acting causes working during long periods of time, and often under more or less varying conditions. The progress of growth is often marked by the banded structure when present, the varying conditions by the alternating constitution of the bands, and the relative ages of the constituents by their relative positions in the separate bands or by the superposition of one upon another, forming what is called a paragenetic series, as in Fig. 5.

#### Grouping of Minerals.

—Certain metalliferous substances have a tendency to occur together, either chemically combined or associated as separate minerals—*e. g.* ores of lead and zinc, of copper and iron, of cobalt and nickel, etc. A similar tendency to association exists with regard to certain gangue minerals, both among themselves and with certain ore groups.

*Oxidation Zone*.—That part of a deposit which is nearest the earth's surface is subject to changes produced by the oxidizing influence of the descending waters. *G*, wall-rock in the lode; *e*, ore. The result of this process is the oxidizing of the sulphuretted ores. This oxidized portion is called the "gossan," "Elserne Hut."

FIG. 1.

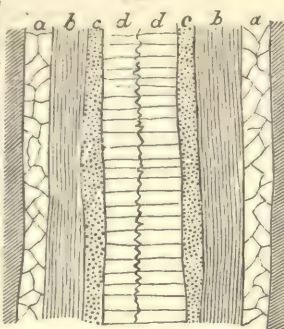


FIG. 2.

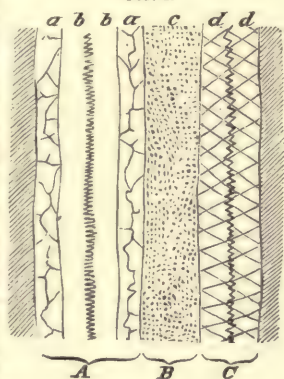
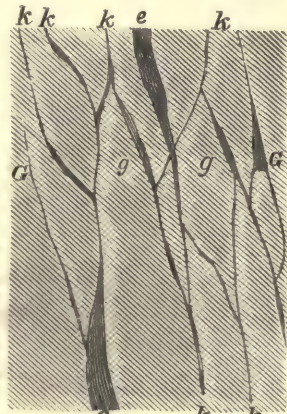


FIG. 3.



Concentric vein structure, Adalbert vein, Przibram (Grimm): *a*, green-stone; *b*, brown blende; *c*, galena; *d*, siderite; *e*, drusy cavities.

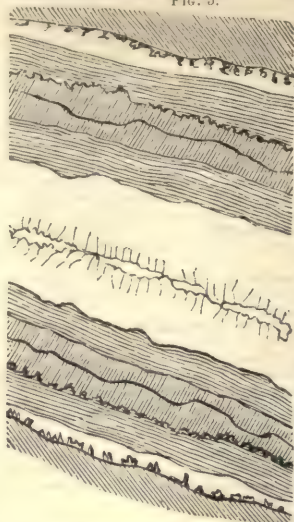
FIG. 4.



*G*, wall-rock in the lode; *e*, ore.

*Classification*.—The following classification is in harmony with our present knowledge regarding the origin of O. D.:

FIG. 5.



Blende.  
Quartz.  
Fluor-spar.  
Blende.  
Heavy spar.  
Iron pyrites.  
Heavy spar.  
Iron pyrites.  
Fluor-spar.  
Iron pyrites.

Calcite.

Calcite.

Iron pyrites.  
Fluor-spar.  
Iron pyrites.  
Heavy spar.  
Iron pyrites.  
Heavy spar.  
Blende.  
Fluor-spar.  
Quartz.  
Blende.

Paragenetic series (Von Weissenbach).

- I. DISSEMINATED CONCENTRATION.
  1. Impregnations, Fallbands.
- II. AGGREGATED CONCENTRATION.
  1. Lenticular aggregations and beds.
  2. Irregular masses.
  3. Reticulated veins.
  4. Contact deposits.
- III. CAVE DEPOSITS.
- IV. GASH-VEINS.
- V. FISSURE-VEINS.
- VI. SURFACE DEPOSITS.
  1. Residuary deposits.
  2. Stream deposits.
  3. Lake and bog deposits.

Forms due to the texture of the enclosing rock or to its mineral constitution, or to both causes.

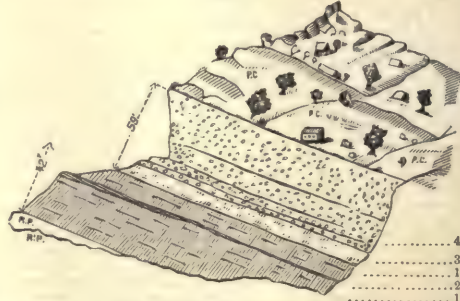
Forms due chiefly to pre-existing open cavities or fissures.

DEPOSITS WHOSE FORMS ARE DEPENDENT ON THE TEXTURE OF THE ROCK OR ON ITS MINERAL CONSTITUTION, OR ON BOTH CONDITIONS.

I. DISSEMINATED CONCENTRATION. — *Impregnations*. — The determining characteristic of this form is the dissemination of one or more metallic substances, in particles from an invisible size up to that of a pea or larger, through the rock-mass. The particles may be in flakes or grains or crystals. They may occur in any kind of rock, sedimentary, metamorphic, or eruptive. The most common illustration of this form is seen in the frequent occurrence of iron pyrites in shales and schists and in hornblende rocks, granites, etc. When this disseminated pyrites contains gold, as is frequently the case, especially in the metamorphic schists, it sometimes becomes of economic value. Very generally the organic remains, especially of plants and fishes, are changed to copper and iron pyrites. The copper ores predominate very greatly over all the others. Ores of lead and zinc frequently occur as impregnations to a small extent in many argillaceous rocks of different ages. They also occur extensively in the various lead-bearing limestones and dolomites, but, owing to the texture of these rocks, the impregnations are very subordinate to the other forms of deposits. Auriferous pyrites and native gold form typical impregnations in some metamorphic schists. Many of the occurrences of ores of cobalt and tin in quartz and mica schists and of tin in granitic rocks are other instances. This form of deposit is one of the most common in Scandinavia, where it is known under the name of *fallbands*. These are beds, or portions of beds, of metamorphic schists impregnated with sulphurets.

II. AGGREGATED CONCENTRATIONS. — 1. Lenticular Aggregations.

FIG. 6.



Pilot Knob: 1, 1, hard specular ore; 2, slate; 3, porphyry conglomerate with ore; 4, porphyry conglomerate with ore in matrix; P. C., porphyry conglomerate with ore; A. P., red porphyry.

*tions and Beds*. — It frequently happens that the ores, instead of being disseminated throughout the rock, are aggregated



into numerous masses. If the rock is stratified, these aggregations are generally lenticular and parallel to the stratification. These may consist wholly of ore, or of ore associated with the minerals forming the rock, or with minerals which are not essential constituents of the rock. When these lenticular masses lie so close together that they predominate over the enclosing rock, or when the ore and its gangue form a continuous interstratified sheet, the deposit is a bed. Excepting, perhaps, tin, there is hardly any ore that does not occur in this form of deposit. The ores of the more common metals, as iron, lead, zinc, and copper, often occur each as the sole constituent of the bed, while ores of the other metals, when present, are generally subordinately

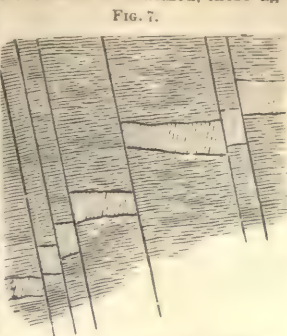


Fig. 7. Faulted magnetite bed, Byram Mine, N. J. (Geol. of New Jersey, 1868).



Iron Mountain: D. P., decomposed porphyry.

associated with the more common ores or with gangue minerals. As iron is the most universally distributed metal, so it forms also the most extensive beds. The beds of hematite in the Archean schists often attain to enormous dimensions. At Pilot Knob, Mo., a bed of hematite more than 40 ft. thick occurs interstratified with bedded quartziferous porphyry and porphyry conglomerate (Fig. 6). The annexed (Fig. 7) shows a much-faulted bed of magnetite, 8 ft. thick at the Byram mine in N. J.

2. *Irregular Masses* (Stöcke in part).—These are all deposits of irregular outline which have not been formed in open cavities. Such are some of the great iron ore deposits of the world, as the hematite (altered from magnetite) of Iron Mt. in Mo. At this place immense masses of ore of undefinable shape occur in porphyry, and this porphyry, which is partly decomposed (D. P. in Fig. 8), is beside traversed throughout by ore in veins of all sizes, forming a perfect reticulation in all directions. Some deposits of this kind are formed by the union of large lenticular masses.

3. *Reticulated Veins*.—In this form the rock is traversed by a network of seams or veins parallel to different planes, surrounding polygonal masses of the rock; they are sometimes so close together that the entire mass has to be mined; when they are separated to such an extent that the intervening rock is not mined, they are called flosses.

4. *Contact Deposits* are such as are formed along or near the plane of contact between 2 non-conformable rock-formations in such a manner that the determining cause of their mode of occurrence can be referred to the contact phenomena. They occur more frequently at or near the contact of limestone or metamorphic

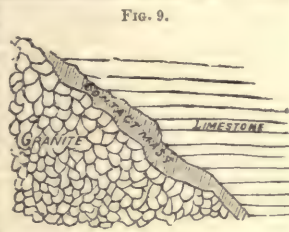
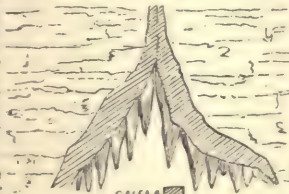


Fig. 9.

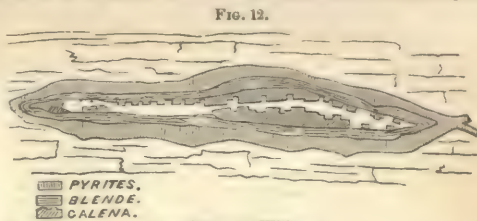


Fig. 10.



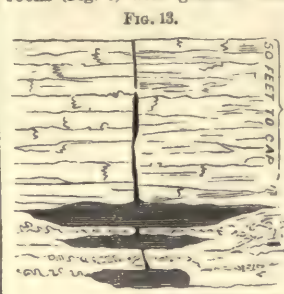
Cave Deposits—chimney (Whitney).

quently at or near the contact of limestone or metamorphic

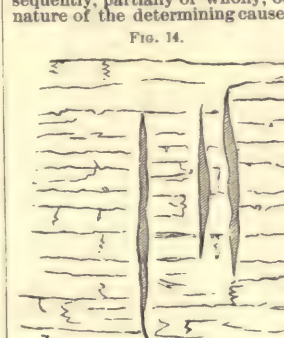


Cave Deposit (Whitney).

rocks (Fig. 9) with granitic rocks and crystalline schists.



Connected caves: 1, first opening; 2, second opening; 3, third opening (Whitney).



Gash vein—Lead ore (Whitney).

They are often undistinguishable from cave deposits, for they have frequently been the starting-points in the formation of caves. They often occur filled with lead and zinc ores in the lead-bearing limestones or dolomites of Mo. and Wis.

V. *FISSURE-VEINS*.—Fissure-veins (true veins, lodes) are deposits formed in fissures, the determining cause of which was the exertion of a force acting over a large area and producing one or more fissures traversing all rocks in its path.

Veins generally send out minor cracks, usually at an acute angle, into the wall-rock, which are called feeders or branches. Very often the vein incloses large masses of the wall-rock or "country" which are called "horses" (Fig. 15). The extension of a vein horizontally is called its strike, direction, course, or bearing. The vertical angle which it makes with the horizon is called the dip. The thickness of veins varies from a mere crack to hundreds of feet. Veins often divide into several smaller ones, which keep proximately the original strike; they are then said to split up. (Fig. 16.) In districts which contain ore-bearing veins there are almost always a number of them, often grouped in a zone of nearly parallel veins, which sometimes run together. Some districts have several zones, each roughly parallel to a different direction, and the different zones are then generally of different ages and different in character. It is a common occurrence to find that a vein has been subjected to an upward or downward movement of the country on one of its sides. This motion has had more or less crushing for a result, and has often left highly polished wall-surfaces. Where the fissure lay in a warped plane, the tendency of a movement was to produce a vein of irregular thickness by bringing the alternating convex portions of the 2 walls

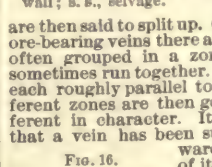


Fig. 15.



by bringing the alternating convex portions of the 2 walls



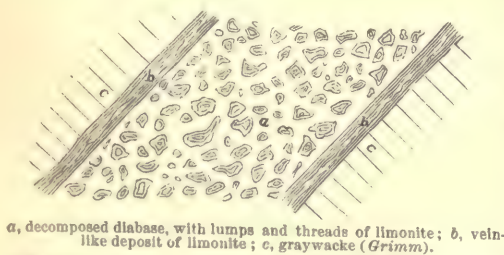
into opposition. An important result of this is the permanent enlargement of the fissure as a whole. (Fig. 17.) The evidence of movement having taken place in a given vein is found in the relative displacement of the opposite sides. This is marked by interruption of the continuation of individual strata if the country rock is stratified (Fig. 17), or, if the vein intersects dikes or other veins which are older, by the displacement of these.

**Faults.**—This dislocation of strata or of dikes or veins is called faulting, and the occurrence is called a fault or throw. The appearance of a fault may, however, be produced without any sliding movement, but simply by the separation of the walls of the fissure when the vein intersects the strata or other vein under an angle of less than 90°; the apparent throw is then proportional to the width of the vein. (Fig. 18.) A vein (Fig. 19, B) may throw one vein (A), and be itself faulted by a still younger one (C). And the younger vein may intersect and throw all the older ones (Fig. 20), producing very complicated results.

The contents of a vein are the ore and the gangue. Some veins have a very simple character as regards the filling, containing one ore, or this and one kind of gangue. Others, again, are exceedingly complex, containing in the same part of the vein or in different parts a great variety of metallic compounds, associated with numerous gangue minerals. Indeed, as there is probably no known element that is not contained in some veins, it is not surprising that a very large portion of the known minerals should have been formed in these laboratories. Veins are generally filled compactly with their contents. The constituents—ore and gangue minerals—are often distributed in symmetrical layers parallel to the walls; they are often also heterogeneously mixed. The distribution of ore and gangue minerals is generally more or less irregular within the same vein. Sometimes the ore is concentrated at different points into bodies called bonanzas, nests, chimneys, pockets, masses, etc., while the rest of the vein is barren. Beside change due to local influences, there is observed in some dists. a difference of character in depth. Thus, the veins of Oruro in Bolivia, which were rich in silver in their upper levels, contained ores barren of silver in depth. Sometimes a dike of eruptive rock has been altered to a considerable depth in such manner as to roughly simulate a fissure-vein. Fig. 21 represents a decomposed dike of diabase near Příbram, in which the iron from the auge has segregated into threads and nodules of limonite in the decomposed rock, and into vein-like bands 2 or 3 ft. thick from the walls inward.

VI. SURFACE DEPOSITS.—1. *Residuary Deposits.*—When, by disintegration and erosion or by being dissolved, a rock-mass containing ore deposits of any form is removed, and the removing cause is not competent to carry away the ore,

FIG. 21.



a, decomposed diabase, with lumps and threads of limonite; b, vein-like deposit of limonite; c, graywacke (Grimm).

this remains in a more concentrated form and is a residuary deposit. The often important masses of magnetic iron sand concentrated by the wave-action on beaches from the disintegrated debris of rock-masses are of this form.

2. *Stream Deposits.*—Stream deposits consist of loosely aggregated material in modern or anc. water-courses, in which gold, platinum, etc. or tin ores are more or less concentrated. The annexed sketch (Fig. 22) represents an auriferous stream deposit formed in a valley which, after being filled with a lava stream, became a mt.-crest by the erosion of the softer hills on either side.

3. *Lake and Bog Deposits.*—In many localities iron ore is deposited in marshes and on the bottoms of lakes. The ore

is a variety of limonite called bog ore, and owes its origin to the action of decaying organic matter on ferric oxide, producing soluble ferrous carbonate, which, on entering the

FIG. 22.

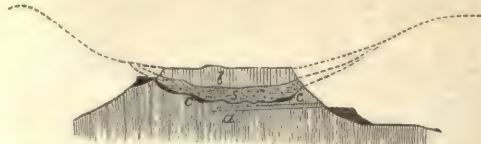
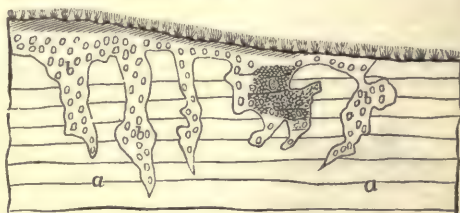


Table Mountain: l, lava; s, sandstone; c, auriferous channels; a, slate.

aërated waters of a lake, is oxidized and sinks. Under this heading come also the European deposits of pisolithic iron ore, washed into open pit-caves in limestones. (Fig. 23.)

FIG. 23.



a, Jurassic or Cretaceous limestone; b, pisolithic iron ore; c, clay, earth, and sand (Grimm).

In its most gen. aspect the formation of an O. D. requires (1) sources from which the constituents are derived; (2) transportation from the source; (3) concentration; (4) arresting causes which are capable of giving fixed and solid forms to the substances that are to form the deposit. There are 3 possible sources—viz. the unknown original interior of the globe; the igneous rocks of the outer crust, especially granite; and the ocean. The ocean has been from early time the great reservoir into which the constituents of all rocks have found their way as detritus or in solution. The plants assimilate the metals in small quantities, as they do potassium and calcium, sulphur, phosphorus, etc., all of which are essential constituents of their tissues or fibre. We have here a very marked concentration. The animals probably derive their share of the heavy metals, as they do that of the other elements, from plants or from plant-eating animals. Here, too, there is a marked concentration. When these plants and animals die they are buried in sedimentary deposits, and the metals they contained are converted into sulphurets through the oxidation of the organic matter in presence of the sulphates in the sea-water. The metals thus concentrated by vital force are incorporated in the sedimentary deposits at the bottom or in coral reefs. In the case of plants there is a still greater concentration, for they are carried by the great oceanic currents into the sargassum eddies, where their remains rot and sink to the bottom. The sediments in which these metals are thus brought together form, when solidified, argillaceous shales, marls, limestones, and sandstones, and it is from these that the crystalline schists, clay-slates, and saccharoidal limestones and dolomites have been formed by metamorphism.

The formation of O. D. becomes, from this point on, a question of dissolving the metals, bringing them together from a very extended space into a very small one, and fixing them there in a solid form. Once dissolved, the metals enter the restless circulation of the waters that permeate the pores, capillary cracks, and fissures of the outer crust of the globe. These circulating waters seek the channels of freest drainage; they work their way from the minute pores and capillary cracks into the larger cracks, and from these into larger, and finally converge into the great fissures. Throughout this journey the circulating solution often passes through rocks of very varying mineral character, which react upon its dissolved salts. Where these reactions precipitate metallic compounds there takes place a concentration of the metallic substances. In the great majority of these deposits the ores are sulphurets, a form under which they would necessarily be precipitated in the presence of organic matter, and sulphates in some instances, or in others on coming in contact with sulphuretted hydrogen gas. Both of these conditions exist in all sedimentary deposits containing remains of plants or animals, until the organic remains have been consumed. The filling of a fissure-vein is the resultant of a great variety of chemical processes, for it was the converging point of countless drainage-systems, each bringing its chemical agents, and each more or less different in this respect from the others. It is therefore natural that in this class of deposits we find the greatest complexity in the character of the ores and gangue minerals.

*Relative Values of Deposits.*—Fissure-veins, as a rule, are more trustworthy, because of the continuity of the fissures, and the consequent facility offered the miner for underground prospecting. The same may be said of certain beds, while the other forms are of the most uncertain character; any given one may be an isolated occurrence or one of many, but from their nature they rarely offer clews by which the miner can work from one to another.

*Literature.*—John Grimm, *Die Lagerstätten der nutzbaren Mineralien*; Von Cotta and H. Müller, *Gangstudien*; J. D. Whitney, *Metallic Wealth*. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. R. PUMPELLEY.]



**Oregon**, one of the Pacific States, between 42° and 46° 18'

N. lat. and 116° 33' and 124° 25' W. lon., is bounded N. by Wash. Terr., E. by Id. Terr., S. by Nev. and Cal., W. by the Pacific; width from E. to W., about 360 m.; from N. to S., about 275 m.; coast-line, about 300 m.; area, 96,090 sq. m.

**Face of the Country.**—

The State is divided by the Cascade and Blue ranges into W., Middle, and E. Oregon. The Coast Range passes through W. O. at from 40 to 70 m. from the coast, but its altitude nowhere exceeds 3000 to 4000 ft., and much of the fertile soil of its slope is covered with forests to the summit. The Cascade Mts. are a continuation of the Sierra Nevada range, and are about 110 m. E. of the coast. They have a mean elevation of 6000 to 7000 ft., while numerous peaks rise 4000 to 5000 ft. higher. The Coast Range is in some places precipitous on its W. slopes, but the greater part of W. O. is fertile and arable. Middle O. is a rolling table-land, with occasional spurs from the Blue Mts. It is not well watered, and its soil is represented as being barren. E. of the Blue Mts. lies E. O., in the basin of the Snake River—a region which has many fertile valleys. The Willamette Valley, between the Coast and Cascade ranges, is 150 m. in length and from 30 to 60 m. in width, with an area of 5,000,000 acres, nearly all of unusual productiveness. In this valley are the prin. towns of the State and almost  $\frac{2}{3}$  of its pop. Umpqua Valley lies between the Callapaia and Grave Creek ranges, and extends from the Coast Range to the Cascade Mts. It is much like the Willamette in productiveness, and has an area of 2,500,000 acres. The Rogue River Valley is in the S. part of the State. It is much like the preceding, and contains about 2,400,000 acres. Middle O. has no considerable valleys, but E. O. has several small ones, as the Grand Ronde Valley in the N. E., containing about 275,000 acres; the Powder River and Burnt River valleys; and in the S. E. the Malheur and Owyhee River valleys.

**Rivers, Lakes, Etc.**—The largest rivers of W. O. are the Columbia, the Willamette, its largest tributary; Young, Clarke and Lewis or Snake rivers, also affluents of the Columbia; Umpqua, Rogue, Tillamook, Yaquina, Alsea, Siuslaw, and Coquille, discharging into the Pacific; and Tualatin, Clackamas, Yamhill, Santiam, Luckiamute, Mary, and Long Tom rivers, tributaries of the Willamette, together with the McKenzie's, Middle and Coast Forks. John Day, Des Chutes, and Umatilla rivers, all affluents of the Columbia, are the prin. rivers of Middle O.; while Snake River and its branches, Grand Ronde, Powder, Burnt, Malheur, and Owyhee rivers are the largest streams of E. O. There are numerous lakes (some of them salt) in S. and S. E. O. The prin. are the Upper and Lower Klamath, Goose, Warner's, Salt, Harney, Malheur, Albert, Summer, and Silver.

**Bays, Harbors, Capes.**—The entrance to Columbia River is the best harbor on the O. coast. Port, Orford, Coos, and Tillamook bays have sufficient depth of water, but are somewhat exposed. For vessels of lighter draught the mouths of Umpqua, Yaquina, Rogue, and Coquille rivers furnish good harbors. The prin. capes or headlands are Point Orford or Cape Blanco, Cape Foulweather, Cape Lookout, Cape Perpetua, Umpqua and Tillamook heads.

**Mineralogy.**—The mineral wealth of the State is great, but imperfectly developed. In Jackson and Josephine cos. gold-placer deposits have been worked since 1851. Since 1862 extensive placers and quartz lodes have been developed in Grant and Baker cos., and the annual production in that quarter has been about \$1,500,000. Placers have been worked on the ocean-beach at Coos Bay. The argentiferous formation of Nev. extends into O. Argentiferous lead has also been found in Jackson, Josephine, and Douglas cos. in S. W. O.; copper at several points in the same quarter, not only as an ore, but in ledges. Iron ore of a superior quality exists in almost every part of the State; a large deposit at Oswego, about 6 m. S. of Portland, yields 54 per cent. of pure iron. There are similar deposits at St. Helen on the Columbia, and in Tillamook, Marion, Columbia, Clackamas, Jackson, and Coos cos. Coal also is met in beds of great thickness on Coos Bay, on Umpqua River, on the Yaquina, at St. Helen, on the line of the Oregon and Cal. R. R., and in Douglas, Clackamas, Clatsop, and Tillamook cos. Among the so-called precious stones, chalcodony, agates, carnelians, and jaspers of uncommon beauty are abundant on the banks of the Columbia. Salt is largely extracted for domestic consumption in Jackson and Douglas cos.

**Zoology.**—The largest of the fauna of the mts. of O. is the grizzly bear; the black and cinnamon bear are also common, with the large wolf and coyote, the panther, catamount, wild-cat, polecat, several species of deer, antelopes, elks, and mt.-sheep or bighorn of E. O. Of the smaller animals there are species of large and small squirrels, the raccoon and porcupine, with beaver, otter, and muskrat in the streams. The mts. are the resort of some silver foxes, martens, hares, and rabbits. In the Columbia seals are abundant, especially near the Cascades. The lower Columbia is

prolific with salmon and salmon-trout. All the rivers emptying into the Pacific swarm with these fish; great sturgeons are also caught in the Columbia; halibut, herrings, smelts, and many other fish exist in these rivers in countless numbers. Above tide-water the streams and lakes teem with trout. Oysters, shrimps, and crabs of several species are found in Coos Bay, Umpqua, and other places on the coast. Among the larger birds are golden and bald-headed eagles, fish and several other hawks, and cormorants; several species of pelicans, gulls, and the albatross, with the great vulture and buzzard; pigeons, quails, robins, jays, yellow-birds, and humming-birds, the trumpeter and Amer. swan, Canada and snow-goose, brant, and many species of wild-duck, including one like the canvas-back of Chesapeake Bay.

**Vegetation.**—That of the coast and W. of the Cascade Mts. is dense and luxuriant, abounding in evergreens, with giant trees in girth and height, the largest of which is the redwood. The lofty O. cedar is confined to the Coast Range, as are also the hemlock spruce, the red fir, white spruce, the O. yew. Among the deciduous trees of the same quarter are white maple, the O. alder, several species of pollard and balsam oaks, and on the lower Columbia and Willamette large white oaks. The willow and cottonwood occur both in W. and E. O. The O. ash is found on the banks of streams, and the O. dogwood. The O. crab-apple and wild-cherry trees are both valuable to graft on. The oak occurs in rich alluvial soil. The broad-leaved evergreen laurel is found in the middle region of O. Above the elevation of 5000 ft. pines, larches, dwarf junipers, and cedars flourish to the snow-line. Arbutus, cornus, and hazels form a thick undergrowth to pines and spruces. The snowberry of E. gardens is indigenous to O. The mock-orange, wild roses, wood-bines, several species of honeysuckle, and other flowering plants abound. There are also lupines, columbines, a small and peculiar sunflower, wallflowers, scilla, ambrosia, asters, myrica, sweet-flowering pea, and a peculiar red clover in the small, rich moist valleys. Of roots in W. O., the camas, not unlike a small onion in appearance, but in taste like the chestnut, abounds in the prairies and supplies the Indians with bread. The bunch-grass is said to cover 20,000,000 acres. All wild berries are found, and the climate, of W. O. especially, is admirably adapted to apples, pears, etc.

**Climate.**—In W. O. both summer and winter are materially tempered by the Pacific winds. Yearly mean temperature in W. O., 53° F.; annual rainfall, 43.69 inches. E. of the Cascade Range, with severe, protracted winters and heavy snows, there is greater heat and dryness in summer, but cool pleasant nights; mean temperature for the year, 52.79° F.; and rarely does the temperature fall lower than 8° below zero; annual rainfall, 20 inches. E. of the Blue Mts. there is the least rain, the summers are drier, and the winters colder with deep snow. Middle O. is more mild and equable. Ice is rarely thicker than an inch in W. O.

**Agricultural Productions.**—By the census of 1880 there were produced in O.—wheat, 7,480,010 bushels; oats, 4,385,650 bushels; barley, 920,977 bushels; corn, 126,862 bushels; rye, 13,305 bushels; buckwheat, 6215 bushels. The wool clip of 1880 yielded 5,718,524 lbs.

**Farm Animals.**—There were in O. in 1880, 134,107 horses, 416,242 cattle, 1,083,162 sheep, and 156,222 swine.

**Fisheries.**—The food-fishes of O. (principally salmon) are of great value; total yield for 1880, \$2,781,024; 538,587 cases of this fish were packed, requiring 1,615,761 salmon.

**Manufactures.**—By the census of 1880 O. had 1744 manufacturing establishments, employing 6056 hands, paying \$2,016,311 in wages, with aggregate products of \$13,342,130; capital invested, \$12,474,019. The prin. industry is in flouring and grist mills and in the working of lumber. Coal mined in 1880, 200,000 tons.

**Railroads.**—There were in operation in O. Jan. 1, 1882, 689 m. of railway, costing \$29,794,045, with net earnings of \$1,981,448. The prin. lines are the O. Central, the O. Railway and Navigation Co. and branches, connecting Portland with the N. Pacific R. R., which will complete in 1883 R. R. connection between the Pacific at Puget Sound and the E. cities.

**Finances.**—The assessed valuation of property in O. in 1880 was \$52,522,084, real and personal; rate of State tax, 6 mills on the dollar, producing \$324,959; State debt, 1880, \$511,376; aggregate indebtedness, State, co., and town, \$848,502; amount raised by taxation, State and local, \$1,113,942.

**Commerce.**—Direct foreign commerce is considerable, amounting in 1881 to \$4,550,814 exports and \$808,263 imports. The internal traffic is large, both by R. R. and rivers. The shipping in 1881 included 91 steam vessels and 38 sailing vessels, aggregating 39,658 tons.

**Banks.**—There was in operation, Oct. 1881, 1 national bank, with capital of \$250,000; circulation, \$223,090; U. S. bonds to secure circulation, \$250,000; aggregate deposits, \$1,984,117. There were beside 4 State banks and trust cos., with \$456,344 capital and \$461,049 deposits, and 12 private bankers, with \$436,500 capital and \$973,519 deposits.

**Education.**—The number of children of school age (4–20 yrs.) in 1880 was 59,615, of whom 37,437 were enrolled in public schools, with aggregate daily attendance of 26,593. Total expenditure for public schools, 1880, \$316,885, of which teachers' salaries required \$212,348. There are 8 colls. or univs., with 55 instructors and 1056 students, paying tuition fees in 1880, \$15,750. There were pub., in 1882, 67 newspapers and periodicals, 7 of which were daily.

**Churches.**—The M. E. number 61 chs., 50 ministers, and 5176 members; Christians (Disciples of Christ), 45 chs., 34 ministers, 4759 members; Baps., 73 chs., 55 ministers, 2016 members; Presbys., 20 chs., 17 ministers, 1055 members; R. Caths., 25 chs., 96 priests, and about 20,000 Catholic pop.; United Brethren, 6 chs., 23 ministers, 918 mem.; members; Prot. Epis., 18 chs., 17 ministers, 800 members; and 15 other denominations, having from 800 to 30 members each.

**Population.**—In 1890, 32,463; 1870, 90,923; 1880, 174,798 (white 163,075, colored 11,693, including 9510 Chi., 1094 Indians, and 2 Japanese).





*Principal Cities and Towns, Pop. 1880.*—Portland, 17,577; Astoria, 2,808; Salem (cap.), 2,538; The Dalles (Dalles City), 2,232; Albany, 1897; Oregon City, 1,263; Baker City, 1,258; Corvallis, 1,128; Eugene City, 1,117; Jacksonville, 839.

COUNTIES.	*Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
Baker.....	7-E	2,804	4,616	Baker City.....	1,258
Benton.....	6-A	4,584	6,403	Corvallis.....	1,128
Clackamas.....	6-B	5,993	9,300	Oregon City.....	1,263
Clatsop.....	5-A	1,255	7,292	Astoria.....	2,808
Columbia.....	5-B	863	2,042	St. Helen.....	209
Coos.....	7-C	1,644	4,834	Empire City.....	412
*Crook.....	6-C	.....	.....	Prineville.....	.....
Curry.....	6-A	504	1,209	Elensburg.....	.....
Douglas.....	7-B	6,066	9,536	Roseburg.....	892
Grant.....	7-D	2,251	4,303	Canyon City.....	393
Jackson.....	8-E	4,778	8,134	Jacksonville.....	839
Josephine.....	8-E	1,294	2,485	Kersey.....	75
*Klamath.....	8-C	.....	.....	Linkville.....	250
Lake.....	8-C	.....	2,804	Lakeview.....	270
Lane.....	7-B	6,426	9,411	Eugene City.....	1,117
Linn.....	6-B	8,717	12,676	Albany.....	1,867
Marion.....	6-B	9,965	14,576	Salem.....	2,538
Multnomah.....	5-B	11,610	25,322	Portland.....	17,577
Polk.....	6-A	4,701	6,601	Dallas.....	670
Tillamook.....	6-A	408	970	Tillamook.....	.....
Umatilla.....	5-D	2,916	9,607	Pendleton.....	730
Union.....	5-E	2,552	6,650	Union.....	418
Wasco.....	6-C	2,809	11,120	The Dalles.....	2,232
Washington.....	5-B	4,261	7,082	Hillsborough.....	402
Yam Hill.....	6-A	5,012	7,945	La Fayette.....	396
Total.....		90,923	174,768		

*History.*—The Gr. pilot De Fuca in 1592, Admiral Fonte in 1640, and other Sp. explorers visited and mapped the greater part of the coast as far as the 55th degree of N. lat. The Nootka treaty of 1790 between Sp. and G. Brit. only gave to the latter some fishing and trading rights in the vicinity of Puget Sound. The discovery and exploration of Columbia River by Capt. Robert Gray, an Amer. capt., who gave the name of his ship to the river; the purchase of La. and all that belonged to it to the Pacific from the Fr. in 1803, their claim being the best, next to that of Sp.; the exploration of Columbia River from its sources to its mouth by Lewis and Clarke by order of our govt. in 1804-05; and the treaty of limits concluded between Sp. and the U. S. in 1819, by which all the terr. N. of 43° N. lat. was expressly declared to belong to us—were conclusive proofs of our title to this region. But the treaty, which the Brit. govt. called a "treaty of joint occupation," concluded in 1818, gave a great deal of trouble. In 1832 the first settlers from the U. S. arrived. In 1834 the missionary colony led by Dr. Marcus Whitman and Rev. Mr. Spalding entered O. Their wives were the first white women who had crossed the Plains, and their children the first Amer. children born in O. In 1846 a treaty was concluded between the U. S. and G. Brit. fixing the boundary on the 49th parallel, except at the Straits of Fuca. O. was formally added to the U. S., but had no Territorial govt. till 1849. Aug. 14, 1848, O. was created a Terr., including what is now Wash. Terr. In Mar. 1849 its first Territorial govt., Joseph Lane, arrived, and organized the Terr., with 8785 in-habs. In 1857 a const. adopted, and application made for admission as a State. This was granted Feb. 14, 1859.

#### Governors.

PROVISIONAL.		Addison C. Gibbs . . . . .	1862-66
George Abernethy . . . . .	1845-49	George L. Woods . . . . .	1866-70
TERRITORIAL.		Lafayette S. Grover . . . . .	1870-77
Joseph Lane . . . . .	1849	S. F. Chadwick . . . . .	1877-78
John P. Gaines . . . . .	1849-53	Wm. W. Thayer . . . . .	1878-82
Joseph Lane . . . . .	1853	Zenas F. Moody . . . . .	1882-87
Geo. L. Curry . 1853-54	1854-59		
J. W. Davis, a few days	1854		
STATE.			
John Whittaker . . . . .	1859-62		

REVISED BY A. R. SPOFFORD.

**Oregon**, city on R. R., cap. of Ogle co., Ill., 100 m. W. of Chicago. Pop. 1880, 1088.

**Oregon City**, on R. R., cap. of Clackamas co., Or., 12 m. S. of Portland. Has fine water-power. Pop. 1880, 1263.

**Oregon River**. See COLUMBIA, or OREGON.

**Orelde**, an alloy of copper with tin, or more rarely zinc, composed of 100 parts of the first to 17 of the tin or zinc. It is used for the cases of cheap watches and for ornamental castings. It resembles gold in color, and affords a good base for electro-plating with gold.

**O'Reilly**, O-TIE (ALEXANDER), COUNT, b. in Ire. in 1725; entered the Sp. military service at an early age; fought in It. during the war of the Aus. Succession; served in the Aus. army against Prus. 1757-58, and was distinguished at Hochkireh; re-entered the Sp. army as lieut.-col. 1761; introduced Ger. tactics into Sp.; was sent to Havana as brig.-gen. 1763; saved the life of Charles III. when threatened by a sedition at Madrid 1765; went to La. June 1768, to take possession of that colony, ceded to Sp. by Fr.; put to death the Fr. leaders who had resisted the transfer of sovereignty; abolished the Fr. laws; appointed inspector-gen. of all the forces in Sp. America 1770; gov. of Madrid 1773; sent into exile in Galicia 1786. D. Mar. 23, 1794.

**Orel/H** (JOHANN KASPAR), b. at Zurich, Switz., Feb. 13, 1787; studied theol., but especially anc. and modern langs. and lit., and was appointed professor eloquentiae in 1819 in his native city, where he d. Jan. 6, 1849. His critical editions of Horace, Tacitus, and Cicero, including *Scholastica Cicero* and *Onomasticon Tullianum*, are very celebrated, also *Inscriptionum Latinarum Selectarum Collectio*.

**Orenburg Gum**, a gummy and saccharine exudation collected in Siberia and Rus. from the trunks of larch trees after great forest-fires have partly destroyed the trees.

**Orestes**, in Gr. mythology, a son of Agamemnon and Clytemnestra; avenged the murder of his father by killing his mother and her paramour, *Ægisthus*, but was immediately WASHINGTON Terr.

\* Reference for location of counties. See map of Oregon and Washington in art. WASHINGTON Terr.

† Formed since census of 1880.

diately attacked by the Erinyes, who drove him mad, pursuing him from place to place. He sought refuge with Apollo in Delphi, and went thence, by Apollo's advice, to Athens, where the court of the Areopagus declared him innocent through the influence of Athens. The myth is treated by the tragedians, Æschylus, Sophocles, and Euripides.

**Orfa, Orfah, or Urah** [Gr. *Edessa*; Ar. *Roha*], cap. of the pashale of Urah in Asiatic Tur., lat. 37° 8', about 40 m. E. of the Euphrates. It is built partly on the side of a hill looking eastward over an extensive plain. The river Kara Kozoon, spanned by 3 bridges, flows through it. Its streets are narrow, but clean. Its gardens resemble those of Damascus. Its mosque and pool of Abraham are famous. It has a large trade, and a pop. of about 40,000, nearly half of whom are Chrs. R. D. HITCHCOCK.

**Organzine**, organ-zeen [It. *organzino*], is silk which has been wound, cleaned, thrown, and twice or thrice doubled and twisted. It is also known as "thrown silk."

**Orgat**, or zhat [Fr.], a flavoring substance much used in medicinal and other drinks, especially in Fr. It is essentially a syrup of sweet and bitter almonds, and possesses a rich almond flavor, but is often modified by the use of other ingredients.

**Orget-orix**, a wealthy and noble Helvetian who formed a conspiracy among the nobility, and persuaded the people themselves to go forth from their terr. with all their possessions, and was appointed to carry out the necessary arrangements. His plans having been disclosed, he was brought to trial. By the aid of his friends and retainers he rescued himself, but d. soon after, about 62 B. C.

**Oribia-sius** [Ὀρειβάσιος], a Gr. phys., b. at Pergamus (not at Sardis), according to Eupapius, who is the prin. authority for his life, in the early part of the 4th century A. D. He early acquired a high reputation, and was taken by Julian with him to Gaul as his phys. (A. D. 355). O. accompanied the emp. on his last fatal expedition against the Pers., and attended him on his death-bed. We have from O. 3 works: *Συναγώγαι ἱατρικαί*, consisting of selections from Galen and other med. writers, divided into 70 or 72 books; an abridgment of this, entitled *Σύνοψις*, in 9 books; and a shorter condensation in 4 books, entitled *Εὐπόριστα*. The date of his death is not known.

**Origen**, surnamed ADAMANTIOS, one of the Chr. Fathers, b. at Alexandria in 185; was early initiated both in Christianity and in Gr. wisdom. During the persecutions which took place in the reign of Severus, his father suffered martyrdom, and the son now undertook to maintain the family by opening a school. He sold his library and subjected himself to the severest asceticism, at the same time pursuing his mental development with unflinching vigor. His school prospered, and his fame increased. In 228 Demetrius, bp. of Alexandria, sent him to Gr. to disperse some heresy which had lately arisen there. On his return he visited Pal., and at Cæsarea he was ordained a presbyter. This ordination Demetrius refused to recognize as valid, partly because it was not given by the bp. of that diocese, to which O. belonged, partly because he knew that O. misunderstood the passage in Matt. xix. 12, had mutilated himself. Two synods held in Alexandria supported the bp., and the second synod even condemned several of his ideas as heretical, and excommunicated him. The bps. of the East—of Syria, Pal., and Ar.—declared for him, and he found refuge in Cæsarea. During the persecutions under Maximinus he fled to Cappadocia. Under Gordianus he returned, but the sufferings and torture to which he was subjected during the Decian persecution broke his strength; he d. at Tyre in 254. Of his many writings (6000, it is said) only a few have come down to us. Of his *De Principiis* there exists only a translation into Lat. Of his *Hexapla* we have only fragments. The beautiful treatise on martyrdom and the celebrated 8 books against Celsus, an apology for Christianity, are entire. (See REDEPENNING, *Origenes, eine Darstellung seines Lebens und seiner Lehre*.)

**Original Sin** (*peccatum originale*) is that act or state of sin from which all other sins originate.

1. *Its Nature and Extent.*—Opinions prevalent (A.) before the *Controversies of Augustine with Pelagius*.—There prevailed no definite views as to the nature and extent of the moral ruin wrought in human nature in consequence of Adam's sin. All agreed in the fact of a sinful taint, and of the need of redemption. The E. part of the Ch. emphasized the self-determining power of human will and man's responsibility. The Lat. Fathers emphasized hereditary sin and guilt, and the absolute dependence of the soul upon grace.

(B.) *The Opinions entertained by the several Parties to the Anthropological Controversies of the Fifth Century.*—(1) Pelagius and his party held that Adam's sin injured only himself; that men are now born in the same moral state in which they were created. (2) The *Semi-Pelagians* held that human nature is seriously injured by Adam's sin, and that hereditary corruption is a fault or disease, rather than a sin properly so called, since it involves no guilt previous to actual transgression. (3) Augustine taught that the apostasy of Adam, in whom all men sinned, is the common guilt of all his natural descendants, who, while retaining freedom in the sense of rational spontaneity, come into being spiritually dead, unable either to begin or to effect any really good act before God—free only to sin, and dependent for salvation upon unmerited, sovereign, omnipotent grace. Before regeneration the soul can only resist grace; afterward, by assistance of grace, it may co-operate with it.

(C.) *The Tridentine Doctrine*, formulated by the Council of Trent (1545-63). It is admitted that human nature bears the guilt of Adam's sin, is morally corrupted, and without grace helpless. In the original creation all Adam's faculties, phys., intellectual, and moral, were in perfect equilibrium, the lower held in due subordination to the higher. To confirm this equilibrium, God added the gift of original righteousness. This gift Adam lost for himself and his descendants. Yet man may seek the grace offered in baptism.



(D.) All the original Protestant Churches, Lutheran and Reformed, agree, as to "original sin," that it includes (1) moral corruption of the whole man as well as the loss of "original righteousness." (2) This implies no phys. change in the substance of the soul, but a depraved moral habit. (3) All the faculties, intellectual as well as emotional or volitional, as far as they relate to moral objects, are depraved. (4) This depravity, although admitting many civil virtues, is called total, because (1st) the whole man is involved; (2d) the breach with God is complete, and, without supernatural aid, irremediable; (3d) the tendency is ultimately to all sin. (5) This condition involves guilt (both of blame and punishment). Some say, because all sin is inherently blameworthy; others say, because it originated in Adam's abuse of free-will, for which we are all responsible. (6) Man is morally impotent to change his own gen. disposition to evil.

(E.) The *Arminian Doctrine*, as held by the Dutch remonstrants, regarded "original sin" rather as a fault or defect of nature than a sin. As held by the Wesleyans, it admits that man's nature is corrupted, indisposed, and disabled from all spiritual good. But both differ from the Lutheran and Reformed chs. in holding (1) that it involves no guilt, since it is not brought upon us by our own agency; and (2) that every soul retains power to co-operate with the grace with which God for Christ's sake endows every soul.

(F.) The *Socinian and Rationalistic Doctrine*.—There is no innate corruption. Sin is propagated by example. Man always retains plenary power to do all God requires of him. There is no grace beyond providential advantages and objective instruction.

II. *The Mode of its Propagation*.—(1) Origen taught the doctrine of the pre-existence of human souls, and their personal sin and self-corruption in a previous state of probation. (2) Tertullian taught the doctrine that souls as well as bodies are derived by generation from parents, and that sin, like every essential quality and many acquired accidents of nature, is propagated *ex traduce*. (3) Jerome held that each soul was immediately created by God. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. A. A. HODGE, D. D.]

**Orinoco**, a river of S. Amer., rises in the Sierra Parime, flows first in a N., and after its junction with the Apure in an E. direction, and enters the Atlantic through a large delta. After its junction with the Apure, 777 m. from its mouth, it is navigable; above that point its navigation is made impossible by numerous rapids and cataracts. It receives 436 rivers and nearly 2000 streams, and at Bolivar, 250 m. from its mouth, it is 4 m. broad and 390 ft. deep. Its waters rise from Apr. to Oct.; large portions of the surrounding llanos are then overflowed.

**Oriole** [Lat. *aureolus*], a name properly belonging to bright-colored Old-World birds of the genus *Oriolus* and the family *Merulidae*; but in the U. S. the name is given to various brightly colored birds of other families, especially to the Baltimore O. The only European O. is the *O. galbula*, or golden O.

**Orion** [Gr. *Ὠρίων*]. This constellation is mentioned by the Heb. word *eslil*, which signifies a "fool," and also an "impious, godless man," called by the Arabs "the giant." The Gr. mythology in various ways represents him as a giant who was slain by Diana, who in remorse placed him among the stars. The constellation is represented by the figure of a man with a sword by his side. Though a S. constellation with regard to the ecliptic, the plane of the equator passes through its middle. It contains 7 conspicuous stars; the 3 forming the belt are also called "Jacob's staff" and the "yard wand." One of the most remarkable nebulae of the heavens is situated in the sword-handle of O.

**Orkney Islands**, a group of 67 islands, of which 28 are inhabited, lie off the N. coast of Scot., from which they are separated by Pentland Frith. They comprise an area of 244 sq. m., with a pop. of 31,372. The largest is Pomona or the mainland; the most remarkable among the others are S. Ronaldshay, Hoy, Flotta, Ronsay, and Sanda. With the exception of the Hoy, which is rocky and mountainous, its W. coast reaching a height of 1600 ft., the O. I. are low, presenting an irregular coast-line. The climate is mild, considering the N. lat.; frosts are very rare, but the summers are often chilly and always moist. Agriculture produces barley, oats, and potatoes, and sheep and cattle are extensively reared. Fishing, hunting for wild birds and eggs, rearing of poultry, and distilling are important occupations.

**Orlando**, Fla. See **APPENDIX**.

**Orléans**, or-le-anz (Fr. or-lah-onz'), city of Fr., cap. of the dept. of Loiret, on the right bank of the Loire. It has many fine promenades, handsome public squares, and elegant buildings, among which the cathedrals are one of the most magnificent Gothic edifices of Fr.; but generally the town is ill built. Its educational insts. are excellent, and its sugar-refineries and manufactures of vinegar and woollen fabrics are very extensive. Pop. 52,157.

**Orléans, Duchy of**, formed a countyship under the Carlovingian and Capetian dynasties, but was erected into a duchy in 1344 by Philip VI. of the house of Valois, and given to his son as an appanage. Subsequently it was held in the same way by different younger branches of the reigning families of Valois and Bourbon. The most remarkable of the families which have held the title and possessions of the duchy is that descending from the younger brother of Louis XIV., PHILIP, a son of Louis XIII., b. in 1640, married in 1661 to Henrietta of Eng., and after her death, in 1671, to Charlotte Elizabeth of Bavaria; d. in 1701. He fought with distinction in the Netherlands, but was deprived of his command by Louis XIV. He protested, but in vain, against the will of Charles II., which called the duke of Anjou to the Sp. throne. But the question of hereditary rights was finally settled by the Treaty of Utrecht, the duke of O. waiving all rights to succession to the throne of Sp., and the duke of Anjou (Philip V.) relinquishing all hereditary rights to the Fr. succession.—The second duke, PHILIP, known as the

"Regent," son of the preceding (b. 1674), married in 1692 Mademoiselle de Blois, daughter of Louis XIV. and Madame de Maintenon. He commanded the armies of Fr. in It. and Sp. His defeat in Turin was due to the tutelage he was under, which overbore his own judgment. His campaigns in Sp. of 1707 and 1708 were brilliant. His reputation was tarnished, however, by alleged intrigues to gain for himself the throne of Sp. On the death of Louis XIV. he became sole regent during the minority of Louis XV.—His great grandson, LOUIS PHILIPPE JOSEPH, fifth duke of O., best known under the name of PHILIPPE ÉGALITÉ, was b. at St. Cloud Apr. 13, 1747, and married in 1769 Adelaide of Bourbon-Penthièvre, a great-granddaughter of Louis XIV. and Madame de Montespan, who brought him immense wealth. An alienation grew up between him and the court, and to the queen, Marie Antoinette, he became an object of hatred almost, which he reciprocated. His rank made him a nucleus for the opposition to the court and to the monarchy. At the famous "Séance royale" he resisted the king, declaring that to the States-General alone belonged the right of imposing taxes. Carried along by the swift current of events, he renounced his rank and titles, and assumed the designation of "Citizen Égalité." At the trial of Louis XVI. he gave his vote "*pour la mort*." His own fall was not thereby long delayed, and he soon followed the king to the guillotine.—His grandson, FERDINAND, the eldest son of Louis Philippe, was b. Sept. 3, 1810. He distinguished himself in Algeria, and his many noble qualities made him much beloved in Fr.; but he was killed, July 13, 1842, by accident, his horses running wild. In 1837 he married Hélène Louise Elizabeth (b. Jan. 24, 1814), daughter of Prince Frederick Louis of Mecklenburg-Schwerin, who bore him 3 sons.—Louis Philippe, count of Paris, Aug. 24, 1838, and Robert, duke of Chartres, Nov. 9, 1840. She d. at Richmond, Eng., May 18, 1858. J. G. BARNARD.

**Orléans, Maid of**. See **JOAN OF ARC**.

**Orloff**, a Rus. family which became noted during the reign of Peter the Great, and rose to eminence by the revolution of July 9, 1792. GREGORI O., b. in 1734, was the lover of Catharine II., and from the son she bore him descend the Counts Bobrinski, a family still flourishing. He is said to have planned and conducted as the chief leader the whole revolution by which Peter III. was murdered and Catharine II. established on the throne; but his rudeness alienated him from the empress. He was banished from the court, lived in exile at Tzarskoe Selo, travelled much, and d. insane at Moscow in 1788.—ALEXEI O., b. in 1737, is said to have strangled the emp. with his own hand, and became celebrated as commander of the Rus. fleet in Archipelagus. At Tohesme he destroyed the Tur. fleet, July 7, 1770. Under Paul he was banished from the court, and d. on his estate in 1808.—ALEXEI O., b. in 1787, entered the army, served in the campaigns of the Fr. war, became aide-de-camp to Alexander I., and distinguished himself during the military insurrection at St. Petersburg, Dec. 26, 1825. As a diplomatist he negotiated the treaties of Adrianople in 1829 and Unkiar-Skelessi in 1833. In 1844 he took charge of the secret police of Rus. At the Cong. of Paris in 1856 he represented Rus., and was made a prince. D. May 21, 1861.—The present head of the family is NIKOLAI, son of the preceding, b. in 1827, and since 1872 Rus. ambassador in Paris.

**Ormolu'** [Fr. "milled gold"], or **Mosaic Gold**, an alloy of zinc and copper, containing from 25 to 75 parts of zinc in 100 of the alloy. It is largely employed in making household ornaments, which are colored by picking in dilute oil of vitriol and then washed and varnished. (See **MOsaic Gold**.)

**Ormond** (JAMES BUTLER), FIRST DUKE OF, b. at Lond. Oct. 19, 1610, ed. by Abp. Abbot as a ward of the king; succeeded to the earldom of Ormond on the death of his grandfather 1632; commander of the royal troops in Ire, as lieutenant, during the insurrection of 1641; created marquis 1642; forced to make a disadvantageous armistice with the rebels 1643; became lord-lieut. 1644; resigned his office to the Parliamentary coms., and retired to Fr. 1647; proclaimed Charles II. in Ire., and made an unsuccessful attempt to capture Dublin 1649; driven from Ire. by Cromwell Dec. 1650; created duke by Charles II. 1660; viceroy of Ire. 1662-66; chancellor of the Univ. of Oxford 1669; narrowly escaped assassination by Col. Blood 1670; again viceroy of Ire. 1676-85, and made a duke in the Eng. peerage 1682. D. July 21, 1688.

**Ormuzd** [from the Zend *ahurō, mazdāo*, the "Spiritual, the Creator of all Things"], in the Zend, Magian, Guebre, or Parsee religion, is the supreme principle of good and the great enemy of Ahriman, the wicked one.

**Ornithology** [Gr. *ὄρνις*, "bird," and *λογος*, "discourse"], that branch of zoology which treats of birds and the lit. respecting them. We look in vain in the anc. authors for any clear idea of the relations of the various groups of this class; birds are chiefly considered (e. g. by Aristotle) with relation to their food and the means by which they obtain it, or (e. g. by Belon and Aldrovand) with respect to their adaptation for progression and their habitat. Willoughby (1676) and his commentator, Ray (1713), first gave a reasonable arrangement of the constituents of the class, dividing it, primarily, into land and water birds; the former were then differentiated into those organized as birds of prey and those adapted for a less carnivorous or for a frugivorous diet; the latter were divided into waders and swimmers. Linnæus (1766) is celebrated as a systematist, and is looked up to as the father, to a great extent, of the modern methods. In the final edition of the *Systema Nature* he divided the class into 6 orders—viz. *Accipitrines*, *Falcones*, *Anseres*, *Gallinae*, *Gallinae*, and *Passeres*. These groups were based entirely on the consideration of the structure of the bill and feet, the other characters enumerated by Linnæus, relating to the body, food, and nesting habits, being quite subsidiary; but this classification was generally accepted, and the views involved therein prevailed with naturalists generally until very recent times, and even with the greater



portion probably to-day. Cuvier in 1797 slightly modified the classification of Linnaeus in its details, but the orders were essentially the same as those of his predecessor. Since the commencement of the 19th century every dept. of O. has been assiduously cultivated, and many works of great merit have been pub.

**Ornithorhynchidæ** [from *ὄρνις*, *ὄρνιθος*, "bird," and *ῥύγχος*, "beak"], one of the 2 families representing the order Monotremata and sub-class Ornithodelphia, and including the "water-mole" or Duck-bill of Australia. The body is somewhat beaver-like; the covering is a dense and soft fur; the jaws are produced into a depressed bill-like snout resembling somewhat the bill of a duck; the nostrils are above and near the end of the bill; no external ears are developed; there are 8 horny teeth—4. e. each jaw is provided on each side behind with a broad and nearly oval tooth with a flattened crown adapted for grinding, and toward the front it has a long and narrow one; the tongue is short, and covered, to some extent, with horny papillæ; the legs are short; the feet well adapted for swimming, and each provided with 5 toes; the anterior ones have a web extending considerably beyond the toes, and the claws are depressed; the posterior feet have webs only between the toes, and the claws are curved; in the male a spur is developed on the hinder surface of each hind leg, which has no representative in the female; the tail is rather short, depressed, and quite broad. The family is peculiar to Australia. As indicated by the webbed feet, it is an aquatic form, living by preference in the still portions of rivers and streams, seeking its food among the plants which grow upon the river-banks, and excavating burrows in the banks, to which it retreats, and in which it forms its nest. This burrow is projected in a serpentine course into the bank, and turns upward toward its termination, and at the end the nest is built. The nest is composed of dried grass, weeds, etc., strewn over the floor. The burrow is expanded toward the end, and is there about 1 ft. long and 6 inches wide; the entire length of the burrow is considerable, occasionally exceeding even 50 ft. Its food consists of water-insects, mollusks, and the eggs of insects and frogs. See also DUCK-BILL.

**Orobanchææ**, the broom-rapes, a natural order of exogenous plants, parasitical herbs growing from the roots of other plants. Being completely parasitic, and feeding upon the elaborated juices of the foster-plant, they are destitute of green herbage, and have dry or fleshy scales in place of leaves. Some of the broom-rapes, which abound in Europe, are injurious, especially one which lives upon clover. None are really of economical importance, but 2 U. S. plants (*Elyphagus* and *Conopholis*), called beech-drops and cancer-root, have been vaunted in popular and empirical med.

**Orodus** [Gr. *ὄρος*, a "hill," and *ὀδός*, a "tooth"], a genus of cestracorn sharks of which the remains are found in the Carboniferous rocks. The teeth have their crowns set with a series of blunt but frequently highly ornamented cones. The spines called *Olenacanthus* probably belonged to the same fish.

**Orhippus**. See HORSE, FOSSIL.

**Orosius**, b. toward the end of the 4th century A. D. at Tarragona in Sp.; took orders, and engaged with zeal in the controversies of his time. At a synod held at Jerusalem he opposed Pelagius, and in so doing provoked the hostility of John, the bp. of Jerusalem. O. wrote in justification of himself a work entitled *Liber Apologeticus (contra Pelagium) de Arbitrii Libertate*; also wrote *Historia (adversus Paganos)*, a "History of the World," in 7 books, from the beginning of the world to A. D. 417, against the charge of pagan writers that the calamities of Rome, especially the capture of the city (A. D. 410), were chargeable to Christianity for having abolished the worship of the old heathen gods. The date of his death is not known. King Alfred translated the history of O. into A.-S.

**Oroville**, on R. R. Butte co., Cal., 75 m. N. of Sacramento, has great water-power. The Ophir Ditch and Mining Co. is located here. Pop. 1880, 1743.

**Orpheus and the Orphic Poems and Mysteries**. After all that has been written about O. and the O. poems, we are still far from having arrived at any clear and distinct knowledge on this subject. To begin with, the etymology of the name O. is unknown to us; whether such a person did ever exist or not it is useless to inquire.

No mention of O. appears in Gr. lit. before Pindar and the dramatists. Aristophanes alludes to him as the one who brought religious rites among men and restrained them from rapine. In Plato, O. is not only frequently mentioned, but verses by him are quoted. Further, verses quoted by Plato have been identified as belonging to the fragments of the O. theogony that have come down to us. We find a reference in Euripides which would appear to connect together the O. and Pythagorean, and according to this there is much to support the view that the Pythagoreans, after the disestablishment of the clubs in Magna Græcia (510 B. C.), took refuge in the O. societies.

As to the origin and peculiar worship of these O. societies opinion among the ancients was widely at variance. Eratosthenes states that O. was torn to pieces by Dionysus by reason of jealousy for the excessive honor paid by the poet to Apollo or Helios. We find in Herodotus Bacchic and O. ceremonies coupled together. In the later circle of the O. poets the adventures of Dionysus are a constant theme; the strangest metamorphoses are related of him capable of the most mystical interpretations. By the few fragments still extant of the O. theogony we see that Dionysus must have occupied in the original work a most prominent place. But it was not to the deity ordinarily known by that name, but to the mystical Chthonian deity, Dionysus Zagreus, that these Bacchic-Orphic rites were paid. Thus we get a connection between the O. mysteries and the Eleusinian mysteries of Demeter.

Of the poems that have come down to us under the name

of O., criticism has long ago proved the larger part to have no claim to antiquity. The only portion of the so called O. poems in which we can discern any traces of antiquity is fragments. These fragments, small as they are, must be sifted still further from the interpolations of Christian and other writers before we can reach the few remains of the early O. poetry, the theogony.

**Orphic Brotherhood** [Gr. *οἱ Ὀρφικοί*], in anc. Gr., a society of ascetic persons devoted to a mystical worship of Bacchus (Dionysus) and the elaboration of a system of theol. under the professed guidance of the spirit of Orpheus. They dressed in white, ate no animal food, avoided all excesses, and professed to aim at purity of life.

**Orpiment** [Lat. *auripigmentum*, "golden pigment"], synonym **King's Yellow**, a tersulphide of arsenic, lemon yellow, sometimes nearly transparent; powder has a rather pale canary-yellow color. It may be prepared artificially by precipitating a solution of arsenic with sulphuretted hydrogen gas, and by fusing together equal parts of white arsenious acid and sulphur. It is a dangerous material, and should be banished from common use as a pigment by those unfamiliar with its nature. It is used, in admixture with lime, as a depilatory, and as an ingredient in fire-works.

**Orr** (JAMES LAWRENCE), b. at Craytonville, S. C., May 12, 1822, grad. at the Univ. of Va. 1842; admitted to the bar and practised in Anderson, S. C.; member of the legislature 1844-45, M. C. 1848-59, and speaker of the 35th Cong.; in 1860 was one of the convention that inaugurated secession, and a State com. to Wash. to treat with the U. S. govt. for partition of property in S. C.; Confed. State senator 1862-65. At the close of the war he became provisional gov. of S. C. 1865-69; judge of the circuit court of S. C. 1870, and in 1873 U. S. minister to Rus. D. at St. Petersburg May 5, 1873.

**Orrery** [from the earl of Orrery, for whom such a machine was made]. An O. may include parts of 2 or 3 planetary machines. These are—the *planetarium*, which is constructed to represent the motion of planets about the sun, sometimes in circular orbits, sometimes in those which are elliptical; the *tellurium*, which is made to represent the motion of the moon about the earth, the motion of the earth about the sun, the varieties in the lengths of days and nights, and the consequent vicissitudes of the seasons, and sometimes also the moon's motions as respects her perigee, nodes, etc., and the occurrence of eclipses; and the *satellite-machine*, intended to illustrate the motions of the satellites of Jupiter around their primary, and Jupiter's own motion around the sun. Planetary machines constructed in accordance with the idea that the earth was the centre of motion were very early in use. Such were the Chi. spheres, said to have been made some 2000 yrs. before the Christian era, and the spheres of Archimedes and Posidonius. It is thought that the earliest machine representing the Ptolemaic system may have been that of Chromatus. This system continued to be represented in all planetary machines until about 50 yrs. after the death of Copernicus (1543). Machines intended to represent the Copernican system were invented in the latter part of the 17th century by Huyghens and Römer.

Perhaps the most perfect O. were 2 invented and constructed by the Amer. astron. D. Rittenhouse, one of which is in possession of the Coll. of N. J. It is fitted for exhibiting continually the motions of the moon and those of the earth and other prin. planets to Saturn inclusive, then the outermost known. Orreries, planetariums, etc., are not regarded with much favor by those best qualified to judge, as it is impossible to preserve the ratio both of the sizes and the distances throughout, on any practicable scale, in the same machine. Telluriums seem to meet with most favor, as giving adequate ideas of the varieties in the length of the days and the vicissitudes of the seasons.

**Orris Root**. See IRIS.

**Orreville**, O. See APPENDIX.

**Orrville**. See ARCHIL.

**Orsini**, or-se-ne (FELICE), b. in 1819 at Meldola in the prov. of Forlì, It.; joined while yet a student at the Univ. of Bologna a secret society for revolutionizing It.; was imprisoned and condemned to the galleys for life, but restored to liberty in 1846 by the amnesty of Pius IX.; acted as a deputy for Bologna in the constituent assembly at Rome in 1848, and after the fall of the Rom. republic was an agitator in Genoa and Modena; fled in 1853 to Eng., but reappeared in 1854 in It., agitating in Parma, Milan, Trieste; was captured at Vienna and put in the fortress of Mantua, but escaped to Eng. in 1856; repaired in 1857 to Paris; on Jan. 14, 1858, he threw 8 explosive bombs under the carriage of the emp. Nap. III.; was guillotined Mar. 13, 1858.

**Orth** (GODFRED S.), b. near Lebanon, Pa., Apr. 22, 1817, ed. at Pa. Coll., Gettysburg; became in 1839 a lawyer of Ind.; was 6 yrs. in the State senate, of which he was 1 yr. pres.; in 1848 a Presidential elector; capt. of troops on the U. S. ram Horner in the O. River 1862; M. C. from Ind. 1863-75; appointed U. S. minister to Aus. 1875; again elected M. C. 1878 and 1880. D. Dec. 16, 1882.

**Orthacanthus** [Gr. *ὀρθός*, "straight," and *ἄκανθα*, "spine"], a name given to certain defensive spines of sharks found in the coal-measures. They are slender and acute, but not always straight, though the name indicates this, and are ornamented with 2 rows of sharp, depressed hooks on the posterior face. They probably belong to the shark of which the teeth have received the name of *Diplodus*.

**Orthoclase** [*ὀρθός*, "straight," and *κλάω*, to "cleave"], the most common species of the feldspar family. It is essentially a potash feldspar, being composed of silica, 64.8 per cent.; alumina, 18.4 per cent.; potash, 16.8 per cent. It has 2 prin. distinct cleavages, one of which is very perfect, the second being somewhat less so. It occurs generally in massive cleavable forms, and varies in color from white and gray to reddish-white and flesh-red; also to greenish and even, rarely, to bright green. Its lustre varies from glassy to somewhat pearly. Its hardness is one degree less than quartz.



**Ortho'graphy**, a Gr. word signifying "correct writing," is the name of that part of gram. which teaches how to represent lang. correctly by writing, and treats of the elementary sounds of which a lang. consists, and the signs by which these sounds are represented—the letters; of the combination of such sounds into syllables and the correct representation of words—the art of spelling. Originally alphabetic writing was phonetic, the words being written down as they sounded. Soon, however, O. was disturbed by an additional principle, the etymological—that is, the representation, by the spelling of a word, of its phys. relations to other words; and at present the O. of many modern langs., such as Eng., Ger., Fr., and the Scandinavian, is a combination of the phonetic and etymological principles. When such discrepancies between the sounds of the lang. and the signs of the alphabet were wholly irreconcilable, necessary letters were invented and superfluous discarded; but the finer shades of pronunciation were generally represented by the combination of several letters, by the application of dumb-letters, and by other orthographical artifices, and thus the free fluctuations of the phonetic-principle were early fastened down on certain points by conventionalities.

**Ortolan**, a name applied to several species of song-birds. In Europe it was primarily employed for the *Emberiza hortulana*, or garden bunting. It is a handsome little bird without song, and is chiefly noteworthy for its extensive use as food. It is some 6 inches in total length, and attains a weight of nearly 3 ounces. In some parts of the U. S. the name has been perverted to the bobolink.

**Orton** (JAMES) b. at Seneca Falls, N. Y. Apr. 21, 1830, grad. at Williams Coll. 1855, at Andover Theological Sem. 1858; travelled in Europe and Asia Minor; became a Congl. minister 1860; instructor in natural science in Rochester Univ. 1866; was at the head of the Williams Coll. expedition, which explored the upper Amazon 1867-68; became prof. of nat. hist. in Vassar Coll. 1869, and ascended the Amazon a second time in 1873, extending the exploration to Bolivia. Was author of *The Andes and the Amazon, Comparative Zoology*, etc. D. in Peru Oct. 24, 1877.

**Oruro**, town of Bolivia, S. Amer., stands in lat. 17° 57' S., at an elevation of 12,455 ft. above the sea. It was founded in 1570, and its gold and silver mines were the richest in Bolivia, next to those of Potosi. It rose rapidly, and at the end of the 17th century was a wealthy city with 70,000 inhabs. But when the mines became less profitable to work, it sank as rapidly as it had risen. Of its former splendor only the chs. and monasteries remain. Pop. 7980.

**Orvieto** (*Orbitum, Urbs Velutis*), town of It., prov. of Perugia, crowns an abrupt volcanic hill near the confluence of the Chiana and the Paglia, about 8 m. from Lake Bolsena. The town contains a handsome new theatre and some fine old palaces not without artistic treasures. The Pozzo della Rocca, or the Pozzo di San Patrizio (a circular well excavated by Clement VII. in 1527 after the famous sack of Rome), is worthy a visit. But the great boast of O. is its marvellously beautiful cathedral. This ch., founded in 1290, is built of black and white marble, and adorned externally with the richest sculptures and the most brilliant mosaics. O. is of Etruscan origin, was not conspicuous under the Romans, but on the breaking up of the empire imitated the example of other strong It. towns by declaring itself independent, and being Guelph in its policy was long a safe refuge for fugitive popes. It has been an episcopal see since 590 A. D. It manufactures excellent white wine, and has trade in silk, grain, and cattle. Pop. 14,455.

**Osage**, cap. of Mitchell co., Ia., on R. R. and on Cedar River, has a coll. Pop. 1870, 1400; 1880, 2012.

**Osage City**, on R. R., Osage co., Kan., 35 m. S. W. of Topeka, in the great coal-basin of the State, has flag-stone quarries and beds of pure yellow ochre. Pop. 1880, 2098.

**Osage Mission**, Kan. See APPENDIX.

**Osage Orange**, or **Bois d'Arc**, the *Maclura aurantiaca*, a N. Amer. tree of the Moraceæ, a division of the order Urticaceæ. It has a handsome, tough, and durable yellow wood, which has been proposed as a substitute for fustic. The fruit is large, yellow, and not altogether unlike an orange, whence the name. It is not edible. The prin. use of the tree is as a hedge-plant.

**Osaka**. See JAPAN.

**Osann** (FRIEDRICH GOTTHILF), b. at Weimar in 1794, became prof. at Jena in 1821, and in 1825 was made prof. of anc. lit. and director of the philological sem. in Giessen; pub. *Sylloge Inscriptionum Antiq. Græc. et Rom.*, *Auctarium Lezicorum Græc.*, *Cicero's de Repub.*, *Beiträge zur Gesch. d. griech. und römisch. Literatur*, etc. D. Nov. 30, 1858.

**Osborne**, Kan. See APPENDIX.

**Osburne** (Lat. *Osci, Opici*; Gr. *Ὀσκι*), an It. race which originally appears to have been the same as the Ausones. Later they became associated with the Samnites and other peoples of S. It. The O. are chiefly interesting from their widely spoken lang., which was kindred to the Lat.

**Oscar II.**, b. Jan. 21, 1829, the third son of King Oscar I. (b. July 4, 1799, king Mar. 8, 1844, d. July 8, 1859) and of Queen Josephine, daughter of Prince Eugene of Leuchtenberg; married, June 6, 1857, Sophia, b. July 9, 1836, daughter of Duke William of Nassau, who bore him 4 sons; succeeded, Sept. 18, 1872, his brother Charles XV. on the throne of Nor. and Swe.

**Oseco**, Ia., on R. R., cap. of Clarke co., Ia., 156 m. W. of Burlington. Pop. 1870, 1298; 1880, 1769.

**Osecola** (a corrupt form of his native name, signifying "Black Drink"), a Seminole chief, son of an Englishman by an Indian mother, b. in 1804, was early distinguished for ability and hatred of the whites; attained great influence among the Seminoles, and strongly opposed the cession of the tribal lands in Fla.; in 1835 his wife, the daughter of a fugitive slave, was stolen as herself a slave, and O., demanding her release of the U. S. agent at Ft. King, used lang. which the latter resented, and the chief was put in

irons. Six months later, the perpetrator of the outrage was murdered; the battle on the Withlacoochie, the massacre of Dade, the assaults on Fts. Micanopy and Drane, and other actions followed, in which the Indians more than held their own; in a conference with Gen. Jessup, under a flag of truce, O. was treacherously seized (Oct. 22, 1837), and imprisoned at Ft. Moultrie, S. C., where he d. Jan. 30, 1838.

**Oscoda**, Mich. See APPENDIX.

**Os'good** (SAMUEL), b. at Andover, Mass., Feb. 14, 1748, grad. at Harvard 1770; studied theol., but became a merchant; was much in public life; an officer in the Revolutionary army, in which he attained the rank of col. and assistant commissary; served in the Mass. legislature; M. C. 1780-84; was first com. of the U. S. treas. 1785-89; P. M.-gen. 1789-91; became speaker of the N. Y. house of assembly; supervisor in New York 1801-03; naval officer of the port of New York 1808-13; author of various works, chiefly on religious questions. D. Aug. 12, 1813.

**Osgood** (SAMUEL), D. D., LL. D., b. in Charlestown, Mass., Aug. 30, 1812, grad. at Harvard Coll. 1832 and at Cambridge Theological School 1835; settled in Nashua, N. H., 1837, in Providence 1841, and in New York 1849; in 1870 left the Unit. for the Epis. Ch., but assumed no pastoral charge. Wrote *Studies in Chr. Biography*, *The Earth-Stone*, *God with Men*, *Mile-Stones in our Life-Journey*, *Student Life*, and contributed largely to periodicals; translated from the Ger. De Wette's *Human Life and Olshausen's Hist. of the Passion*; was for many yrs. home corresponding sec. of the New York Historical Society. D. Apr. 14, 1880.

**Osh'kosh**, city and R. R. centre, cap. of Winnebago co., Wis., on the W. shore of Lake Winnebago, at the mouth of Fox River, is the seat of the State Normal School and the N. Wis. Insane Asylum, and has extensive lumber manufactures. Pop. 1870, 12,663; 1880, 15,748.

**Oslan'der** (ANDREAS), whose true name was **Hosemann**, b. Dec. 19, 1498, at Gunzenhausen, near Nuremberg; studied theol. at Ingolstadt and Wittenberg; became preacher at Nuremberg, and labored with energy for the Ref. In 1548 he was deprived of his office, as he would not agree to the Augsburg Interim, but he was shortly after (1549) made preacher and prof. in theol. at Königsberg. Here he entered into a hot controversy concerning justification. Justification and sanctification he represented as forming only one act. Wrote *Harmonia Evangelica*, *De Lege et Evangelio*, and *De Justificatione*. D. Oct. 17, 1562.

**Osl'er**, ōz'her (Fr.), a name properly belonging to those species of willow, suitable for basket-making. In Europe large areas of land are devoted to the cultivation of O., and the attempt has been made to start the business in the U. S. Care should be taken to select species which are not brittle when cured and dried. The plants are put out in rows, and if the best quality is to be produced, the ground is cultivated twice a year between the rows.

**Osl'ris**, the most celebrated of all Egyptian deities, eldest son of Seb or Saturn, and Nut or Rhea. He is stated to have civilized the Egyptians by teaching them the art of agriculture, and to have travelled over the rest of the world. At the age of 28, on the 17th day of the month Athor, when the sun was in Scorpio, he fell a victim to the conspiracy of his brother Set or Typhon, Aso, an Ethiopian queen, and 72 other accomplices. A mummy-chest which exactly fitted the size of the body of O. was brought into a banqueting-room and offered as a present to him whom it fitted. After all the conspirators had unsuccessfully tried it, O. did so, and the conspirators nailed down the cover and poured lead over it, or sealed it with a leaden seal. The body and chest were conveyed down the Tanaitic branch of the Nile to the sea. The Pans and satyrs, or rather the local gods of Chemmis, informed Isis, his sister and wife, then at the city of Koptos, and she cut off a lock of her hair and went into mourning. She then, it appears, departed to discover the child of her sister, Nephthys, who had been married to Typhon, but had given birth to a child, the issue of O., and found Anubis. Hearing that the chest had been carried by the waves to Bybios in Phœnicia and lodged in a tamarisk, which, grown into a large tree, inclosed the chest, so that it could not be seen, and that the king of Bybios had made a pillar to his house out of the trunk of the tree, Isis went thither, where she so ingratiated herself with the queen as to be appointed nurse to the royal child. She suckled the boy with her finger and laid him on burning coals, while, transformed into a swallow, she hovered around the pillar at night. Discovered in these actions, she revealed herself, and obtaining, by request, the pillar, took out the chest and body of O., restoring the rest to the king. She then sailed back to Egypt with them, but deposited them in a remote place while about to visit Horus at Butus. The chest was discovered by Typhon in the moonlight, who tore the body into 14 pieces, which he scattered about the country. These Isis again sought out in a papyrus boat, and discovered all except some portions devoured by the dogs of Anubis or Typhon for the supremacy, the goddess contended with Set or Typhon for the supremacy, and Horus defeated Typhon in a battle which lasted 3 days and nights. When, however, Typhon was set at liberty by Isis, and Horus had torn off her diadem, for which Thoth substituted the head of the cow of Athor, Typhon accused Horus of illegitimacy, but that god was justified before the other gods by Thoth, and Typhon, after 2 battles, was again defeated by Horus.

In the Egyptian mythology O. appears to be the Pluto of the Hades or Kærnet. Seated on his throne in the hall of the Two Truths, or place of the great judgment, he awards, as judge of the dead, the rewards or punishments of the future state. In this he is assisted by his sisters, Isis and Nephthys, and Thoth, the Hermes or scribe of the Hades, and his children, Horus, Anubis, and the 4 genii of the head, accompanied by the 42 demons or gods who avenged the sins committed during life. Although this is his prin. function, he was also allied occasionally with other deities, as



Sekar or Socharis, a kind of solar Pluto, and then represented with the head of a hawk. In the ritual of the dead he is said to have been justified by Thoth 14 times before the gods of as many regions. His discovery and embalment, the lamentations of his sisters at his death, and the mystical representation connected with his legend occur on monuments and papyri, especially those of a later age, which describe the reconstruction of his form by the god Chnoumis out of the mud and water of the Nile, and his embalment by Anubis, the outer bandages with which he was swathed often having over them a net to depict that in which his body was found in the Nile. In the ritual there is a table of 112 different titles of this god. On his head he wore the *att* crown, at the sides of which are the ostrich feathers of his truth, referring to his truth and jurisdiction over the judgment-hall of those goddesses in Hades, his hands emerging from his mummified form, holding the crook and whip, emblems of government and punishment. No deity has been more difficult to explain in all Egyptian mythology, for he was thought to represent the sun, the moon, the constellation Orion, the earth, the inundation of the Nile, the principle of humidity, the reproductive power of nature, the divine beneficence, and even by some to anticipate the doctrine of the resurrection of the body, as his form and type, destruction and embalment, make him more mortal than ordinary deities of the Pantheon. [From orig. art. in *J.'s Univ. Cyc.*, by SAMUEL BIRCH, LL.D.]

**Oskaloosa**, city and R. R. centre, cap. of Mahaska co., Ia., has 2 colls., and is in the best coal-region of the W., with large deposits of fire-clay and iron ore. Pop. 1870, 3204; 1880, 4598.

**Osmaze**, a name given by Thénard to that portion of meat extract which is soluble in alcohol and contains those constituents of the flesh which determine its taste and smell.

**Osmium** [Gr. *ὀσμή*, "odor"], an element of matter found in association in nature with platinum. Its only ore is a native compound with another metal of the same natural group, Iridium (which see), forming the mineral metallic alloy called iridosmine or osmiridium, which is excessively hard, and therefore used for tipping gold pens. It is probably the heaviest, as it is the most infusible; of known substances. O. is believed to be, in some of its combinations, the most poisonous also of known substances, its compounds, when heated before the blow-pipe, emit, during the combustion to osmic acid, a singular and unpleasant odor, whence the name of the element.

**Osmose** [Gr. *ὀσμός*, "a push," or "propulsion"], a more gen. term for *ENDOSMOSE* (which see) and *EXOSMOSE*. *Diasmose* is another term which has been used to include the whole subject.

**Osprey**. See FISH-HAWK.

**Osselin**, os'-se-in [Lat. *os*, "bone"], the modification of gelatine in bones, forming substantially the whole of the organic part of the bone, apart from the tricalcic phosphate, which makes up the mass of the earthy part.

**Ossian**. See MACPHERSON, JAMES.

**Ossifrage** (the "bone-breaker"), a name formerly given to various rapacious birds, especially to some of the eagles and to the lammergeier, which is believed to be the O. of the O. T.

**Ossoli**, os'-so-le (SARAH MARGARET FULLER), MARCHIONESS, b. in Cambridgeport, Mass., May 23, 1810, daughter of Hon. Timothy Fuller, M. C. 1817-25; was in childhood a proficient in the classical langs. and modern lit.; became well acquainted with the modern Ger. classics; taught langs. in Boston to private classes and in Mr. Alcott's school; became prin. of a school at Providence, R. I., in 1837; took extreme interest in the philosophical views of R. W. Emerson; gave a series of *conversazioni* for ladies at Boston 1839; was in 1840 ed. of the *Dial*, a quarterly magazine; became widely known for powers of conversation; made in 1839 a translation of Eckermann's *Conversations with Goethe*, and in 1841 of the *Letters of Gûnderode and Bettina*; made in 1843 a journey to Lake Superior, and wrote *A Summer on the Lakes*; removed to New York in Dec. 1844; became a writer for the *Tribune*, to which she contributed most of the *Papers on Art and Literature* issued in a vol. in 1846; expanded an early essay in the *Dial* into a vol. entitled *Woman in the Nineteenth Century*; went to Europe early in 1846; visited Rome in May 1847, whence she wrote letters to the *Tribune*; married in Dec. the marquis Giovanni Angelo Ossoli; was a witness of the Rom. revolution of 1848 and of the siege of Rome by the Fr. in 1849, at which time she was appointed by Mazzini directress of one of the hospitals; embarked at Leghorn for the U. S. May 17, 1850, accompanied by her husband and infant son, and with them perished by shipwreck at Fire Island, near New York. An unpublished hist. of the Rom. revolution was lost with her. Her newspaper correspondence has been collected and pub. under the title *At Home and Abroad*. (See *Memoirs* by EMERSON, CHANNING, and CLARKE.) D. July 16, 1850.

**Ossory** (THOMAS BUTLER), EARL OF, son of the first duke of Ormond, b. in the castle of Kilkenny, Ire., July 9, 1634; fought with valor in the great rebellion; was imprisoned for several months in the Tower by Cromwell; took refuge in Flanders; returned with Charles II., and was made lieutenant of the forces in Ire. 1660; aided the duke of Albemarle in gaining the naval battle of the Downs over the Dut. fleet June 1666; was rewarded by the title of Baron Butler of Moore Park, Sept. 14, 1666; was made rear-admiral and second in command to Prince Rupert 1673; led the Eng. troops in the defeat of Marshal Luxembourg at Mons 1678, and perished by shipwreck July 30, 1680.

**Ostade**, os'-tah-de, van (ADRIAN), (1610-1685), a Dutch painter of genre, b. at Lubeck; studied at Haarlem; made his residence at Amsterdam. His works, of which nearly 400 are catalogued, represent scenes of happiness in humble life.

**Ostade, van** (ISAAC), younger brother and pupil of Adrian, b. at Lubeck about 1617; his latest work bears date of 1654. His pictures represent cheerful out-door scenes. They are not numerous, and are highly valued.

**Osteology** [Gr. *ὀστέον*, "bone," and *λόγος*, "discourse"], the science treating of the skeleton of vertebrate animals. The skeleton is either of uniform cartilage or membrane continuum, or of cartilaginous or osseous segments arranged in continuous succession, so as to form 2 tubes, one superior and one inferior, attached by a solid axis between them, the whole furnished with various appendages. Each axial segment is in turn composed of sub-segments, each of which arises from a separate (sometimes more than one) centre of ossification in the primal cartilage or membrane. Each primary segment of the skeleton is called a vertebra, and each vertebra is composed of the same elementary segments, some of which may be omitted, subdivided, etc., and also greatly modified in their form for the accommodation of the viscera they inclose. The superior arches or tubes protect the nervous axis of the animal, while the inferior surround the nutritive organs, or the digestive, circulatory, respiratory, and reproductive systems. (See *J.'s Univ. Cyc.* for an exhaustive article on O. by PROF. E. D. COPE.)

**Osterhaus**, os'-ter-hows (PETER J.), b. in Prus.; formerly an officer in the Prus. service, he emigrated to Amer. and settled in St. Louis. On the outbreak of the c. war he was made major in the 2d Mo. Volunteers, of which regiment he became col., participating in the battles of Wilson's Creek and Pea Ridge; brig.-gen. of volunteers June 1862; commanded a brigade in the 13th corps at capture of Arkansas Post, siege of Vicksburg, and in the 15th corps at Chattanooga, Missionary Ridge, and operations resulting in capture of Atlanta, having been promoted to be major-gen. in July. In Sherman's march to the sea he commanded the 15th corps from Atlanta to Savannah; as chief of staff to Gen. Canby, he received the surrender of Kirby Smith May 26, 1865; mustered out Feb. 1866.

**Ostia**, os'-te-ah, an old Rom. town, situated on the left side of the mouth of the Tiber, about 18 m. from Rome. Anc. writers agree in stating that it was founded by Ancus Marcius as a maritime station for his cap., but it was not until the wars with Carthage that it became important as a port for the introduction of foreign grain. From that time it grew rapidly, and was soon the prin. commercial and naval station of the Romans. The harbor was never a really good one, and in the reign of Claudius it was already so shoaled up by deposits from the Tiber as to necessitate the construction of an artificial basin about 2 m. to the N. This was called *Portus Augusti*, afterward *Portus Trajani*; but the new town which grew up around it (*Portus* or *Portus Urbis*) never equalled the old one in size and opulence. O. began to decline with the declining empire, and early in the 9th century was a heap of ruins.

**Ostracism** [Gr. *ὀστρακισμός*, from *ὀστρακον*, "a shell, potsherd, or tile"], a form of temporary banishment which once prevailed in Anc. Athens and some other Gr. cities (Argos, Megara, Miletus). The Athenian senate and ecclesia having decided that O. was necessary in the case of any citizen, the 10 tribes voted upon the question in the agora. Each voter in favor of the O. presented a tablet of burnt clay, on which was written the name of the person to be banished. If there were 6000 votes for it, the person ostracized was obliged to leave the state within 10 days and not return for 10 yrs. unless recalled.

**Ostrich**, the *Struthio camelus*, the largest of living birds, belonging to the order Ratite, and a native of Arabia and of Africa. It is represented in S. Amer. and Australia by several similar but smaller birds, as the cassowary, emu, nandu. The male O. is sometimes 8 ft. high and may weigh 300 lbs. It is an extremely swift runner, but has no power of flight. It is gregarious and polygamous, the wives of one male laying their eggs together in one nest; by day they are exposed to the sun's heat, but at night incubation is kept up until the greater part of the eggs are hatched. The O. is now domesticated and bred in considerable numbers in the Cape Colony for the feathers, etc. The O. has a habit of swallowing stones, iron, bits of leather, and the like, which assist in the trituration of food in the gizzard. The ordinary food of the O. is grass, leaves, grain, and seeds, but it does not altogether reject animal food.

**Ostrogoths**. See GOTH.

**Ostrolenka** [Polish, *Ostroleka*], town of Rus. Poland, govt. of Lomza, on the Narew, has 3466 inhabs. The place became famous by the battle fought here, May 26, 1831, between the Poles under Skrzynecki and the Rus. under Diebitsch. The Poles retreated to Warsaw, but the Rus. were unable to follow them on account of their own losses.

**Ostrowski**, the name of a celebrated family of Polish nobility, originally descending from the palatinate of Lublin. TOMASZ ADAM RAWICZ, COUNT OSTROWSKI, b. at Ostrow Dec. 21, 1739, took an active part in the establishment of the const. of May 3, 1791, and was appointed minister of finance, but resigned when the king shortly after joined the confederacy of Targowicza, and lived after the third division of Poland (1795) in retirement on his estates. On the establishment of the duchy of Warsaw he was made grand marshal of the diet Mar. 9, 1809, and pres. of the senate Dec. 6, 1811. The Poles received their new const. of 1815 from his hands. D. Feb. 5, 1817.—His son, ANTONI JOANNES, COUNT OSTROWSKI, b. at Warsaw May 27, 1782, entered in 1806 the Fr. body-guard; was made a member of the provisional govt. of the duchy of Warsaw; entered the Polish senate after the death of his father, and offered a firm opposition to the grand-duke Constantine. In the revolution of 1830 he took an active part, and wrote the manifesto which the last remnant of the Polish army issued (Oct. 4, 1831) to the kings and nations of Europe after crossing the Prus. frontier and laying down their arms. He afterward lived in Fr., and pub. *Le Panславisme moscovite*.

**Oswald** (SAINT), king of Northumbria, b. in 604, son of



Ethelfrid, killed in 617; resided some yrs. thereafter an exile in Scot. (or Ire.), where he was converted to Christianity; came to the throne 634; made war upon the King of Wales; introduced Christianity into Wales; was killed at Maserfield Aug. 5, 642, by the heathen king Penda of Mercia.

**Oswego**, city and R. R. junc., on Neosho River, cap. of Labette co., Kan. Pop. 1870, 1196; 1880, 2351.

**Oswego**, city, port of entry, and important R. R. and commercial centre, cap. of Oswego co., N. Y., near the E. end of Lake Ontario, 328 m. N. E. of New York, is the prin. port upon the Amer. side of Lake Ontario. The commodious harbor, partly artificial, is at the mouth of Oswego River, which furnishes great water-power. Ft. Ontario, a case-mated work, overlooks the lake and harbor. O. contains 2 parks, a public library with 20,000 vols., a State normal and training school, and opera-house. Among the public buildings are the co. c-h. and jail, city hall, State armory, and the govt. building containing the custom-house and P. O., and a U. S. c-h. It has extensive starch works, flouring mills, iron-works, and a large trade in grain. Pop. 1870, 20,910; 1880, 21,116.

**Othman**, or **Osman** (AL GHAZI), the founder of the empire of Tur. (called from this the Ottoman empire), b. at Sergut, Bithynia, in 1259, was the son of Orthogru, a Tur. soldier, whom in 1280 he succeeded as commander in Armenia under the sultan of Iconium. In 1299 he was made ruler of Bithynia, and the remainder of his life was occupied with wars with the Byzantines, against whom he gradually made headway. D. Aug. 10, 1326.

**Othman Ibn Affan**, the third caliph of the Moslems, b. about 574, a relative of Mohammed; one of the earliest converts to Islam; son-in-law and sec. to the prophet; succeeded Omar in 644, and ruled to 655. Insurrections took place in Egypt, Per., etc., and were quelled only by making concessions. His internal govt. was characterized by weakness and despotism, and when he ordered Mohammed, the son of Abubekr, to be put to death, the latter marched to Medina, entered the city without opposition, and stabbed the caliph. Under O. the first naval expedition by the Arabs was undertaken, a pillaging campaign against Cyprus and Rhodes, in 649.

**Otho (Otto) I.**, THE GREAT, emp. of Ger., b. Nov. 22, 912; succeeded his father, Henry the Fowler, in 936, as king of Ger., but was not crowned emp. of the Romans until 962. His 36 yrs. reign was a series of wars with Czechs, Its., Hungarians, N. Slavi, Danes, Grs., and malcontent nobles at home, but the emp. was everywhere triumphant. D. in 973 at Memleben, Thuringia.—**Otho II.**, son and successor of Otho I., b. 955, was crowned king of Lorraine 961, of It. 962, emp. 967; succeeded his father 973; repressed the c. wars of Ger. and It.; drove out Lothaire, king of Fr., who had invaded Ger., designing to make good his claim upon Lorraine; ravaged Champagne and compelled Lothaire to give up his claim 977-980; carried on a war in Calabria with the Grs. and Ars., by whom he was defeated at Basantello July 13, 982. D. at Rome Dec. 7, 983.—**Otho III.**, son and successor of Otho II., b. in 980, became king of Ger. in 983, but not crowned emp. until 996. His reign was a turbulent one. D. at Paterno in Campania, Jan. 23, 1002.—**Otho IV.** (Otho of Brunswick), son of Henry the Lion, b. 1175; took refuge in Eng. after his father's death, and was made count of Poitou by Richard Lion-heart, his uncle, 1195; in 1198 he claimed the empire, and was elected by the Guelph faction; proclaimed emp. by the papal legate 1201, and crowned by Innocent III. 1203, his rival, the Ghibelline co-emp. Philip of Suabia, having d. in 1208. Having violated his pledge to support the papal claims in regard to benefices, he was excommunicated and was compelled to resign the govt. 1212, but several times attempted to resume power. In 1214 his forces were badly beaten by Philip Augustus at Bovines; in 1215 he was formally deposed by the fourth Lateran Council; in 1217 his last military insurrection was repelled by Frederick II. D. at Harzburg May 15, 1218.

**Otho**, king of Greece. See **OTTO**.

**O'tis** (GEORGE ALEXANDER), M. D., b. at Boston Nov. 12, 1890, grad. at Princeton 1849, and at the med. dept. of the Univ. of Pa. 1851; studied surgery 2 yrs. in London and Paris; established the *Va. Med. Journal* 1853; entered the army 1861 as surgeon; was assigned to duty July 1864, in the office of the surgeon-gen. at Wash.; wrote monographs on *Amputation of the Hip Joint* and *Excisions of the Head of the Femur for Injury*; prepared a *Report of Surgical Cases treated in the Army of the U. S. from 1867 to 1871*, and in 1872 edited the surgical vol. of the first part of the *Med. and Surgical Hist. of the War*; became curator of the Army Med. Museum at Wash., and engaged in preparing the remaining portion of the surgical hist. of the war. D. Feb. 23, 1881.

**O'tis** (HARRISON GRAY), son of Samuel A., b. in Boston Oct. 8, 1763, grad. at Harvard 1783; was admitted to the bar in 1786; a Federalist leader in Cong. 1797-1801; U. S. dist. atty., Boston, 1801; speaker in the Mass. legislature 1803-05; pres. of the Mass. senate 1805-11; judge of common pleas 1814-18; was U. S. Senator 1817-22, mayor of Boston 1829-32. D. Oct. 23, 1843.

**O'tis** (JAMES), b. in West Barnstable, Mass., Feb. 5, 1725, grad. at Harvard 1743; studied law, and began practice at Plymouth 1746; removed to Boston 1750. In 1761, when advocate-gen. of the admiralty, he refused to argue in favor of the writs of assistance, and resigned his office; in 1762 was elected to the State legislature; in 1765, on his motion the Stamp Act cong. met in New York, to which he was a delegate; his speeches and pamphlets (*Vindication of the House of Reps., Rights of the Brit. Colonies, and Consideration on behalf of the Colonists*) placed him at the head of the patriotic party in Mass.; in 1769 denounced in print the cons. of customs, and on Sept. 9, meeting one of the cons. in a coffee-house, he was attacked, and received a cut on his head which led to derangement; retired to Andover, where he was killed by lightning May 23, 1783.

**O'tis** (SAMUEL ALLEYNE), b. at Barnstable, Mass., Nov. 24,

1740, grad. at Harvard 1759; became a merchant in Boston; held important public positions; M. C. 1787-88, sec. of the U. S. Senate 1789-1814. D. Apr. 22, 1814.

**Otranto**, duke of. See **FOUCHÉ**.

**Otse'go**, Mich. See **APPENDIX**.

**Otsego Lake**, a fine lake of Otsego co., N. Y.,  $7\frac{1}{2}$  m. long,  $1\frac{1}{2}$  broad, 1193 ft. above tide. Its waters abound in fish, and its picturesque shores were the scene of many memorable incidents in Cooper's *Leatherstocking*. The lake is the source of the main fork of the Susquehanna River.

**Ot'tawa**, city and important R. R. centre, cap. of the Dominion of Canada, on the S. bank of the river of the same name, occupies a central position, almost equidistant (about 126 m.) from Toronto and Montreal, and 95 m. from Kingston, and is the central mart of the lumber-trade of Canada. O. was founded in 1827, under the name of Bytown, in honor of its founder, Col. By, which it retained until 1854, when it was incorporated as a city under its present name. In 1856 it was selected as the cap. of Canada, and was occupied as such 10 yrs. later. The public buildings are on Parl. (or



Capitol (Ottawa, Canada).

Barrack) Hill, a commanding bluff on the bank of the Ottawa. Major's Hill, on the E. side of the Rideau Canal, has been laid out as a public park. The lower town is on a level plain, and there are large suburbs. At the E. end of the city is the v. of New Edinburgh, where is Rideau Hall, the residence of the gov.-gen. O. is the seat of the bp. of Ont. (Ch. of Eng.) and of the bp. of Ottawa (R. Cath.). Among the educational insts. are Ottawa Coll. (R. Cath.), and 2 convents, under the charge of nuns; a normal school for Central Canada, and a collegiate inst., established by govt. The chief industries of O. are connected with the lumbering business, but the mineral wealth of the neighboring country—mainly iron and plumbago—is considerable. Pop. 1871, 21,545; 1881, 27,417.

**Ottawa**, city and R. R. centre, cap. of La Salle co., Ill., on the Ill. River, has extensive manufactures and good shipping facilities. The great mineral springs upon the S. bank of the Ill. River are surrounded by a handsome park. Pop. 1870, 7736; 1880, 7634.

**Ottawa**, city and R. R. centre, cap. of Franklin co., Kan., 53 m. S. W. of Kansas City, Mo., has a university. Pop. 1870, 2941; 1880, 4032.

**Ottawa**, on R. R., cap. of Putnam co., O., 50 m. S. W. of Toledo. Pop. 1870, 1129; 1880, 1293.

**Ottawa River**, in Canada, is the boundary between the provs. of Ont. and Que. (except in the very lowest parts of its course). It rises on the divide between the basin of the St. Lawrence and Hudson's Bay, and flows S. E. and E., communicating with the St. Lawrence at the W. end of Montreal Island. It sends off the Rivière des Prairies, between Montreal Island and the Isle Jésus, N. of which the Ottawa flows, joining the St. Lawrence below the Island of Montreal. It has numerous rapids, some of which are flooded out by dams and others surmounted by canals. It has a heavy trade in lumber. Its cataracts afford great water-power. It is navigated by steamboats and canal-boats, and is connected with Lake Ontario by Rideau Canal. Its valley contains much fertile land. Length, 791 m.

**O'tendorfer** (OSWALD), b. at Zwittau, Moravia, Feb. 26, 1826; studied law at Prague and Vienna; settled at New York 1850; became an ed. of the *New Yorker Staats-Zeitung*, and subsequently its manager and proprietor. Under his auspices it became a leading Ger.-Amer. paper and a prominent advocate of the Dem. party.

**O'ter** (Lat. *lutra*; Fr. *loutre*; Ger. *Otter*), a name applied to several species of carnivorous fur-bearing animals of the family Mustelide. The typical species is the European O., (*Lutra vulgaris*). It feeds upon fish, and is very hard to shoot. It is hunted by a peculiar race of dogs called otter-hounds. The N. Amer. O. (*Lutra Canadensis*) is much larger hounds. The true O. have a singular fondness for sliding down hill upon mud and snow. Brazil, India, China, S. Afr., and other countries have peculiar species of O., some of which are without nails or with only rudimentary ones. India furnishes to commerce the skins of a small, short-haired O. One of the aberrant genera of O. is the *Enhydra* or sea-O. The *Enhydra marina* of the N. Pacific coast furnishes the sea-O. fur of commerce, which is highly prized in Rus. and Chi. It is the largest of the living O., and is found in the open sea, often far from land.

**Otterbein**, of'ter-bin (PHILIP WILLIAM), founder and bp. of the United Brethren in Christ, b. at Dillenburg, Ger., June 4, 1726; entered the Reformed ministry in 1749; came in 1752 to Amer. as a missionary; labored especially in Pa. and Md.; founded his new ch. at Lancaster, Pa., in 1775;



with Martin Boehm was chosen bp.; toiled for many yrs. with great earnestness and success. D. Nov. 17, 1813.

**Otterbein University**, at Westerville, O., about 11 m. from Columbus, is under the control of the United Brethren in Christ; was organized in 1847, chartered with univ. privileges, and has an endowment of \$70,000. There is a regular classical course covering 4 yrs., after 2 yrs. of preparatory instruction; scientific, with 4 yrs. of study and one of preparatory; ladies', similar to scientific, but with less of science, and Eng. course, omitting anc. and modern langs. and covering 3 yrs.

**Otto I.**, king of Gr. from Oct. 5, 1832, to Oct. 27, 1862, b. at Salzburg June 1, 1815, the second son of King Louis of Bavaria; was established on the throne of Gr. by the election of the Gr. people and the guaranty of Rus., Eng., and Fr. His govt. was a failure. He confided the whole power to Ger. officials, and Ger. was used as the official lang. This manner of proceeding was stopped by the revolution of Feb. 14, 1847, and by a new revolution of 1848 he was compelled to accept a liberal const. Mar. 30, 1844, but under this form the intrigues of the Rus., Eng., and Fr. diplomats made his govt. almost impossible. When the Crimean war broke out the king and the people united for a short time in the same sympathy; both felt that Gr. was the natural adversary of the Turks. But a Fr.-Eng. fleet was stationed at Piræus, and neutrality was imposed on the country in a humiliating manner. The embroilments between the people and the king recommenced, and the whole country rose in rebellion in Oct. 1862. A provisional govt. was established at Athens, declaring the Gr. throne vacant, and King O. left the country. D. at Munich July 26, 1867.

**Ottocar II.**, king of Bohemia from 1253 to 1278, b. about 1230, a son of Wenceslas I.; revolted against his father, but was defeated; acquired Aus. and Styria by marriage; made a crusade, after succeeding to the throne, against the heathen Prus.; conquered their country and founded Königsberg; defeated the Hungarians on the Marchfeld in 1260, and took possession of parts of Hungary; inherited Carniola and Carinthia in 1269, and ruled with vigor and intelligence his vast empire. But in 1273 he opposed the election of Rudolph of Hapsburg as emp. of Ger.; the consequence was a war, in which O. was compelled to cede Aus., Styria, Carniola, and Carinthia. Once more he tried his fortune against Rudolph, but fell in the battle of Jedespeng, Aug. 26, 1278.

**Ottoman Empire.** See TURKEY.

**Otto of Roses.** See ATTAR OF ROSES.

**Ottumwa**, city and R. R. centre, cap. of Wapello co., Ia., on the Des Moines River, 75 m. N. W. of Burlington, has 2 sems. and great water-power. Pop. 1870, 5214; 1880, 9004.

**Otway** (THOMAS), b. at Trotton, Sussex, Eng., Mar. 3, 1651, ed. at Winchester and Christ Church, Ox.; memorable as the author of many dramatic pieces, the most successful of which were *Don Carlos*, *The Atheists*, and especially *Venice Preserved*. D. Apr. 14, 1685.

**Oudendorp**, ow'den-dorp, van (FRANZ), b. in Leyden July 31, 1696; was made rector of the school at Nymwegen in 1724, rector at Haarlem in 1726, and called as prof. of eloquence and hist., along with Hemsterhuys, to Leyden 1740; pub. valuable editions of classic authors, as *Julius Obsequens*, *Lucan*, *Frontinus*, *Cæsar*, *Suetonius*, and began an edition of *Apuleius* (continued by Ruhnken and Bosscha). D. at Leyden in 1761.

**Oudinot**, oo-de-nô' (CHARLES NICOLAS), duke of Reggio, marshal of Fr., b. Apr. 26, 1767, at Bar-le-Duc. In the dept. of Meuse, Fr.; distinguished himself in the battles of Friedland and Wagram, when he was made a marshal and created duke. His greatest feat was his manoeuvre in order to protect the crossing of the Beresina in 1812. In 1823 he led the first corps during the invasion of Sp. He d. at Paris Sept. 13, 1847.—His son, NICOLAS CHARLES VICTOR, b. Nov. 3, 1791, commanded in 1849 the expedition against the Rom. republic, and compelled the city of Rome to unconditional surrender July 2. Protested in the chamber of peers against the *coup d'état*. D. July 7, 1863.

**Oulachan**, Eulachon, or **Candle-Fish**, the *Thaleichthys pacificus*, a fish of the smelt family (Microstomidae) and resembling the smelt and the capelin. In the spring it enters in great shoals the harbors and fords of Brit. Columbia and Wash. Terr. to spawn. The fish is excessively fat and will burn like a candle.

**OUNCE** [Lat. *uncia*, the 12th part of a pound], in troy weight,  $\frac{1}{12}$  of a lb., or 480 grains; in avoirdupois weight,  $\frac{1}{16}$  of a lb., or 437 $\frac{1}{2}$  grains Troy. In the U. S. the apothecaries' O. is the troy O.; in G. Brit. it is now the avoirdupois. In the U. S. the fluid O. is  $\frac{1}{16}$  of a wine-pint, in G. Brit. the 12th of an Imperial pint.

**OUNCE**, the *Felis uncia*, a large cat of India resembling the leopard and panther, but lower, rougher, paler, and with a longer and more hairy tail and a thicker fur. The spots are also more irregular than those of the leopard.

**Ourray**, cap. of Ouray co., Col., on Uncompahgre River. Pop. 1880, 864.

**Ourebi** [Dut. *bleek-boc*, or "pale buck"], *Scopophorus ourebi*, an antelope of S. Afr., is nearly 3 ft. high, and found in great numbers in open plains. It is of pale brown-yellow tint, white beneath, and has sharp straight horns. It gallops rapidly, and its progress is effected by numerous graceful leaps. Its flesh is dry but very good.

**Ouseley**, ooz'lee (Sir FREDERICK ARTHUR GORE), Bart., only son of Sir Gore Ouseley, ambassador to Pers., b. in Lond., Eng., Aug. 12, 1825, grad. at Christ Church, Ox., 1846; was curate of a Lond. ch. 1849-51; became precentor of Hereford Cathedral 1855, and incumbent of St. Michael's, Tenbury, Worcestershire, 1856; distinguished for his attainments in music as a science; took an active part in establishing St. Michael's Coll., Tenbury, of which inst. he is warden; became prof. of music in Ox. Univ. 1855; author of several esteemed anthems, a *Treatise on Harmony*, and a *Treatise on Counterpoint and Fugue*.

**Outram**, oo'tram (Sir JAMES), G. C. B., b. in Derbyshire, Eng., Jan. 29, 1803; entered the military service of the E. I. Co. 1819; was aide-de-camp of Sir John Keane in the Afghan war; appointed political agent in Lower Sindh, with the brevet rank of major, and com. at Hyderabad; was commander-in-chief of the Brit. forces in the Per. war of 1856-57; arrived in India in the midst of the Sepoy rebellion; relieved Havelock at Cawnpore Sept. 15, then waived the command in favor of Havelock, whom he accompanied to the relief of Lucknow Sept. 25 in his capacity of chief com. of Oude; aided Sir Colin Campbell in the final recapture of Lucknow Mar. 1858; was knighted and made lieut.-gen. 1858; received the thanks of Parli. 1860; became a member of the supreme council of India; retired in broken health 1861. D. at Paris Mar. 11, 1863.

**Oval** [Lat. *ovum*], an egg-shaped curve; a curve resembling an ellipse. A semi-oval formed by arcs of circles of different radii and tangent to each other is sometimes used by engineers in the construction of arches. Such curves are often called basket-handled curves.

**Ovampos**, a tribe of Afr. inhabiting the Atlantic coast region S. of Cuanene River, and near Walvisch Bay. Except near the coast the soil is fertile. The surface is elevated and healthful. The people are warlike and strong, but ugly and filthy. They have made some progress toward civilization. They keep large herds of cattle and swine and raise much grain and poultry. Their country abounds in elephants and other large game.

**Ovarian Dropsy**, accumulation of a serous and albuminoid fluid in cystic enlargements of the Graafian follicles of the ovary. The swelling appears at first on one or other side of the abdomen, but, increasing, occupies the median portion, and increases in size with the accumulation of fluid until the abdomen may equal or exceed the size of the abdomen in pregnancy, large uterine tumors, the dropsy of cirrhosis, hydatid, or the cancerous, fatty-waxy liver. O. D. is to be distinguished from the above conditions.

Before the modern operation of "ovariotomy," or extirpation of the sac, the prognosis was bad. Death finally resulted from exhaustion, unless relieved in exceptional cases by tapping or accidental rupture. Ovariectomy was first performed by an Amer. phys. and surgeon, Dr. Ephraim McDowell. At first attended with great mortality, now, by the aid of improved methods and instruments, the antiseptic method, and trained nurses, the mortality is light. A great majority recover. Dr. Spencer Wells of Lond. has performed ovariectomy over 1000 times. The late Dr. Atlee of Phila. and the late Dr. Peaslee of New York ranked high in number of cases and favorable results.

**Oven Bird**, or **Golden-crowned Thrush**, the *Seiurus aurocapillus*, a N. Amer. bird of the family Sylviolidae, remarkable for its nest, which it builds upon the ground and roofs over with a dome-shaped covering. It is a shy, retiring bird, of an olive-brown color, 6 inches long, and is often seen running along the ground.

**Overbeck** (FREDERICK), b. at Lubeck July 3, 1789; studied painting in Vienna from 1806 to 1809; settled in 1810 at Rome; embraced Roman Catholicism in 1814; was an apostle of the sentimental religious school in art; held beauty subordinate to piety; earned the title "Nazarene," which was bestowed on the men of his school. D. in Rome Nov. 12, 1869.

**Overbury** (Sir THOMAS), b. at Ilmington, Eng., in 1581, grad. at Queen's Coll., Ox., 1598; travelled on the Continent; became a resident of Edinburgh 1601, where he was an intimate friend of Robert Carr, afterward Viscount Rochester and earl of Somerset; was knighted 1608; travelled on the Continent 1609; wrote *Observations upon the State of the Seventeen United Provs.*; incurred the enmity of Rochester, and of the countess of Essex, by his opposition to their criminal intrigues; refused a foreign mission offered him as a means of removing him from the country, and was thereupon thrown into the Tower, where he was cruelly treated, and d. Sept. 15, 1613. Three yrs. later Rochester, then earl of Somerset, and his countess were convicted of having poisoned O.

**Œverture** [Fr. *ouverture*], the name given to the introductory movement, symphony, or elaborate prelude occurring in oratorios, operas, cantatas, and similar compositions. The O., though complete in itself, is generally so framed as to bring the mind of the hearer into a correspondence of tone and sympathy with the leading traits of the work to which it is prefixed.

**Ovibus** [Lat.], a genus of the *Bovidae* or ox family, and the type of a peculiar sub-family, the *ovibovinae*. The only known living species, *Ovibus moschatus*, the musk-ox, so called from the strong musky flavor of the meat of the bulls and lean cows, is about the size of a 2-yr.-old heifer. It is now confined to the extreme N. parts of the N. Amer. continent, where it ranges over the barren grounds to the N. of lat. 60°, roaming in summer to the islands within the Arctic circle, though never reaching Greenland. During the glacial period its range must have been far more extensive, as its bones have been found in the valley of the Avon at Bath, and elsewhere in Eng.; while the remains of species allied, termed *Bootherium* by Leyd., have been found in the U. S.

**Ovid**, on R. R. Clinton co., Mich., about 20 m. N. of Lansing. Pop. 1880, 1479.

**Ovid** (PUBLIUS OVIDIUS NASO), b. Mar. 20, 43 B. C.; received an elegant education in the schools of the rhetoricians; studied afterward at Athens; travelled in Asia Minor and Sic., and lived then for many yrs. in Rome, until, in the latter part of the yr. 8 A. D., Augustus suddenly banished him to Tomi. It is probable that the cause was the intrigue in which the poet, during the period between his second and third marriages, indulged with Julia, the daughter of Augustus. At Tomi, a small Getic town, at the delta of the Danube, the fastidious favorite of the metropolis found life intolerable, and month after month sent the most



humble supplications to Augustus, but the emp. was immovable, and the poet d. in exile 18 A. D. His works comprise *Heriades*, 21 letters from heroines to their lovers; *Amores*, love-elegies; *Arms Amandi*, *Remedia Amoris*, *Metamorphoses*, *Fasti*, a poetical commentary on the Rom. calendar; *Tristia*, *Epistole ex Ponto*; the tragedy *Medea* is lost.

**Oviedo y Valdes**, o-ve-á'do e vahl'des, de (GONZALO FERNANDEZ), b. at Madrid, Sp., in 1478; was made inspector of mines in the W. I. 1514; held offices at Hispaniola; visited Darien and Nicaragua; made several voyages to Sp.; was appointed historiographer of the Indies; pub. a *Sumario* or brief hist. in 1526, and *Historia General y Natural de las Indias Occidentales*. He was also author of *Las Quinquagenas*, and of *Historia de Nicaragua*. D. at Valladolid, Sp., in 1557.

**Oviparous Animals** [Lat. *ovum*, "egg," and *pario*, to "produce"] are those which do not bring forth their offspring in a well-developed or even a fetal state, but in the condition of an egg. *Ovooviparous* are those which develop the ovum into a perfect egg, which, however, hatches before birth, so that living young are brought forth. All mammals are *oviparous*, that is, bring forth living young which has never been contained within a complete egg, though all have been through the *ovum* stage. But the non-placental mammals (marsupials and monotremes) have been called *semi-oviparous* because their reproduction is analogous to that by means of the complete egg.

**Ovule** [Lat. *ovum*, "egg," a rudimentary seed awaiting the action of the pollen, which, fertilizing a special cell or its contents, incites the formation of the germ or embryo. The O. consists of a nucleus and usually 1 or 2 coats, through which there is an orifice at the top known as the *foramen* or *micropyle*. The part where the coats, nucleus, etc. are united together is called *chalaza*. O. have 4 prin. forms—the *orthotropous*, or straight; the *campylotropous*, or curved; the *amphitropous*, or half-inverted; and the *anatropous*, or inverted. The last is the most common form. When the pollen reaches the stigma—which it does either by falling directly upon it, or through the agency of wind or insects—it absorbs moisture from the glutinous or naked tissue, and produces a tube. This insinuates itself between the loose cells and penetrates the style until it reaches the embryo sac. It contains the fluid contents of the original pollen-grain. The actual body awaiting fertilization is a globule of protoplasm, and is called the *germinal vesicle*. It grows by cell-multiplication.

**Owasco Lake**, in Cayuga co., N. Y., 11 m. long, 1½ m. wide, and 758 ft. above the sea. Its waters flow into Seneca River.

**Owatona**, city and R. R. centre, cap. of Steele co., Minn., on Straight River, 90 m. W. of Winona, has important manufactures. Pop. 1870, 2070; 1880, 3161.

**Owego**, R. R. centre, cap. of Tioga co., N. Y., on Susquehanna River, 236 m. from New York, has manufactures, a public library, and an acad. Pop. 1870, 4756; 1880, 5525.

**Owen** (DAVID DALE), M. D., son of Robert Owen, b. at New Lanark, Scot., June 24, 1807, was ed. at Hofwyl, Switz., and came to the U. S. with his father in 1823, to assist him in his social experiment at New Harmony; subsequently studied geol. and other natural sciences. In 1835 received the degree of M. D. from the Med. Coll. of O., and in 1837, by appointment of the legislature, made a geological reconnaissance of the State of Ind. Under instructions from the U. S. Land Office he subsequently made an examination of the mineral lands of Ia., and in 1848 was employed by the govt. to take charge of a geological survey of Wis., Ia., and Minn. The results of this survey, extending over a period of 3 yrs., were pub. by Cong. in 1852. From 1852 to 1857 he was employed in a geological survey of Ky., the results of which were pub. In 1857 he became State geologist of Ark., and the report of his survey was pub. D. Nov. 13, 1860.

**Owen** (JOHN), D. D., "the great dissenter" and the "prince of divines," was b. at Stadham, Oxfordshire, in 1616; was ed. at Queen's Coll., Ox., 1638-37; was an early advocate of the Parliamentary cause, and an adversary of Laud's measures; received the living of Fordham, Essex, which he exchanged for a Presb. pastorate at Coggeshall, where he introduced independent ch. govt. In 1649 he became private chaplain to Oliver Cromwell, in 1651 dean of Christ Church, Ox.; was vice-chancellor of the univ. 1652-57, when he was deprived by the Presb. party; in 1673 he removed to Lond. His *Exposition of the Epistle to the Hebr.* is his greatest work. D. Aug. 24, 1683.

**Owen** (JOHN), b. in Bladen co., N. C., Aug. 1787, was ed. at the State Univ.; gov. of N. C. 1828-30, pres. of the Harrison convention at Harrisburg, Pa., 1840, and held other public positions. D. Oct. 1841.

**Owen** (JOHN JASON), D. D., LL.D., b. at Colebrook, Conn., Aug. 13, 1803, grad. at Middlebury Coll. in 1829, and at the theological sem., Andover, Mass., in 1831; entered the Presb. ministry in 1832; became in 1836 pres. of Cornelius Inst., New York; prof. of Lat. and Gr. in the New York Free Acad. 1848, and its vice-prin. in 1853; v.-p. of the Coll. of the City of New York 1866; prepared annotated eds. of the *Anabasis* *Cyropedia*, *Iliad*, *Odyssey*, *Thucydides*, and the *Acts of the Apostles*; compiled a *Gr. Reader* and wrote a *Commentary on the Gospels*. D. Apr. 18, 1869.

**Owen** (LEWIS), D. D., LL.D., b. at Maltraeth, Anglesea co., Wales, in 1833; ed. at Winchester School and New Coll., Ox., where he obtained a fellowship; was prof. of canon law during the reign of Mary, and having remained attached to Catholicism retired in the reign of Elizabeth to Flanders; became prof. at Douay, which he founded in union with Cardinal Allen, as also an Eng. coll. at Rome, where he obtained high ecclesiastical dignities. D. Oct. 14, 1894.

**Owen** (RICHARD), C. B., F. R. S., LL.D., D. C. L., b. at Lancaster, Eng., in 1804, studied med. at Edinburgh and St. Bartholomew's, Lond.; Hunterian prof. in the Royal Coll. of Surgeons in 1836; supt. of the nat. hist. dept. of the Brit. Museum in 1855; has attained world-wide renown as a comparative anatomist, paleontologist, and of later yrs. as a

student of sanitary science. Wrote *Lectures on the Comparative Anat. and Physiology of Invertebrate Animals*, *Lectures on the Comparative Anat. and Physiology of Vertebrate Animals*, *Odontography*, etc.

**Owen** (RICHARD), M. D., son of the succeeding, b. at New Lanark, Scot., Jan. 1810, was ed. at Hofwyl and Glasgow; came in 1827 to the U. S.; served as an officer in the Mex. war, and afterward assisted his brother, D. D. Owen, in geological labors; held professorships of natural science in the Military Inst. and Univ. of Nashville 1849-58; removed in 1858 to New Harmony, Ind. Author of *A Key to the Geol. of the Globe*, etc.

**Owen** (ROBERT), social reformer, b. in Newtown, Montgomeryshire, N. Wales, Mar. 14, 1771, where he d. Nov. 19, 1858; engaged in the cotton manufacture at New Lanark, Scot., where he introduced important reforms having for their object the improvement of the condition of the laborers in his employ; then directed his attention to social questions on a broader scale, publishing in 1812 *New Views of Society, or Essays upon the Formation of the Human Character and Book of the New Moral World*, in which he advocated doctrines of human equality and the abolition of class distinctions. The Duke of Kent became his patron, and his followers were numerous. His religious views exposed him to bitter opposition, and after the death of his patron he came to the U. S. in 1823, and founded at his own expense a communist society at New Harmony, Ind. The scheme proving a failure, he returned to Eng., where he tried several similar experiments with the same result. In 1828, by invitation of the govt. of Mex., he went to that country in the hope of carrying out his socialistic schemes, but was disappointed. His later yrs. were spent in efforts to promote a religion of reason and to improve the condition of the working-classes.

**Owen** (ROBERT DALE), LL.D., eldest son of the preceding, b. in Glasgow, Scot., Nov. 7, 1801, was ed. at Fellenberg's coll. near Berne, Switz.; came to the U. S. with his father in 1823, and assisted him in his efforts to found the colony of New Harmony, Ind. On the failure of that experiment he visited Fr. and Eng., but returned to the U. S. in 1827. In 1828, with Frances Wright, he founded *The Free Enquirer*, a journal devoted to socialistic ideas and to opposition to the supernatural origin and claims of Christianity. He settled in New Harmony, Ind., where for 8 successive yrs. (1835-38) he was a member of the legislature. From 1843 to 1847 M. C., acting with the Dem. party; took an active part in the settlement of the N. W. boundary question; introduced the bill organizing the Smithsonian Inst., and served for a time as one of the regents; in 1850 was a member of the Ind. constitutional convention; through his efforts Ind. conferred independent property rights on women. In 1853 he went to Naples as U. S. *chargé d'affaires*, and in 1855 was appointed minister, and held the place until 1858. In 1860 he discussed the subject of divorce with Horace Greeley in the *Tribune*. After the breaking out of the c. war he was a warm champion of emancipation. When the proposition was made by certain politicians to reconstruct the Union with N. Eng. left out he addressed a letter to the people of Ind., exposing the dangerous character of the scheme. In 1862 he served as a member of the commission on ordnance stores, and in 1863 was chairman of the Amer. freedmen's commission. Among his numerous works are *Moral Physiology*, *Pochohontas*, a drama; *Footfalls on the Boundary of Another World*, *The Wrong of Slavery and the Right of Freedom*, *The Debatable Land between this World and the Next*, and *Threading my Way*, an autobiography. D. June 24, 1877. [From orig. art. in *J's Univ. Cyc.* by OLIVER JOHNSON.]

**Owensboro'**, city, cap. of Daviess co., Ky., on R. R. and the O. River, 160 m. from Louisville. It has an extensive tobacco trade. Pop. 1870, 3487; 1880, 6231.

**Owl** [Ger. *Eule*; Dut. *uil*], a gen. name for all the nocturnal birds of prey. They are all short and heavy, with large head and eyes, the latter of which are in almost every instance fitted for night-vision and surrounded by radiating feathers. Nearly all have a singularly noiseless flight and a quick sense of hearing; 206 species are recognized as inhab. of all regions. Owls have in all ages and countries been regarded as of ill omen by the superstitious.

**Owl-Parrot** is a large bird with the aspect and nocturnal habits of the owl. It digs in the earth with its hooked beak after roots, on which it feeds. It seldom flies, and generally rests in hollow stumps and logs. It is reputed to hibernate in caves in large groups.

**Ownership**, in law. This consists in dominion or control over property, real or personal. Considered as to its nature, it is of 2 sorts, absolute and qualified; regarded as to the number of owners, it is individual or joint. By absolute O. is meant such a full control over property that one may do with it as he pleases. He may dispose of it freely, or even destroy it without action, unless he may in some way injure the rights of others. The unrestricted right to sell must be regarded as in gen. incidental to O. O. is qualified in the case of wild animals and of bailment. (See BAILMENT.) The qualification in the case of wild animals is, that the animal may recur to its state of original wildness, and O. thus be wholly lost. In the case of bailment, the qualification consists in the fact that the ultimate owner has parted with it for a special purpose, as, for example, to have it repaired, or to raise money on it by way of pledge. The bailee may in such a case be regarded as a temporary or "special owner," while the bailor may be deemed the "general owner." The interests of the two, when combined, constitute complete O. O. is said to be several when it exists in one person, joint when it is vested in more than one. The subdivisions of joint O. are partnership, joint tenancy, tenancy in common, and the case of part owners of ships. O. may be lost or materially qualified by abandonment. This topic is peculiarly applicable to personal property. One may purposely cast away a chattel. If it be sunk in the sea, he may wholly abandon all effort to re-



cover it. In this last case the property is called derelict. Any one may then interfere and save it, and have a claim upon the property saved for services. T. W. DWIGHT.

**Owosso**, city and R. R. centre, Shiawassee co., Mich., 25 m. N. E. of Lansing, has good water-power. Pop. 1870, 2505; 1880, 2501; 1884, 2573.

**Owley** (WILLIAM), b. in Va. in 1782; removed in 1788 to Lincoln co., Ky., with his father; became a teacher and lawyer of Garrard co., whence he removed to Boyle co. in 1843; was a judge of the Ky. supreme court 1812-28, and gov. of Ky. 1844-48. D. Dec. 1862.

**Ox.** See CATTLE.

**Oxalates**, compounds of OXALIC ACID (which see) with bases. The salt of sorrel has been referred to as potassic dioxalate, and the first known source of oxalic acid. Oxalate of ammonia is largely in use in chemical laboratories as a reagent for lime. O. of lime occurs largely in the vegetable kingdom in different tissues and cells in the form of square prismatic crystals. Braconnot found that certain lichens growing on limestone rocks were half calcic O.

**Oxalic Acid** [Gr. *ὄξαις*, a name for a kind of sorrel, whence the botanical name of the genus *Oxalis*, which contains this acid; Fr. *acide oxalique*; Ger. *Kleesäure Oxalsäure*]. Salt of sorrel, which is an acid oxalate of potash, has for an unknown period been procured in Ger. from certain species of oxalis and rumex. Beside the plants above mentioned, there are sea-shore plants, *Salsola* and *Salicornia*, which contain it as oxalate of soda. It is found as insoluble oxalate of lime in a great number and variety of plants, and in certain morbid conditions this latter salt is formed largely in the animal body, passing off by the urine, and forming what is called the "mulberry calculus" in the bladder.

All the O. A. of commerce is prepared by artificial processes, of which 2 are in common use: 1. By the action of nitric acid on sugar, starch, or molasses. 2. By fusing a hydrate of an alkali with starch or cellulose. Sawdust is generally used. The commercial crystallized acid dissolves in about 9 parts of cold and 1 part of boiling water. When to its solution or that of an oxalate a lime-solution is added, there is thrown down oxalate of lime, an exceedingly insoluble substance, and for lime in solution it is the most delicate test. Except in very weak solutions, it is an exceedingly dangerous, fatal, and rapid poison, and its universal sale in shops and common use in households is greatly to be reprehended. It has been known to produce death in 10 minutes, preceded by horrible agonies. The best antidote is carbonate of lime: chalk, powdered marble, or house plaster. It is used in the arts for cleaning leather, for discharging colors in calico-printing, and in scouring metals. For the latter purpose, cleaning brass and copper, it is now much used in households, as well as for removing ink-stains from fabrics. The greatest care should be used that it be not mistaken for Epsom salt (which it almost exactly resembles in appearance), a fatal and not infrequent accident. [From orig. art. in *J. s. Univ. Cyc.*, by Prof. H. WURTZ, Ph. D.]

**Oxalis** [Gr. *ὄξαις*], wood-sorrel, the prin. genus of the sub-order of Geraniaceae, from which it has been separated by some authors. The plants composing the family are popularly known as wood-sorrels. The leaves are alternate, compound, and closing at night or sometimes to the touch, like those of Mimosa. All the species possess a sour juice, due to the presence of potassic binoxalate. *O. acetosella* has been said to yield, from 500 lbs. of the fresh plant, 4 lbs. of this salt, which, under the name of "salts of sorrel" and "salts of lemon," is used to remove the stains of iron-rust. The commercial article is obtained from other sources, and should never be marked "salts of lemon," as it is a dangerous poison. In the plants it exists only in sufficient degree to render them pleasantly acid, and in Fr. they are sometimes used for culinary purposes. The *O. crenata* of Peru and Chili is used as an article of food, the tuberous roots forming a substitute for potatoes. Some of the species are astringent and have been used in cases of blood-spitting and in the prevention of malignant fevers. This plant is common in the woods of both continents, blossoming in June. It is supposed by some to be the true shamrock, the national flower of Ire., instead of the clover, generally so considered. There are over 300 known species of this sub-order.

**Oxaluria** [Lat. "oxalic urine"], a morbid condition of the gen. system which favors the constant excretion of oxalic acid by the kidneys. Persons who have a constant and large deposit of oxalate of lime in the urine suffer more or less from dyspepsia, and, as a rule, they are more or less hypochondriacal; they are irritable and easily excitable, and there is more or less impotence. A prominent symptom is a severe and constant pain or sense of weight across the loins. Nitro-muriatic acid, either alone or combined with tonics, and laxatives seem to be the favorite remedies.

**Oxenden** (ASHTON), D. D., b. at Broome Parke, near Canterbury, Eng., in 1808, ed. at Univ. Coll., Lond.; rector of Pluckly-with-Pevington, Kent; became honorary canon of Canterbury Cathedral 1864, and bp. of Montreal, primate, and metropolitan of Canada 1869.

**Oxenstjerna**, oks'en-sheer-nah (AXEL), COUNT, b. at Fanö, Upland, Swe., June 16, 1583; studied theol. and jurisprudence at Rostock, Jena, and Wittenberg, and was employed after his return to Swe. in 1603, by Charles IX. in several important diplomatic negotiations. On the accession of Gustavus Adolphus in 1611 he was made chancellor of Swe., and as such he negotiated the Peace of Knered with Den. in 1613, of Stolbowa with Rus. in 1617, and the armistice with Poland in 1629; accompanied Gustavus Adolphus during his campaigns in Ger., taking charge of all diplomatic affairs. After the fall of Gustavus Adolphus at Lützen in 1632 he was empowered by the Swe. representatives to continue the war, and at the cong. of Heilbronn the Prot. princes chose him head of the league against the emp. He concluded an alliance with Hol. and Fr., and returned in 1636 to Swe. as chief of the govt. during the minority of Gustavus Adolphus's daughter Christina. When she became

of age in 1644 his influence decreased, and when she abdicated he retired altogether into private life, and d. at Stockholm Aug. 28, 1654.

**Oxford**, and old city of Eng., the cap. of Oxfordshire, is situated 55 m. N. W. of Lond., on the Isis, near its junction with the Cherwell, among rich and beautiful surroundings, and contains a great number of splendid edifices. Its trade and manufactures are comparatively insignificant; it is as a seat of learning it has acquired its fame, its univ. being the oldest inst. of the kind in the United Kingdom. It is attended by about 6000 students, and has an annual revenue of between £400,000 and £500,000. It consists of 19 colls. and 5 halls. Pop. 38,289.

**Oxford**, on R. R., cap. of Lafayette co., Miss., contains the Univ. of Miss., the Union Female Coll., Oxford Inst., and the Oxford Male Acad. Pop. 1870, 1422; 1880, 1534.

**Oxford**, N. C. See APPENDIX.

**Oxford**, R. R. centre, Chenango co., N. Y., 8 m. S. of Norwich, has an acad. Pop. 1870, 1278; 1880, 1209.

**Oxford**, on R. R., Butler co., O., 39 m. N. W. of Cin., contains the Oxford Female Sem. and Miami Univ. Pop. 1870, 1738; 1880, 1743.

**Oxford**, R. R. junco., Chester co., Pa., 55 m. from Baltimore. Lincoln Univ. for colored persons is about 4 m. from this town. Pop. 1870, 1151; 1880, 1502.

**Oxford** (ROBERT HARLEY), EARL OF, b. in Lond., Eng., Dec. 5, 1661; raised a cav. regiment for the service of the prince of Orange 1688; entered Parl. 1690 as an extreme Whig, but changed his political views; was chosen speaker Feb. 1701; re-elected in the 2 succeeding Parls.; was made chief sec. of state 1704; incurred the enmity of Marlborough and Godolphin; was made chancellor of the exchequer Aug. 1710; was stabbed at the council-board by the marquis of Guiscard, a Frenchman, Mar. 12, 1711; was created earl of Oxford and Mortimer May 24, and lord high treas. May 29; consolidated his popularity by the Peace of Utrecht, Apr. 1713, but was dismissed July 27, 1714. Regarded with distrust by George I., he was impeached of high treason by Parl. Aug. 1715, committed to the Tower, acquitted June 1717; lived thenceforth in retirement. D. May 21, 1724.

**Oxford Clay**. The Oxford clay, so called from its extensive development in Oxfordshire, Eng., is a deposit widely extended over Europe, constituting the argillaceous member of the middle Oolite series of rocks. It consists of a stiff, grayish-blue to dark-blue clay, containing more or less lime, and varying in different localities from 200 ft. to 600 ft. in thickness. It abounds in fossils, chiefly ammonites and belemnites.

**Oxford University**. The first notice of Ox. as a seat of learning dates from the time of Edward the Confessor. In the reign of Stephen we find Vacarius, a Lombard, giving lectures on Rom. law at Ox. The first charter was granted to the univ. by John; in 1301 the univ. numbered within its walls 3000 students. From Henry III.'s time date the foundations of 3 colls., University (1253), Balliol (1263), Merton (1264). In a little more than half a century from this date 2 other colls. were established, Exeter (1315) and Oriel (1326); Queen's followed in 1340, and New Coll. 1373. In the reign of Henry VI. we find 3 new colls. established, Lincoln (1427), All Souls' (1437), Magdalen (1456). The univ. found a generous patron in Richard III. In Henry VIII.'s time 3 new colls. were founded, Brasenose (1509), Corpus Christi (1516), Christchurch (1525). Wolsey endowed seven professorships; especially the study of Greek was encouraged by the learned prelate. The religious controversies did much to hinder the advancement of learning; in Mary's reign the univ. appears to have been in a state of great stagnation. Endowments, however, were not wanting, for in 1554 Trinity Coll. was founded, and St. John's followed 3 yrs. later. Queen Elizabeth's reign is remarkable in the hist. of O. U. for the foundation by Sir Thomas Bodley of the Bodleian Library, and for the passing of the act which confirmed the univ. as a corporate body; also, Jesus Coll. was established in this reign. Shortly after the succession of James I. the 2 univs. had the privilege granted of sending each 2 members to Parl. In 1612 Wadham Coll. was founded, and 12 yrs. later Pembroke. During the times of Charles I. the univ. sided with the king, and suffered in consequence. In 1650 Cromwell was elected chancellor of the univ. Under James II. the univ. came violently into collision with the Crown. In 1714 Worcester Coll. was founded; Hertford Coll. followed in 1740, which in 1818 was turned into Magdalen Hall, and in 1874 was metamorphosed again into Hertford Coll. Three yrs. before, in 1871, a new coll., Keble, had been founded. Beside these colls. there are a few halls attached to certain of the colls., as St. Alban's Hall, attached to Merton Coll., St. Edmund's Hall to Queen's Coll., etc.

The highest officer in the univ. is the chancellor; the election is determined by the members in convocation, and the office is held for life. The marquis of Salisbury is the present chancellor. The vice-chancellor is nominated by the chancellor from among the heads of colls.; the office is held for 4 yrs. To assist the chancellor and vice-chancellor 2 other officers are appointed, the high steward and deputy steward. The business of the univ. is transacted in 2 separate assemblies, the house of congregation and the house of convocation. In the former the business is confined to granting ordinary degrees and confirming the nomination of examiners made by the vice-chancellor and the proctors. All other business is conducted in the house of convocation. The business of the proctors is to guard against any breach of discipline on the part of members of the univ.; there are 2 proctors, assisted by 4 pro-proctors.

Before entering the univ. a preliminary examination, the matriculation, must be undergone, varying in difficulty according to the status of the coll. Shortly after entering, the student is confronted by responsions, the first public examination; for this a slight knowledge of classics and math. is required. In order to get a degree the student must have resided at least 12 continuous terms at the univ., and



must have passed the necessary examinations. The study of anc. lit., hist., and philos.—*literæ humaniores*—is the study most largely encouraged at Ox.; the degree is usually acquired in the classical schools. There are also schools in modern hist., civil law, and theol. For those who go to study math., natural science, etc., there are also schools in those subjects. Attached to each coll. are fellowships and scholarships, awarded in most cases by open competition. Instruction is conducted mainly by the coll. tutors; lectures are also delivered by the univ. profs. The univ. yr. is divided into 4 terms—Michaelmas, Hilary, Easter, and Trinity. [From orig. art. in *J.'s Univ. Cyc.*, by A. H. BULLEN.]

**Ox-gall** (*fel bovum*), the bile of the domestic ox, is used in the arts in scouring wool. When refined from its coagulable and coloring matters it is used by artists in mixing colors, which it often improves in tint, while it fixes them and makes them flow better. It is also used in some kinds of artists' varnish and in cleansing ivory tablets for artists' use. In med. it is sometimes given when a deficiency of bile is suspected to exist, and as an external application some consider it powerfully discutient.

#### **Oxidation.** See OXYGEN.

**Oxides**, compounds of OXYGEN (which see) with metallic and other basic substances. O. make up almost the whole mass of known matter. Water is an O. of hydrogen, 88.88 per cent. of its weight being oxygen, and all the massive solid rocks, without exception, are made up substantially of different O. All the elements except fluorine combine with oxygen to form O., some combining in several different proportions to form as many different O. O. divide themselves into several natural groups. Basic O., or simply bases, are those which combine with acid O. to form salts or neutral O., and, conversely, *acid O.*, or *acids* simply, are those which combine with bases to form salts. This is, however, a very gen. definition, subject to several conditions and modifications in certain cases. Generally speaking, again, it may be stated that acid O. contain larger proportions of oxygen than basic; and when an element combines to form different O. with oxygen, those which contain most oxygen will be acid, and those containing least basic. The degree of acidity or basicity of an O. depends also, however, upon the acidic or basic relations of the element which is combined with the oxygen.

#### **Oxlip.** See PRIMROSE.

#### **Oxpecker.** See BEEF-EATER.

**Oxychlorides**, sometimes called **Basic Chlorides**. This class of compounds may in some cases be regarded as compounds of oxides and chlorides, but in many other cases we find difficulty in admitting the presence of 2 molecules of the basic element. The O. are sometimes formed by the direct action of an oxide of a metal upon the chloride of the same metal, as in the cases of lime, magnesia, zinc, etc. In the latter 2 cases important cements are founded upon the formation of such O. Other classes of O. are formed by the partial decomposing action of water upon the chlorides of some metals, acting by removing a portion of the acid, as in the cases of antimony and bismuth. There are some native mineral O., as atacamite and talligite, O. of copper, and mallockite and mendipite, O. of lead. Other elements beside the metals form O., such as silicon, carbon, sulphur, selenium, nitrogen, phosphorus. O. of phosphorus is a compound of considerable interest.

**Oxygen, Air, and Ozone.** *Names.*—The word oxygen is from the Gr. *ὀξύς*, "acid," and *γενέω*, "to engender," or "generate," and was applied by Lavoisier to represent the generalization which he had arrived at, and which in his day was almost universally accepted, that oxygen was the sole "acidifying principle." The first discoverer of O., Priestley, called it "dephlogisticated air." Condorcet called it "vital air." Scheele called it "Feuerluft," fiery or fire-supporting air.

*History.*—Priestley in 1774 prepared pure O. by heating red oxide of mercury, which is dissociated by heat into metallic mercury and oxygen gas. One yr. later than Priestley, in 1775, the great Swe. chemist Scheele made independently the same discovery. Lavoisier may be justly regarded as the discoverer or propounder of the true theory of fire, oxidation, and combustion, as consisting in combination with O. of the air.

*Occurrence in Nature.*—O. constitutes nearly if not quite half the total weight of known matter, and silicon not far from  $\frac{1}{4}$ . Of water, the liquid part of the earth, O. forms a still larger proportion, or *eight ninths*. Of living matter, vegetable and animal, O. also forms by far the largest element, by reason of the fact that water is so predominant a constituent of these. Apart, however, from the water existing as such in living beings, much O. is contained in their solid constituents when perfectly dry. Thus cellulose and starch both contain 49.38 per cent. of O., albumen 23.5, and gelatine 27.5 per cent. Of normal atmospheric air O. constitutes from 20.8 to 20.9 per cent. by volume, and by weight about 23 per cent., the O. being a little heavier than the nitrogen.

*Preparation.*—Of accomplishing this there are many methods beside that of Priestley, above referred to. Peroxides of manganese and barium both evolve O. when strongly heated. Peroxide of barium will take the O. up again at a lower temperature from a current of moist air, and the alternation of these 2 operations upon this peroxide, or, which is the same thing, upon anhydrous baryta, constitutes Boussingault's method of making O. The method of Tessie du Motay consists in the alternate exposure to a current of air and of steam of a salt of manganic acid. Sulphuric acid will evolve O. from a number of substances when heated therewith, such as bichromate of potash, permanganate of potash, peroxide of manganese, peroxide of lead, etc. It may also be obtained by electrolysis of water acid, etc. Deville and Debray proposed 2 new methods, both of which furnish it at first in admixture with sulphurous oxide gas, one being to pass sulphuric acid in vapor over heated pla-

tinum, the other to heat white vitriol, or sulphate of zinc, to a high temperature. The method still in most gen. use, both in chemical laboratories and in the manufacture of O. for commerce, is to heat chlorate of potash to fusion. The evolution of the O. is greatly facilitated and hastened by pulverization of this substance and mixture with small proportions of certain metallic oxides, peroxide of manganese being generally used.

*Chemical Properties.*—A colorless and inodorous gas. It is magnetic—more so than any other gaseous substance. Its density, air being unity, is 1.10561. Bunsen found that ice-cold water can hold in solution 4.111 per cent. of its vol. of O., and water at 20° C. (= 68° F.) only 2.838 per cent. When pure it manifests the most energetic affinities, and when inhaled soon destroys instead of sustaining life, by reason of an abnormally rapid oxidation of the blood. (See NITROGEN.) A combustible body, as a charred splinter of wood, a candle with a snuff upon it, or the like, if having but a spark of fire adherent, instantly kindles into flame when immersed in O. In this way it may be distinguished from all other gases except laughing gas, which has the same power. O. will itself burn with flame in an atmosphere of a combustible gas like hydrogen. Even gaseous ammonia may be substituted for the hydrogen in this experiment. O. is equivalent to 2 equivalents of hydrogen, chlorine, or other monadic element, and is therefore a dyad. When it burns with hydrogen, 2 vols. of the latter combine with 1 vol. of O., and the 3 vols. condense to 2 vols. of steam; but whether this condensation is on the part of the hydrogen or of the O., or of both, is as yet matter of speculation.

*Uses of Oxygen.*—Outside of the applications of O. as a purely scientific and analytical agent in the chemical laboratory, its practical uses have not yet been developed to any great extent, in consequence of the large expense of obtaining it free from nitrogen. Dr. Hare's applications of it for producing intense heat for fusing metals, and intense light by the invention properly called Hare's lime-light, remain yet the most important uses.

*Ozone.*—This is a modification of O., known sometimes as "active oxygen," which, up to this time, stands almost if not altogether alone in some respects. Allotropic modifications of solid and liquid substances are exceedingly common, but those of gaseous bodies are little known, ozone being the only one that has been at all studied. As in the case of all allotropic changes, when O. passes to the form of ozone there is found to be a change of vol., and a thermal disturbance also. Ozone is formed when O. is submitted to various agents and operations. The electric spark and the slow oxidation of phosphorus are 2 of the most familiar. The O. formed by electrolysis contains it, also that evolved from a mixture of sulphuric acid and permanganate of potash. Loew found it as a gen. product of flame in air. It is always readily detectable, when masking odors are absent, by its very singular and characteristic odor, which, once perceived, is always recognizable again. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. HENRY WURTZ, Ph. D.]

#### **Oxygenated Water.** See HYDROGEN PEROXIDE.

**Oxygen, Medicinal Uses of.** O. is locally irritating to raw surfaces, exciting inflammation if too long applied. Inhaled in health with proper precautions to remove carbonic acid, etc., it is perfectly respirable, and does not produce much substantial change in the rate of performance of the functions. But when there is defective respiration, and the system suffers in consequence from imperfect oxygenation of the blood, the inhaling of pure or slightly diluted O. affords decided relief. Hence, in asthma, pulmonary emphysema, croup, diphtheria, dyspnea from heart disease, etc., inhalations of O. are often useful. In consumption of the lungs, anæmia, severe dyspepsia, indolent ulcers, etc., in some cases much benefit has followed inhalations of O. But where ulceration or active inflammation is present the use of the gas requires care. O. for medicinal use must be perfectly pure, and is best prepared by decomposition of potassium chlorate. It is inhaled from a bag connected with the mouth by a tube provided with a proper mouth-piece to keep the expired air from mixing with the gas; and the nostrils being left free, enough air is at the same time inspired to somewhat dilute the O.

**Oxyhydrogen Blow-pipe**, a piece of apparatus invented in 1801 by Dr. Robert Hare of Phila. for the purpose of producing a very high temperature by burning hydrogen and oxygen together. It is now extensively used for melting platinum and for producing the Drummond light, by rendering a piece of lime intensely hot. The best form is a jet consisting of a tube for the delivery of oxygen, with a larger tube around it, the hydrogen being delivered through the annular space.

**Oxysalts**, salts or neutral compounds (neither acid nor basic) formed by the saturation of an oxygen acid by an oxygen base. The term is necessary to distinguish this class of compounds from the other large class of salts called haloid salts, which contain no oxygen, being formed by the combination of a metal with one of the halogen group of elements, chlorine, bromine, iodine, and fluorine. To this latter class common salt belongs, and is therefore not an O.

**Oxysulphides**, compounds formed by the joint combination of sulphur and oxygen with a metal or other element. They are not very numerous or important.

**Oyer and Terminer** [Fr. to "hear and determine"]. In Eng. practice, courts of O. and T. are tribunals having criminal jurisdiction which are held before the queen's coms., among whom are usually included 2 judges of the superior courts at Westminster, in every co. of the kingdom. In most of these cos. sessions are held twice in each yr. The name of these courts is derived from the lang. of the commission by which the judges are empowered to act. They are directed "to hear, inquire, and determine" all treasons, felonies, and misdemeanors. They can only proceed upon indictments found at the same assizes in which the trial is had. In the U. S. the phrase O. and T. is not infrequently



employed as a designation of criminal courts, but the extent of the particular jurisdiction which they exercise and the mode of their organization are generally determined by express statutes. In N. Y. this is the highest court of original jurisdiction in criminal cases.

GEORGE CHASE.

**Oyster**, the Eng. name common to the species of the family Ostreidae and genus *Ostrea*. All the species of the genus agree in the following characters: The animal has the mantle margin double and finely fringed; the gills are nearly equal; the lips plain; the palpi triangular and attached; the shell is irregular and rough; the left valve adherent and convex; the right free and flat or concave; the umbones moderately prominent, and not or scarcely incurved; the hinge toothless; the ligamentary cavity elongated. The genus is almost cosmopolitan in range, but not represented in the polar seas. The most notable are the *O.* of Europe (*Ostrea edulis*) and the *E. U. S.* (*Ostrea virginiana*). The former is a comparatively small species, found generally in the European seas; the latter is the common large Amer. species, and its great head-quarters are the waters of Chesapeake Bay; it has none of the coppery taste characteristic of the European species.

**Oyster-catcher**, a name given to various wading birds of the Turnstone family and of the genus *Hæmälopus*. The U. S. have 3 species, *H. palliatus*, called the flood-gull, and *H. niger* and *ater*, the last 2 from the Pacific coast.

**Oyster-plant**. See SALISIFY.

**Ozaka**. See JAPAN.

**Ozanam** (A. F.). See APPENDIX.

**Ozark Mountains**, a series of steep and heavily timbered ridges of S. Mo., extending into Ark. and the Ind. Terr. They are nowhere of great elevation, and are believed to possess great mineral wealth.

**Ozone**. See OXYGEN.

## P.

**P**, a consonant of the class of labial mutes. **P** is an abbreviation for *Pater*, "father;" **PP**, for "fathers;" **p**, for page;" **pp**, for "pages." **P** in chem., designates phosphorus. In Lat. **P** stands for the proper name Publius.

**Pa'ca**, the *Caloglypsus paca*, one of the largest of rodent mammals, a native of S. and Middle Amer. It is 2 ft. long and generally dark brown with streaks and patches of white. The zygomatic arch is prodigiously developed, so that the cheek pouches are protected by a bony case. Its tail is very small. It burrows in the earth, and is cleanly in its habits. It is clumsy in build, but very active.

**Paca** (WILLIAM), b. at Wye Hall, Md., Oct. 31, 1740, grad. at Phila. Coll. 1759; studied law in the Middle Temple, Lond., and became a lawyer at Annapolis, Md.; was a leading patriot in 1774; was in Cong. 1774-79, and again 1786; signed the Dec. of Ind.; was in the State senate 1777-79, chief-justice of Md. 1778-80, chief-justice of the State court of appeals for admiralty and prize cases 1780-82, gov. of Md. 1782, 1786; was in the convention of 1788 which ratified the U. S. const.; U. S. dist. judge 1789-99. D. 1799.

**Pacific Ocean**. See OCEAN.

**Pacific University of the**, in Santa Clara Valley, Cal., 50 m. S. of San Francisco, chartered in Aug. 1851, under the auspices of the M. E. Ch.; the preparatory dept. opened in May 1852; in 1854 the coll. proper was formed. Sept. 22, 1858, the coll. of med. was inaugurated in San Francisco, being the first med. coll. in the State. In 1871 a fine building was erected between Santa Clara and San José, 1½ m. from each city, and both sexes admitted to the same classes.

**Packard** (ALPHEUS SPRING), D. D., b. at Chelmsford, Mass., Dec. 20, 1799, grad. at Bowdoin Coll. in 1816; was a college tutor 1819-24; prof. of Lat. and Gr. langs. and lit. 1824-65, and in 1864 was made Collins prof. of natural and revealed religion. He edited the *Writings of Jesse Appleton*, *Xenophon's Memorabilia*, and wrote a *History of the Bunker's Hill Monument Association*, etc. D. July 13, 1884.

**Packard** (ALPHEUS SPRING, JR.), M. D., Ph. D., b. at Brunswick, Me., Feb. 19, 1839, grad. at Bowdoin Coll. 1861; studied nat. hist. in the museum of comparative zoology at Cambridge, devoting himself particularly to entomology; grad. in med. at Me. Med. Coll. 1864; made several scientific expeditions; for several yrs. lecturer on entomology at Bowdoin, a curator of the Peabody Acad. of Sciences at Salem, Mass., and one of the eds. of the *Amer. Naturalist*, and established the *Annual Record of Entomology* 1868. Author of *Observations on the Glacial Phenomena of Labrador and Me.*, *A Guide to the Study of Insects*, etc. Became prof. of nat. hist. in Brown Univ. 1878.

**Packard** (FREDERICK ADOLPHUS), LL.D., b. at Marlborough, Mass., Sept. 26, 1794, grad. at Harvard 1814; studied law, and was 1817-29 a lawyer at Springfield, Mass., and ed. of the *Federalist* newspaper of that town; was 1829-67 ed. of the publications of the Amer. Sunday-School Union, Phila.; edited also for many yrs. the periodicals of that society and the *Journal of Prison Discipline*; author of the *Union Bible Dict.*, *The Teacher Taught*, etc. Declined in 1849 the presidency of Girard Coll. D. Nov. 11, 1867.

**Pack'er** (ASA), b. in Groton, Conn., Dec. 29, 1805; in his youth was employed in a tannery; learned the carpenter's trade; in 1823 removed to Mauch Chunk and engaged in boating coal to Phila.; in company with his brother transacted a large mercantile business at Mauch Chunk and elsewhere; leased and worked the Lehigh Coal and Navigation Co.'s mines and shipped the coal to New York and Phila.; purchased and worked coal-mines at Hazleton; largely concerned in building Lehigh Valley R. R.; engaged in other R. R. enterprises; acquired great wealth; took much interest in public affairs; served several terms in State legislature; 5 yrs. judge of co. court, and twice elected M. C.; in 1868 was prominent Presidential candidate; the next yr. received Dem. nomination for gov.; gave liberally for religious and educational objects; gave 60 acres of land

for site and \$500,000 for buildings for Lehigh Univ., at S. Bethlehem, Pa. Beside large amounts to other insts., he bequeathed the income of \$1,500,000 for its support, also the income of \$600,000 for a library for same. D. May 17, 1879.

**Packer** (WILLIAM FISHER), b. in Howard, Pa., Apr. 2, 1807; learned the printer's trade; became a clerk in the register's office of Lycoming co. 1825; worked as journeyman printer 1825-27; studied law, and in 1827 became a journalist of Williamsport, Pa.; was 1832-35 supt. of the W. Branch canal construction; became in 1836 a Dem. journalist of Harrisburg; was (1839-42) one of the canal coms.; in 1842-45 auditor-gen. of Pa.; speaker of the house 1847-49; State senator 1849-51, pres. of the Susquehanna R. R. 1852, gov. of Pa. 1858-61.

**Pack'tong**, the commercial name of the Chi. *petung*, or white copper, an alloy resembling Ger. silver in appearance, but composed of arsenic and copper fused at a low temperature, 2 parts of arsenic to 5 of copper. It was once extensively exported to Europe, but of late the cheaper nickel alloys have driven this substance out of the European market; it is still extensively employed by the Chi.

**Pactolus** (Πακτώλης, now *Sarabal*), a small stream of Lydia in Asia Minor, flows from Mt. Tmolus into the Hermus. It is barely 10 ft. wide and a foot deep.

**Pacu'vius** (MARCUS), b. at Brundisium about 219 B. C.; lived in Rome; became celebrated as a painter and tragedian; retired when an old man to Tarentum. D. there about 130 B. C. It is probable that he also wrote *Satura* and comedies, and his tragedies, which were not mere translations from Gr. writers, but often original treatments of subjects from the Rom. hist., were still appreciated at the time of Julius Caesar.

**Padang** is a terr. of the Dut. dominions on the W. coast of Sumatra, consisting of the dists. of Upper and Lower P., and containing the city of Padang, the cap. of the terr., situated at the mouth of a river of the same name. Only the low and marshy coast-land is hot and unhealthy; the slopes of the high volcanic mts. have a delicious climate and a fertile soil, producing coffee, pepper, indigo, and caoutchouc, and yielding gold, iron, copper, quicksilver, and diamonds. The city, which is the residence of the gov., contains a Malay pop., living in bamboo huts on the left bank of the river, and a pop. of Europeans and Chi. living in houses of stone on the more elevated right bank. The place carries on an extensive trade. Pop. 12,000.

**Pad'dle-fish**, the *Polyodon folium*, a fish of the Miss. O., etc., remarkable for having the nose prolonged into a thin bony appendage. It has no scales, is 5 ft. long, has a tough but eatable flesh, and uses its snout for the purpose of digging in the mud in search of food.

**Pad'dock** (BENJAMIN HENRY), D. D., b. at Norwich, Conn., grad. at Trinity Coll. 1848, at the Epis. Gen. Theological Sem., New York, 1852; assistant at Epiphany ch., New York, 1852-53; rector of Trinity, Norwich, Conn., 1853-60; of Christ ch., Detroit, 1860-69; of Grace ch., Brooklyn, 1869-73, became bp. of Mass. Sept. 17, 1873.

**Pad'ua** (It. *Padova*; Lat. *Paduana*), a town of It., in lat. 45° 24' N., lon. 11° 52' E. The city is a triangular inclosure, surrounded by a wall 8½ m. in extent, the base of the triangle being toward the W. The vast plain of Venetia extends to the limits of the horizon on all sides, except to the S. and W., where it is broken by the Euganean Hills. P. is in full railway communication with Venice and Lombardy, as well as with S. It. The Bacchiglione, a tributary of the Brenta, after entering the town, divides into 2 branches, and from these a network of canals intersects the city. The streets of P. are narrow and the houses high and built on arcades, but some of the squares, gardens, and public buildings are very fine. The Prato della Valle or Piazza delle Statue, now called Piazza Vittorio Emanuele, is an irregular triangle surrounded by water and adorned with about 80 statues. The botanical garden is the oldest in Europe. The municipal palace is a vast rhomboidal structure, containing the largest vaulted room in Europe; length, 267¾ ft.; breadth, 89 ft.; height, 49 ft. The Caffè Pedrocchi is also unrivalled in its way. The Univ. of P. originated in the early part of the 13th century. The usual number of students is about 2000. The ch. of Sant' Antonio (begun in 1232, finished in the 14th century) is a grand building of mixed arch., surmounted by 7 cupolas. The magnificence of the interior can hardly be exaggerated. There are many other sumptuous chs.—the Cathedral, Santa Giustina, Sant' Andrea, etc.—but the oratory of the Annunziata neill' Arena, commonly called the Chapel of Giotto, is of the highest interest to the art-student as containing the best preserved frescoes of that great master. The great antiquity of P. is undisputed, but its certain hist. begins only with the Rom. period. There is as yet very little commercial or industrial activity in this town. Pop. 72,174.

**Padu'eah**, city and R. R. centre, cap. of McCracken co., Ky., on the O. River, near the mouth of the Tenn. Has a female sem., and is the shipping port for tobacco, grain, and pork. Pop. 1870, 6886; 1880, 8036.

**Pæ'an** [Gr. *παῖων*, *Paion*, properly a name of Apollo, or of the god of healing], among the anc. Grs. a hymn of thanksgiving and joy, such as was sung especially before and after battles.

**Pæonine** (*coralline*), a red coloring-matter obtained by treating phenol with sulphuric and oxalic acids. (See PHENOL and ROSOLIC ACID.)

**Pæ'ony** [Gr. *παῖωνια*, probably from *Pæon*, the god of med., on account of its medicinal qualities], a name given to herbs and shrubs of the genus *Pæonia*, order Ranunculaceæ. The U. S. has but one native species, *P. Brownii*, of the Pacific States and Brit. Amer. It has small purple flowers. The various Old-World species are cultivated as ornamental plants. All have a poisonous principle, and some species were once employed in med., but none are much used at present.

**Pæ'st'um** (*Posidonia*; It. *Pesto*), an anc. town of S. It.,



on the Gulf of Salerno, about 40 m. S. E. of Naples. It is spoken of by Strabo as a Gr. colony from Sybaris. The magnificent ruins consist, in the main, of crumbling walls and towers and of several more or less well-preserved temples. Colossal porphyry and granite vases have been found here, and medals with figures of anchors, rudders, etc., both of the Gr. and later periods. The chief interest of P. is in two very anc. Doric temples, sacred, one to Neptune, the other probably to Ceres, and a third, of unusual construction, called without reason the Basilica. Between the temple of Neptune and that of Ceres are the ruins of, probably, a Rom. theatre and amphitheatre. The malaria of this coast has left it almost without inhabs., but this does not prevent it from being frequently visited.

**Paez** (JOSE ANTONIO), b. near Acariagua, Venezuela, June 13, 1790; entered the patriot army in 1810, and for victories over the Sp. rose to gen. of division 1819; took a leading part at the battle of Carabobo, which secured the independence of Colombia 1821; became military commandant of Caracas; opposed the new Colombian const. 1826; was at the head of the revolution which culminated in the independence of Venezuela Sept. 1829; was the first pres. of the new republic; again elected 1839; minister to the U. S. 1860-61; made dictator 1861-62; again came to the U. S.; wrote his *Autobiography*; visited the Argentine Republic and Peru, and returned to New York 1872. D. May 6, 1873. —His son, RAMON PAEZ, resident for many yrs. in New York, is author of *Public Life of José Antonio Paez, Wild Scenes in S. Amer., and Ambrosian Contrastes*.

**Paganini**, pah-gah-nee'ne (NICOLÒ), b. at Genoa Feb. 18, 1784; gave, when 9 yrs. old, his first public concert as a violin-virtuoso in his native city, and produced an extraordinary enthusiasm. Afterward he led for many yrs. a most adventurous life, emerging suddenly from obscurity and oblivion, thrilling the inhabs. of some It. town, or rather putting them into a fit of frenzy, by his violin, and then disappearing as suddenly, sometimes playing for bread in a market-place and sometimes refusing to play though a fortune was offered him. From 1828 to 1833 he made a concert tour from Vienna, through Ger., to Paris and Lond., and the sensation he produced has never been equalled before or since by any virtuoso. Wealthy, but with broken health, he returned in 1834 to Parma. D. May 27, 1840.

**Paganism**, as a name for heathenism, originated among the Chrs. when Christianity gained superiority in the cities and the worship of the old Gr. and Rom. gods was confined to remote villages (*pagi*) and the scattered settlers in the country (*pagani*). It is now used as a gen. term including all polytheistic religions.

**Page** (JOHN), b. at Rosewell, Va., Apr. 17, 1743, grad. at William and Mary Coll. 1763; was a leading statesman of Va. during the Revolution; M. C. 1789-97, a Presidential elector 1800, gov. of Va. 1802-05. D. Oct. 11, 1806.

**Page** (JOHN), b. at Haverhill, N. H., May 21, 1737, was a State legislator 1818-20 and in 1835; register of deeds for Grafton co., N. H., 1828-34. U. S. Senator 1836-37, State councillor 1838, gov. of N. H. 1839-42. D. Sept. 8, 1865.

**Page** (THOMAS JEFFERSON), b. in Va. about 1815; entered the U. S. N. 1827; became lieut. 1833; was engaged for many yrs. upon the coast survey and subsequently in the Chl. squadron; commanded the U. S. Exploring Expedition on the La Plata, Paraná and Paraguay rivers 1853-56; became commander Sept. 1855; resumed and completed his explorations 1859-60, and served in the Confed. navy, attaining the rank of com. Wrote *La Plata, the Argentine Confederation, and Paraguay*.

**Page** (WILLIAM), b. in Albany, N. Y., Jan. 23, 1811, came to New York when 8 yrs. old. A precocious talent for art took him from the study of law, and afterward from divinity. He painted portraits in Albany and New York with eminent success, and is known as an experimenter in color, as in a *Flight into Egypt, Moses and Aaron on Horeb*. His *Venus* became famous. P. has lectured on art.

**Pages**. See GARNIER-PAGES.

**Pa'get** (SIR JAMES), BART., F. R. S., D. C. L., b. at Great Yarmouth, Eng., in 1814, ed. in surgery at St. Bartholomew's Hospital; reached the highest honors of his profession, and was made a baronet 1871. Wrote *Lectures on Surgical Pathology, etc.*

**Pago'da** [Per. *but-gada*, the "house of idols"], a name applied to a great variety of E. I. temples and religious monuments, both Hindoo and Buddhist. They are usually of stone, are mostly terraced pyramids, and some are purely monumental, having no interior apartments.

**Pahlampoor'** is a small state of Hindostan, tributary to G. Brit., situated between lat. 23° 57' and 24° 41' N., and lon. 71° 51' and 72° 45' E. Pop. 322,000, of whom 1 1/2 are Moslem. The cap., of the same name, is surrounded with walls, has an extensive trade, several manufactures, and 30,000 inhabs.

**Paine** (ALONZO CHRISTOPHER), b. at Schaghticoke, N. Y., July 31, 1797, grad. at Williams Coll. 1819; was admitted to the bar in 1819; as reporter of the N. Y. court of chancery 1828-46 he prepared 11 vols. of *Reports*; was in the N. Y. assembly 1826-30, State senator 1838-42, justice of the State supreme court 1847-51, 1855-57, member of the N. Y. constitutional convention of 1867. D. Mar. 31, 1868.

**Paine** (CHARLES), b. at Williamstown, Vt., Apr. 15, 1799, grad. at Harvard, 1820; became a successful manufacturer; gov. of Vt. 1847-48; was one of the fathers of the railroad system of Vt., and was active in the S. Pacific R. R. movement. D. July 6, 1853.

**Paine** (ELLIAN), LL.D., b. at Brooklyn, Conn., Jan. 21, 1757, grad. at Harvard 1781, and in 1784 became a lawyer in Vt.; member of the State constitutional convention of 1786, of the legislature 1787-91, a judge of the State supreme court 1791-95, U. S. Senator from Vt. 1795-1801, U. S. dist. judge 1801-42; was also a successful manufacturer of cloth at Northfield, Vt., and a member of many learned and benevolent societies. D. Apr. 28, 1842.

**Paine** (HALBERT E.), b. at Chardon, O., Feb. 4, 1836, grad. at Western Reserve Coll. 1845; was admitted to the bar at Cleveland 1848; removed to Milwaukee, Wis., 1857; was col. of the 4th Wis. Volunteers 1861-63; brig.-gen. Mar. 1863; participated in the defence of Wash. against Early's raid; commanded a division in the Vicksburg campaign, and lost a leg in the last assault on Pt. Hudson June 1863; was brevetted maj.-gen. Mar. 1865; was a delegate to the Phila. "Loyalist Convention" 1866; M. C. 1865-71.

**Paine** (MARTYN), M. D., LL.D., b. at Williamstown, Vt., July 8, 1794, grad. at Harvard 1813; studied med. and took his med. degree in Boston 1816; practised at Montreal 1816-22; removed to New York, where he was one of the founders of the Univ. Med. Coll. 1841, in which he subsequently held professorships. Author of a work on *the Cholera Asphyxia, Med. and Physiological Commentaries, treatises on Materia Medica, and on the Institutes of Med., The Soul and Instinct, etc.* D. Nov. 10, 1877.

**Paine** (ROBERT), D. D., b. in N. C. Nov. 12, 1799; removed to Tenn. early in this century; in 1818 joined the Tenn. conference of the M. E. Ch., and did pastoral work till 1830; became pres. of La Grange Coll., Ala., till 1846, when he became bp.; was a member of every General Conference from 1824 to 1846; chairman of the committee which reported the plan of separation on the basis of which the M. E. Ch. was divided; prominent in the Louisville convention in 1845 which organized the M. E. Ch. South, and also in the General Conference of 1846, by which he was elected bp. Wrote *Life and Times of Bp. McKendree*. D. Oct. 20, 1882.

**Paine** (ROBERT TREAT), b. in Boston Mar. 11, 1781, grad. at Harvard 1749; studied theol. and acted as chaplain in the army; subsequently studied law and admitted to the bar in 1759, settling at Taunton; in 1770 was prosecuting officer of Preston and his men for the massacre at Boston; elected to the legislature 1773; delegate to Continental Cong. 1774-78, meanwhile filling various important positions in Mass.; was one of the signers of the Dec. of Ind., atty.-gen. of Mass. 1780-90; judge of the supreme court of Mass. 1790-1804, when he resigned. With others he founded the Amer. Acad. of Mass. (1780). D. May 11, 1814.

**Paine** (ROBERT TREAT, JR.), son of the preceding, b. at Taunton, Mass., Dec. 9, 1773, grad. at Harvard 1792; became a contributor to the *Mass. Magazine*; established the *Federal Orrery* Oct. 1794; sold his newspaper the following yr.; wrote in 1798 the song *Adams and Liberty*; removed to Newburyport and commenced the study of law; delivered a *Eulogy* on Washington Jan. 1800; practised law at Boston 1802, and abandoned it 1803 to devote himself to theatrical lit. His original name was Thomas Paine, but he took that of his father by permission of the Mass. legislature in 1801. D. Nov. 13, 1811.

**Paine** (THOMAS), b. at Thetford, Eng., Jan. 29, 1737, son of a Quaker; received an indifferent education, but acquired considerable knowledge while working at his trade as a stay-maker; served a short time on board a privateer 1755; preached occasionally as a dissenting minister; obtained a post in the revenue service; became a grocer and tobacconist at Thetford and at Lewes; was chosen by the excisemen to advocate their interests, and wrote a pamphlet, *The Case of the Officers of the Excise* (1772), which probably led to his introduction to Dr. Franklin; was dismissed from his office on a charge of smuggling 1774, when, by the advice of Franklin, he went to Amer.; arrived at Phila. Dec. 1774; obtained immediate employment as ed. of the *Pa. Magazine*; pub. in Bradford's *Pa. Journal*, Oct. 1775, an article entitled *Serious Thoughts upon Slavery*; wrote, at the suggestion of Dr. Rush, his celebrated pamphlet *Common Sense*, which struck the key-note of the situation by advocating independence and a republican govt.; received from the Pa. legislature a grant of \$500 in recognition of its value; established in Dec. 1776 a periodical entitled *The Crisis*, which appeared at irregular intervals and had great influence in maintaining the spirit of the army and the people; was chosen in 1777 sec. to the committee of foreign affairs; was dismissed and censured by Cong. in 1779 for revealing diplomatic secrets; was soon afterward elected clerk to the general assembly of Pa.; rendered good service in 1780 in promoting a subscription for relieving the distress of the army; went to Fr. with Col. Laurens, whom he aided in negotiating a loan 1781; received from Cong. a grant of \$3000 (1785) and from the State of N. Y. an estate at New Rochelle as rewards for his services; went again to Fr. 1787; invented an iron bridge, which was set up the following yr. at Rotherham, Eng.; wrote in 1791-92 his *Rights of Man*, a vindication of the Fr. Revolution, which gave him immense popularity in Fr. and led to his election to the Fr. National Convention as deputy for Calais; took his seat in that body; usually acted with the Girondists; opposed the execution of the king, advocating his banishment to Amer.; was imprisoned by the faction of Robespierre, Jan. to Nov. 1794, narrowly escaping the guillotine; wrote in prison a portion of his *Age of Reason*, a deistical work; again took his seat in the Convention; resided nearly 2 yrs. in the family of James Monroe, then minister in Fr.; wrote several political letters and pamphlets; returned to the U. S. in 1802, making the voyage in an Amer. sloop-of-war; was cordially received at Wash., Phila., and New York, and was chosen ed. of the *Federalist* by Jefferson at Monticello, but insulted by the Federalists at Trenton and elsewhere; resided the remainder of his life at New York, and on his estate at New Rochelle. (See *Biographies* by W. COBBETT and G. VALE.) D. June 8, 1809.

**Painesville**, R. R. centre, cap. of Lake co., O., has a good harbor on Lake Erie, a park, and a female sem. Pop. 1870, 3728; 1880, 3841.

**Paint** [Lat. *pingere*, to "paint"] is a name which is generally limited to mixtures of insoluble colors or pigments with certain materials which prepare them for application to surfaces of wood, iron, stone, plaster, canvas, etc. by the aid of a brush. P. are used not only for purposes of decora-

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tion, but to protect surfaces from moisture and decay. All P. consist essentially of 2 parts: (1) the pigment; (2) the vehicle. The pigments are very varied in character; the whites are generally white lead, more or less adulterated with barytes, oxide of zinc, prepared chalk, etc.; the yellows are ochres, chromate of lead, etc.; the reds are red oxide of lead, ochres, oxides of iron, red oxide of copper, vermillion, dichromate of lead, carmine, carmine, madder, and other lakes, etc.; the blues are Prus. blue, ultramarine, smalt, Thénard's blue, verditer, etc.; the greens are verdigris, Paris green, verditer, borate of copper, chromate of copper, oxide of chromium, cobalt green, and green lakes, the most common being, however, a mixture of chrome yellow and Prus. blue; the browns are umber, bole, terra di Sienna, bistre, sepia, etc.; the blacks are lampblack, bone-black, anthracite, graphite, etc. (See LAKE.) The vehicles determine the character of the P.: we have oil-P. and water-colors.

**Oil Paints.**—The most common vehicle is linseed oil, especially valuable on account of its property of oxidizing to a resinous body, which holds the P. in a firm water-proof varnish. By boiling this oil with litharge and sulphate of zinc it acquires the property of drying very rapidly. For some purposes other oils, as nut and poppy oils, are substituted for linseed oil. In the preparation of oil-P. the pigment is mixed with a small quantity of raw linseed oil and ground in a mill to make the mixture homogeneous. About 8 per cent. of oil is added to white lead, 12 or 13 per cent. to zinc white. The pigment, ground in oil, is put up in convenient packages for the painter, who mixes it for use with a further quantity of raw and boiled linseed oil, and colors it to any desired shade with colored pigments, which are also furnished ground in oil. Pigment and oil alone would be so thick as to make the labor of applying the P. to any large surface almost impossible, so *thinners* are employed in preparing P. Thinners are either spirits (oil) of turpentine or benzine, the portion of petroleum having a gravity of about 0.82 B. As it is desirable that the P., after it has been applied to a surface, should dry speedily before it is contaminated by dust or rubbed off by accident, it is necessary to do something more than boil the linseed oil; a fourth class of substances is used, the *driers* or *siccatives*. Driers are sugar (acetate) of lead, sulphate of zinc, verdigris, biniodide of manganese, red lead, Japanner's gold size, etc. By far the most powerful sicative is the borate of manganese, one one-thousandth being sufficient to greatly hasten the drying of linseed oil.

**Water-Colors.**—For many purposes P. are prepared with the aid of water as a vehicle, glue or gum being added to make the pigments adhere after the evaporation of the water. Such P. can only be used for interior work, walls and ceilings, for coloring pictures, maps, etc. The most common P. of this kind is called "kalsomine," and is a mixture of prepared chalk with a solution of glue, to which ultramarine is added to neutralize a faint yellow tint for white, and ochres, etc. for other colors. Silicate of soda, soluble glass, has been suggested as a vehicle for pigments and as specially adapted for application to walls and ceilings, as it produces a very hard and durable surface. Naphthas and tars, both coal and wood, are used as vehicles for cheap P. or for P. for special purposes, as for protecting iron, ships' bottoms, etc. Poisonous pigments are also used to prevent the adhesion of barnacles and other marine animals and sea-weeds to ships' bottoms, specially copper compounds, the red oxide, etc. Artists' colors are composed of very carefully prepared pigments ground in a small quantity of very fine oil, and put up in metallic tubes.

C. F. CHANDLER.

**Painter** (GAMALIEL), b. at New Haven, Conn., May 22, 1743; erected the first house at Middlebury, Vt., 1779; served as capt. and quartermaster in the war of the Revolution; was a delegate to the convention which in 1777 declared the independence of Vt.; was representative in the Vt. legislature; member of the constitutional convention 1793, and judge of the co. court; councillor 1813-14; was the prin. founder of Middlebury Coll. D. May 21, 1819.

**Painter's Colic.** See LEAD-POISONING.

**Painter's Cream,** a mixture of mastic, lead, acetate, nut-oil, and water, applied by artists to oil-paintings to prevent them from drying during the interruptions of the work; is applied with a brush and washed off with water.

**Painting** [Lat. *pingere*, to "paint"], as a fine art, consists of drawing, invention, relief, perspective, and color (in the modern artistic sense), and history shows that its development has taken place in the above-mentioned order. *Drawing* consists not only in outline, but in the correct form of any surface expressed by the pencil or brush. It is form, as distinct from color. *Invention* is the method with which the artist disposes his figures in order to explain his meaning, to tell his story—the variety of gesture, pose, expression, drapery, and accessory. *Relief* is that management of light and shade which gives the pictured figure the appearance of standing out from its surroundings and background. *Perspective* is the application of geom. to the art in representing streets, buildings, galleries, and interiors by mathematical rules. *Color* is intimately connected with light and shade (*chiaroscuro*); for until the gradations and alterations of tone made by it are recognized, color may be ornamental, but never artistic. It consists of harmony, opposition, sentiment, and truth, and is never seen except when art has arrived at its highest state. Color is the luxury of art, and usually precedes its decadence.

The oldest examples of pictures have been found on the walls in the tombs of Thebes, on mummy-cases, and on pottery. They comprise a multitude of domestic, historic, and mythologic subjects, are spirited in action, aiming at accuracy of representation, and showing much invention in grotesque forms of animals, ornaments, and symbols. They consist of a simple outline filled in with flat tints, making a solid figure or monochrome, without lights, shades, or any

attempt at background other than the color of the substance painted upon. The pigments used are black, white, yellow, red, brown, blue, green, and also gilding. A more intellectual people was needed before P. could rise to a higher plane, but Egypt taught the first lesson. It was in Etruria that Egyptian forms were gradually improved upon. This improvement can be traced on their terra-cotta vases dating from 700 to 200 B. C., rising from the rudest shapes and designs to the most elegant and artistic. The first have simple objects, wreaths, flowers, animals, painted in a uniform color on a ground of a different tint, chiefly brown on ash color. In 600 B. C. figures are introduced, brown on cream color; a little later black, white, and crimson figures appear with incised outlines. At the date of 450 B. C. we have black figures with a red ground, the flesh of women white, also black glazed vases with figures of red, white, and blue, the colors harmonious and ornamental, though never seeking to imitate nature, except in the few attempts of representing flesh as white, and with no light and shade.

The earliest art of the Grs. was very rude; they were obliged to write at the bottom of their pictures the name of the object represented. Tradition designates Eumares the Athenian as the first who distinguished the sexes; Cimón of Cleone, who attempted foreshortening, painted the veins, muscles, and articulations of the joints, and gave to draperies their natural folds; Panæus, who painted portraits in his battle-pieces; Polygnôtus of Thasus, who observed expression and grace, making the lips smile and the draperies fly, ornamenting and arranging the hair; Apollodorus of Athens, celebrated for color, light, and shade. He was one of the great pioneers of the art, and lived about 376 B. C. Zeuxis appeared, celebrated for natural color, or close imitation of color; Parrhasius, the first who succeeded in giving his figures relief, observing manners, customs, and passions with the mind of a philos., and delineating the same in his pictures, for which he first made designs on parchment with pen and ink; Pamphilus applied perspective to painting and founded an acad.; Apelles, the Raphael of his age, seized that undefinable quality called grace; Calades preferred subjects from ordinary life rather than from hist. or fable, and painted small pictures, and Marcus Ludius was a celebrated landscape-painter. The Romans conquered pictures rather than made them. Less ideal than the Grs., they excelled in portraiture, and in their compositions expressed more movement. Their art being but a reflex of that of Gr., it could scarcely be called national. The Byzantine period came next, through which art languished, shackled by traditions to which it was unable to give life. But finally, the old civilizations being ended and a new one established, its demand for expression formed a third great era in painting, called the Renaissance.

The building of the cathedral of Pisa in 1063, and of St. Mark's at Venice, brought many Byzantine artists into It. From this beginning came the school of It. Cimabue (1240-1300) was the first to make any noticeable change in the old manner, throwing off the yoke of arbitrary forms and going to nature for his inspiration. The 3 centuries from this date are reckoned the period of the greatest artistic activity the world has known. Oil was made available for the painter's use in 1410 by John Van Eyck. Perspective was again practised about 1464, anat. was thoroughly investigated and applied to art by Da Vinci and Michael Angelo, and painting on glass reached great perfection. Every It. city had its school of P. That of Florence attained its highest perfection in Da Vinci (1445-1520) and Michael Angelo (1474-1564). The Roman school found its glory in Raphael (1483-1520). Bologna had Guido (1574-1642). Parma is known by Correggio (1494-1534). Naples, Genoa, Mantua, Cremona, and Milan all had their schools and their masters. Venice, latest in date, and consequently most perfect in the mechanical parts of the art, uniting sentiment with color in Titian (1480-1576), and Gr. appreciation of pure nature, the dignity of humanity, and the beauty of color in Paul Veronese (1530-88). The Ger. school, with Albert Dürer (1471-1528), is noted for its close adherence to nature. The Flemish school, with Rubens (1577-1640), shows great wealth of color with poverty of ideas. The Dut. school, with Rembrandt (1606-74), also shows grace and poetry of color, but lacks refinement of subject. Sp. is refined, dignified, good in color and drawing, lending to a borrowed manner an originality of treatment which gives it the right to be called a national school. Ribera (d. 1655), Zurbarán (1598-1662), Velasquez (1594-1660), and Murillo (1613-85) are its shining lights. The school of Munich of the present day takes the Rom. for its model, Düsseldorf imitates the Florentine, Antwerp the Venetian; Fr. is eclectic, and has followers of every school. [From orig. art. in *J.'s Univ. Cyc.*, by ELISA J. HALDEMAN.]

**Paisley**, town of Scot., in the co. of Renfrew, on the White Cart, 3 m. from its junction with the Clyde, consists of an old town situated on the W. bank of the river, and presenting a mean appearance, and a new town on the opposite bank, paved and well built. The abbey is the only remarkable edifice the city contains; P. is merely a manufacturing place. Of its manufactures cotton thread occupies the first place; next in importance rank the shawl manufactures and the manufactures of silk gauze. Beside these 3 chief branches of industry, others, such as cotton printings, handkerchiefs, carpets, soap, and starch, are pursued with success. Pop. 50,123.

**Palæography** [formed from the Gr. *παλαιός*, "ancient," and *γραφία*, "writing"] is the science of reading old MSS. and determining their age from circumstantial evidence in the absence of any formal authentication, the data being the materials, bark, leaves, skin, paper, etc., which have been used for writing, the character of the letters, and the whole style of writing, the form of signatures, superscriptions, etc.

**Palæologus**, the last Byzantine dynasty, ascended the throne in 1261 (Michael VIII.) and lost it in 1453 (Con-



stantine XIII.). One branch of the family held possession from 1305 to 1533 of Montferrat, an independent principality of N. It., between the terms of Piedmont, Genoa, and Milan. Another branch ruled over Morea from 1380 to 1460.

**Palaeontology** (Gr. *παλαιός*, "ancient," *ὄντα*, "beings," and *λόγος*, "a discourse"), the science that treats of fossil remains of animals and plants. More than 2000 yrs. ago the remains of marine animals imbedded in the rocks had attracted attention, and their true character had been recognized by both the Egyptian and Greek philosophers. In after times the minds of men were so darkened by ignorance and superstition that at the beginning of the 16th century, when fossil shells were observed in N. It., they were attributed to the influence of the stars, to the fermentation of a certain *materia pinguis*, or to the action of an imaginary "plastic force," and were called "the sports of nature." For 2½ centuries afterward this question of the character of fossils was discussed with great interest and no little acrimony, and the tide of public sentiment, mainly due to monkish influence, was so strongly opposed to the acceptance of the view that they were the remains of animals and plants that had once existed on the globe that the advocates of this theory were made to suffer not only obloquy, but persecution.

About the beginning of the 18th century the old superstition had been so far vanquished that fossils were generally accepted as relics of living organisms, but it is doubtful whether the opposition would not have been much longer maintained had it not been suggested that all marine fossils were the products of the Noachian deluge, and thus a confirmation of Script. This view was quite generally entertained even as late as the early part of the 19th century. During the 18th century the facts of geol. were subjects of investigation by some of the foremost intellects of the age, and the true nature of fossils having been generally recognized, they were studied with much care, both in comparison with living forms and in connection with the strata that contained them. After the first great step had been made, others followed, though still slowly, and it gradually came to be known that most of the remains found buried in the earth represented animals, or plants different from those now living, and that certain groups of fossils were associated with certain strata. Still later it was discovered that the sedimentary rocks formed a sequence which was invariable wherever observed, the different members of this sequence being identified by their relative positions and by their characteristic fossils. When a large amount of material had been collected, it was noticed that the animal and vegetable forms buried in the lowest and oldest rocks were most unlike those living on the surface of the globe; also, that the fossils contained in strata more recent than these approached nearer and still nearer to those now living. Thus it was learned that the earth in the different geological ages had not only exhibited great diversity of phys. geog., but that the aspects of nature had varied greatly, from the prevalence in each of animals and plants peculiar to itself. All this sequence of events required immense intervals of time, and the logical consequence of the acceptance of the truth in regard to fossils was the abandonment of the conventional notion universally entertained in former times, that the earth was only 6000 yrs. old, and it was seen that millions of yrs. were necessary for the accomplishment of the changes recorded on its surface. These millions are now generally conceded by all intelligent men, and the dogma of 6000 yrs., formerly insisted on with such pertinacity, is seen to be a matter of man's invention, and without authority from the Scriptures, where the chronology of creation is left untold.

In tracing the history of P. it may be said that the foundations of the science as it now exists were really laid in Paris in the first quarter of the present century, when Cuvier, Lamarck, and Brongniart took up the study respectively of fossil mammals, mollusks, and plants, and began the careful comparison of their structures, with each other and with living organisms. From the fragmental or otherwise imperfect condition of many fossils, the more obvious characters, such as were commonly used in the comparison and classification of living animals and plants, could not be appealed to, and attention was turned to their external forms and to the microscopic structure of the fragments submitted to observation. Thus, a single tooth or bone was found by Cuvier to be so characteristic of the structure to which it belonged that, as it was somewhat extravagantly said, he proved it to be possible "from a tooth or toe to reconstruct a whole lion." In this research the science of comparative anat. had its origin. Lamarck in a less degree accomplished for the Mollusca what Cuvier had done for the vertebrates, and Brongniart, by studying the nervation of leaves and the cell-structure of wood, showed that the minute anat. of plants is hardly less diagnostic of their relations than their external and more apparent characters. In order to make such comparisons intelligently, however, it became necessary to subject living forms and structures to a far more close and careful study than had before been bestowed on them. The result was not simply the discovery of characters by which extinct forms could be compared with living ones, but much light was poured on the subject of the organization and relation of living animals and plants, greatly to the advance of zoology and botany.

P. has also broadened and deepened our knowledge of the living flora and fauna by illuminating the whole subject of classification. The number of fossil species known in some depts. of nat. hist. far exceeds that of those now living, and the material for comparison is not only thus proportionately increased, but the extinct forms so frequently supply the missing links in the classification of recent species that their aid is now regarded as indispensable. We are compelled to look to P. for the origin and hist. of our living groups of animals and plants; and although by far the greater part of the organisms which have existed

on the surface of the globe have probably perished, and the great treas. of the earth holds far more material than has been taken from it, we may still say that P. has given us all we know of the hist. of life on the globe. Every day adds to the value and interest of its teaching, and we may reasonably hope that through the study of extinct forms of life we shall ultimately gain what we now lack—a clear comprehension of the system of nature. The value of P. is also manifested in another and eminently practical way. Since it has been demonstrated that certain fossils are peculiar to certain strata, that fact has been made the basis of the classification of the entire series of sedimentary rocks, and all the great groups into which the geological series has been divided are named according to the character of the remains of life they contain. Fossils are thus the criteria by which we determine the ages of strata in geological explorations and surveys, constituting accurate labels which the palaeontologist reads at sight.

The following is a brief *résumé* of the characteristic features of the life of each of the geological ages, beginning with the oldest:

**Eozoic Age.**—The life of the incalculable lapse of time represented by the immense mass of sedimentary strata which form the Laurentian and Huronian systems has been almost entirely obliterated by the metamorphism of the rocks on which its hist. was once inscribed. Only one fossil has been found in the Laurentian, and the organic nature of this has been strenuously denied. This fossil is the *Eozoön Canadense*, supposed to be a protozoan, and nearly allied to the Foraminifera. Though individual fossils have disappeared from the Eozoic rocks, conclusive evidence remains that life in great abundance prevailed during the time of their deposition. This evidence consists of (1) immense beds of limestone, which are generally conceded to be of organic origin; (2) beds of graphite, the residuary product of the distillation of vegetable tissue; (3) apatite, the phosphate of lime, an abundant constituent of the Eozoic rocks, the phosphorus of which is supposed to be derived from organic tissue; (4) numerous and extensive deposits of iron ore, in the deposition of which organic matter doubtless played an important part. The Eozoic rocks form a series of sedimentary strata estimated to have a maximum thickness of about 50,000 ft., or nearly half of the geological column, and the view is entertained by good geologists that they represent a large fraction, perhaps half, of the time covered by the geological record.

**Cambrian Age.**—The limits of the Cambrian system are as yet undefined, and it remains for geologists to decide by convention where the line shall be drawn between this and the overlying Silurian. For convenience, however, it is assumed here that the Cambrian system reaches up to the Potsdam sandstone and the "Lingula flags," and includes the greater part of the "Primordial" fauna of Barande. The type rocks of this system are the Longmynd series of Wales, the Harlech and Menevia beds of Eng., Barande's *Etages* "B" and "C" of Bohemia, Angelin's divisions A and B of Swe., the St. John's or Acadian group of Newfoundland and N. B., etc. The life of this age is represented by the remains of sea-weeds in large numbers, and animal forms belonging to all the invertebrate subkingdoms, the protozoans by sponges, the radiates by crinoids, the mollusks by gasteropods, pteropods, and brachiopods, the articulate by worms and trilobites—the latter in very large numbers, including the genera *Paradozites*, *Conocoryphe*, *Microdileus*, *Olenus*, *Agnostus*, etc. More than 200 species of trilobites have been found in the primordial beds, and some of them 2 ft. in length. These constitute the most striking feature of the fauna of the age and its highest development of life; and this may be considered the culminating period in the life of this group of crustaceans. No corals have yet been found in these oldest fossiliferous rocks, nor any traces of the highest order of mollusks, the cephalopods.

**Lower Silurian Age.**—In the classification here adopted the Lower Silurian system includes the Potsdam sandstone, the Calciferous sandrock, the Que. group, the Chazy, Bird's-eye, Black River, and Trenton limestones, and the Utica and Hudson shales. In the Brit. Islands the Lower Silurian system contains the Lingula flags, the Tremadoc and Skiddaw slates, the Llandovery and Bala beds. The rocks of this age are highly fossiliferous, and over 10,000 species of fossils have been described from them. They include numerous representatives of all the invertebrate groups, but the remains of mollusks far outnumber all others. From this fact this is sometimes called the Age of Mollusks. The remains of protozoans are also in some localities exceedingly numerous. They consist of sponges (*Brachiospongia*, *Archæocyathus*, etc.) and Foraminifera (*Receptaculites*, *Ischadites*, etc.). The *Receptaculites* were Foraminifera of gigantic size, forming disks sometimes a foot in diameter, and so numerous in the Galena limestone on the upper Miss. and the Trenton in Nev. that they constitute an important portion of the mass of the rock. The radiates are represented by crinoids, corals in considerable numbers, but generally of small size, and graptolites which are so numerous and varied as to constitute one of the most peculiar and characteristic features in the life of the age. The mollusks include an immense number of brachiopods, some pteropods (*Hyalithus*, *Conularia*, etc.), numerous gasteropods, and conchifers, and a great variety of cephalopods, some of which attained gigantic dimensions. A species of *Orthoceras*, for example, attained a diameter of 15 to 18 inches, and a length of from 20 to 30 ft. The articulate of the Lower Silurian embrace annelids, phyllopoas, eurypterids, and ostracods. The trilobites were mostly of different genera from those of the primordial fauna. They were numerous and varied, but were less important elements in this than in the preceding fauna. The annelids are represented by tracks and burrows and by the genera *Concholithes*, *Serpulites*, *Ortonia*, etc.; the phyllopoas by *Ceraticaris*, *Pelocaris*,



etc.; the ostracods, which were very abundant, by *Leperditia*, *Byrichia*, etc. The plants of the Lower Silurian were probably all marine; certain casts of stems found at Clin. and in Swe. have been described as those of terrestrial plants, but none of their tissues have been preserved, and their external forms do not prove this.

**Upper Silurian Age.**—After the deposition of the marine sediments of the Lower Silurian the sea retired, and land conditions supervened over much of the area it occupied. Later the sea returned and again covered parts of its old bed, depositing on these parts a new series of sediments that contained a new fauna, in which, however, a few of the old species remained. The Upper Silurian fauna is essentially that of the Niagara sea, which in its advent produced the Medina sandstone, with its beach-inhabiting *Lingula cuneata*, the sea-weed *Arturophyus Hallii*, etc., and in its sojourn spread the great calcareous sheet of Niagara and Clinton limestones over most of its bed. In the subsequent shallowing and withdrawal of this sea the Salina group was formed in an isolated evaporating basin, and by a temporary return of deeper water the earthy limestones of the Helderberg group were deposited. In Amer. no traces of vertebrate life have yet been found in the rocks of this age, but in the Old World fishes inhabited the Upper Silurian sea during the later epochs of its existence. As a whole, the Upper Silurian fauna may be regarded, zoologically, as a continuation of that of the Lower Silurian, as it is composed of the same great groups. The protozoans are represented in it by sponges and rhizopods. Among them are the genera *Asterospongia*, *Astyplospongia*, and *Receptaculites*. Corals are far more numerous than in the sediments of the Lower Silurian ocean. Crinoids are abundant and form a large number of genera, of which the most characteristic are *Ichthyocrinus* and *Caryocrinus*. Star-fishes (*Palaaster*, etc.), as in the Lower Silurian, were not uncommon. Among the mollusks all the different orders, except the Tunicata, are well represented. Among the articulate trilobites were numerous, and included some of the most interesting and highly organized species known, belonging to the genera *Lichas*, *Homalonotus*, *Calymene*, *Dalmanites*, and *Ilænus*. The bivalve crustaceans were exceedingly abundant in the land-locked basins of the Salina and Helderberg epochs. The phyllo-pods had striking representatives in species of *Ceratiocaris*, but the most remarkable crustaceans of the Upper Silurian were the Eurypterida (*Eurypterus*, *Pterygotus*, *Stimonia*, *Stylonurus*, etc.), and they formed the summit of the life-series of this age in Amer. The most conspicuous additions made to the life of the globe in this age were land-plants (lycopods) and fishes (small bucklered placoderms), which came upon the stage in Europe during the last epoch. No clew has yet been obtained to the origin of these groups.

**Devonian Age.**—The Devonian rocks exhibit the same general arrangement—i. e. a circle of deposition—as the formations below; in Amer. the Oriskany sandstone and Canda-gallit forming the mechanical base, the Corniferous and Onondaga limestones the organic centre, and the Hamilton, Genesee, and Portage shales, generally carbonaceous, its mixed summit. We thus have proof that the series was formed by the third submergence of portions of the land, similar in kind and effects to those which had preceded it. The life of the incoming sea of this age was in some respects very different from that of the preceding ages, inasmuch as this sea was populated with great numbers of fishes. (See Fossil Fishes.) Of the origin of this fish-fauna we as yet know absolutely nothing, as no connecting links have been found between the vertebrates and the invertebrates. The bucklered fishes of the Devonian are not unlike, in general aspect, some of the crustaceans which formed the preceding dynasty, but in structure they are as widely separated from them as are the fishes from the crustaceans of the present day. The other forms of marine life of the Devonian were exceedingly numerous. The protozoans were represented by sponges. Corals abounded, and in some instances formed reefs which rival those of the present day in extent and the variety of forms they included. Crinoids were abundant, and large masses of rock are chiefly composed of their debris. Mollusks were represented by all the living orders, except the Tunicata. The fishes of the Devonian include scaled and plated ganoids and elasmobranchs, the latter, however, far inferior in size and numbers to the former, which ruled the seas and formed the highest development of animal life. The continents of the Devonian age, for the first time in the hist. of the world, were covered with land-plants. These were mostly acrogens (ferns, lycopods, and equiseta), among which were tree-ferns which equalled, if they did not exceed, in size any of those now living. Conifers seem to have occupied the higher portions of the land, and to have formed several genera which belong to the family of the Araucarians. Sea-weeds grew along the shores of the Devonian oceans, and in the period of the shallowing and retreating of the water they flourished in unprecedented variety and luxuriance, as their decomposing tissues seem to have supplied the carbonaceous matter with which the shales of the Upper Devonian are impregnated.

**Carboniferous Age.**—The Devonian sea deposited the Hamilton and Huron shales in the last period of its existence, when it was already narrow and shallow. Subsequently it was withdrawn from its old bed, and then ensued a change of its level which caused it to spread over the previously deposited sediments a broad sheet of mechanical materials, now known by the name of the Portage sandstones and the Chemung, Catskill, and Waverly groups. All this mass of mechanical sediment was finally overthrown by the ocean in a submergence that was (on this continent) more extensive than either of those which have been described. In this invading sea the Carboniferous limestone was deposited. This is made up of the remains of a new fauna, so entirely distinct from that which preceded it that only a single species (*Strophomena rhomboidalis*) is known to have been

an inhab. both of the Devonian and Carboniferous oceans. The Carboniferous age, as is well known, takes its name from the beds of coal contained in the strata then formed. The life of this age included far more terrestrial forms of animals and plants than that of the preceding periods. The chief additions are, in the beginning of the age, amphibians, and in its last epoch true reptiles. The sea of the Carboniferous age abounded in fishes, both ganoids and elasmobranchs, the latter far more powerful in size and numbers than they were in the Devonian sea, while the ganoids were for the most part driven from the open ocean and confined to shores, rivers, and lakes. The invertebrate life of the Carboniferous sea was as varied as before, but in many respects different. The protozoans have left comparatively few distinct forms, but one genus (*Fusulina*) was so abundant that thick and widespread strata of limestone are composed almost entirely of its shells. Crinoids were exceedingly numerous, and this was the golden age of the group. True echinoids made their first appearance in the genus *Archæocidaris*. Corals are comparatively few and small in the Carboniferous rocks. Polyzoa were, however, very numerous, and constituted many genera, of which *Leptopora Archimedes* is the most characteristic. The brachiopods were already declining, but 2 families introduced in the Devonian become conspicuous elements in the molluscan fauna—*Productus* and *Chonetes*. The pteropods were chiefly represented by *Conularia*, of which there were many species. The gasteropods of the Carboniferous form a great number of genera, among which may be mentioned *Bellerophon*, *Pleurotomaria*, *Eumphalus* and *Macrochelis* as the most characteristic. Of the cephalopods, *Nautilus* and *Goniatites* are the most abundant, this being the culminating period in the life of both these genera. The conchifers show a considerable advance in numbers over those of the lower systems. For the most part they belong to the genera *Allosina*, *Aviculopœtes*, *Sanguinolites*, and *Myalina*. Perhaps the most striking additions to the molluscan fauna are the land-shells *Pupa* and *Conulus*. The crustaceans were comparatively few and small, but include higher forms than the older fauna. Among them we find *Bellinurus* and *Prestwichia*, related to *Limulus*, and *Anthracopalemon* and *Gamposys*, the forerunners of our shrimps and lobsters. In the coal-measures myriapods and insects of several orders have been found. The fishes were ganoids, sharks, and rays, all in large numbers. Amphibians have left their remains mostly in the sediments of the lagoons of the coal-marshes. Traces of something like 80 genera and 60 species have been found in rocks of this age. True reptiles seem also to have been in existence during the coal-measure epoch, the vertebræ of an *Enaliosaur* having been found by Prof. Marsh in the coal-strata of N. S. The plants of the Carboniferous age included algae, lycopods, ferns, equiseta, and conifers. No mosses, lichens, liverworts, grasses, palms, or angiosperms have left any traces of their existence. Cycads grew in the coal-measures, but were apparently small. These, with a few monocotyledonous flowering plants, were prophetic of the flora of the succeeding age. The life of the Permian was simply a continuation of that of the Carboniferous.

**Triassic Age.**—The Triassic is the first of the Mesozoic ages; it ushers in a new era in the world's hist., and one separated from the preceding by a more distinctly marked hiatus than appears elsewhere in the series. The Amer. representatives of the Trias are chiefly terrestrial, shore and shallow-water deposits containing little limestone, and therefore affording an imperfect record of the marine life. In some parts of the Old World the Trias constitutes a typical circle of deposition of which the base is the Bunter-sandstein, the calcareous marine centre, the Muschelkalk, and the mixed Keuper above. The fauna and flora of the Trias include many new and striking forms, which must have given a peculiar aspect to nature in that age. The vegetation was chiefly gymnospermous, the cycads predominating, conifers also being numerous. Endogenous plants likewise began to make their appearance in considerable numbers, and in the beautiful forms of *Yucca* and *Pandanus*. We find in the Trias tracks of the first known mammals, the little marsupials *Microlestes* and *Dromatherium*. By far the most conspicuous feature in the fauna was, however, formed by the great development of the Amphibia, of which this seems to have been the golden age. Amphibians were then the ruling dynasty, and they included in their number many which in size and prowess would compare with the most formidable reptiles now living. True reptiles were also numerous in the Triassic age, and we have here the introduction to the "Reign of Reptiles," which was the characteristic feature of the life of Mesozoic times. Although numerous skeletons of reptiles and amphibians have been found in rocks of this age, by far the most impressive traces they have left are the tracks which the shore-inhabiting species made on the beaches washed by the waves of the Triassic sea. These impressions are found in great numbers in the Conn. Valley, N. J., and Kan. They were formerly called bird-tracks, but are now believed to be rather the tracks of amphibians and reptiles, and by their variety and abundance are significant of the richness of the fauna of which they constitute almost the sole record. Another peculiar group of Triassic reptiles were the *Anomodontia*, chiefly found in S. Afr., some of which had heads like turtles, but most were provided with huge canine teeth. The invertebrate life of the Trias is very imperfectly represented. In the Muschelkalk, however, and the Rhaetic beds—which latter form the summit of the formation—a large number of radiates and mollusks have been discovered. These show a peculiar mingling of Palæozoic and more recent types. For example, in mollusks the genera *Orthoceras* and *Goniatites*, so abundant below, disappear altogether, and are succeeded, first by the more complex *Ceratites*, and in the Upper Trias by the genus *Ammonites*, so much expanded in the Jura and Chalk. Fishes have



left numerous remains in the Triassic rocks, and these show that only ganoids and elasmobranchs were living in that age. Most of the fishes are small, and were the inhabs. of bays, lakes, and rivers. They include *Ceratodus* and the peculiarly Triassic forms *Catopterus*, *Ichtyperus*, etc.

**Jurassic Age.**—The most marked feature in the life of the Jurassic is formed by the development of reptilian life, and this is the culminating period of the great reptilian age. The vegetation consisted mainly of cycads, conifers, and ferns. The cycads here attain their greatest development, and must have given a peculiar aspect to the scenery of the age. The Protozoa are represented by sponges and foraminifera, both of which groups have left a large number of representatives in the fossil state. Corals were numerous, but no portion of the Jurassic seabed yet exposed to our view exhibits any traces of coral-reefs, and most of the forms preserved are small. The echinoderms were exceedingly abundant, and *Pentacrinus* must have covered portions of the sea-bottom with a thicket-like growth of stems and branching arms. The echinoids proper were in this age far more numerous than before, and many beautiful species have been collected belonging to the genera *Hemicidaris*, *Diaster*, *Diodema*, etc. Star-fishes and ophiurans were also common, and all this group of radiate forms is far better represented here than in the rocks of the preceding ages. Among the mollusks, bryozoans are rare, and the same may be said of pteropods. Brachiopods were not uncommon, but were far less numerous and varied than in the earlier seas. The Paleozoic genera *Leptæna* and *Spirifer* disappeared in the Jurassic age, and the most abundant brachiopods were *Rhynchonella* and *Terebratula*. The conifers exhibit great expansion in the long list of genera and species which inhabited the Jurassic ocean. Among them the oysters, with their associates, *Gryphaea* and *Eoogyra*, are notable additions to the older molluscan fauna. The same may be said of *Trigonia*, *Lima*, *Pholadomya*, and *Diceras*. The Gasteropoda of the Jurassic are numerous and varied, and they have much the aspect of those of the present day. A large number of genera which are now living make their first appearance in the Jurassic rocks, such as *Nerita*, *Turritella*, *Pteroceras*, *Buccinum*, *Fusus*, *Murex*, etc. The Cephalopoda have left an immense number of species in the sediments of the Jurassic seas. They are represented by several species of the genus *Nautilus*, which has run almost unchanged through the geological ages to the present day; and, far more numerous than the *Nautilus*, the *Ammonites*, which form a group which must have given a peculiar character to the molluscan fauna of the age. The dibranchiate cephalopods were represented by the Belemnitidae, a family which began in the latter part of the Triassic age and ended in the Cretaceous, but which had its maximum development in Belemnites, one of the most characteristic features in the Jurassic fauna. In this system we first find unmistakable fresh-water deposits—the Purbeck beds. These contain numerous mollusks, such as *Cyrena*, *Limæa*, and *Viviparus*, which have continued to inhabit fresh-water lakes and streams, with little change of form, to the present day. Whether birds existed in the Triassic age is still an open question, but that they lived in the age of the Jura is proved beyond a doubt, not only by single feathers, but by the discovery of *Archæopteryx* in the Solenhofen slates. This bird, however, differed considerably from the birds of the present day in this, that the vertebral column was prolonged into a tail of considerable length. In this and some other features the *Archæopteryx* seems to be a kind of connecting link between birds and reptiles. The mammals of the Jurassic age, though somewhat numerous, were small, and held a completely subordinate place in the fauna. Reptilian life then seems to have expanded in every direction, for there were swimming, walking and flying reptiles, and their huge dimensions and formidable armaments serve as central and hideous figures in the pictures which the imagination paints of the age. Of the Jurassic marine lizards, the *Ichthyosaurus* and *Plesiosaurus* are best known, though the remains of many others have been found. Another great group, that of the *Dinosauria*, inhabited the land, and surpassed in dimensions our largest pachyderms. Some of these were carnivorous (*Megalosaurus*), while others were vegetable feeders (*Iguanodon*, *Atlantosaurus*, etc.), the latter found in Col., and the largest of known animals. The *Pterosauria* (winged lizards) form several genera (*Pterodactylus*, *Rhamphorhynchus*, etc.), and some of them exceeded our largest birds in size. The fishes of the Jurassic were all ganoids and elasmobranchs, the latter chiefly represented by hyodont sharks, of which the defensive fin-spines and pointed teeth are met with. Most of the ganoids had rhomboidal scales, and were but slightly heterocercal.

**Cretaceous Age.**—In most respects the life of the Cretaceous age is but a continuation of that of the Jurassic; but some very important additions were made to pre-existing forms. Reptilian life seems to have been scarcely less abundant in the Cretaceous than in the Jurassic age. The cephalopods that were so numerous in the Jurassic seas were still further multiplied and varied, until they became a more striking feature of molluscan life than in the preceding age. We have to record the advent in the Cretaceous age of the highest order of plants, the angiosperms, and of fishes, the teleosts—which rapidly superseded, one the cycadaceous flora, and the other the ganoid fauna of the preceding age. The Chalk itself is mainly composed of the remains of Foraminifera, which seem to have been especially abundant in this age. Though mostly microscopic in size, their shells form almost the entire mass of strata several hundred feet in thickness. Sponges are also numerous in the Cretaceous; scarcely any but the calcareous and silicious species have been preserved, but these were much more abundant than in the present seas. Molluscan life in the Cretaceous age approached still more closely to that of the present day than did that of the Jurassic, and a large

part of the genera which left their remains in the Chalk are represented, though by different species, in the present seas. Radiates were abundant, and among the Cretaceous species we find nearly all the groups now living, with some that have passed away. Reef-building corals seem not to have existed in any of the Cretaceous seas the sediments of which have been examined, though the smaller forms are quite numerous. The echinoderms were represented by few crinoids as compared with preceding ages, but more than are now living. Of the higher members of the group, the echinoids and asteroids, the number was large, and in character they closely resembled those of the Jurassic. We know little of the articulate of the Cretaceous, except the marine crustaceans. They are more highly organized than those of the preceding ages, and they include representatives of both our lobsters and crabs. The teleost fishes, which began in the Cretaceous, seem to show no evidence of derivation from previously existing forms, and they included at least one genus, *Beryx*, which is now living in the Atlantic. *Gemmeroides* is another well-known Cretaceous genus, supposed to be allied to the salmon, and to represent the highest group of the teleosts. The change in the vegetation of the earth which took place in the Cretaceous age gave some signs of its approach in the first-formed strata of the system, where a few angiospermous leaves are found mingled with a vastly preponderating number of acroporous and monocotyledonous plants. By the middle of the Cretaceous age the angiosperms had spread over the European and Amer. continents, and vegetation had assumed the gen. aspects which it has at the present day.

**Tertiary Age.**—The rocks of this age are in some places several thousand feet in thickness. They were divided by Lyell into 3 groups, the lowest of which he called the Eocene, the middle Miocene, and the uppermost the Pliocene. In many parts of the world the Tertiary strata are of fresh-water origin, and hold the remains of a much larger number of land animals and plants than are to be found in the older formations. The gen. character of the life of the Tertiary is expressed by designating this as "the Reign of Angiosperms and Mammals." Even in the Eocene rocks the remains of mammals abound, and these indicate such size and variety as to prove that the group of huge reptiles which dominated the world in Mesozoic times had, even thus early, given place to a mammalian dynasty that had become the rulers of the animal kingdom. The first knowledge of the mammalian fauna of the Eocene was gained through the discoveries of Cuvier, made in the gypsum-quarries of Montmartre, near Paris, where the skeletons of *Palæotherium*, *Anoplotherium*, and some other tapirid animals were found. Since then great additions have been made to the known fauna of the Eocene by explorations in W. Amer., where, in the sediments of anc. lakes, there have been found and described by Leidy, Marsh, and Cope the remains of perhaps 200 distinct species. These include many large animals allied to the rhinoceros, but attaining nearly the size of the elephant, and provided with several pairs of horns and 2 huge canine tusks in the upper jaw—the *Dinocera* of Marsh, and the most striking feature in the life of the first epoch of the age of mammals. The marine life of the Tertiary was, like the terrestrial, very different from that of the Cretaceous, which indicates the lapse of vast periods of time between the deposits of the 2 systems. Among the marine vertebrates the most striking are *Zeuglodon*, a peculiar cetacean which attained a length of 70 ft., and inhabited the Atlantic and Gulf waters; *Carcharodon*, a shark of nearly equal size; and a manatee (*Squalodon*). The smaller fishes of the Eocene are chiefly teleosts, which had now almost completely supplanted the ganoids. The remains of rays, sword-fishes, and saw-fishes are not uncommon in the Tertiary marls of N. J. and S. C. The reptiles include snakes (which here make their first appearance), turtles, and crocodiles, the latter being abundant. Among the invertebrates, the most conspicuous features are as follows: the Protozoa are chiefly represented by Foraminifera, of which some existed in great numbers and attained relatively large size. Among these may be mentioned *Nummulites* and *Orbitoides*, which had discoid shells, sometimes an inch in diameter, and made up almost mt.-masses of limestone. Corals are not numerous, and those found are closely allied to living forms. In the mollusks we find a great change from the fauna of the Cretaceous. All the family of the Ammonitidae, which filled the Cretaceous sea, had disappeared from the world before the deposit of the Eocene strata. The dibranchiate Belemnites also left no representative whatever in Tertiary rocks. *Nautilus* held on the even tenor of its way, as throughout the preceding ages. The gasteropods and conifers are more numerous and varied than in any previous age, and many of the former were well represented in the first Tertiary sea. The fresh-water mollusks of the Tertiary, like those of the Wealden and Purbeck, have a most remarkable resemblance to those now living. The vegetation of the Eocene of Europe is sub-tropical in character, including forms that now flourish in the E. I. and Australia. At this time the great chains of the Pyrenees, Alps, Carpathians, etc. were not raised, and the S. coast of Europe was probably washed by a tropical sea. In Amer. the Eocene flora was much more like that of the present day, but the abundance and variety of palms give it a sub-tropical character.

The life of the Miocene and Pliocene epochs shows an increase in the number and elevation of the rank of mammals and the culmination of the mammalian age. The elephant, mastodon, and camel, with a large number of extinct herbivores, and carnivores allied to our lions, hyenas, wolves, bears, and ferrets, go to make up a fauna far richer than any now existing upon the globe. In addition to the orders obtained from the Eocene, we here meet with edentates, proboscideans, and true monkeys. The Tertiary horses, which are numerous, had 4 toes in the Eocene, 3 useful toes



in the Miocene, and 1 useful and 2 dwarfed toes in the Pliocene, showing a gradual transition to the present horse, in which the lateral toes are obsolete. (See Henss.) The vegetation of the Miocene was in many respects similar to that of the present day, and included a number of species now living. The climate of the N. hemisphere was in the Tertiary mild, and a luxuriant vegetation covered all N. Amer. to the Arctic Sea. At this time there must have been a land-connection between this continent and Europe on the E. and Asia on the W., as the Amer. Tertiary flora is found in the Miocene deposits of Europe, and is now living in Chi. and Japan. From Europe the flora was apparently exterminated by the Ice period; while, having space for a southward retreat, it survived in Amer. and E. Asia.

**Glacial Period.**—Immediately following the Tertiary, with its immensely developed mammalian life and a rich vegetation which reached almost to the poles, came a period of great cold, when the present climate of Greenland descended on the Amer. continent as low as New York, and all the N. half of the continent was covered with ice or snow. By this great revolution of climate a large part of pre-existent animals and plants was destroyed. The life-history of this period of the world is exceedingly meagre. In the alluvial deposits and caves of Europe, and in some of the interglacial peat-beds of both Amer. and Europe, mere glimpses of it are obtained. We there find the evidence of the existence of elephants and rhinoceroses, provided with thick wool and hair to protect them from the severity of the climate, and of the presence in low lats. of the musk-ox and reindeer, now the inhabs. of the Arctic regions. The giant beaver (*Castroidea*), the mastodon, elephant, and rhinoceros, which were then associates with the musk-ox and reindeer, have now entirely disappeared. With the amelioration of the climate and the retreating of the glaciers northward the larger mammals referred to extended their migrations to the Arctic seas, where their remains are now found in great quantities. By what influences they were exterminated we are as yet unable to say. Contemporary with the animals last mentioned was man, who made his advent in Europe probably immediately after the culmination of the Ice period. Whence he came and what was his origin are not yet taught by Paleontology.

J. S. NEWBERRY.

**Paleosaurus** [Gr. παλαιός, "ancient," and σαῦρος, "lizard"], a genus of fossil thecodont lizards having affinities with the crocodiles and the dinosaurs. Their bones are found in the Permian strata of Europe.

**Palaephatus** [Παλαεφατος], a grammarian of Athens or of Egypt, was the author of a variety of works treating mostly of the current myths—e. g. *Αἰγυπτιακὴ Θεολογία*, *Μυθικὰ Βιβλίον*, and, most celebrated, *Τρωικά*, which are all lost. There is extant a treatise, *Περὶ Ἀπίστων Ἱστοριῶν* (*Concerning Incredible Tales*), usually ascribed to this P., though both it and the *Τρωικά* are sometimes assigned to another of the name.

**Palatinate, The** [Ger. *Pfalz*], formerly a political division and independent state of Ger., consisted of 2 separate terrs., the Upper P., now forming the N. part of the kingdom of Bavaria, and the Lower P., now forming the S. part of Rhenish Prus., the N. part of the grand duchy of Baden, and the prov. of Bavaria, called Rhenish Bavaria. From the 11th century these 2 terrs. belonged together and formed an hereditary monarchy, their ruler being one of the electors of the Ger. empire. But in 1648, by the treaty of Westphalia, they were separated.

**Palatine** [from the Lat. *palatium*, a "palace"]. In mediæval Fr. and Ger. there were counts palatine attached to the court and palace of the sovereign for the purpose of assisting the latter in his judicial duties. Later, in these and in other countries, counts P. were detached from the court and placed in charge of remote or turbulent provs., where they maintained a court and palace in the sovereign's name. This was the origin of the counties P. Lancaster and Chester, in Eng., as formerly Durham, Hexham, and Pembroke, are counties P. King John divided Ire. into 12 counties P. Scot. had anciently a county P. of Strathern.

**Palatine Hill** (*Mons Palatinus*), one of the most important of the 7 hills of anc. Rome, was the site of *Roma Quadrata*, the original city. It was the official abode of the emps., and in mediæval times of the highest dignitaries.

**Palatka**, Fla. See APPENDIX.

**Paleolithic, Lacustrine Villages, or Lake Dwellings.** In many parts of the world, as in the E. I. Archipelago, we find races of men living partially in dwellings built upon piles over water, and Herodotus describes this custom as prevailing among certain anc. tribes. A new interest has of late yrs. been given to this mode of constructing habitations from the discovery in Switz. of the remains of villages that had been thus built by a people or peoples belonging to a period anterior to authentic hist. Some of them belong to the later Stone Age, or Neolithic Period, others to the Bronze Age, while the latest bring us down to the introduction of the Iron Age. In the Stone Age we are impressed with the labor and ingenuity displayed in the building of these pile-villages by men whose most effective tools were chipped flints and other stones. As the Stone Age gradually gave place to the Bronze, and metal was introduced, we have, from the very composition of the metal, evidence of a growth of commerce. The inhabs. of both periods fed upon the flesh of the urus, of the aurochs, the elk, and of other animals long extinct in Switz., and with these are found the remains of the beaver, the ibex, and the bear, almost exterminated, as well as those of the fox, the sheep, and numerous other still abundant forms; but the mammoth, the rhinoceros, the reindeer, etc., which were the associates of Paleolithic man, are quite unrepresented. The Bronze Age carries us back from 3000 to 4000 yrs., and that of the Stone Age to from 6000 to 7000 yrs.

**Palembang**, a Dut. possession on the E. coast of Sumatra, comprises an area of 61,911 sq. m., with 573,697 inhabs. The coast-land is low, marshy, overgrown with jungles,

and extremely hot, but it is not unhealthy except in the immediate neighborhood of the swamps. The inland is higher, and covered with rice-fields, with plantations of sugar, cotton, pepper, and tobacco, and with immense forests of gum and cocoa-nut trees. Coal and oil-springs are found, also gold dust, iron ore, sulphur, and arsenic. The tiger, leopard, panther, elephant, and rhinoceros haunt the country. The cap. is Palembang, where the Dut. gov. resides. It is built on both sides of the Moosee, a broad and deep river, which forms a fine harbor. The city has upward of 40,000 inhabs. and carries on a very active trade both with the inland and with Java, Chi., and Siam.

**Paleramo** (anc. *Panormus*), city of Sic., situated on the N. coast, in lat. 38° 6' 44" N., lon. 13° 20' E. It lies on a beautiful bay formed by a spacious inland sweep of the sea. This enchanting bay has received the name of the Conca d'Oro, the Golden Shell. The city walls form a square, the 4 angles corresponding very nearly to the 4 cardinal points of the compass. The harbor lies to the N. of the town, and is sheltered by a huge mole. The Orto flows into the sea near the E. angle. Two fine streets, the Macqueda or Strada Nuova, and the Vittorio Emanuele, formerly Toledo, intersect each other at right angles near the centre of the city, thus dividing it into 4 sections. Most of the other streets are narrow, crooked, and in bad condition. The favorite promenade is the beautiful Marina, running along the shore on the line of the old fortifications. The chs. of Palermo (about 300) are, many of them, very sumptuous. The cathedral, built in the 12th century, is highly interesting; San Domenico is the largest ch. in the city; the Olivella is the most gorgeous ch. of P.; the Della Catena has a remarkably fine portico; San Giovanni was built by King Roger; the Compagnio del Rosario contains admirable pictures; beside these, there are many other very noteworthy chs. The royal palace is in part the work of the Arabs, but it was transformed by the Normans. The Palazzo de' Tribunali is very old, having been rebuilt in 1307; the Palazzo della Città was begun in 1300 by a king of the Aragonese line. Some of the private edifices are remarkable for their antiquity, others for their arch. P. contains a univ. with about 600 students, several public libraries, and various literary and scientific associations, also hospitals and other charitable organizations. The environs of P. abound in objects of interest—the great cathedral of Monreale, the Castello della Zisa, the Castello della Cuba, Monte Pellegrino, in which is the grotto of Santa Rosalia, the patroness of the city; and, beside these, numerous other noticeable castles and villas. P. is first known in hist. as a Carthaginian dependency. During the Punic wars it fell into the hands of the Roms, and became a great naval station. In the 5th century A. D. it was taken by the Vandals, and was ceded by them to the Goths, who were driven out by Belisarius. The rule of Byzantium was terminated by the Saracens (830), under whom it became a splendid Arab town. In 1071 the Normans, under Count Roger, took P. Charles of Anjou removed his court to Naples (1269), since which time P. has never been a permanent royal residence. From 1830 the revolutionary failures of Naples were repeated in P. until the landing of Garibaldi at Marsala (1860) caused an uprising here, and by an enthusiastic *plebiscite* P. became a part of the kingdom of It. Pop. 244,991. [From orig. art. in *J.'s Univ. Cyc.*, by CAROLINE C. MARSH.]

**Palestine** [Heb. פלשתינה, *Peleseth*, "land of wanderers,"

from which came *Παλαιστίνη*], a name designating originally only the country of the Philistines, but in the later Gr. and Rom. period applied to the whole country of the Israelites on both sides of the Jordan. Josephus (d. 97 + A. D.) uses the name in both of these senses. Its boundaries cannot be determined exactly. Approximately, they were as follows: On the W. the Mediterranean; on the N. a line beginning near the *Promontorium Album*, S. of Tyre, in lat. 33° 10', trending northward till, near the S. base of Hermon, it strikes lat. 33° 16', and then runs straight on to the desert; on the E. the Ar. desert, and on the S. the parallel of lat. 31°, a little S. of Beersheba (31° 16'), curving to take in Kadesh. The length of this terr. is about 150 m., its average breadth W. of the Jordan more than 40, and E. of the Jordan about 40 m.—The country is made up of 4 long parallel strips of terr., lowland and highland alternating.—Of the 4 lakes of P., the northernmost is Philala, 5 m. E. of Banias, nearly round, about 1 m. in diameter, and of unknown depth, occupying apparently the crater of an extinct volcano. Merom (now *Huleh*), 10 m. S. of Banias, in the midst of an extensive papyrus marsh, from 100 to 150 ft. above the sea, is a triangular lake, with its apex pointing southward, about 5 m. long, nearly 4 m. across at its base, and 15 ft. deep. Ten m. farther down is Gennesaret, 12½ m. in length, 6¼ in its greatest breadth (at Magdala), 165 ft. deep, and 633 ft. below the level of the Mediterranean. The Dead Sea, some 65 m. farther S., is 40 m. long, nearly 10 m. broad, more than 1300 ft. below the level of the Mediterranean, and more than 1300 ft. deep. No fish live in it.—Of rivers, the only one of much importance is the Jordan, which has no considerable tributaries emptying into it from the W., and only 2, the Hieromax (now *Yarmuk*) and the Jabbok (now *Nahr ez-Zerka*), from the E. Most of the so called rivers of P. are merely winter torrents, which run dry in summer.—The fountains of P. are one of its most characteristic features. Robinson enumerates 30 in a circuit of 8 or 10 m. around Jerusalem.—The geol. of the country has been studied by Seetzen (in 1805), by Poole (in 1836), by Russegger (in 1836-38), by Anderson (in 1848), by Lartet (in 1864), and others, but not exhaustively.—The climate, on the whole, is mild. There are only 2 seasons, summer and winter, the former, from Apr. to Nov., rainless or nearly so; the latter, from Nov. to Apr., rainy. P. was once very fertile, and might be so again. The products of the soil still range from peas, beans, wheat, and barley to grapes, figs, olives, apricots, lemons, oranges, and dates.—The botany of P., unlike



that of Egypt, is richly varied. Not less than a thousand species of plants have been reported, and probably another thousand might be added. Of shrubs, the most abundant and most beautiful is the oleander. The whole country was once well timbered, and still there are groves, and even forests, of pine and oak beyond the Jordan. But on the W. side of the river, from Beersheba all the way up to Leb-  
—The wild animals of the country are much the same as in anc. times, except that the lion has disappeared. Of domesticated animals, the horse is less used than the ass, the mule, and the camel. Sheep and goats are abundant, but swine are scarcely ever seen. The dogs are nearly all of one breed (the shepherd), and are outcasts and scavengers. Fish still abound in the Lake of Galilee, but the natives employ rude methods in taking them, and very little has yet been done toward ascertaining the number of species. There are many species of reptiles, not a fourth part of which have yet been described.

The immediate predecessors of the Hebs. in P. were descended from Canaan, the 4th son of Ham. But they were preceded by a pre-historic pop., supposed to have been Semitic. The Heb. commonwealth reached the summit of its prosperity and power under David and Solomon. Visible decay began (about 975 B. C.) with the secession of the 10 tribes. Assyria crushed the N. kingdom of Israel about 720 B. C., and Babylon crushed the S. kingdom of Judah about 587 B. C. Since then the country has been under foreign domination, with hardly more than the shadow of independence at any time. In 1517 the Ottomans came in, and made the country a part of the Tur. empire. As no census is ever taken, the pop. of P. cannot be exactly determined, but is supposed to be well on toward 400,000, which is less than a tenth of what it probably was in the time of Solomon. Of this number only about 18,000 are Jews. The little remnant of the Samaritans at Nablus numbers only about 150. The bulk of the inhabs. are a mixed race, descendants of the anc. Syrians and their Arab conquerors.

Pilgrimages to the Holy Land began with Helena, the mother of Constantine, in 326, and have continued ever since. It is only within a comparatively recent period that the true critical method has been pursued. Seetzen was there from 1805 to 1807, Burckhardt in 1810, Irby and Mangles in 1817-18. But no one man has ever done so much for the geog. of the Holy Land as Dr. Edward Robinson. Next in rank with respect to the amount and quality of service rendered is Dr. William M. Thomson of Beyroot, for more than 40 yrs. an Amer. missionary in Syria and the Holy Land, whose book appeared in 1858. In 1848 the lower Jordan and the Dead Sea were for the first time thoroughly explored and surveyed by Lieut. Lynch of the U. S. N. In 1859 Johann Gottfried Wetzstein, Prus. consul at Damascus, explored the N. section of the country E. of the Jordan. In 1866 the marsh and lake of Huleh and the upper Jordan were explored by John Macgregor of Scot., and in the same yr. the Lake of Galilee was accurately surveyed by Capt. Wilson of the Eng. Royal Engineers. In 1865 the Eng. "Palestine Exploration Fund" was organized, and in 1870 the Amer. "Palestine Exploration Society." The survey of W. P. was completed in 1873; the survey of E. P. is now (1882) in progress.

The lit. of the subject is of immense extent. Tobler, in his *Bibliotheca Geographica Palestinae* (1867), enumerates more than 1000 writers in this dept. of study. R. D. HIRNCOCK.

**Palestine**, R. R. centre and cap. of Anderson co., Tex. Pop. 1880, 2997.

**Palestrina** (anc. *Præneste*), town of It., prov. of Rome, on the site of an anc. and powerful city of Latium. This town, 18 m. N. E. of Albano, 22 m. E. S. E. of Rome, is situated on a spur of the Apennines, about 1600 ft. above the sea. It covers only a portion of old Præneste, whose strong citadel crowned the height now occupied by the mediaeval castle San Pietro. The church of San Rosalia is richly adorned with marbles and alabaster. The Palazzo Barberini was erected in the 15th century. The old walls of P. are an admirable study for the antiquary, as portions of the earliest cyclopean, the later polygonal, the Rom. square tufa block, and the brick constructions are all still existing. Traces of the Saracens, too, are not wanting. The modern town is in itself of no interest except as the seat of one of the 6 suburban bishoprics. Pop. 6015.

**Palcy** (WILLIAM), D. D., b. at Peterborough, Eng., July 1743, grad. at Christ's Coll., Cambridge, where he became a tutor and lecturer on moral philos. and divinity; took orders in the Ch. of Eng.; rector of Musgrove 1775; archdeacon of Carlisle 1782; wrote *Principles of Moral and Political Economy*, *View of the Evidences of Christianity*, and *Natural Theol.* D. May 25, 1805.

**Palfrey** (JOHN GORDHAM), D. D., LL.D., b. in Boston, Mass., May 2, 1796; studied theology; succeeded Edward Everett as minister of Brattle Square ch. in Boston 1818; succeeded Andrews Norton as prof. of sacred lit. in the Cambridge Divinity School 1831; retired in 1839. From 1844-47 was sec. of state in Mass. In 1847 represented the anti-slavery Whigs in Cong.; was one of the creators of the Rep. party, an able ally of Sumner and Adams; lost his seat in Cong. after a fiercely contested struggle against the "compromise" Whigs; ran for gov. of Mass., but was defeated, in 1851; retired from public life and devoted himself to lit. Dr. P. often visited Europe for purposes of historical study in connection with his N. Eng. hist. D. Apr. 26, 1881.

**Palgrave** (Sir FRANCIS COHEN), b. in Lond. July 1788, originally named Cohen; belonged to a Jewish family; studied law; was employed in 1822 by the record coms.; edited numerous early historical documents; wrote a *Hist. of Normandy and Eng.* and other works upon particular periods of Eng. hist. D. July 6, 1861.

**Palgrave** (WILLIAM GIFFORD), son of the preceding, b. at Westminster Jan. 24, 1826, ed. at the Charterhouse and at Trinity Coll., Ox., where he grad. with first-class honors

1846; served as an officer of the Bombay Native Inf. from 1847 till 1853, when he joined the R. Cath. Ch., entered the Society of Jesus, studied theol. at the Jesuit sem. at Laval, Fr., took orders as a priest, was sent as a missionary to Syria, resided several yrs. in and near Damascus, obtained an intimate knowledge of Arabic and of Mohammedan theol., and undertook in 1862 a daring journey through the Wahabite kingdoms of Central Ar. in the disguise of a phys.; returned to Europe 1863; left the order of Jesuits 1864; pub. his *Personal Narrative of a Year's Journey through Central and E. Ar.*; went to Egypt on a special mission for the release of the prisoners held by King Theodore of Abyssinia, July 1865; was appointed Brit. consul at Soukhoum-Kalé 1866, at Trebizond 1867, at St. Thomas, W. I., 1873, and at Bangkok 1878; pub. *Essays on E. Questions*, *Hermann Agha*, *an E. Narrative*, etc.

**Pali** is the lang. in which the sacred books and standard lit. of the S. Buddhists are written. It bears about the same relation to Magadhi, the lang. spoken in Megadha at the time when Buddha was alive, as ecclesiastical does to classical Lat., and about the same relation to Sans. as It. does to Lat. Immediately after Buddha's cremation (between 400 and 543 B. C.) a council of 500 of his disciples was held, at which the prin. doctrines of the teacher were collected into the books of the so called *Three Caskets*. These were handed down orally from each generation of priests to the next, but in course of time opinions began to differ. To cleanse the priesthood from these heresies a council was held about 250 B. C. at Pataliputra, and by that council the Buddhist canon was finally settled. Eleven yrs. afterward Buddhism was introduced into Ceylon, and with it the Pali sacred books, which were handed down orally in that island until about 80 B. C., when they were for the first time committed to writing. The whole *Three Caskets* occupy in the native MS. rather less than 5000 palm leaves, and the *Three Caskets* would occupy, if printed in roman type of the size used in this article, about 1800 pp. of this *Cyc.* The commentary is nearly the same length as the text itself. Of the text about 1/4 consists of metaphysics, 1/4 of rules and directions for the Buddhist priesthood, and the remainder, about 3/4 of the whole, of hymns, parables, and sermons. The *Winaya*, or monastic rules, is probably the oldest form of ritual extant by which men devoted themselves to a life of poverty and chastity. Among the old Buddhist jatakas are many of the fables formerly ascribed to Æsop, and many of those comical and fairy tales which have long been the delight of European childhood. Many of the later Pali works are of great antiquity and interest, and among them the old Singhalese royal and temple chronicles derive especial importance from the fact that they are the only anc. works existing in India which really deserve the name of hist. The oldest, the *Dipavansa*, or *Hist. of the Island* (of Ceylon), was written shortly after 300 A. D. in Anurādhapura, and contains in its first 8 cantos a sketch of Buddhism in India before its introduction into Ceylon; the best known is the *Mahāvansa*. It was written in Ceylon by Mahanāma, a priest, who d. about 500 A. D., and commences, like the *Dipavansa*, with a hist. of Buddhism in India.

Pali studies will receive a fresh impulse from the publication of Dr. Kuhn's *Pali Grammatik*, and the completion of the *Pali Dictionary* by Mr. R. C. Childers. [From orig. art. in *J. s. Univ. Cyc.*, by T. W. RHYS DAVIDS.]

**Pall'el, Lake of** (or **Nassla**), a small lake not far from Catania in Sic., interesting for the great quantity of carbonic gas which issues from it, and which throws up the water in jets to the height of 6 ft.

**Palimpsest**, a word derived from 2 Gr. words, *πάλιν*, "again," and *ψάρος*, "rubbed" or "scraped." is used to indicate an anc. writing of which the original ink has been washed away or erased to enable a scribe to use the material again. In the earliest times there is little doubt that extreme dearth and scarcity of parchment, produced by the want of skilled and organized workmen, caused scribes and authors to take refuge in this means of perpetuating their productions to the detriment of others who had preceded them, but it is probable that only writings of an ephemeral and trivial nature were allowed to pass under the scraping-knife of the vellum-seller. In later days, when the dissemination of letters had become general, there is equally little doubt that good, even in some cases unique, classical texts were ruthlessly destroyed for the sake of inserting matters of little or no value. The extensive conquests of the caliph Omar in these days nearly annihilated the manufacture of papyrus, hitherto furnished in great quantity by Egypt, but destroyed along with the other national industries which fell together with the native rule, and no other means of writing was in existence to supply the deficiency. Parchment, or vellum, always dear and by no means universally plentiful, soon became enhanced in value, and the large styles of uncial and capital writings then in vogue assisted this dearth by reason of the large amount of writing surface required. Hence naturally sprung the adoption of the P.; and from the fortunately imperfect manner of erasing the writing, the good and caustic qualities of the inks, and the manner of almost pressing in the letters into the substance of the vellum, the old writings were frequently left but partially scraped away and visible more or less distinctly under the new sentences. By these means many valuable recoveries of old texts have been achieved. Nevertheless, the erasure of MSS. has been so extensively carried on that the world has without doubt lost on this account a large number of classical works. In lost on this account a large number of classical works. In process of time, however, the MSS. which had been subjected to the process of scraping and obliteration fell under the notice of those who endeavored to restore their original texts. At first the imperfect knowledge of any definite palimpsesting skill rendered the results unsatisfactory. But in the 18th century, Knittel, a Ger. theologian, carefully went through the P. at Wolfenbüttel, and was so fortunate as to



identify fragments of the Bible of Ulphilas, translated from Heb. into Gothic, and of late many curious morsels of antiquity have been patiently rescued from oblivion. [*From orig. art. in J.'s Unit. Cyc., by W. D. BIRCH.*]

**Pal'issy** (BERNARD), b. at Capelle Biron, in the dept. of Lot-et-Garonne, Fr., about 1510, in humble circumstances; was apprenticed to a potter, and afterward, on account of his knowledge of geom., engaged for some time as a land-surveyor, but pursued, in spite of poverty, religious persecutions, and manifold impediments, the art of pottery, enamelling, glass-painting, etc. He was a Prot., and was twice imprisoned as a heretic—in 1557, when he was liberated by the intercession of the constable of Montmorency, and in 1588, when he was thrown into the Bastille and kept there to his death in 1590. The most remarkable of his glass-paintings is a representation of the myth of Psyche, after Raffaello. Of his pottery, vases, ewers, jugs, salvers, etc., generally small in size but highly finished, collections are formed in several of the Paris museums. He is one of the first artists of the Fr. Renaissance.

**Palla'dio** (ANDREA), b. at Vicenza Nov. 30, 1518; studied first sculpture, but was led to the study of arch., in which he became one of the greatest masters. He lived and built principally in Venice and Vicenza. He also wrote a work on arch., from which, and from the imitation of his actual construction, originated the so called Palladian style. D. Aug. 19, 1580.

**Palla'dium**. The celebrated P. of Troy was to the Gr. poets and historians what the Holy Grail was to the Arthurian romances. The account of its origin is given by Apollodorus: "They say that Athene after her birth was brought up by Triton, who had a daughter Pallas. On a day Pallas and Athene, as they were practising warlike games together, came into contention with one another; then, just as Pallas was about to strike a blow, Zeus in fear stretched his ægis before her; but she, being aware, looked up, and fell wounded by Athene. Then Athene made great moan over her and raised a statue to her, and girded round the breasts thereof the ægis which Pallas had feared, and placing this statue next that of Zeus, did honor to it. But afterward, when Electra, after her ravishment, fled thither, then did Athene cast down the Palladium on to the land of Ilium. But Ilius prepared a temple for it and did honor to it; and such is the tale told of the Palladium." The P. was given by Zeus to Dardanus; on the taking of Troy a copy of the statue was exposed by the Trojans, while the real P. was hidden away, to be brought afterward by Æneas to It. The Trojan P. was supposed to be preserved in the Rom. temple of Vesta.

**Palladium**, a white or steel-gray metal of the platinum group, and usually associated with platinum. It is ductile and malleable, and infusible in an ordinary furnace. It does not oxidize readily, but dissolves in hot nitric acid or aqua regia. It alloys readily with gold. With silver it forms a ductile compound. The specific gravity ranges from 11.3 to 11.8.

**Palla'dius**. 1. RUTILIUS TAURUS ÆMILIANUS, a Roman author, probably from the 4th century of our era, wrote a work on agriculture, *De Re Rustica*, in 14 books, which was much used during the Middle Ages.—2. A Chr. Father, b. in Galatia in 367 A. D.; bp. of Helenopolis in Bithynia in 400, and of Aspona in Galatia in 430. D. in 430. Wrote the *Historia Lausiacæ*, a collection of biographies of hermits, dedicated to Lausus, gov. of Cappadocia.

**Pal'lah** [Dut. *roode bok*, or "red buck"], a fine dark-red antelope of S. Afr., the *Æpyceros melampus*. It has a white belly, a black mark upon the croup, and black tufts on the back part of each foot. It has long handsome horns, somewhat lyrate and ringed. It is very swift, and is found in considerable herds in bushy places.

**Pallas**. See ATHENA.

**Palla's** (PETER SIMON), b. at Berlin Sept. 22, 1741; studied med. and natural science; was invited by Catharine II. in 1768 to Rus. as prof. of natural science at the Acad. of St. Petersburg; made from 1768 to 1774 a journey of exploration through S. Siberia to the frontier of Chi.; resided for many yrs. in the Crimea, where the empress gave him extensive estates, and partook with great activity in all scientific undertakings in Rus., but returned at last to Berlin. Wrote *Travels through the S. Provs. of the Rus. Empire, Flora Rossica*, etc. D. Sept. 8, 1811.

**Palm**. See PALM OIL, PALM TREE, and PALM WINE.

**Palm** [Lat. *palmæ*, "hand"]. Most anc. measures were derived from parts of the human body, originally indicating the actual measure by the foot, the palm of the hand, etc., but in process of time acquiring a fixed and theoretical value. The Rom. *palmus* was of 2 lengths—respectively of 9 and 3 inches. The modern It. measure of *palmi* is derived from the larger palm.

**Pal'ma** (JACOPO) (called IL VECCHIO, "The Elder," to distinguish him from his nephew, IL GIOVANE), an It. artist, b. at Lerinatta, near Bergamo, about 1490, d. about 1560, occupies a place between Bellini and Titian. He was a gentle, thoughtful painter, excelling in grace and color. His works were numerous; the best are *The Three Graces* at Dresden, the altar-piece of the S. Maria Formosa at Venice, the *Adoration of the Magi* at Milan, a *Holy Family* in St. Stefano at Vicenza. All the European galleries have specimens of his art. O. B. FROTHINGHAM.

**Palm'er**, R. R. junc., Hampden co., Mass., 15 m. E. of Springfield. Pop. pt. 1870, 3631; 1880, 5504.

**Palm'er** (EDWARD HENRY), b. at Cambridge, Eng., Aug. 7, 1840, grad. at Cambridge 1867; was a member of the Sinai Surveying Expedition of 1868-69, and the survey of Moab in behalf of the Pal. Exploration Society, 1869-70; acquired a good practical knowledge of Oriental languages, and became prof. of Arabic at Cambridge 1871. Author of *The Neger, or S. Country of Script., The Desert of the Exodus*, and of a *Per.-Eng. and Eng.-Per. Dict.* D. Aug. 11, 1882.

**Palm'er** (ERASTES DICK), b. at Pompey, N. Y., Apr. 2, 1817, was for some yrs. a carpenter at Utica; began in 1846

to cut cameos; removed to Albany; began a new career as a sculptor 1852; produced many portrait-busts, etc. in marble, groups of allegorical and mythological characters, and a group of 15 figures representing the landing of the Pilgrims, intended for the capitol at Wash.

**Palmer** (JAMES S.), b. in N. J. 1810; entered the navy as mdpn. 1825; was engaged in naval battles in Sumatra 1838; commanded a blockading vessel on the Mex. coast 1846-47, and on the Atlantic coast of the Confed. States 1861-62; became capt. July 1862; led the advance at the passage of the Vicksburg batteries 1862; was Farragut's flag-capt. at New Orleans and Mobile; commanded N. Atlantic squadron 1865; became rear-admiral 1866. D. Dec. 7, 1867.

**Palmer** (JOHN McCaULEY), b. at Eagle Creek, Ky., Sept. 13, 1817; removed to Ill. 1832; was admitted to the bar 1840; State senator 1852-55; was prominent in the organization of the Rep. party 1856; delegate to the Peace Convention Feb. 1861; col. 14th Ill. Volunteers in Apr.; brig.-gen. of volunteers Dec. 1861; maj.-gen. of volunteers Nov. 1862; in command of the 14th corps in Sherman's Atlanta campaign May-Sept. 1864; subsequently in command of dept. of Ky.; resigned 1866; gov. of Ill. 1869-73.

**Palmer** (JOHN WILLIAMSON), M. D., b. at Baltimore Apr. 4, 1825, studied med. in Phila.; was city phys. of San Francisco in 1849; went in 1852 to Chi.; served 1852-53 as surgeon of an E. I. Co.'s war-steamer in the Burmese campaign; was active in the Confed. cause 1861-65; wrote *The Golden Dragon, The Queen's Heart*, a comedy; *The New and the Old*; translated Michelet's *L'Amour*, etc.; compiled *Folk-songs*.—His wife, HENRIETTA LEE PALMER, b. in Baltimore in 1834, is the author of *The Heroines of Shakespeare* and of translations from the Fr., etc.

**Palmer** (JOSEPH), b. in Mass. 1718, was a member of the provincial cong. of Mass. 1774-75; a member of the committee of safety appointed by that body; col. of militia during the operations of 1775-76, and brig.-gen. in the R. I. campaign of 1777. D. Dec. 25, 1788.

**Palmer** (JOSEPH), M. D., b. at Needham, Mass., Oct. 3, 1796, grad. at Harvard 1820; studied med.; taught school at Roxbury, and was one of the masters of the Lat. school at Boston for some yrs.; resided in Cuba 1829-30, after which he became connected with the Boston press; was historiographer of the Mass. Historical Society and the N. Eng. Genealogical Society 1856-61, and author of the annual necrology of Harvard Coll. 1851-68. D. Mar. 3, 1871.

**Palmer** (RAY), D. D., b. at Little Compton, R. I., Nov. 12, 1808, grad. at Yale 1830; studied theol. at New Haven; became pastor of Congl. chs. at Bath, Me., 1835, and at Albany, N. Y., 1850, and sec. of the Amer. Congl. Union at New York 1866. Author of contributions to periodicals, doctrinal works, and religious poems, among which is the hymn, "My faith looks up to Thee."

**Palmer** (ROUNDELL), D. C. L., BARON SELBORNE, b. at Mixbury, Oxfordshire, Nov. 27, 1812, was ed. at Rugby and Winchester schools; grad. at Trinity Coll., Ox., 1834, with high honors, obtaining a fellowship at Magdalen Coll. and the Eldon law scholarship; was called to the bar 1837; entered Parl. 1847; became queen's counsel 1849; knighted and appointed solicitor-gen. 1861; was atty.-gen. 1863-66; was counsel of the Brit. gov. before the Geneva court of arbitration on the "Alabama claims" 1871; became lord chancellor with the title of Baron Selborne of Selborne, Hampshire, Oct. 1872, retiring from that office Feb. 1874. Author of *The Book of Praise, from the best Eng. Hymn-writers*. Became lord chancellor again in 1880.

**Palmer** (WILLIAM ADAMS), b. in Vt. about 1780, was a member of the Vt. legislature 6 yrs., clerk of the courts 8 yrs., elected judge of the supreme court 1816, State senator 2 yrs., U. S. Senator 1818-25, judge of probate and of the co. court, member of the constitutional conventions of 1828 and 1836, and gov. of Vt. 1831-35. D. Dec. 1860.

**Palmerston**, pal'mer-ston (HENRY JOHN TEMPLE), VISCOUNT, and Baron Temple, b. at Broadlands, Hampshire, Eng., Oct. 20, 1784, a son of an Irish peer of the family of Sir William Temple; succeeded in 1802 to his title; was ed. at Harrow and St. John's Coll., Cambridge, where he passed M. A. in 1806; declined the election to the House of Lords as a representative peer for Ire.; entered Parl. for Bletchingley 1806; represented Newport in Parl. 1807-11, and Cambridge Univ. 1811-31, and after that represented Bletchingley, S. Hants, and Tiverton; became a junior lord of the admiralty 1807; was sec. at war 1809-28, under 5 administrations, having abandoned high tory principles for moderate liberalism; was sec. of state for foreign affairs 1830-34, 1835-41, and 1846-52, attaining great distinction as a diplomatist; sec. of state for home affairs 1852-55; premier and first lord of the treas. 1855-58 and 1859-65; was appointed lord warden of the Cinque Ports 1861, rector of Glasgow Univ. 1863. D. at Brockett Hall, Herts, Oct. 18, 1865.

**Palmet'to**, popular name of the palm tree of the S. Atlantic States, *Sabal palmetto*, called the cabbage palmetto; it nearly reaches the height of 50 ft. in Fla. Trunks useful for piers and piles, not being attacked by the teredo; leaves used for braiding hats, and the "cabbage" (forming leaves) is boiled and eaten. There are 3 dwarf species, one of which is the saw, and one the blue P.

**Palmitic Acid**. See OLEIC ACID.

**Palm Oil**, the thick oil obtained from the fleshy pericarps of the fruit of *Elais Guineensis* and *melanococca*, a palm tree of Afr., and to some extent from other palms. It is extensively imported and made into soap, candles, and glycerine, and is used for lubricating purposes. It is bleached and then pressed, and thus the palmitine is extracted for candle-making, while the elaine is used for lubricating, etc. The fresh oil is of a deep orange-red and a pleasant smell. The oil palm is naturalized in S. Amer.

**Palm Sunday**, the Sunday before Easter, celebrated in the Gr. and R. Cath. and Lutheran chs. in commemoration of the triumphal entry of the Lord into Jerusalem, when the multitude cast branches of trees before him.



**Palm Tree**, a gen. term applicable to any member of the natural order *Palmeæ* which assumes the arborescent form. Its members are mostly trees with upright cylindrical trunks prolonged by a terminal bud and crowned by a few large clustered, fan-shaped or pinnate leaves. These, as in the case of ferns, are called fronds. They are sometimes 50 ft. long and 8 or 10 ft. wide, and are in all cases stalked. The flowers are small, either perfect or polygamous, and with a double perianth of 6 divisions. Fruit, a berry or drupe, with fibrous flesh and varying much in size. Some species are shrubby and branched, while others, like the rattan, trail often as much as 1000 ft., climbing by means of hooks. Whatever may be the form, the stem is always woody and the root fibrous. The stem is hardest on the outside, where it is apt to be silicious; within it is full of fibres, easily separable. The trunk is rough with the sheathing burs of the leaves, which as they fall leave scars. In many it is beset with formidable spines. It is frequently of great height, sometimes as much as 190 ft. Humboldt computed the number of flowers on a single palm at about 600,000, and the matured fruit was in an equally large proportion. There are few countries favorable to their production in which some local and peculiar species are not found. The cocoa-nut is one of the most widely spread. In Amer. the *Chamærops palmæto* extends from Fla. to N. C. It is likely that the number of species scattered over the world may be 1000, but not more than 600 are definitely known. The stems are used for constructing dwellings, the leaves for thatching and for making fans, while various weapons are constructed from different parts. Cordage, fishing-lines, mats, oars, walking-sticks, masts, sails, etc. are made from them. The young bud is often eaten as a sort of cabbage, while the fruits, as the cocoa-nut and the date, are delicious articles of food. Drinks and liquors are manufactured of the juices, and sugar is separated under the name of jagcery. Oil is also obtained, while sago, vegetable ivory, and the betel-nut are other products. Meds. and wax are derived from certain species, and indeed there is scarcely a use to which this order cannot be applied. [From orig. art. in *J. de Univ. Cyc.*, by W. W. BAILEY.]

**Palm Wine, or Toddy**, an alcoholic beverage prepared from the saccharine sap of various species of palm. It yields by distillation a stronger drink called arrack.

**Palmyra**, one of the noblest of the palm trees, the *Borassus flabelliformis* of India and Ceylon. Its fruit is a valuable food, its timber is excellent, and it furnishes thatch, cordage, material for hats, fans, umbrellas; its leaves are used for writing tablets; sugar and arrack it produces abundantly. The young shoots are boiled and eaten, the seeds are edible, and the fruit yields a useful oil. This tree is from 20 to 60 ft. high. Palmyra-wood is the commercial name of this and of various other palms.

**Palmyra**, an anc. city of Upper Syria, situated in an oasis, 120 m. N. E. of Damascus, was founded or enlarged by Solomon, and formed at that time a bulwark against the Bedouin hordes of the desert. Under the wars between the Romans and the Parthians it acquired great importance. In the 8d century of our era, Odonathus established an independent Palmyrene kingdom, which was brought to great prosperity by his widow, Queen Zenobia. But when the queen refused to acknowledge the authority of the Rom. emp., Aurelian defeated her army, dissolved her empire, and captured her capital in 273. A revolt, during which the Rom. garrison was slain, occasioned its destruction shortly after, and it never recovered. In 633 it was devastated by the Saracens, and again in 744. In 1400 Tamerlane completely destroyed it, and now it is only a vast field of ruins, among which some tombs with inscriptions in the old Palmyrene lang., and a temple of Baal, are remarkable. A small v., *Thadmor*, inhabited by a few Syrian shepherds, is close by.

**Palmyra, R. R. June**, cap. of Marion co., Mo., 6 m. W. of the Miss. River. Pop. 1870, 2615; 1880, 2479.

**Palmyra**, Wayne co., N. Y., on R. R. and the Erie Canal. Pop. 1870, 2152; 1880, 2308.

**Pa'to Al'to**, in the S. extremity of Tex., between Matamoros and Point Isabel. An action took place here, May 8, 1846, between the Amers. under Taylor and the Mex. under Arista, in which the latter were defeated. The Mex. loss was about 100, that of the Amers. less than 50.

**Palpitation** [Lat. *palpitatio*; Fr. *palpitation*; Gr. *παλμός*; Ger. *Herzklopfen*]. The heart usually performs its important work without attracting any attention, the person, to use a common phrase, "not knowing that he has a heart." The perceived and forcible beatings are called "palpitation." It may occur in a healthy as well as in a diseased heart, caused by physical exertion, mental excitement, the use of tobacco, flatulent dyspepsia, a watery state of the blood (*anæmia* or *hydrocæmia*), or a sense of P. may arise from increased nervous sensitiveness, without any real increase in the force of the heart-beats; while, on the other hand, in enlargement of the heart the beats may be very strong, and yet not be recognized, except by an external examination. In hypertrophy and in fatty degeneration of the heart P. is a common occurrence, generally coming in paroxysms, lasting from a few minutes to some days, with equally varying intervals. The extract of nux. vomica and the tincture of aconite are much relied on to subdue the excited heart when it is diseased; secondary P. in the healthy heart is treated by removing the cause. ALONZO CLARK.

**Pam'lico (or Pamlico) Sound**, the largest of the sounds of N. C., is fenced by long low islands from the open sea, with which it communicates by several inlets. It is about 20 ft. in average depth, with much very shoal water. It communicates with Albemarle Sound on the N. Its shores are low and often marshy. The fisheries are important. The Neuse and Pamlico are its largest tributary rivers.

**Pam'pas**, a name given to the vast plains of S. Amer., extending along the rivers of La Plata and Paraguay from the E. slope of the Andes to the Atlantic, and comprising

an area of about 1,500,000 sq. m. The soil is light and unproductive, and the violent transition from the wet season, with its moist, mild climate and frequent rain-storms, to the dry season, with its scorching heat, makes it impossible for trees to grow; the vegetation consists only of grass, luxuriant during the wet season, but withered during the dry. Large herds of wild horses and cattle roam in these plains, and their hides, tallow, and flesh form the prin. support of the inhabs., a half-white tribe called Guachos.

**Pampas Grass** (*Gynertium agæntum*), a reed-like grass from the temperate regions of S. Amer., now much cultivated for ornament. The recurved slender leaves are clustered thickly at the ground. From the middle of the tuft the flowering stems rise 6 to 12 ft. high, and bear an ample silvery panicle.

**Pam'philus**, b. at Berytus in Phenicia about 240 A. D.; embraced Christianity; became a friend and associate of Eusebius; founded a library at Cæsarea in Pal., which he bequeathed to the Chr. ch. there, and suffered martyrdom in 309. He wrote an apology for Origen.

**Pamphylia**, pam-fil'-e-a, an anc. dist. of Asia Minor, extending along the Mediterranean from Cilicia on the E. to Lycia on the W. It was mountainous, being covered with ramifications of the Taurus Mts., which formed its N. boundary. The inhabs. were a mixed race. The country belonged to the Per. empire, and after its fall to the Macedonians. When Alexander died it fell to Syria, and became subsequently a Rom. prov.

**Pan** (Gr. *Πάν*), the Gr. god of flocks and pasturage, a son of Hermes by some nymph. His gen. aspect was that of the satyrs and fauns, half human and half bestial. He was the inventor of pastoral music and of the syrinx. He was of a lecherous turn and had a loud voice, by which he used to frighten the wayfarer and even put armies to a sudden flight, whence such flight is called *panic*.

**Pa'na**, city and R. R. June, Christian co., Ill. Pop. 1870, 2207; 1880, 3009.

**Panama**, pah-n-a-mah', town of the U. S. of Colombia, S. Amer., in the state of Panama, stands on the bay of the same name, an inlet of the Pacific, and has a good though somewhat shallow harbor; large vessels cannot enter, but are compelled to anchor farther out in the bay, where anchorage is not perfectly safe. It forms the terminus on the Pacific of the Panama R.R., terminating at Aspinwall on the Atlantic and connected by lines of steamers with San Francisco. Pop. 18,378, mostly negroes or mulattoes.

**Panama, Isthmus of**, formerly called the Isthmus of Darien, extends from lat. 7° 20' to 9° 40' N., with a breadth of from 30 to 70 m., connecting N. with S. Amer. and separating the Pacific from the Atlantic. The country is mountainous, its highest peak, the Picacho, rising 7200 ft. above the sea, while in other places the mts. sink into ranges of low hills. The coast is rocky and lofty along the Caribbean Sea, but mostly low and swampy along the Pacific. The soil is fertile, and all the products of the tropical zone can be easily raised. Forests abounding in excellent timber are numerous, and salt, gold, copper, and iron are found. The climate is very unhealthy, except on the heights. A ship-canal from the Atlantic to the Pacific Ocean is in progress here. The isthmus forms a state, one of the U. S. of Colombia, comprising an area of 31,571 sq. m. Pop. 285,000.

**Panchatantra** [Sans. the "five books," or sections], an anc. collection of E. I. fables and tales purporting to have been written by one Vishnusaarman for the instruction of the sons of King Amarasaki of Mihiliroyopya. The fables are in prose, the morals are in verse. It was probably written after 400 A. D. The P. is the foundation of the later Hitopadesa. The P. was translated in the 6th century A. D. into Pehlevi, and thence, 200 yrs. later, into Arabic. From the Arabic it long ago passed into W. lit. Translations exist in Tur., Per., Malay, Pushtu, Tartar, and all the European langs.

**Pan'coast** (JOSEPH), M. D., b. in Burlington co., N. J., in 1805, took his medical degree at the Univ. of Pa. in 1828; became in 1831 an instructor in anat. and surgery; in 1834 phys. in chief to the Children's Hospital, Phila., and surgeon to the Phila. Hospital; prof. of surgery 1838, and of anat. 1861, in the Jefferson Med. Coll., Phila.; was visiting surgeon of the Phila. Hospital 1838-45; has written *Operative Surgery* and *Essays and Lectures*; edited reprints and translations of European works, and is author of many professional papers and member of various learned societies. D. Mar. 7, 1882.

**Pandana'cæ, or Screw-Pines**, a natural order of endogenous trees and shrubs, nearly all tropical, and in some cases closely approaching the character of palms. Thus the *Caridodoea palmata*, and especially the *Phylephas macrocarpa* (the first producing the material for Panama hats, the last affording vegetable ivory), are often called palms, but are perhaps nearer this order. The screw-pines proper (*Pandanus Freginætiæ*, etc.) send down aerial roots, as if to prop themselves up, while others are decumbent or climbing. Some of the species afford useful fruits and seeds, others powerfully fragrant blossoms. A few have active and even poisonous properties. The leaves of *Pandanus vacca*, the yaquais of the Isle of France, afford a fibre which is exported largely; the roots are used for making coarse brushes. The *Nipa fruticans*, a palm-like tree of Tenasserim, affords large quantities of sugar (jaggery).

**Pando'ra** (Gr. *Πανδώρα*, the "all-endowed"), in the old Gr. legend, was the first woman on earth, sent by Zeus to mankind in vengeance for Prometheus's theft of the heavenly fire. Aphrodite gave her beauty, Hermes cunning, and each of the gods bestowed on her some fatal gift for the punishment of mankind. Finally they gave her a box full of blessings for mankind, but, prompted by curiosity, she opened the box, and they all flew away, except hope.

**Pangborn** (Z. K.). See APPENDIX.

**Pangen'esis**, a theory of generation propounded by Charles Darwin, according to which it is not the reproductive elements nor the buds which generate new organisms,



but the cells themselves throughout the body, the physiological units transmitted by the sexual elements only as vehicles. Similar hypotheses have been set forth by Buffon, Bonnet, Owen, and Herbert Spencer.

**Pangolin** [a name of Malay origin], called also **Badjerkelt** and **Caballaya**, the *Manis pentadactyla*, an edentate mammal of India and the E. generally. It is remarkable for its scaly armor. It is 5 ft. long, including the scaly and prehensile tail. It is an ant-eater, and can climb trees. There are many species. They are all slow of motion, and defend themselves by assuming the form of a ball.

**Panini**, pah'n'i-ni, the oldest grammarian in the Sans. lit. whose works have come down to us, flourished in the 4th century B. C. His gram. of the Sans. lang. formed for many centuries the foundation of the grammatical study of that lit., and is still admired as something unsurpassed in its kind. (See GOLDSTÜCKER, *Panini*, London, 1860.)

**Pansy**. See VIOLET.

**Pantheism** [Gr. "All-god-ism"], a word used to designate the monistic doctrine, which identifies the totality of being with God. Not that each thing is God, but that the whole substance proper is God, and the entire phenomena are the necessary phenomena of God's nature. I. It is or is not virtually identical with atheism, as the old nomenclature made it, just as the term God is defined.

II. The divisions of P. help to define it. (1) Psychological P. considers God as the soul or vital principle. (2) Cosmologic, ontologic P., anc. form: the universe and God are identical; modern form: one only substance, eternal, manifested in extension as matter, in thought as mind. (3) Mystical P., the Hindoo P. (all things constitute an essence, of which the real and ideal, the objective and subjective, are but the opposite poles). (4) Idealistic P. of the Middle Ages: *Erigena* (emanation); *Amaury de Chartres* (nature is the totality of the phenomena and modes of God, without substantial and distinct existence); *Bruno* (16th century, the prototype of the most recent P.). (5) The materialistic P. (a misnomer): matter is the original, self-existent, immutable, eternal; the atom is God.

A twofold division is proposed: I. The Oriental type, which loses the world in God—acosmism. II. The Occidental type, which loses God in the world; totally denies the substantiality of God; evolution, not being; process, the absolute in the way to being; *Fichte*, *Schelling*, *Hegel*.

III. Materialism is the temptation of physicists and physicians. P. has a charm for metaphysicians. Its dialectic simplicity, and its seeming consonance with the rise of all the phenomenal world from what we call substance, and its subsidence into it, tempts men to doubt whether that substance, so called, be not a mere mediate thing, a seeming substance to its own phenomena, the real phenomenon to the true substance, and no more than a link to the finality into which it will subside, which is the only true substance, because it depends on nothing, and all depends on it; while the seeming substances of the common illusion are but phenomena, one remove less from the original. The metaphysical dialectics of the case as against P. shuts itself up very much to the question whether phenomena can have phenomena. If they can, the total notion of substance is destroyed, and the pantheistic notion with it. If they cannot, the common notion of substance stands, but the pantheistic vanishes. It is reduced to annihilation. But the real "crucible of every philosophical system is found in its ethical principle." The lower forms of P. are so deterministic as to make religion and morality impossible; and wherever P. accepts an unmistakable principle of morals, it abandons to that extent its logical consistency. (See BRETSCHNEIDER, *System. Entwicklung*.)

CHARLES P. KRAUTH.

**Pantheon** (Gr. *ἱεῖον*, a temple for all the gods), a Rom. temple built in 27 B. C. by Marcus Agrippa, near the centre of the Campus Martius. In 610 Pope Boniface IV. consecrated it as the ch. of Santa Maria ad Martyres. It is known as Santa Maria Rotonda. It has a noble dome, and its portico is equally celebrated. Here are buried Raphael and many other famous men.

**Panther** (Gr. *πᾶνθηρ*), originally applied to an Old-World leopard (*Felis pardus*, L.). In U. S. perverted to the puma.

**Pantomime** (Gr. *παντομίμος*, "all-imitating"), the art of representing thought, sentiment, will, and action by mimicry only, by attitude, gesture, and movement, is a Rom. invention, though the name is Gr. and originated in the time of Augustus. It soon became very fashionable at all domestic festivities. On ordinary occasions a little P. with music and dance was enacted before each course—before the roast boar, a hunting scene; before the mutton, Ajax delirious, etc. The social position of the pantomimist was nevertheless very low. Hylas was flogged publicly at the prætor's request, on account of some blunder he had made on the stage. The reason was that the obscenity and indecency which these P. displayed exceeded all description. Such representations ceased, of course, when Christianity became a power in society. The companies were dissolved or banished. During the Dark Ages they strolled from town to town, exhibiting themselves in the marketplace as acrobats. Later they were now and then employed at the performance of the mysteries, and by associating themselves with the *commedia dell'arte* their representations assumed the form under which we now know them. They borrowed the masks Harlequin, Perrot, Columbine, and Pantalone from the *commedia dell'arte*, formed a loose plot, mostly of comical elements, and filled out the scheme in a manner half acrobatic, half ballet. CLEMENS PETERSEN.

**Panyasis** (*Πανυσίης*), placed by the canon of the Alexandrian grammarians in the rank of distinguished epic poets, was, according to Suidas, a native of Halicarnassus; flourished about A. C. 480. P. sought to revive epic poetry, which had had its blooming period, and had given way to the lyric and tragic. He composed 2 poems—the *Heraclea*, an account of the exploits of Hercules, in 14 books, in heroic verse; and the *Ionica*, in pentameter verse, treating of

Codrus, Neleus, and the Ionian settlements; only a few fragments remain. Was put to death by the tyrant Lygdamis about A. C. 457.

**Pao'ia**, city and R. R. junc., cap. of Miami co., Kan., near Marais des Cygnes River. Pop. 1870, 1811; 1880, 2312.

**Pao'li** (PASQUALE), b. near Morosaglia, Corsica, in 1726, ed. at Naples; returned to Corsica in 1755 as leader of the party which strove to expel the Genoese; deprived them of nearly all their strongholds in the island, at the same time bringing the agriculture, commerce, and industry of the country to a flourishing state. His success excited great sympathy in Europe, but in 1767 the Genoese sold their claims on Corsica to Fr., and in 1769 P. was driven from the island. In 1792, when Corsica was formed into an independent dept., the Fr. govt. appointed P. chief both of the civil and military administrations. He again placed himself at the head of a revolution; drove the Fr. garrison and party, to which belonged the family of Bonaparte, from the island in 1796, and proclaimed George III. king of Corsica. The Eng. now took possession of the island, but disagreements soon arose between them and P. He once more left his native country and retired to Eng. D. Feb. 5, 1807.

**Papacy**. See PAPAL STATES and POPE.

**Papal Infallibility**. See INFALLIBILITY.

**Papal States**, **The**, occupied the central part of the It. peninsula, and extended, though with a very irregular shape, from the Adriatic to the Mediterranean, bounded S. by Naples, and N. by Tuscany, Modena, and the Aus. possessions. They comprised an area of 15,389 sq. m., with 3,124,668 inhabs., had Rome for their capital, and yielded (in 1859) a revenue of 14,533,325 scudi. Their origin dates back to the 8th century and the alliance between the popes and the Frankish kings; their dissolution began in the third decade of the present century. On Aug. 21, 1870, King Victor Emmanuel simply took possession of Rome, declaring it the capital of It., abolishing temporal power of the pope.

**Papavera'ceæ** [from *Papaver*, "poppy," one of its genera], a natural order of polypetalous exogenous plants, herbaceous (with a single Californian exception), distinguished by having a milky, yellow or red, and acid or narcotic juice; the parts of the flower in twos or some multiple of two, rarely in threes, but never in fives; the petals always at least twice as many as the sepals, and the two sets, the latter falling when the flower opens, and the former usually at the close of the day; the stamens indefinitely numerous, and the compound pistil with 2 or more many-seeded parietal placentæ. The qualities of the order are best represented by the poppy and its inspissated milky juice, *Opium* (which see). The seeds of all are said to be innocent, abounding in a bland fixed oil. That of the common poppy is an article of commerce, and is even used as an adulteration or substitute for olive oil. ASA GRAY.

**Papaw'** [Malay, *pāpaya*]. (1) The fruit of the *Carica papaya*, a small S. Amer. tree of the order Papayacæ. This fruit has an acid quality, and when boiled with meats renders them tender. The juice contains an albuminous substance resembling or identical with fibrine, is antiseptic, and has detergent powers. (2) In the U. S. the name papaw, or pawpaw, is given to *Asimina triloba*, *parviflora*, *grandiflora*, and *nygnæa*, handsome shrubs, or the former a small tree, of the order Anonacæ. The pulpy fruit of the first mentioned is edible and not unpleasant, but if eaten in any considerable quantity is liable to cause nausea.

**Pa'pe** (JOHANN GEORG WILHELM), a distinguished Gr. lexicographer, b. at Culm in Pruss., Jan. 3, 1807; appointed prof. 1837, in the Gray Cloister Gymnasium in Berlin; pub. *Etymologisches Wörterbuch d. griechischen Sprache*, a preparation for his greater work, *Handwörterb. d. griechischen Sprache*, in 3 vols., the 3d vol. devoted to proper names; added a *Deutsch-griechisches Handwörterb.* D. Feb. 23, 1854.

**Pap'per** [Lat. *papyrus*, from Gr. *πάπυρος* and Egyptian *pappi*, "a reed"]. The earliest known attempt at the production of an article similar to the P. of later or modern times was made in Egypt many centuries before the Chr. era. We have accounts of manufactories of P. for exportation at Memphis 700 B. C. The lower part of the stem of the papyrus plant is, under its rough pellicle or skin, composed of thin layers of much cohesive power. These, being carefully separated, were laid side by side with edges overlapping, and on being subjected to pressure became a sheet of considerable tenacity. The number of these layers regulated the thickness of the sheet; they were made more solid and firm by beating, and were susceptible of a degree of polish. This rude kind of P. was not improved until about 450 B. C., when parchment was first used for books and valuable documents. At the beginning of the Chr. era the use of parchment in Rome and Gr. became very extensive, but not to the exclusion of papyrus, which was still exported largely from Egypt for many centuries. The Pers. and Arabs are known to have made P. from cotton fibres from the 6th to the 7th century. The art was introduced into Sp. by the Moors, and here it was first discovered that linen and cotton rags were suitable for the manufacture of P. From the 12th century Sp. appears to have been the principal P.-producing country, it ranking second. During the 14th century the art was in use in Fr. and Ger. to a moderate extent, and in the next century these 2 countries had become the largest P.-producers; but during the 15th century Hol. made rapid progress, and soon exported large quantities. Near the end of the 15th century—about 1490—the first P.-mill in Eng. was built at Hertford. In Fr. the art had flourished, P. being made there of superior quality, and exported to all European markets.

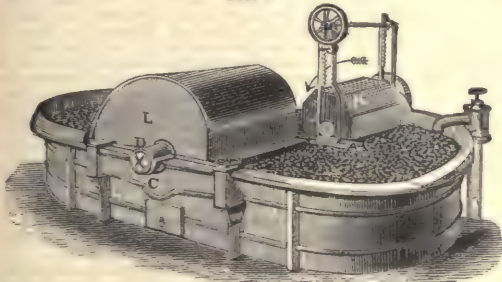
The great increase in the manufacture and consumption of P. did not begin until after the invention of the P.-machine. The original inventor, Louis Robert of Essonne, Fr., received in 1799 a patent for 15 yrs. It was introduced in 1802 by Leger Didot into Eng., where it was nearly perfected by the Fourdriniers, whose name it bears. The other prin. piece of machinery requisite for P.-making—the en-



gine for washing and beating—was invented in Hol. Cotton and linen rags were first used in Europe for making P. about the end of the 11th century, and for a period of 700 yrs. no other material was employed. In 1682 Bladen took out a patent for making P. from cotton, linen, hemp, flax, cordage, silk, woolen, and all sorts of materials. A hundred yrs. later we learn that white P. was made from wood in Ger. About the same time attempts were made to use straw for the same purpose, but with no practical result. The first invention that has been of any real advantage and worked in a practical manner was that patented by Mellier (about 1854) for the treatment of straw and other vegetable fibres by boiling at a pressure of 80° or over in caustic alkali of 4 per cent. Almost simultaneously with this invention came a like method of treating wood chemically, and by nearly the same means, reducing it to a condition so that it could be bleached and used for white P. The patents to Watt & Burgess were issued in 1854, and improvements were patented by Ladd, Keene, Dixon, and others. The result, after yrs. of experiment and expenditure, was the erection in 1865 of extensive works at Manayunk, Pa. The fibre from wood, though softer and more pliable than that from straw, being wanting in strength as compared with that of esparto-grass or of the softest rags, is valuable when mixed with rags, and proves a great addition to the supply of P-stock. About the same time came Voelter's invention for reducing wood to fibre by machinery, without the use of chemicals. The wood is ground on stones rotating at high speed, the fibres being literally torn apart or separated; but they have very little power of cohesion, and consequently scarcely any strength. Mixed with rags, they increase the bulk of the P. In the U. S. 200 stones are now grinding it, their product, 15,000 to 20,000 tons yearly, being used mainly for newspapers. About 2 yrs. later the conversion of esparto-grass into white P. was attempted. This material is found in large quantities in Sp., and the best qualities and largest supplies have been obtained from Sp. The prin. consumption of it has been in Eng. Straw without bleaching is largely used for ordinary grades of wrapping P. and straw boards. Jute, old ropes, bagging, waste from cotton factories, all kinds of old papers, paper clippings, all kinds of old waste material of vegetable fibre, are used by the P.-makers. Old newspapers and printed books are boiled in alkali to discharge the printer's ink, and used for making white P.

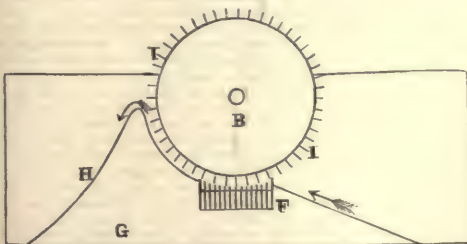
The first stage in modern P.-making is the careful sorting of the rags. This is done by hand on tables with bottoms of coarse wire-cloth, which allow a portion of the dust to fall through. The rags are also sorted into various qualities for the different grades of P., then cut into small pieces. The machine for cutting the rags has 2 rapidly revolving blades coming in contact with a third or bed-knife. By these the rags are cut quite small, and are then carried on moving bands to the duster, a large wire-cloth covered cylinder having a shaft inside with arms, the outlet end being lowest. This is revolved rapidly, giving the rags a thorough tossing and tumbling, whereby the dust is dislodged and falls through the wire cloth, after which they are ready for the boiling process. This boiling softens or dissolves all grease, loosens the dirt, and prepares the rags for the thorough washing process which ensues. The washing and beating engines are much alike in form and construction—in fact, only requiring a change of knives to be used for either purpose. The engine (Figs. 1 and 2), an oblong vat

FIG. 1.



with the ends rounded, is from 12 to 24 ft. long, from 5 to 8 ft. wide, 2½ to 3 ft. deep. The size mostly in use, and herein referred to, is 15 ft. × 6½ ft., capacity 300 to 400 lbs. A partition, called the "midfeather" (A), runs lengthwise

FIG. 2.



of the middle of the engine, but not the entire length, being distant from each end half the width of the engine. This partition forms an endless passage-way for the pulp, half the width and the whole length of the engine; and through

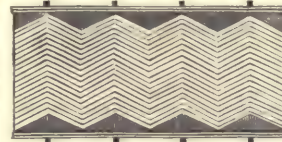
this passage-way the pulp is continually moved by the action of the engine-roll B. The roll is the same in length as the distance from the midfeather to the side of the engine. This roll is on a heavy iron shaft extending across the width of the engine and beyond for a bearing and driving pulley or gear; the end of the shaft on which the roll-block is secured also extends beyond the side of the engine, and the bearing D is on a long lever C, which, being raised or lowered by a screw, raises the roll from contact with the bed-plate F, or lowers it in closer contact with it. This bed-plate F is placed in a solid block G, which fills up the width between the midfeather A and the side of the engine. The front part of this block slants down to the bottom of the engine, thus allowing an easy approach of the pulp to the roll and knives of the bed-plate. From the back of the bed-plate, this block G is made to conform in shape to the curve of the circumference of the roll—near it, but not in contact. This part of the block is called the "backfall," H. From the top its shape is a curved descent to the bottom of the engine. The roll B is a solid wooden or iron cylinder securely fastened on a heavy iron shaft; lengthways on its surface, and parallel with the shaft, are equidistant grooves, 3 or 4 inches deep, and usually 2 to 2½ inches apart. The roll-bars I are steel plates, the same in length as the face of the roll, 6 to 8 inches broad, about half an inch thick, hammered quite thin on one edge, having a notch or slot on each end. They are placed in the grooves, and are wedged tightly in their places; a heavy iron ring is driven tightly and firmly into each end of the roll; this ring fits into the notches in the end of the roll-bars; then the whole is tightly wedged, the bars extending 2½ to 3 inches above the periphery of the roll. The bed-plate F, composed of a number of bars of steel with strips of wood between, firmly bolted together, is of the same length as the roll-bars; the form that has

FIG. 3.



layer of wood, all bolted together. The face of the bed-plate is curved to fit the sweep of

FIG. 4.



been the longest in use is called the elbow-plate (Fig. 3). Another form of bed-plate now much used is made of a large number of thin steel blades zigzag in form (Fig. 4); after each a thin layer of wood, all bolted together. The face of the bed-plate is curved to fit the sweep of the roll. The straight bars of the roll, coming in contact with these diagonal knives or bars of the bed-plate, and grind, tear, and macerate most effectually the fibres of the material.

In the washing-engine are one or two cylinder-washers, K, which are lowered into, and partly submerged in, the mass of stock, and raised when their work is completed. They are round or octagonal cylinders of framework, with solid ends, but covered with fine wire-cloth on their periphery. When immersed in the stock, which is floated in a full supply of water, they revolve, and the dirty water passes through the wire cloth, is taken up by a series of scoops on their inside, and discharged through an opening in their shafts or journal. From the boiler the rags are placed in this first or washing-engine with a plentiful supply of water. The roll, revolving rapidly, draws toward and under it the floating rags; they are violently thrown over the top of the backfall H, and with them a volume of water. This action continuing, the rags are forced along, and soon the whole mass of rags and water is steadily moving in endless journeys around the engine and under the roll. The cylinder washer K is lowered and partly submerged in and revolves with the mass, continually discharging the dirty water, while a full supply of fresh, clean water is added during the whole operation. This washing continues from 3 to 5 hours, by which time the rags are thoroughly washed and rinsed by the passage through them of so much clean water. Over the roll is placed the curb, a box covering it, without which the roll by its rapid revolutions would throw out of the engine the rags and water. During this washing the rags have been partially ground and disintegrated, and are known as "half stuff."

The rags are now ready for bleaching, which is done by adding to the mass of half stuff in the engine a solution of chloride of lime, and later a small portion of sulphuric acid, which quickens the action of the chlorine. By raising a valve in the bottom of the engine the half stuff is emptied into a steep-chest in a room below. The half stuff remains in the steep-chests until the chlorine has fully acted on it. The water is then drained off, and it is next taken to the beating-engine. The beating-engine is substantially the same as the washing-engine, and is provided with a cylinder-washer, but with roll-bars and bed-plate less blunt. The cylinder-washer is used for a short time, only to wash out the chlorine liquor, which is done by rinsing and changes of water. The lever C, sustaining the end of the roll-shaft, is now lowered, bringing the roll-bars in close contact with the bed-plate; the roll, revolving at high speed, produces a thorough grinding and beating of the pulp.

The half stuff is now ready for the P.-machine, and is emptied into stuff-chests, and more water added until it is of a semi-liquid consistency. It is here kept in constant agitation, that it may be thoroughly mixed with the water. A quantity is placed in the vat, a wooden tub. The mould is a light, flat wooden frame covered with wire cloth. A thin frame, called the deckle, is placed on the mould. The vatman, holding the vat with both hands, dips it into the pulp in the vat, and slowly raises it level and flat. The vatman carefully, with a peculiar slow shaking motion in both directions, raises the mould; the water runs through



the wire cloth; the shaking motion of the half-liquid pulp causes the loose floating fibres to knit and adhere together. Soon the water has drained through this sieve-like mould; leaving a wet sheet of paper perfectly formed, but too wet and pulpy to be handled. The vatman slips off the deckle on to another mould, passing the first mould, with the sheet of paper on it, to another workman, the coucher, who, after letting it stand in an inclined position a short time to drain, reverses the mould, laying it on a woollen blanket or felt, to which the pulpy sheet of paper adheres, leaving the mould. On this sheet is laid another felt, which in turn receives its sheet of paper, until 120 to 150 each of alternate sheets of paper and pieces of felt are piled up. This pile, called a "post," is now placed in a press and pressure applied to squeeze out as much water as possible. The sheets, although wet, can be handled, and after another pressing and stripping are hung up in the loft to dry. When dry the operation of sizing follows.

**Sizing.**—P. in its natural state is porous and absorbent, and cannot be written on until it is sized. P. made by hand is, after drying, dipped, a few sheets at a time, and passed through animal sizing, a weak solution of glue; it is then hung up to dry, afterward pressed, calendered, etc.; the glue sizing also tends to harden and stiffen the P.

**Plating-Machines.**—P. hung up to dry comes down very rough. The early P.-makers pressed this between metal plates, and a moderately smooth surface was obtained. A later improvement was pressing between heated plates. P. so treated was called "hot pressed." The plating-machine was the next improvement. This machine is a pair of heavy and strong iron rollers in a stout iron frame. Great pressure is applied by weights and levers or by screws. The P. is placed between thin sheets of copper or steel, and passed between the rolls until the required surface is obtained.

**Calenders.**—The calenders now in use have from 5 to 8 rolls in a stack, in strong iron frames, screws at the top pressing the rolls together, the alternate rolls being of highly polished iron and rolls covered with P. The P. rolls are made by passing a heavy iron shaft through a hole in a great number of sheets of linen or manila P. The P., subjected to hydraulic pressure, becomes nearly a solid mass; it is then secured in its place by iron collars, turned round, and highly polished. The sheets are fed between the 2 upper rolls, and kept in position and carried through the set by tapes, carrying the P. after leaving one pair of rolls to the point of contact of the next pair. This process is repeated until the desired surface is obtained. C. E. O'HARA.

**Paper-Hangings, or Wall-Papers,** are reported to have been made in Sp. and Hol. before 1553, but their manufacture has only in recent time become a leading industry. The P. was formerly printed by hand. Of late, cylinder-printing is used, identical in principle with the processes employed in calico-printing. But some choice styles are still hand-printed, and some striped papers are colored by a simple process, the colors being imparted through apertures, underneath which the P. is rapidly drawn. Flock-printing is done by printing the pattern in with varnish and then sprinkling on colored *flocks*, in powder, the flocks being the shearings of woollen cloth. Satin P. are finished with powdered statite, and polished.

**Paper, Mulberry.** See MULBERRY PAPER.

**Paper, Nautilus.** See ARGONAUT.

**Paphlagonia** was a district of Asia Minor extending along the S. shore of the Euxine Sea from Pontus to Bithynia, and bounded S. by Galatia. It was inhabited by wild tribes of the Semitic race, and it was celebrated for the excellent horses it produced. Originally it formed an independent state, but it was conquered by Croesus and incorporated in the Per. empire. After the death of Alexander it became independent, but was conquered by Mithridates, and after his fall was part of the Rom. prov. of Galatia.

**Paphos** was the name of 2 anc. cities of the island of Cyprus. One of them was called *Palaipaphos* (Old Paphos), and was famous for its temple of Aphrodite, who was born here from the foam of the waves. The other was called *Neopaphos* (New Paphos), where St. Paul preached to the proconsul Sergius.

**Pa'p'ias**, a Chr. Father of the 2d century, bp. of Hierapolis in Phrygia; suffered martyrdom at Pergamus during the persecutions of Marcus Aurelius about 163. He was a very strong millenarian.

**Paper - Mâché**, pap'yā - mah'shā [Fr. signifying "mashed" or "pulped paper"], the name of an industry which seems to have been previously in use in Chi. and the E. In its original sense, of paper moulded into required forms, P.-M. is found to have been used in the construction of the ceilings of some of the Elizabethan mansions. The *carton-pierre* now used is a combination of stucco and P.-M. Early in the last century snuff-boxes are found made of P.-M. In 1772 Henry Clay of Birmingham took out a patent for a process in which P.-M. was made by pasting together sheets of spongy paper over metal moulds. The prin. seat of the P.-M. industry is still at Birmingham, and both the pulp and Clay's process of making the blanks are in use.

The decoration to which P.-M. has been subjected has varied considerably in character. It may be doubted whether the simple lines of bronze, gold, and black of the earlier specimens have been exceeded in point of good taste and effect. Copies of paintings have sometimes been introduced, and for a time subjects in gold-size and colored bronzes were common. Pearl-shell inlaying was patented in 1825. The ornament was painted on the pearl with varnish, and the unprotected part eaten off with acid. The thin laminae of shell are simply fastened to the partially prepared P.-M. by copal varnish. Electro deposition and photography have also been used in the decoration of this article. Aluminium colored designs on tracing-paper are transferred. The vice of the manufacture at present is a tendency to excessive ornamentation, not simple or chaste in character.

**Papinianus** (EMILIUS PAULUS), b. about 170 A. D., held high and influential positions under Septimius Severus, but was put to death in 212 by Caracalla. His works—37 books of *Questiones*, 19 of *Responsa*, 2 of *Definitiones*, etc.—were considered the highest authority in Rom. jurisprudence, and several of the most eminent Rom. jurists, as, for instance, Ulpian and Caius, were his disciples. The *Digests* contain 395 extracts from his works.

**Pappus** (ΠΑΠΠΟΣ) of ALEXANDRIA, a distinguished math. who flourished in the second half of the 4th century (A. D. 379-395). His most important work was the *Μαθηματικαὶ Συλλογαὶ* ("Mathematical Collections"), explanations of earlier math. with extracts and his own criticisms on them, in 8 books, of which 6 have been preserved; of value in the hist. of math. He wrote also a description of the world, rivers of Afr., on the explanation of dreams. The extant portions of P. have only recently been printed in Gr.

**Papua, or New Guinea**, a large island extending from lat. 0° 30' to 10° 4' S. and from lon. 131° to 151° 30' E., and comprising an area of about 250,000 sq. m., lies immediately N. of Australia and connects the Malay Archipelago with the Polynesian groups. The interior of this vast island is almost entirely unknown to us, and even the coast-land has been explored only in a few points. Best known are the N. coast, along the Geelvink Bay and the delta of the Amberno, and the S. coast, along the Torres Strait, which separates P. from Australia, and at its E. extremity forms a large inlet called the Gulf of Papua. The inhabs. the Papuans or Papua negroes, seem on a closer acquaintance not to be so homely and savage as formerly reported. They are of smaller stature than the Afr. negroes, and characterized by a lateral compression of the head, an almost disappearing chin, and excessively thick lips and broad nostrils. P. was discovered in 1511 by the Port., and visited in 1615 by the Dut. In 1828 the latter built a fort on Triton Bay and claimed the island for the Netherlands.

**Papyrus**, a kind of reed or cyprus. Its Egyptian name was *papir*, from which *papyrus* is derived. It was cultivated at the remote period of the 4th dynasty in the delta or Lower Egypt, and continued till some centuries A. C. The flowers were used for crowns, the pith or pulp for wood, the roots for fuel, the whole stem for ropes, matting, sails, boats, boxes, and sandals; but its prin. employment was for the fabrication of papyrus, or rather paper, which was manufactured from slices of its stem. For this purpose the ends were cut off, and about 30 pellicies or phylæ under the rind of the prismatic stalk peeled from the whole length by a fine knife or needle. A number of these were laid close to one another vertically on a board, and over them another set close to one another horizontally. They were then moistened with water of the Nile, to which gum may have been added, hammered, pared, smoothed, and bleached in the sun. The papyri were made in long rolls. On this paper all the Egyptian books were written by a reed, frayed and black ink made of animal carbon and oil and rubrics of red paint. The larger compositions are divided into short pages about 8 or 9 inches long, and from 10 to 14 lines to a page; and when the material was scarce these were written on both sides of the roll. Small documents, such as letters, had seals of clay attached to them. The subjects of the papyri comprise the circle of Egyptian lit., such as the *Book of the Dead*, or *Ritual*; hymns to Ammon, Ptah, and the Nile; the *Lamentations of Isis*; the *sā-en-sin-sin*. Beside these historical compositions, letters, romances, gr. letters, etc. have been discovered. Egyptian P. was in use in Gr. and came into gen. use at Rome, and the plant is said to have been raised in S. It. A great trade flourished at Alexandria, and P. was used in Europe till the 12th century A. D. The papyri of Herculaneum were only charred like burnt paper. By a careful unrolling of these charred fragments, under a process discovered in 1758, several of these papyri have been copied. There are probably in Europe alone 4000 Egyptian papyri and fragments which have been unrolled, and there ought to be at least as many more in the sepulchres of Egypt. [From orig. art. in *J.'s Univ. Cyc.*, by SAMUEL BIRCH, LL.D.]

**Para**, pah-rah', or **Belem**, town of Brazil, the cap. of the prov. of the same name and a place of considerable commercial importance, with an excellent harbor on the right bank of the Para. It is well built and has several elegant buildings and beautiful promenades, and its climate is healthy even for Europeans. Pop. 35,000.

**Para**, the S. and most frequented branch of the Amazon, S. Amer., 40 m. broad at its entrance into the Atlantic, 200 m. long, and navigable throughout its whole length for the largest vessels. It is in this arm of the Amazon that the famous *bore* is formed.

**Parable** [Gr. *παράβολα*, a "comparison"], a short fictitious narrative intended to illustrate some point in moral or religious teaching. P. abound alike in the teaching of Christ and in the Jewish Talmudical writings.

**Parabola** [Lat. *parabola*; Gr. *παράβολη*], a plane curve having one or more infinite branches, but no asymptote. It is a property of the common P. that every part of the curve is equally distant from a fixed point and from a given straight line. The fixed point is called the *focus*, the given line is the *directrix*, and a straight line through the focus perpendicular to the directrix is the *principal axis*. Any line parallel to the prin. axis is called a *diameter*, and it may easily be shown that every diameter bisects all the chords of the curve that are parallel to the tangent at its vertex. The prin. axis is therefore a line of *right symmetry*, and every other diameter is a line of *oblique symmetry*. The breadth of the curve through the focus is called the *parameter* of the curve; it is also called the parameter of the prin. axis. The parameter of any diameter, including the parameter of the prin. axis, is equal to 4 times the distance from the focus to the vertex of that diameter.

The common P. may be cut from any conic surface having a circular base by a plane parallel to one of the elements of



the surface. The cutting plane intersects all the elements of the cone, except the one to which it is parallel, and all the points of intersection lie on one nappe of the cone; hence, the curve has but one branch, and that branch extends to an infinite distance; the 2 parts of the branch approach parallelism as they recede from the vertex, and at a comparatively short distance from the vertex they become sensibly parallel to each other and to prin. axis.

**Paraboloid** (Gr. *παράβολος* and *εἶδος*), a volume bounded by a surface of the second order whose plane sections in certain directions are parabolas. The surface itself is also spoken of as a paraboloid. There are 3 prin. varieties of P.—viz. *elliptical*, *hyperbolic*, and *parabolic*—each of which has 2 particular cases. None of the P. have centres except in certain particular cases, in which they have an infinite number of centres. Elliptical P. are those in which all sections parallel to a straight line called the axis are parabolas, and in which all other sections are ellipses. If the sections perpendicular to the axis are circles, the surface is a P. of revolution; if the vertex is at an infinite distance, the parabolic sections are parallel lines and the surface is an elliptical cylinder; hence the P. of revolution and the elliptical cylinder are particular cases of the elliptical P. Hyperbolic P. are warped surfaces of double generation, such that all sections parallel to any two elements of the first and second generation are hyperbolas, and all other sections parabolas. The particular cases of this class of surfaces are 2 intersecting planes and the hyperbolic cylinder. In the parabolic P. all plane sections are parabolas; the particular cases of this class are 2 parallel planes and the parabolic cylinder.

**Paracelsus**, the assumed name of Philippus Aureolus Theophrastus Bombastus von Hohenheim, b. at Einsiedeln, Switz., in 1493, was the son of a phys.; read the works of the alchemists and magicians, and travelled on foot far and wide collecting information regarding the healing art from barbers, blacksmiths, and wise women; spent much time in the mines of the Tyrol; took the degree of M. D.; served for a time as a military surgeon in Den., the Low Countries, and It., and then resumed his wanderings. Ecclampadius procured him a professorship of med. and surgery at Bâle (1526), but he was soon compelled to leave the place (1527) by the Galenic phsys., for he openly burned Galen's books, and denounced the Ar. masters, then so generally studied. If we may believe his adversaries, P. was almost always drunk and was guilty of gross irregularities; certain it is that he had to resume his wandering life, and that after many strange vicissitudes he was thrown from a window and killed by the servants of a physician at Salzburg, Sept. 23, 1541. He left 6 professional treatises, beside a large number of works which bear his name, some of which were written by his enemies to injure his reputation, and others by fanatical admirers. P., though he displayed many traits of the charlatan, lived a most useful life. The profession of med. at his time needed reformation quite as much as the Ch. did. He destroyed the humoral pathology, broke the tyranny of Galen and his Ar. followers, and introduced many new and valuable remedies. He taught a singular theosophy, and was a person of erratic character, but he must be placed among the great men of his age.

**Parachute** (Fr.), a machine first successfully employed by Blanchard at Strasbourg in 1787, and designed to enable aeronauts to descend safely to the ground from a balloon. It is shaped like an umbrella, and is taken up in a collapsed or closed form. The car is first attached beneath the P., and the balloon above the whole; a rope passing through the hollow stem of the P. attaches the balloon to the car; this rope is cut at the proper time, the car falls rapidly, and the P. is expanded by the action of the air.

**Paradise** (Gr. *παράδεισος*; Sans. *paradesa*) signifies a garden or pleasure-ground, and is used by the Septuagint to express the Heb. Eden. Metaphorically, it is often used synonymously with *heaven*, denoting the future bliss which awaits the righteous.

**Paraffine**, par'af-fîn [*parum affinis*, "little affinity"], a beautiful white waxy solid which occurs native in the mineral wax ozocerite, and in petroleum, and also found in coal and shale oil, and the products of the destructive distillation of many other organic bodies, as oil, fats, wax, wood, peat, albertite, grahamite, etc.

**Uses**.—P. has numerous important applications in the arts. Beautiful candles are made from it. It is extensively used for water-proofing fabrics, cloth and leather for shoes, even dress silks, which are thus protected from the stains which result from spilling liquids upon them. It is used for water-proofing or protecting from rust or decay and putrefaction, meat, fruit, timber, metals, cartridges, pills, etc.; for making tight the stoppers of acid bottles; as a substitute for sulphur in the manufacture of matches; for oil-baths of constant temperature; for refining alcohol and spirits; by passing the vapor during distillation through melted P., which abstracts the fusel oil; considerable quantities are used for chewing-gum, supplying material for a disgusting habit too common among children. C. F. CHANDLER.

**Paraffines**, the first and simplest series of hydrocarbons. The first number of the series is marsh-gas. The next two members are gases at ordinary temperatures; then follow about 20 liquids, and the series finally terminates with solid waxy P. The P. occur in nature in the fire-damp of coal-mines, the gas from stagnant pools, petroleum, and ozocerite or solid native paraffine. They are also found among the products of destructive distillation, in coal-gas, tar, coal and shale oil, etc.

**Properties**.—Methane, ethane, propane, and quartane are gases at ordinary temperatures; most of the others are volatile liquids, regularly increasing in specific gravity, viscosity, boiling-points, and vapor-density as they become more and more complex. Those containing 20 carbon atoms or more are white crystalline waxy solids. The P. are saturated hydrocarbons, and are distinguished by their chemical indifference, and are incapable of uniting with other bodies,

such as chlorine, bromine, sulphuric acid, etc.; whence the name "paraffine," from *parum affinis*, "little affinity." The P. are scarcely attacked by oxidizing agents at ordinary temperatures; when heated they are either wholly burned to water and carbon dioxide, or they may yield in addition small quantities of other oxidation-products, as acetic acid, etc. They are also oxidized by the long-continued action of air or oxygen gas. By exposing the heavier paraffine oils to temperatures near their boiling-points they are split up into simpler lighter P. and olefines. C. F. CHANDLER.

**Paraguay**, pah-râh-gwâ'. The republic of P. is situated between the rivers Paraguay and Parana, extending northward to the Rio Apa. On the E. and N. it is bounded by Brazil, and on the S. and W. by the Argentine Republic and Bolivia. The S. part of P. consists almost entirely of swamps and jungles. Farther to the N. it is more elevated and very fertile, finely diversified into hills and valleys, the former of which are covered with timber. The country is well watered, and has several small rivers, that take their rise in the Cordilleras of the E. part of the state and flow into the P. The Cordilleras are but ranges of hills, none of which exceed 3000 ft. in height. The only extraordinary feature of the country is the falls of Salto de Guayra, at a point on the Parana nearly E. of Asuncion, where the river makes a perpendicular descent, and then flows through a wild and picturesque country of broken hills and gorges.

The climate of P. is warm, but generally healthy. The soil and climate are well adapted to the growth of maize, tobacco, cotton, sugar-cane, the mandioca or Yucca root, and all the tropical fruits. It also produces the yerba maté or Paraguayan tea. The animal kingdom is similar to that of the same lat. of Brazil.

The religion of the country is nominally R. Cath., though under the first and second Lopez little or no respect or allegiance was shown to the Holy See. The bps. and priests were mere spies of the pres. The lang. spoken by the Paraguayans among themselves is that of the Guaraní Indians. The elder Lopez tried to supersede the Guaraní by the Sp.; as yet but a small proportion of the inhabs. speak anything but a *patois* of mixed Guaraní and Sp.

**History**.—Sebastian Cabot was the first discoverer of P. (1526). The navigator was attacked by Payagua Indians, who were repulsed. In 1535 an expedition was sent out by Pedro de Mendoza. But he was never heard of afterward, and an expedition that was sent to search for him a yr. later established a fort and trading-post on the site of what is the town of Asuncion. The colony thus commenced was never broken up. The govt. soon fell into the hands of Domingo Martinez de Irala. He dealt justly by the Indians, and made himself feared and respected. He encouraged his men to take the native women as wives, and to respect both their marital and parental ties. The result was, that the colony increased beyond any subsequent example, and a semi-civilized nation of a mixed breed grew up within the next 60 yrs. in the very heart of S. Amer. In 1611 the power of the govt. fell into the hands of Dr. José Gaspar Rodríguez Francia. This man, then (1811) at the age of 52, soon became the absolute dictator of P., and for 29 yrs. ruled the entire country with merciless rigor. He died in the year 1840, and for nearly 30 yrs. no freedom of expression or thought had been permitted. Two consuls—Carlos Antonio Lopez and Mariano Roque Alonso—were chosen by a sort of cong. as an executive head of the nation. Lopez soon got the power into his own hands, and at the end of 3 yrs. managed to have himself declared pres., which position he continued to hold till his death, which occurred in Sept. 1862. He was followed by Francisco Solano Lopez, who was killed in 1870. Since 1870 the govt., though nominally republican, has been completely under the control of Brazil. Pop. 346,048, besides 130,000 Indians. [From orig. art. in *J.'s Univ. Cyc.*, by HON. CHARLES A. WASHBURN.]

**Paraguay**, a river of S. Amer., rises in lat. 13° 30' S., lon. 55° 50' W., at an elevation of 9535 ft. above the sea; flows southward through the Brazilian province of Matto Grosso, then on the boundary between Brazil and Bolivia, and then through the terrs. of the Argentine Republic, where it joins the Parana in lat. 27° 17' S., after a course of about 1800 m. It is navigable 100 m. above the city of Corumba, and its course is almost entirely free from obstructions. Steamers ply regularly on its waters from Buenos Ayres, on the Rio de la Plata, to the influx of the Cuyaba, one of its affluents.

**Paraguay Tea**. See MATÉ.

**Parallax**, the difference of direction in the angular measurement of a given fixed object as seen from different points. The effect of P. is very perceptible to the observer who is himself in motion; the objects on either side of him have a parallactic motion in the contrary direction, which is greater as the objects are nearer. The effect is very striking in the rapid motion of a railroad train. The use of the word "parallax" is, however, confined almost exclusively to astron., in which science the term expresses the difference of direction of a given celestial object as observed, or supposed to be observed, from the 2 extremities of a radius of the earth. One of these supposed points of observation is always the earth's centre, and the other some position on the earth's surface. When the object is in the horizon, the radius is at right angles to the straight line drawn to it from the point of observation on the earth's surface, and the P. is then greatest. It is called the straight lines drawn to it from the extremities of the radius are both necessarily oblique to such radius, and the P. is less. Such a P. is called *parallax in altitude*, and is proportioned to the horizontal P. as the sine of the zenith distance is to the radius.

As for purposes of astronomical computations the directions of bodies are always referred to the earth's centre, it is necessary to correct the apparent altitude of a body by adding the P. in order to attain the real altitude. For computations of very distant bodies the horizontal P. is always



employed, and is the angle subtended at the body in a right-angled triangle, of which the earth's radius is the perpendicular. The equatorial radius and the equatorial horizontal P. are commonly used in such computations. The moon's horizontal P. is larger than that of any other celestial body, and amounts to  $57^{\circ} 6'$  at its mean value. The equatorial horizontal P. of the sun is about  $8.88''$ ; that of Uranus is not as large as half a second. The earth as seen from the fixed stars possesses no sensible magnitude, but the earth's orbit, having the enormous dimensions of more than 180,000,000 m. in diameter, has an angular magnitude large enough to be appreciable as seen from one of these; and this, though excessively minute, amounting in gen. only to a small fraction of a second, has in a few instances been satisfactorily determined. (See STARS.) This parallax, as being connected with the earth's periodical revolution, is called the *annual P.*; the other, being dependent on the daily rotation, is called the *diurnal P.* The fixed stars and all other celestial objects rising in the E. and setting in the W. have an *apparent* parallactic motion enormously great, but this is due not to the change of place of the observer, but to the change of the position of his plane of reference, which is his horizon. Telescopes constructed to move upon an axis parallel to that of the earth are made to follow the stars with great facility, since no change of the position of the tube in declination is necessary; and on this account such telescopes are frequently spoken of as *parallactic instruments*, but they are more usually called *equatorials*, because the circle they describe is parallel to the equator.

F. A. P. BARNARD.

**Parallelogram** [Gr. *παράλληλος* and *γραμμή*], a quadrilateral whose opposite sides, taken 2 and 2, are parallel. If one angle of a P. is a right angle, all the other angles are right angles, and the figure is a rectangle. If 2 adjacent sides are equal, the other sides are also equal, and the figure is a rhombus.

**Parallelepipedon** [Gr. *παράλληλεπίδον*], a polyhedron bounded by 6 parallelograms. If the faces are rectangles, the volume is a rectangular P.; if the faces are squares, the volume is a cube. In any P. opposite faces are equal to each other, as are also diagonally opposite polyhedral angles.

**Parallels of Latitude**, on the terrestrial sphere, are circles drawn around the earth parallel to the equator. Through the centre of each circle passes the earth's axis. The equator itself is the only one of these parallels which is a great circle. The tropics and polar circles are important parallels.

**Paralysis** [Gr. *παράλυσις*, to "relax"], impairment or loss of voluntary or normal reflex motion through defective nervous excitation. Any part of the body containing muscular fibres may be paralyzed. Thus we have P. of the heart, of the arteries, of the bowels, of the limbs, or of the muscles of the face, the eyeball, etc. (See HEMIPLEGIA, INFANTILE PARALYSIS, LEAD POISONING, PARALYSIS AGITANS, PARAPLEGIA, PROGRESSIVE MUSCULAR ATROPHY, SCRIVENER'S PALSY.)

**Paralysis Agitans**, or senile palsy, an involuntary tremor of the whole body, or exceptionally of a part, due to old age, to privation and exposure to cold, and also to the enervating influence of alcoholic abuse, opium, tobacco, coffee, tea. There is no true paralysis or loss of motor power, but continuous tremor, due to malnutrition of the nervous centres. It need not shorten life. It is amenable to rest, warm clothing, good diet, and tonics.

**Paramaribo**, cap. of Dut. Guiana, S. Amer., on the Surinam. It is a neat town, the streets broad and lined with rows of tamarind and orange trees. It is the residence of the gov., has barracks, many places of worship, a fine hospital, and a considerable trade; but it is very unhealthy. Pop. 20,000, most of whom are black.

**Parameter** [Gr. *παρά*, "beside," and *μέτρον*, "measure"], in gen., any one of the *elements* or necessarily given numbers or lines by which one curve is distinguished from another of the same species. The radius (or diameter) of a circle is its sole P. The major and minor axes of an ellipse are the determining P. of the particular curve, but other systems of lines can be used. The coefficients of the algebraic (or other) equation which expresses any curve form a system of P. The double ordinate at the focus of a parabola is more particularly called the "parameter," since it alone determines the particular parabola to which it belongs; and this element is also known as the *latus rectum*.

**Parana**, pah-rah-nah', a river of Brazil, which forms the boundary between the provs. of Parana, São Paulo, and Minas Geraes on the one side, and Matto Grosso and Goyaz on the other. After joining the Paraguay and the Uruguay, it forms the Rio de la Plata.

**Paranaphthalene**. See ANTHRACENE.

**Paraplegia**, par-a-plé-jé-a [Gr. *παράπλησιον*, to "strike beside"], paralysis of the lower limbs, and (usually) of the lower part of the trunk, including the bowels and bladder. There may be *anæsthesia* (loss of sensibility) or *dysæsthesia* (morbid sensations) in the same parts. Although the limbs are not under the control of the will, they are often the seat of strong movements of an involuntary or reflex character. The cause of P. nearly always is a disease in or about the spinal cord, in any part below the medulla oblongata; usually the lesion is in the dorsal or lumbar part of the organ. (See MYELITIS.) The same symptoms may appear, without gross disease of the spinal cord, in consequence of irritation in some external part, of the action of cold upon the body, disease of the bowels, etc. Beside P. in the above strict sense, there are paraplegiform affections and pseudo-paraplegia. The former is typically exemplified by progressive locomotor ataxia, a disease in which, through disease of the nervous organs, there is loss of function in the lower limbs, but without abolition or diminution of voluntary power; or through hysterical loss of sensibility in the feet and legs, or by spasm in the muscles

of the lower limbs, a paraplegiform affection is produced. Pseudo-paraplegia may be the result of muscular or articular disease in the lower limbs, of severe pain in the same parts, or in the lower part of the body, or of a delusive conception on the part of the patient. E. C. SEGUIR.

**Parasites** [Gr. *παράσιτος*], **Animal**. In both the animal and vegetable kingdoms there are countless forms which live at the expense of others. This dependence varies greatly, some being only parasitic to the extent of deriving their food in common with their hosts, while others during their whole life are attached to particular animals.

Parasitic animals belong to numerous different types of the animal kingdom, and they have, therefore, nothing in common except the physiological character of dependence to a greater or less extent for subsistence upon other animals. It is also evident that their origin is from a number of different sources, and that if the theory of evolution is assumed they have become developed from as many different free-living types as there are independent types of structure.

**Degrees and Manner of Parasitism**.—There are all degrees of parasitism, from simple attachment for the time being for some purpose or other, to permanent habitation in the interior of another animal. The animals exhibiting these differences have been separated under the terms "messmates," "mutualists," and "parasites proper."

The messmate is one who is received at the table of his neighbor to partake with him of the produce of his day's fishing. To this category belong those forms which partake of the nutriment imbibed or provided by the host, but which do not attack directly their host.

The mutualists are animals which live on each other, without being either P. or messmates; many of them are towed along by others; some render each other mutual services; others, again, take advantage of some assistance which their companions can give them; some afford each other an asylum; and some are found which have sympathetic bonds that always draw them together.

The parasites strictly so called live at the expense of their hosts, and take advantage of them, but prudently, so as not to endanger their lives. Scarcely any portion of the body is free from the intrusion of parasites. The different regions of the exterior are often infested by kinds which are peculiar to each, while almost every organ and system in the interior has its special parasites. These have been discriminated into the following groups: (1) Those forms which are found in a free state in the cavities or passages which mutually communicate with the exterior—*e. g.* the respiratory passages; (2) those which are contained in closed cavities, natural or accidental—*e. g.* the blood-vessels; (3) those which belong especially to some organic system—*e. g.* the muscles of animal life; and (4) those which affect complex organs, such as the eye, etc.

**Development and Acquisition of Parasitic Habits**.—Many P. pass through 2 or more stages, and in different kinds of animals, before attaining their full development. There are, for example, 2 species of tapeworms in man—*viz.* *Tenia solium* and *Tenia medio-canellata*. These are found in the intestinal cavity in a fully developed condition and with numerous segments, in which are developed eggs, and which become from time to time detached. In the common hog and cattle are found imbedded in the muscles bladder-like sacs connected with a head. The head in the entozoon of the hog resembles that of the *Tenia solium*, while that in the one of the cattle is similar to the head of the *Tenia medio-canellata*. It is found, further, that these cysts from the hog are developed into the *Tenia solium*, and those from the cow into the *Tenia medio-canellata*. It is therefore evident that the tapeworms of man are the result of eating the flesh of the hog or beef, *mutatis mutandis*, in a raw or imperfectly cooked state. On the other hand, the hog and the cattle have evidently derived these cysts from having eaten the eggs evacuated from man or some other animal with their food. (See RUDOLF LEUCKART, *Die menschlichen Parasiten, und die von ihnen herrührenden Krankheiten*.)

THEODORE GILL.

**Parce**. See FATES.

**Parch'ment** [Fr. *parchemin*] is not really leather: it is merely the well-cleaned and carefully dried skins of hares, rabbits, calves, asses, or sheep. Common P. is prepared from sheepskins, but vellum, a far finer variety, is made from the skins of young calves, goats, or still-born lambs. Sheepskins are often split and made to yield two sheets of P. Drum-heads are made from calves' skins, heads of kettle-drums from asses' skins, sieves for gunpowder-mills from hogs' skins. P. was known long before the invention of paper. The name is derived from the city of Pergamus in Asia Minor.

**Pardon**, in law. This as generally understood is an act proceeding from the executive dept. of a govt., which relieves an individual from the penal consequences of a crime which he has committed. A distinction is taken between a reprieve and a P. The former is the suspension of a sentence for a time, while the latter entirely removes its effect. A P. may be considered under 2 gen. divisions: I. Its nature and effect; II. The mode of granting and making use of it.

I. The nature of a P. is to blot out the offence to which it is applied, and to treat the wrongful act as though it had never existed. The power to pardon is granted in the U. S. const. in the most gen. and comprehensive terms to the Pres. "He shall have power to grant reprieves and P. for offences against the U. S., except in cases of impeachment." (Art. II. sec. 2.) This power cannot be controlled or limited in any manner by Cong. He alone has the power to pardon offences committed in a terr. in violation of acts of Cong. It not only extends to personal punishment, but also to the remission of fines, penalties, forfeitures, and costs in criminal cases.

In some of the States the power of P. is granted to the



govs. by the State const. in the same gen. way as in the U. S. const. In others there are different provisions, perhaps vesting the pardoning power in a board of P., or, if granted to the gov., it is subject to certain restrictions—e. g. obtaining the consent of the senate; the State consts. should be consulted. In Eng., while this power is usually exercised by the king, it may be by act of Parl. In this country, if a const. delegates it in gen. terms to a gov. or pres. it is entirely withdrawn from the legislature. A P. may be either absolute or conditional. The claimant under a conditional P. must make clear affirmative proof that the condition has been complied with.

**II.** A P. may be made either by gen. proclamation or in a particular instance. The usual form is a deed signed by the executive, with the great seal attached. Publication in newspapers is not necessary to make it operative. It is a deed to which delivery is essential. It is accordingly revocable until it has been actually delivered to the prisoner or issued to the keeper of the prison in which he is confined with intent that it should become available to him. It may accordingly be revoked while it remains in the hands of the U. S. marshal, who is to be regarded as the messenger of the Pres., and not as the agent of the person pardoned. When a person pardoned desires to avail himself of his P., he must bring the fact before the court by some appropriate method, such as a plea or motion. Otherwise, the court will not take notice of it. T. W. DWIGHT.

**Paré, par'ré** (AMBROISE), b. at Bourg-Hersent, near Laval, Fr., 1517, was the son of very poor parents; became a barber; studied surgery in Paris; joined the society of St. Côme, and in 1536 entered the army in it, as a surgeon. His introduction of the ligature for bleeding arteries after amputation was the foundation of modern surgery, and he wrote a work on gunshot wounds which is still of value. His great invention dates from 1596. From 1582 to 1590 he was surgeon to 4 Fr. kings. He was a devout Huguenot, but his reputation for surgical skill saved him at the massacre of St. Bartholomew and at other critical junctures. D. at Paris Dec. 22, 1590.

**Paragoric Elix'ir** (*tinctura opii camphorata*), an anodyne made by saccharifying together 60 grains each of powdered opium and benzoic acid, 40 grains of camphor, a fluidrachm of oil of anise, 2 troy ounces of honey, and 2 pints of alcohol. After standing 7 days it is filtered for use. Liquorice is sometimes added. It is a mild anodyne and antispasmodic.

**Paréira Brava** [Port. "wild vine"], the dried woody root of some S. Amer. climbing plants of the order Menispermaceæ. It is a tonic and diuretic drug, used especially in chronic inflammations of the bladder and the urinary passages.

**Paréira-Rosa.** See ROSA.

**Par'iah** [Hindoo, "mountaineer"], one of the lowest classes in Ind., so called because generally of the stock of the hill-tribes. The P. have woolly hair and thick lips. They are very degraded, are not allowed to approach within many ft. of any Hindoo, and have to some extent adopted a system of caste among themselves.

**Par'ian Ware**, a name given to vessels, statuettes, and bric-à-brac made of the same materials as fine Eng. china. The material is reduced to a liquid state and then cast in moulds made of plaster of Paris. Great care must be taken in the firing.

**Parima**, pah-ree'mah, or **Parime, Sierra**, also called the **Highlands of Guiana**, a mt.-system of S. Amer., occupies the N. E. part of the country, and separates the plains of the lower Orinoco from those of the Rio Negro and the Amazon.

**Paris**, par'ris, the cap. and prin. fortress of Fr., on both sides of the Seine, forming nearly a circle, and surrounded with hills whose tops are crowned with forts. As the seat of the central govt., the centre of commerce and industry, the vital point in the spiritual life of the nation, the great depository for historical, scientific, and artistic monuments, it bears absolute sway over the country. The *ciité*, situated on the *Ile de la Cité* in the Seine, forms the oldest part, the kernel of the city, and around this centre the rest of the city forms 3 belts. The first belt, the *ville* proper, is bounded by the inner *boulevards*, the most important thoroughfares, constructed by Louis XIV. in 1670 on the site of the old fortifications. The second belt consists of the *faubourgs*, and is surrounded by the outer *boulevards*, running along the former demarkation wall. The third belt extends to the bastioned wall, beyond which the whole vicinity is covered with villas, gardens, and parks. The Seine traverses the city in a curve, and divides it in a larger part to the N. and a minor to the S. The longest diameter of the city, from Porte Point du Jour in the S. W. to the outermost point of La Villette in the N. E., is about 7½ Eng. m., while its shortest diameter, a line leading through the intersecting point of the Seine in the S. E., by the Tuilleries to Les Batignolles, is 5½ Eng. m. long. The whole area comprises about 135 sq. m., and is covered with about 45,000 buildings. The whole city is very finely built, with broad streets lined with large and stately houses, which are generally occupied by several families. The greatest changes and improvements were undertaken by Nap. III., and are due to the talent of the prefect Haussmann. It is divided into 20 *arrondissements*, but the old names of the old divisions are still in common use, especially in cases in which the quarter has received a certain character from its inhabs.—such as Faubourg St. Germain from the legitimist aristocracy; Faubourg St. Honoré from the diplomacy and the financiers; Quartier Latin from the students; and Faubourg St. Antoine from the workmen. The most important and the most beautiful streets are the *boulevards*, of which those situated on the right bank of the Seine surpass the streets of any other city in splendor of architecture and in the luxurious outfit of the stores and cafés. A series of such

streets, 4800 metres long and 30 metres broad, runs from the Place de la Bastille to the Madeleine ch. Beside these there are numerous other beautiful though less famous *boulevards*. They consist of a macadamized roadway in the centre, and sidewalks paved with asphaltum on both sides; rows of trees are planted between the roadway and the sidewalks. The most celebrated public squares are—the Place de la Concorde, between the garden of the Tuilleries and the Champs Élysées. The Obélisque de Luxor, a present from Mehemet Ali to Louis Philippe, was raised here in 1836. Two beautiful fountains are constructed under the obelisk; 8 statues, representing the 8 largest cities of Fr., adorn the square, which is surrounded with a balustrade with columns and chandeliers. The Jardin des Tuilleries, to the E. of the square, and belonging to the celebrated palace of the same name, contains old and handsome trees, and is adorned with statues of marble and bronze; it is a favorite rendezvous for children and nurses. On the Place du Carrousel stands the Arc de Triomphe, erected in 1806 by Nap. I. in commemoration of his victories over Aus. and Rus. On the Place Vendôme stands the Colonne Vendôme, erected by Nap. I. in 1806. The Place de l'Étoile, from which 12 *boulevards* and *avenues* radiate, contains the Arc de Triomphe de l'Étoile, the largest triumphal arch ever erected, 49 metres high, 45 broad, and 23 thick. The Champ de Mars is a military parade-ground, situated on the left bank of the Seine, 1000 metres long, 500 broad, and capable of accommodating 30,000 men drilling and manœuvring. The Champs Élysées, laid out in 1616, is a small Eng. park, extending from the Place de la Concorde to the Arc de Triomphe. The Avenue du Bois de Boulogne leads from the Arc de Triomphe to the Bois de Boulogne, a beautiful park, comprising an area of 90 hectares, and extending from the line of fortifications to the Seine. Other fine promenades are the Parc de Monceaux, to the N. E. of the Arc de Triomphe, and the gardens of the Palais Royal and de Luxembourg. The river is lined with 27 quays and spanned by 23 bridges. The city has 65 chs., beside a number of chapels. Of these the most celebrated is the cathedral of Notre Dame, situated in the E. part of the *ciité*. It is a Gothic structure, erected from the 12th to the 14th century. Ste. Chapelle, also situated in the *ciité*, is perhaps the most beautiful mediæval structure in existence. The Madeleine was founded in 1764, but not finished until the reign of Nap. I. On the left bank of the Seine the most important ecclesiastical structure is the Panthéon. The city is still richer in palaces, of which the most celebrated are situated in the centre of the city—the Tuilleries, Louvre, and Palais Royal. The Tuilleries is now mostly in ruins. The Louvre (which see) is both in architectural respects and as a museum of art the grandest and most interesting building in P. The Palais Royal, opposite the New Louvre, was built by Richelieu (1629–36). The Palais de Justice, situated in the *ciité*, was the residence of the king to the close of the 14th century, at which time it was assigned to the Parl. The Palais de Luxembourg is also historically interesting, containing an excellent collection of modern sculptures and pictures. The Palais du Corps Législatif, opposite the Place de la Concorde, on the left bank of the Seine, has the form of a Gr. temple with a Corinthian peristyle. Other noteworthy public buildings are the Hôtel des Invalides, an imposing pile, crowned by a gilded dome, immediately under which stands the sarcophagus of Nap. I. In the Palais de l'Institut, built in a semi-circle, crowned with a dome, the Fr. Acad. holds its meetings. Close by is the Palais des Beaux-Arts, the Mint, the Bourse, the Central Hall, with 3200 stands for vegetables, fish, poultry, etc. Of the numerous theatres of P., the most prominent are the New Opera, Théâtre Français, L'Opéra Comique, Le Vaudeville, Les Variétés, Le Palais Royal, etc. The insts. of learning and education are grand. At the head stand the Institut de France, the Sorbonne, the Collège de France. There are 9 other colls. The most celebrated are the École de Médecine, École Militaire, École Centrale des Arts et Manufactures, etc. The Bibliothèque Nationale, probably the largest and richest library in the world, contains 3,000,000 vols., 150,000 MSS., 300,000 maps and plans, beside other scientific treasures, among which is a celebrated cabinet of medals and antiques. Other important libraries are Ste. Geneviève, Mazarine, de l' Arsenal, de l'Université, etc. Of great importance for the study of nat. science is the Jardin des Plantes. With respect to commerce and industry, P. occupies a position of the first rank. Characteristic and often unique in their kinds are the articles of luxury, fashion, play, knick-knacks, bronzes, leather goods, musical instruments, artificial flowers, shawls, carpets, tapestry, etc. The reason is that in Fr. art and industry walk hand in hand. Among its charitable insts. the most remarkable are the Hôtel Dieu, Charité, Pitié, La Pitié, La Pitié, etc. A peculiar inst. is the Morgue, in which the bodies found in the Seine are exposed for 3 days. The most interesting among the cemeteries are du Père Lachaise, de Montmartre, and du Montparnasse; the first especially is very famous. P. forms the centre of the railway system of Fr. Pop. 2,269,023. [From orig. art. in *J's Univ. Cyc.*, by AUGUST NIEMANN.]

**Paris, R. R. junc.**, cap. of Edgar co., Ill., has a large trade and important manufactures. Pop. 1870, 3057; 1880, 4573.

**Paris, R. R. junc.**, cap. of Bourbon co., Ky., on a tributary of the Licking River, is an important cattle-market and the chief seat of the manufacture of Bourbon whiskey. Pop. 1870, 2655; 1880, 3204.

**Paris, Mo.** See APPENDIX.

**Paris, Tenn.** See APPENDIX.

**Paris, R. R. junc.**, cap. of Lamar co., Tex., near Red River, is centre of rich cotton region. Pop. 1880, 3960.

**Paris**, a son of Priam, the king of Troy, and Hecuba, carried off Helen, the wife of Menelaus, king of Sparta, thereby bringing on the war between the Grs. and Trojans. Being wounded during the siege by a poisoned arrow, he d. before the capture of the city.



**Paris** (JOHN AYRTON), M. D., b. at Cambridge, Eng., Aug. 7, 1785; grad. in med. at Caius Coll. 1808; resided some time in Lond., and several yrs. at Penzance, Cornwall, where he founded the Royal Geological Society of Cornwall; returned to Lond. 1817; lectured on materia medica and the philos. of med.; invented the "tamping bar," an implement coated with copper for the protection of miners from the perils caused by the sparks emitted from iron bars; wrote *Memoir of Sir H. Davy, Pharmacologia, or the Hist. of Med. Substances, A Treatise on Diet*, etc.; became pres. of the Lond. Coll. of Phys. 1844, and retained that position until his death, at Lond., Dec. 24, 1856.

**Paris**, pah-re', de (LOUIS PHILIPPE ALBERT D'ORLEANS), COMTE, grandson of Louis Philippe, b. at Paris Aug. 24, 1838. He was only 4 yrs. of age when, by the accidental death of his father, the duc d'Orleans, he became, after the king, the representative of the House of Orleans. Scarcely 10 yrs. of age, the revolution of 1848 occurred, when, with his mother and brother, he witnessed the stormy scenes in the French Chamber of Deputies, where the duchess had presented herself. They escaped with difficulty from thence, from Paris, and from Fr. In 1849 the duchess, who had first repaired to Belg., rejoined the royal family at Claremont, Eng., where, under her care and in Ger., his education was conducted. Her death occurred (May 18, 1858) a yr. before he attained his majority. Travels in Gr., Egypt, and the E. occupied the subsequent yr. or two, and in Aug. 1861 the prince, with his brother, the duc de Chartres, accompanied their uncle, the prince de Joinville, to the U. S. Though anticipating but a few months' sojourn, they did not fail to avail themselves of the opportunity of exhibiting sympathy for the republic. Their proffer of gratuitous services was welcomed by the Pres. and sec. of state. They were attached to the personal staff of Gen. McClellan with rank of capt. During their short career in the field no opportunity was lost by either of the young officers to serve on detached expeditions, in which, on more than one occasion, they freely exposed themselves. An imperious necessity compelled them to return to Europe, leaving as soon as the army reached James River (July 2, 1862). In 1864 the count wedded his cousin, the princess Isabella, eldest daughter of the duc de Montpensier. On his return to Eng. he devoted himself to the study of the condition of the operatives, then in distress through the "cotton famine." The results of his protracted labors were made known in papers written for periodicals, which were subsequently embodied in a work on the *Workingmen's Associations in Eng.* Two other publications, *L'Allemagne nouvelle* and *L'Esprit de Conquête*, show the count in the broader light of a statesman and profound student of the political signs of the times. Absorbing as such studies must have been to one in his position, they have not excluded devotion to a yet more laborious work. He devoted many yrs. after he bore the commission of a capt. in the service of the U. S. to writing the *Hist. of the Civil War in Amer.* J. G. BARNARD.

**Paris Green**, "Scheele's green," is a compound of oxide of copper and arsenious acid, *arsenite of copper*. White arsenic (arsenious acid) is dissolved by boiling in caustic potash-lye 11 parts of arsenious acid to 32 of solid potash, and added while hot to a hot solution of 32 parts of blue vitriol, sulphate of copper. The precipitate that falls has a very rich, bright, and peculiar tint of green, which is difficult to obtain by other means. It is one of the most deadly of poisons. It is used for coloring wall-paper and other ornamental paper, and paper for binding books, and for innumerable other uses.

**Paris, Plaster of**. See GYPSUM.

**Park** (EDWARDS AMASA), D. D., b. at Providence, R. I., Dec. 20, 1808; grad. at Brown Univ. 1826, and at Andover Sem. 1831; became in 1831 Congl. pastor at Braintree, Mass.; was 1835-36 prof. of moral and intellectual philos. in Amherst Coll.; held the Bartlett professorship of sacred rhetoric in Andover Theological Sem. 1839-47, and in the latter yr. became Abbot prof. of sacred theol. in the same inst. (resigned 1881); in 1869-70 travelled in Europe and the E.; was one of the prin. eds. of the *Bibliotheca Sacra*; editor of *Discourses and Treatises on the Atonement*, etc.

**Park** (MUNGO), b. at Fowlsheils, Selkirkshire, Scot., Sept. 10, 1771; studied surgery at Edinburgh, and was 1792-93 assistant surgeon on the Worcester Indianman; journeyed up the Gambia and visited the Niger 1795-97; settled as a surgeon in Scot.; took command, in Jan. 1805, of a small military exploring party despatched by the Afr. Association and the Brit. govt. to trace the course of the Niger. Most of his party d. of fever, and before the Niger was reached only 5 white men were left out of 44. The party built for themselves a little schooner, with which they descended the Niger, some 1500 m., when they were treacherously murdered by a large party of natives.

**Park** (ROSWELL), D. D., b. at Lebanon, Conn., Oct. 1, 1807; grad. at Union Coll. and at W. Pt. 1831, and until Sept. 1836 served as a lieut. of engineers; was prof. of nat. philos. and chem. in the Univ. of Pa. 1836-49; took orders in the P. E. Ch. 1843; was an instructor in Conn. 1846-52, pres. of Racine Coll. 1852-59, chancellor of the same 1859-63; founded in 1863 a school at Chicago. Author of *Pantology, Sketch of West Point, a Handbook for European travel*, and a vol. of original, translated, and selected poems. D. July 16, 1869.

**Park City**, Ut. See APPENDIX.

**Parke** (JOHN G.), b. near Coatesville, Pa., Sept. 22, 1827; grad. at W. Pt. 1849; served in corps of topographical engineers for many yrs. as chief astron. and surveyor in locating the N. W. boundary. Appointed brig.-gen. of volunteers Nov. 1861, he accompanied Burnside to N. C.; promoted to be maj.-gen. Aug. 1862, he served as chief of staff of the 9th corps in the battles of South Mountain and Antietam, and on Burnside's succeeding to the command of the Army of the Potomac was retained by him as his chief of staff; was in command of the 9th corps during its march to Vicksburg, and for a time of left wing of Sherman's army; in

command of a division of the 9th corps on Burnside's re-assuming command, and engaged in Tenn. in siege of Knoxville, etc., and in Richmond campaign of 1864, again attaining command of the 9th corps before Petersburg (Aug. 1864), which he retained through the subsequent operations. In 1864 he became a major of the corps of engineers, and for several yrs. had charge of a division in the office of the chief of engineers; colonel in 1864.

**Parker**, Dak. See APPENDIX.

**Parker** (AMASA J.), LL.D., b. at Sharon, Conn., June 2, 1807; was prin. of Hudson Acad. 1823; grad. in 1825 at Union Coll.; came to the bar in 1828, and practised at Delhi, N. Y.; entered the legislature in 1833; was chosen a regent of the univ. 1835; M. C. 1837-39; became in 1844 vice-chancellor of New York, a circuit judge, and afterward a judge of the State supreme court; in 1859 was appointed U. S. dist. atty. He prepared 6 vols. of law reports; was one of the eds. of the third edition of Judge Tapping Reeve's *Law of Baron and Feme*, etc.

**Parker** (FOXHALL A.), b. in New York Aug. 5, 1821, was appointed a mdpn. in the U. S. N. 1837; grad. from the Naval School at Phila. 1843; served against the Fla. Indians, on the Coast Survey, and in the Mediterranean squadron; lieut. 1850; served at the Washington navy-yard as executive officer 1861-62; co-operated with the Army of the Potomac on several occasions in command of seamen; on garrison-duty at Ft. Ellsworth and in building Ft. Dahlgren; drilled some 2000 seamen in the exercise of artil. and small-arms, thereby promoting in no small degree the success of Admiral Foote's operations with the Miss. flotilla; commander July 1862; commanded the steam-gunboat Mahaska (1862-63), and the Wabash off Charleston June to Sept. 1863, most of which time was spent on Morris Island in charge of a naval battery; commanded the Potomac flotilla, consisting at one time of 42 vessels, from Dec. 1863 until the close of the war, being frequently engaged with the enemy; was promoted to capt. "for good service during the rebellion," July 1866; was chief of staff to the N. Atlantic fleet 1872; ordered to special duty at Wash. Aug. 1873, and appointed chief signal-officer of the navy July 1873. In 1868 he prepared, by order of the navy dept., systems of *Fleet Tactics under Steam and Squadron Tactics under Steam*; in 1865, *The Naval Howitzer Afloat*; and in 1866, *The Naval Howitzer Ashore*; all of which are text-books at the Naval Acad. In Dec. 1874 he was appointed chief of staff of the united fleets under command of Admiral Cies which were assembled for instruction in tactics in the Fla. waters; supt. U. S. Naval Acad. July 1878. He was one of the associate eds. of *J's Univ. Cyc.* D. June 10, 1879.

**Parker** (JAMES), b. at Bethlehem, N. J., Mar. 3, 1776; grad. at Columbia Coll. 1793; inherited immense landed estates; was a member of the N. J. legislature for many yrs.; M. C. 1833-37; member of the State constitutional convention 1844; pres. of the State Historical Society; gave to Rutgers Coll. the land upon which its buildings were erected. D. Apr. 1, 1868.

**Parker** (JOEL), LL.D., b. at Jaffrey, N. H., Jan. 25, 1795; grad. at Dartmouth 1811; became in 1815 a lawyer at Keene, N. H.; a judge of the N. H. supreme court 1833, chief-justice 1838; in 1840 chairman of a committee to revise the laws of the State; was in 1847 a law-prof. in Harvard. Author of treatises on *The Three Powers of Govt., Non-extension of Slavery, The Right of Secession*, etc. D. Aug. 17, 1875.

**Parker** (JOEL), D. D., b. at Bethel, Vt., Aug. 27, 1799; grad. at Hamilton Coll. 1824; was ordained 1826; held pastorates in Rochester, N. Y., New Orleans, Phila., and Newark, but principally in New York; was pres. of the Union Theological Sem. and prof. of sacred lit. 1840-42; wrote several religious works, and was for a time associate ed. of the *Presb. Quarterly Review*. D. May 2, 1873.

**Parker** (JOEL), LL.D., b. at Monmouth, N. J., Nov. 24, 1816; grad. at Princeton Coll. in 1839; studied law, and was admitted to the bar in 1842; was elected to the State legislature in 1847; subsequently was county attorney. Upon the breaking out of the c. war he was made maj.-gen. of volunteers, in 1862 was elected gov. of N. J., and again elected in 1871. In the national Dem. convention of 1876 he was among those prominently named as a possible nominee for Pres. of the U. S.

**Parker** (MATTHEW), D. D., b. at Norwich, Eng., Aug. 6, 1504, ed. at Corpus Christi Coll., Cambridge; took priests' orders 1527, and the same yr. M. A. and fellow of his coll.; chaplain to Anne Boleyn 1533, dean of Stoke Clare Coll., Suffolk, 1535, chaplain to Henry VIII. 1537, prebendary of Ely 1541, master of Corpus Christi Coll. 1544, dean of Lincoln 1552; was deprived by Queen Mary 1553 for having married; appointed abp. of Canterbury in 1559. The Bishops' Bible was printed at his expense. Later he became an enemy of conventicles and of the nonconforming spirit. He pub. A.-S. and other early Eng. chronicles. D. May 17, 1575.

**Parker** (PETER), M. D., b. at Framingham, Mass., June 18, 1804; grad. at Yale Coll. 1831; studied theol. and med. at New Haven; went to Canton, China, as a missionary 1834; established a hospital, in which more than 2000 patients were treated the first yr.; had great success both in surgery and med., and trained many Chl. students; visited the Loo-Choo Islands and Japan 1837; returned to the U. S. 1840-42; became interpreter and sec. of legation to the Amer. mission in Chl. 1845, retaining charge of the hospital; acted as *chargé d'affaires* during the absence of the minister; again visited the U. S. 1855, but went to Chl. the same yr. as com. with power to revise the treaty; returned to Amer. 1857; has been a regent of the Smithsonian Inst., and has filled other honorable scientific posts.

**Parker** (SAMUEL), D. D., b. at Portsmouth, N. H., Aug. 28, 1744; grad. at Harvard 1764; was an instructor for 9 yrs.; ordained to the Anglican ministry 1774 by the bp. of Lond.; until 1779 assistant minister, and then rector of Trinity ch., Boston; in 1804 consecrated bp. of the P. E. Ch. for the diocese of Mass. D. Dec. 6, 1804.



**Parker** (THEODORE), b. at Lexington, Mass., Aug. 24, 1810, was a grandson of Capt. John Parker, who commanded the company of minutemen fired on by Brit. troops at Lexington Apr. 19, 1775; was distinguished in childhood for a precocious memory; studied Lat., Gr., and mental philos. while working on the farm or in the tool-shop; taught school at the age of 17; studied at Lexington Acad.; entered Harvard Coll. 1830, but did not pursue the regular course, being obliged to carry on his studies at home and teach private classes at Boston and Watertown; entered the Cambridge Divinity School 1834, grad. 1836; was settled at W. Roxbury as pastor of the Second (Unitarian) church June 1837; soon arrived at religious views widely differing from those of conservative Units.; laid down the principles of his new transcendental system in a series of 5 lectures delivered at Boston in the autumn of 1841, published under the title *A Discourse of Matters Pertaining to Religion*, followed by a series of 6 *Sermons for the Times*; wrote articles in the *Dial*; pub. a vol. of *Critical and Miscellaneous Writings*, and a translation of De Witt's *Introduction to the O. T.*; spent nearly 2 yrs. travelling in Europe; returned to Boston in the autumn of 1844, when a controversy grew warm within the Unitarian denomination, arising from the act of several pastors of chs. at Boston, who admitted him to their pulpits. As the result, Mr. P. established an organization at Boston known as the "Twenty-eighth Congregational Society" (1846), which worshipped at the Melodeon, and subsequently for many yrs. at the Music Hall; founded and edited for 3 yrs. the *Mass. Quarterly*; was indicted in the U. S. court (June 1854) for resistance to the Fugitive Slave Law in the case of Anthony Burns, but was never brought to trial; pub. several vols. of speeches, addresses, and sermons, and many single sermons; continued preaching until Jan. 1859, when he was prostrated by an attack of bleeding at the lungs. D. at Florence, It., May 10, 1860.

**Parker** (WILLARD), M. D., LL.D., b. at Lyndeborough, N. H., Sept. 2, 1802, grad. at Harvard 1826; studied med. and surgery; became prof. of anat. in the Vt. Med. Coll., and also in that of Berkshire 1830; prof. of surgery in the latter inst. 1833, and at Cincinnati 1836; spent some time in the hospitals of Paris and Lond.; was for 30 yrs. (1839-69) prof. of surgery in the New York Coll. of Phys. and Surgeons, after which he exchanged into the chair of clinical surgery. In 1854 he first described and reported cases of what is now known as "malignant pustule." He became pres. of the N. Y. State Inebriate Asylum at Binghamton in 1865; was the first to call attention to the phenomena of concussion of the nerves as distinguished from that of the nerve-centres, and has made important discoveries in practical surgery, including the operation of cystotomy for the relief of chronic cystitis, and that for the cure of abscess of the "appendix vermiciformis." He was one of the associate eds. of *J.'s Univ. Cyc.* D. Apr. 25, 1884.

**Parkersburg**, on R. R., Butler co., Ia., 18 m. W. of Cedar Falls. Pop. 1880, 652.

**Parkersburg**, city, on R. R., cap. of Wood co., West Va., on the O. River, at the mouth of the Little Kanawha; possesses great facilities for manufactures and oil-refining, and has several lines of steamers on the O. and the Little Kanawha. Pop. 1870, 5546; 1880, 6582.

**Parker's Landing**, R. R. junction, Armstrong co., Pa., on the Allegheny River. Pop. not given in census.

**Parkes** (named from its inventor), a substitute for vulcanized india-rubber and for gutta-percha, was originally a compound of castor oil and gun-cotton, but it is understood that as good or better results can be obtained from cheaper materials. It is claimed that it is cheaper and better than vulcanite or gutta-percha for all the purposes for which they are used.

**Parkhurst** (CHARLES HENRY). See APPENDIX.

**Parkman** (FRANCIS), D. D., b. at Boston June 4, 1788, grad. at Harvard 1807; studied divinity with W. E. Channing and in Edinburgh; was 1813-49 pastor of the New North ch., Boston (Unit.). Author of *The Offering of Sympathy*; founder of the P. professorship of pulpit eloquence in the Cambridge Divinity School. D. Nov. 12, 1852.

**Parkman** (FRANCIS, JR.), b. in Boston, Mass., Sept. 16, 1823, grad. at Harvard 1844; travelled in the far W. and in Europe, and in spite of a severe chronic disease, accompanied by partial blindness, has attained a high rank as an historian. His prin. work is *Fr. and Eng. in N. Amer.*, of which the following parts have appeared: *Hist. of the Conspiracy of Pontiac*, *Pioneers of Fr.*, *The Discovery of the Great W.*, *The Jesuits in N. Amer.*

**Parliament, British.** The origin of parliamentary govt. in Eng., like that of many other Brit. insts., is involved in much obscurity. There can, however, be no doubt that alike in Sax. and Norman times the Eng. people had always some share in making the laws whereby they were governed. The Witenagemote (or assembly of the wise) of the Sax. period, and the P. (or free-speaking council), which is traceable both in etymology and function to Norman influence, were at once the outgrowth and the guardians of popular rights and liberties. The taxes and crown levies could only be raised through the sanction of the people themselves; and it is one of the oldest traditions of Brit. govt. that there ought to be no taxation without representation. Successive sovereigns after the Conquest (1066) had encroached upon popular prerogative, until, in the reign of King John, the evil culminated in practical absolutism on the part of the Crown. The result was a violent recoil and a resolute demand for the restoration of baronial and popular rights, which led to the signing of Magna Charta on the field of Runnymede (1215). The Great Charter of King John is the oldest constitutional document extant in Eng.

I. *Of what does P. consist?*—The Imperial P. consists of the queen, the lords, and the commons. The 3 estates of the realm are the lords spiritual, the lords temporal, and the commons. The sovereign is the executive authority, and is charged with the duty of enforcing the will of P.; but in

the matter of legislation the sovereign is no more than a constituent part of P. acting in conjunction with the 3 estates of the realm. In ordinary times there can be no meeting of P. unless the monarch is present at the opening of it, either in person or by coms.

The House of Lords is constituted as follows: I. Lords Spiritual (2 archbishops, 24 English bishops); II. Lords Temporal (5 peers of the blood royal, 21 dukes, 18 marquises, 111 earls, 24 viscounts, 242 barons, 16 Scotch representative peers, 28 Irish representative peers).

The creation of peerages is vested unreservedly in the Crown. All peerages are hereditary, the House of Lords having decided that a life-peer cannot, as one of their number, discharge any legislative functions. The Scotch representative peers are elected for 1 P., the electors being those Scotch peers whose titles are older than the union with Scot. The Irish representative peers sit for life, and are elected by the whole body of Irish peers, no matter from what period their titles date.

The House of Commons is constituted as follows: 489 members from Eng. and Wales (including 5 members for 3 univs.), 60 members from Scot. (2 univ. members), and 103 members from Ire. (2 univ. members).

Certain persons are disqualified to sit in P. Minors, lunatics, outlaws, and aliens are excluded; so also are the common-law judges, the clergy of the Established chs. of Eng. and Scot., and R. Cath. priests; likewise pensioners under the Crown during pleasure or for a term of yrs., contractors with govt., members of the India council, and peers of P. By the act of 1858 property qualification has been abolished. A member of the House of Commons cannot resign his seat; but if he accept any office of profit under the Crown, his seat is vacated *ipso facto*. Members of the House of Commons are now elected by secret ballot in all the constituencies of the United Kingdom, with the exception of the univs. No religious test whatsoever is imposed upon members, the only oath taken by them being the oath of allegiance.

II. *The Powers of P.*—The House of Lords has 2 functions, the legislative and the judicial. In legislation it acts in concert with the queen and the Commons, the assent of all 3 being necessary to give validity to a bill, which then becomes an act of P. Practically, the law-lords alone sit in a judicial capacity, though every peer has a legal right to take part in trying appeals. The criminal cases which come before the House of Lords are those in which a person is impeached by the Commons, or those in which a true bill has been found by a grand jury against a peer of the realm. Every peer, when dissatisfied with a decision of the house, has a right, with leave, to enter a protest on the journals. When sitting in his judicial capacity, he gives judgment on his honor, and not on his oath; but when summoned as a witness in any cause, he must be sworn. All bills affecting the rights and privileges of peers must originate with the House of Lords, and they may not be amended, but may be rejected by the Commons. The House of Commons is vested with the right of imposing taxes and voting money for the public service. Election petitions are tried by the common-law judges. Both branches of the legislature have certain privileges and powers for the protection of their own dignity, independence, and honor.

III. *The Forms of P.*—P. assemblies on the summons of the sovereign; and although the law provides that not more than an interval of 3 yrs. shall elapse from the dissolution of one P. to the assembling of the next, the practice of voting money for the public service annually has rendered this statute superfluous, as the govt. could not be carried on without an annual meeting of the House of Commons. Should the sovereign die between the dissolution of a P. and the issuing of writs for a new election, the old P. revives, and may continue to sit for a period not exceeding 6 months. At the beginning of each session the queen states her reasons for convening the Lords and Commons, and gives an outline of the legislation contemplated by her ministers. This statement is known as "the speech from the throne," and is either delivered personally or by coms. Adjournment is decided by each house for itself, but prorogation and dissolution are the sole acts of the sovereign. A P. expires at the end of 7 yrs. The sovereign, however, usually puts an end to it by dissolution, and does not allow it to expire by efflux of time. When the estimates are laid before the House of Commons a member may move and carry the reduction of a vote, but no additional grant of public money can be made without a recommendation from the queen. A member of either house cannot be questioned outside of P. for anything he has said in his place; but if he afterward publish his speech, he is liable to an action for libellous imputations, and is not protected by the privilege of his position as a member of P. The persons of members are free from arrest in civil causes, but they may be adjudged bankrupts, and their goods are liable to distress on legal process, like those of private citizens. Every bill, before it becomes an act, must be read 3 times in each house, and also be reviewed clause by clause in a committee of the whole house or by a select committee. When a bill has passed both houses, the sovereign's assent is given, usually by commission, the Commons being summoned to the bar of the House of Lords, with the speaker at their head, to hear the announcement of the queen's will. (See *Rules, Orders, and Forms of Proceeding of the House of Commons relating to Public Business* (1874).) (From orig. art. in *J.'s Univ. Cyc.*, by RICHARD SMYTH, M. P.)

**Parma**, DUCHY OF, one of the political divisions of It. previous to the formation of the It. kingdom in 1860, embracing the actual provs. of P. and Piacenza.

**Parma**, city of N. It., situated in the great plain of Lombardy, about 12 m. S. of the Po and 75 m. S. E. of Milan. It is in direct railway communication with all the large towns of Piedmont, Lombardy, and Venetia. The town is circular in form, is surrounded by bastions, and is



divided into two unequal parts by the river Parma. The streets are in good condition, the squares large, and the public promenade, near the castle, is pleasantly shaded with trees. Among the public buildings should be noticed the cathedral (Rom. Byzantine, begun in 1060 and consecrated by Paschal II. 1106); the baptistery (begun in 1196), a fine specimen of Lombard arch.; the ch. of San Giovanni Evangelista; the Madonna della Steccata, a ch. of the Renaissance. The municipal museum, the acad. of fine arts, the school of design, and the Farnese theatre are all in the great building known as the *Piotta*, which was intended to form a part of a colossal ducal palace never completed. There is a univ. here, and a library of 150,000 vols. P. owes its chief attraction to the masterpieces of Correggio in the acad. of fine arts, and to its well-preserved frescoes in Camera di San Paolo. There is little business activity in P. beyond trade in the produce of the prov., which consists chiefly of silk, grain, cheese, and cattle. Pop. 45,217.

**Parma, Duke of.** See FARNESSE (ALEXANDER).  
**Parmanides** [*Παρμενίδης*], son of Pyrrhus, and the most notable of the philos. of the Eleatic School, was b. at Elea, a Phocæan colony situated in Lucania, about the yr. 519 B. C. He is said to have been the pupil of Xenophanes, and to have adopted the mode of living of the Pythagoreans. He took an active part in the govt. of his native city, and appears to have attained a ripe old age.

**Writings.**—The only work of P. known to the ancients was *On Nature* (*Περὶ Φύσεως*), written in dactylic hexameters. It was divided into 8 parts: 1, An introduction; 2, a treatise *On Truth*; and 3, a treatise *On Opinion*. The known extant fragments of P. are comprised in something less than 160 hexameters.

**Philosophy.**—P. was the greatest of the pre-Socratic thinkers. The kernel of his thought is the notion of pure Being, which he identifies with pure Thinking. Pure Being alone *is*. Non-Being and all the array of finite thoughts and things which its assumption entails are delusions. In opposition to pure Being stands not only non-Being, but the whole sensuous world, with its innumerable finite objects. Though the latter is mere delusion, P. has nevertheless given us a theory of it in the third part of his work, which is a sort of cosmogony. The ground of all delusion and finitude is the assumption of the reality of the negative or of non-Being, which gives the antitheses we find in nature—light, dark, fire, earth. Out of these are woven the sensuous world, which consists of a number of concentric spheres, the inmost (the earth) and the outmost (the firmament) being solid, while the intermediate ones are commingled light and darkness. The predominance of the one element or the other determines the nature of each particular object. (See ZELLER, *Philos. der Griechen*, vol. i.) [From orig. art. in *J. S. Univ. Cyc.*, by THOMAS DAVIDSON.]

**Paranáiba**, par-nah-ee'-bah, a river of Brazil, rises in lat. 11° S., in the prov. of Goyaz, flows N., forming the boundary between the prov. of Piauí and Maranhão, and enters the Atlantic after a course of about 750 m.

**Paranásus**, a mt. of Gr. in the dist. of Phocis, rises 8068 ft. above the level of the sea. Its 3 peaks are covered with snow for the greatest part of the yr.; its sides are covered with beautiful forests. In ancient times it was consecrated to Apollo and the Muses.

**Parnell** (CHARLES STEWART). See APPENDIX.

**Parr**, the young of the salmon of Europe, and also applicable to the corresponding state of other species after the fry stage and before that of smolt. It is distinguished by cross bands.

**Parr** (CATHARINE). See CATHARINE PARR.

**Parr** (THOMAS), commonly known as **Old Parr**, b. at Wingham, Shropshire, late in the 15th century; was taken to London by the earl of Arundel Sept. 1635, and introduced at court as being 152 yrs. old. D. at Lond. Nov. 15, 1635.

**París** (ALBION KEITH), b. at Hebron, Me., Jan. 19, 1788, grad. at Dartmouth 1806; came to the bar 1809; became a lawyer of Paris, Me. (then Mass.); entered early into public life; M. C. from Mass. 1815-19; appointed in 1818 U. S. dist. judge; removed to Portland; was one of the leading members of the Me. constitutional convention 1819; became judge of probate 1820, gov. of Me. 1823-27, U. S. Senator 1826-28, judge of the State supreme court 1828-36, second comptroller of the U. S. treasury 1836-50, mayor of Portland 1852. D. Feb. 11, 1857.

**Parrot** [from Fr. *perroquet*], a name in its widest sense applied to all the Psittacidae, and in a more restricted sense employed for the moderate-sized species, like the green and gray parrots, as contradistinguished from the parrots, macaws, lorises, cockatoos, etc.

**Parrot-Fish**, a name applied to many fishes of the family Scaridae.

**Parrott** (ROBERT PARKER), b. at Lee, N. H., Oct. 5, 1804, grad. at W. Pt. 1824; remained at the Military Acad. as assistant prof. until 1829; was transferred to the ordnance corps in 1836, in which yr. he resigned and accepted the superintendency of the W. Pt. iron and cannon foundry, Cold Spring, N. Y.; judge of court of common pleas, Putnam co., 1844-47; was inventor of the system of rifled guns bearing his name, and of their projectiles. D. Dec. 24, 1877.

**Parry** (SIR WILLIAM EDWARD), b. at Bath, Eng., Dec. 19, 1790; entered the navy 1808; was engaged in the naval service on the Amer. coast during the war of 1812; was a member of Sir John Ross's Arctic expedition 1818; commanded another expedition 1819-20, with which he penetrated farther W. within the Arctic circle than any previous explorer, thereby gaining a reward of £5000 offered by Parl.; made other expeditions 1821-23 and 1826, in the last of which he penetrated farther N. than any earlier navigator; was knighted 1829; became rear-admiral 1852, lieutenant-gov. of Greenwich Hospital 1853, and d. at Ems, Ger., July 8, 1855. He pub. narratives of all his voyages.

**Parseism.** See PARSEES.

**Par'sees** [Per. *pārsī*] is the name generally given to the

modern followers of Zoroaster. When, in 651 A. D., Pers. was conquered and subjugated by the Arabs, the whole pop. was converted to Islam. Only a small number of the Pers. continued to cling to the national faith, and these were subjected to severe persecutions. Most of them emigrated to the W. coast of India and settled at Bombay, Surat, Nawsari, Ahmedabad, etc. Those remaining in Pers. were hard pressed; they decreased in numbers and sank into poverty. Those, on the contrary, who went to India, prospered much.

**Parsnip** [Fr. *persil*; Ger. *Petersilie*; Gr. *πετροσαλμον*], the *Petroselinum sativum*, a biennial umbelliferous herb cultivated in gardens. There are many varieties. The leaves of most are used in garnishing meats. Others are sometimes cultivated for the root, which resembles the parsnip. The root of common P. has valuable medicinal qualities.

**Parsnip**, formerly often written **Pastnip** (*Pastinaca sativa*), an umbelliferous plant, usually biennial, is found wild in S. and Central Europe, in Eng., and in the S. parts of Rus. Asia. There is a considerable difference between the wild and the cultivated P., the root of the latter being larger, without branches, softer, and more fleshy. It succeeds best in light rich soil. The Guernsey P. has a root 4 ft. long; the Dutch, only from 20 to 30 inches. The wild P. has an acrid taste, and sometimes malignant consequences when eaten; the cultivated assumes the same acrid taste as soon as it begins to grow in spring.

**Parsons**, city and R. R. June, Labette co., Kan., has extensive car-works and machine-shops. Pop. 1880, 4199.

**Parsons** (LEWIS E.), a native of N. Y.; became in 1841 a Whig politician and successful lawyer of Talladega co., Ala.; became a Douglas Dem. in 1860, and was a U. man throughout the c. war; in 1865 provisional gov. of Ala. under Pres. Johnson, and was unanimously sent to U. S. Senate, but not allowed to take his seat.

**Parsons** (RICHARD C.), b. at New London, Conn., Oct. 10, 1826, went to O. 1847; studied law at Cleveland, where he was admitted to the bar 1851; was a member of the State legislature 1857-61, and its speaker 1859-61; was offered by Pres. Lincoln the mission to Chili, but declined; served (1861-62) as consul at Rio Janeiro, Brazil; collector of internal revenue at Cleveland 1862-66, marshal of supreme court of U. S. 1866-72, M. C. 1873-75.

**Parsons** (SAMUEL HOLDEN), b. at Lyme, Conn., May 14, 1787, grad. at Harvard 1786; studied law, and was admitted to the bar 1789; rep. in the legislature many yrs. in succession from 1762; became king's atty. 1774, when he removed to New London; member of the Conn. committee of correspondence 1775, in which yr. he took command of the 6th Conn. regiment at the siege of Boston; took part in the battle of L. I.; chosen by Cong. brig.-gen. Aug. 1776; succeeded Putnam in command of the Conn. line 1779; became maj.-gen. Oct. 1780; practised law at Middletown after the peace; com. to treat with the Miami Indians 1785; member of the Conn. convention for the ratification of the const. of the U. S. Jan. 1788; appointed by Washington first judge of the N. W. Terr.; was com. of Conn. to purchase from the Wyandot Indians the tract in N. E. O. known as the Conn. or W. Reserve 1789; settled near the O. River; pub. a paper on the antiquities of the W. States in the *Transactions* of the Amer. Acad. D. Nov. 17, 1789.

**Parsons** (THEOPHILUS), LL.D., b. at Byfield, Mass., Feb. 24, 1750, grad. at Harvard 1769; taught school at Falmouth (now Portland); was admitted to the bar there 1774; returned to Byfield in consequence of the destruction of Falmouth by a Brit. squadron in Oct. 1775; began legal practice at Newburyport 1777; a member of the patriotic association called the "Essex Junto," and author of the pamphlet known as the *Essex Result* (1778), which contributed largely to the defeat of the State constitution then proposed by the legislature, and the establishment of the prevailing N. Eng. school of constitutional doctrine; a member of the convention held at Ipswich in 1779 which framed a new const., and of the convention of 1788 for the ratification of the Federal const.; several times elected to the State legislature; removed to Boston 1800, attained the highest position at the Mass. bar, and became in 1806 chief-justice of the supreme judicial court, which post he held until his death. His *Decisions*, which fill vols. II. to x. of the Mass. Reports, have given him a vast legal reputation. (See his *Life*, by his son.) D. Oct. 30, 1813.

**Parsons** (THEOPHILUS), LL.D., son of the preceding, b. at Newburyport, Mass., May 17, 1797, grad. at Harvard 1815; studied law; visited Europe; practised some yrs. at Taunton, and afterward at Boston; was a frequent contributor to the *N. Amer. Review* and other periodicals; founded the *U. S. Literary Gazette*; wrote 3 vols. of *Essays* in support of the doctrines of the Swedenborgian or "New Jerusalem" Ch.; became in 1847 Dane prof. of law at Harvard Law School; was author of some 15 vols. of legal treatises, of a *Memoir of Chief-Justice Theophilus Parsons*, of *Deus Homo*, *The Infinite and the Finite*, and several minor religious treatises, and of *The Political, Personal, and Property Rights of a Citizen of the U. S.* D. Jan. 26, 1882.

**Parsons College**, situated at Fairfield, Ia., at the junction of the Chicago, Burlington and Quincy with the Chicago and S. W. R. R., was founded by the late Lewis B. Parsons, a citizen of Ia., who d. in Keokuk, Ia., in 1856, and in his will directed his sons and executors to locate and found a coll. to be under the control of the Presbs. of Ia. On Feb. 24, 1875, Gen. L. B. Parsons, having selected a board of trustees and transferred to them the legacy, valued at \$40,000, founded the coll. in accordance with the provisions of the will. The citizens of Fairfield contributed to the inst. for its location \$27,000. A course of 3 yrs. for the preparatory dept. and 4 yrs. for the collegiate was arranged, at the end of which the degree of B. A. is conferred. The preparatory dept. opened Sept. 8, 1875, and in 1876 there were on the roll 62 students. The college was tendered to and accepted by the Presb. Synod of Ia. South, Oct. 22, 1875. A freshman class was organized in Sept. 1876.



**Parthenogenesis** [Gr. *παρθένος*, "virgin," and *γένεσις*, "production"], in animal biology, the production of young by a female without fecundation by a male. This definition excludes all cases of alternate generation and all instances of fœtation by inclusion. True P. is the development of the embryo from the ovum, by the normal course of gestation, without sexual congress. For example, it is certain that the eggs from which male or drone bees are hatched are laid by unimpregnated bees. P., alternate generation, gemmation, etc., have been grouped together as agamic or individual reproduction. Not one instance of either in any of the vertebrate animals has been observed by any scientist.

**Parthenon** [Παρθενών, from *παρθένος*, the "virgin," a title of Athena], a noble temple of Athena Parthenos at Athens. It was built by Pericles about 438 a. c. The archæ. were Ictinus and Callicrates, and a part of the sculptured decorations were from the hand of Phidias. It stands upon the Acropolis. It is of the Doric order, built of the best Pentelic marble, 228 ft. long and 101 ft. wide. There were 46 columns in its peristyle. Its end porticoes have 8 columns each, and the sides 17 each, reckoning the corner columns twice. Its walls are 66 ft. high. It is regarded as the finest production of Gr. arch.

**Parthia**, an ancient territory of W. Asia, was situated S. E. of the Caspian Sea, and corresponded nearly to the modern Per. prov. of Khorassan. It was wholly mountainous, and inhabited by a rough, wild, and warlike people of Scythian descent, famous for their horsemanship and skill with the bow. Agriculture and trade they despised; war was their only occupation.

**Parties, Political, of the U. S.** The first sign of P. after the Dec. of Ind. arose out of the attempt to form a const. or frame of govt.: for the Confederation of 1781 was in no sense a govt., and all felt the necessity of some change. During the 4 months of the session of the convention of 1787 men took their sides. Those who prevailed were for a republic which should be a political organization with all the attributes of a govt. within the sphere of its operation. It was to make its laws through a cong., to adjudicate all questions through its own courts, and to execute its laws through its own executors. At the same time the States were to be preserved. Each State was to be sovereign on all its internal questions not remitted by the const. to the jurisdiction of the republic.

*The Federalist and Dem. Parties.*—When the const. was adopted by the convention and submitted to the people, meeting by conventions in the several States, the division of opinion between the members of the national convention extended through the whole people. By what seems an accident, those who supported the const. were called "Federalists," and those who opposed it "Anti-Federalists." When the const. was adopted, those who supported it, the Federalists, naturally formed the majority of the first Cong. Those who had opposed the const. naturally but gradually formed the majority into an opposition. The const. being a fact, the title of Anti-Federalist was no longer applicable, and they gradually took to themselves the title of "Democrats." So the first acknowledged P. P. after the adoption of the const. became the Federalists and the Democrats. Jefferson, indeed, always objected to the use of "Democrat" as the party name. He insisted upon calling it the "Republican party;" and that term was struggled for some time, but not with success. Notwithstanding the occasional efforts of a few, there has been in the U. S. no party which established for itself the title recognized by its opponents in hist. of the "Republican party" until the middle of the 19th century. The Federalists held the govt. for 12 yrs., through the administrations of Washington and Adams; the Dems. came in under Jefferson in 1801, and continued to hold the govt. until the Federal party as a distinct organization had dissolved, and the old lines of demarkation had nearly disappeared. There was no opposition to the reelection of Mr. Monroe in 1820. The election of 1824 was mainly a personal contest between Jackson, Adams, Clay, and Crawford. The election of 1828 was a contest between Adams and Jackson, and no name indicating principle was adopted by the supporters of the 2 candidates. In the course of the 8 yrs. of Jackson's administration his supporters gradually organized themselves into what they claimed to be the Dem. party, and the Jackson Democrats of 1829-37 remained in undisturbed possession of the title.

*The National Rep. Party.*—The opposition to Jackson's administration organized themselves under the title of National Republicans in 1831, and Mr. Clay was their candidate in the election of 1832, when Jackson was re-elected. Jackson and his party were opposed to the U. S. Bank, and the favorers of the bank were in opposition. Jackson and his supporters were opposed to any gen. plan of internal improvements under the direction and at the expense of the republic, and, with some local exceptions, to what was known as the "American system" of protection of manufactures by duties on imports. Thus, the National Rep. party had for its active principle the support of the U. S. Bank, protection by tariff, and internal improvements.

*The Whig Party.*—Various considerations led the opposition to drop the title of National Republican, and adopt the name of Whig. In the Presidential election of 1840, in which the Whigs gained their first national victory, they owed it in a great measure to a popular dissatisfaction with the extreme party govt. followed up by Van Buren, the disordered state of the finances after the rejection of the U. S. Bank, and to a widespread belief that the Whig party was more conservative and constitutional than the Dem. The question of a U. S. Bank as a bank of discount, as well as a fiscal agent of the govt., became settled against the Whigs; a practical line of distinction sufficient for application removed from party politics the question of internal improvements; a surplus revenue made duties for protection only indefensible, and although the Dem. party furnished most

of the free-traders, the adjustments of the tariff became mostly local struggles of different interests for the advantage of duties laid professedly to raise the necessary revenue.

*The Slavery Question.*—By the close of the last century all the N. and Middle States had abolished and prohibited slavery, and it had been prohibited in all the Terrs. belonging to the republic at the adoption of the const., and the slave-trade was abolished. But the La. purchase and the acquisition of Fla., to which no restrictions were applied, had more than doubled the number of slave States; the raising of cotton, rice, and sugar had become among the largest interests of the country, and the ownership of about 4,000,000 slaves was regarded as an enormous investment. The slave States had thus one paramount interest on which they would unite at any moment in disregard of every other political question; and the free and the slave States were separated by a geographical line. As a domestic inst. within each State, slavery was acknowledged by all intelligent public men to be entirely a State matter. Not that the const. specially made it so in terms, but because it clearly came within that category of domestic insts. which were left to the control of each State, and not transferred by the const. to that of the republic.

*Slave and Free Territory.*—The republic possessed a vast amount of unsettled terr. lying beyond the limits of the States. Over this terr. Cong. had the exclusive legislative power. Slavery had been prohibited under the Confederation in all the terr. then possessed by the U. S.; and that prohibition was regarded as based on compact among the States. When new terr. was added to the republic, as by the La. purchase, the free States sought to prohibit slavery in those Terrs. at the outset, and also to make it a condition to their admission as States that slavery should not exist within them. The slave States naturally resisted these efforts, and strove to secure for themselves as large a share of the expected States as possible. The question was for a time settled by the Missouri Compromise. It came up again in the case of the annexation of Tex., which was disposed of by a joint resolution of the two houses of Cong., which provided that Tex. might be divided into 4 States, as soon as it had sufficient pop., and that the existence of slavery should be no objection to their admission.

*Kansas, Etc.*—The act of 1854, establishing the Terr. of Kansas, declared the Missouri Compromise inoperative and void, as inconsistent with the principle of non-intervention by Cong. with slavery in States or Terrs. The act provided that the existence of slavery should be no objection to the admission of the Terr. as a State. As slavery could not be prohibited in Kan. while it was a Terr., the struggle turned upon the const. it should adopt as a State, and was transferred to the soil of Kan. This contest had great influence in the formation and growth of the Rep. party, hereafter to be described. In 1856-57 the slave-power obtained a great victory by the decision of the supreme court in the case of Dred Scott; a majority of the judges pronouncing an opinion that a person of African negro descent could not be a citizen of the U. S. in the sense of entitling him to sue as such in the courts of the republic. There was another subject which brought slavery into national politics. This was the rendition of fugitive slaves. And the passage of the fugitive slave law of 1850 did more to inflame the anti-slavery sentiment of the N. than anything in our hist.

*The State Rights Doctrine.*—There is one more topic to be considered before the structure of the Rep. party can be properly understood. That is the subject of what is called State Rights, or, more properly, State supremacy. The Dem. party, after the const. was adopted against their votes, naturally took to close construction of its jurisdiction and authority, and especially as between it and the States. These views culminated in the Va. and Ky. resolutions of 1797, 1798, and 1799, which assert substantially that the const. is a federal compact between sovereign States; that each State is the rightful judge of the constitutionality of any measure; each may construe the compact for itself, and judge as well of infractions as of the mode and measures of redress. These resolutions became part of the platform of principles of the Dem. party, and were adopted with enthusiasm and unanimity by the slaveholding States.

*The Liberty Party.*—The early anti-slavery societies looked solely to moral influence, but in the course of time they became also political associations, and took upon themselves the name of the Liberty party; and although it never had a majority in any State in the U., or perhaps in any dist. of a State, yet as a third party it often exerted an indirect influence upon the two great parties of the country in the free States. This was first shown in the Presidential election of 1844, the absorbing question being as to the annexation of Texas, which was favored by the Dem. party, and generally opposed by the Whigs of both sections, though upon different grounds. Down to the day of the election there seemed scarce a doubt of the success of Mr. Clay, but he wrote a letter which dissatisfied the Liberty party, who in N. Y. unexpectedly cast their votes for Mr. Birney. The popular vote of N. Y. out of nearly 500,000 votes gave a plurality of 5106 to Polk over Clay, while 15,812 were cast for Birney, most of which Polk received the 36 electoral votes of the State—more than  $\frac{1}{2}$  of the whole electoral college—by virtue of this small plurality of about 5000, while he was in an actual minority of over 10,000. The electoral vote throughout the republic was 170 for Polk to 105 for Clay, while the transfer of the 36 votes from N. Y. to Clay would have given him 141 votes to 134 for Polk. This was the first indication of the importance of slavery in national politics.

*The Free-Soil Party.*—The decidedly pro-slavery position taken by the national conventions of both the Whig and Dem. parties in 1848 caused much dissatisfaction in N. Eng., W. N. Y., and Northern O., and a convention was convened at Buffalo in the hope of organizing a national political party



based upon opposition, under the const., to the further extension of the slave-power. This convention, and the principles laid down in its platform, were the foundation of what was afterward the Rep. party. The platform asserted the following principles: (1) A common resolve to maintain the rights of free labor; (2) that neither Cass nor Taylor could be supported by the opponents of slavery extension; (3) that slavery in the several States is a matter over which the general govt. has no authority; (4) that it was the settled policy of the nation at the beginning to exclude slavery from all the Terrs.; (5) the only safe means of preventing the extension of slavery into terr. now free is to prohibit its extension by act of Cong.; (6) no more slave States, no more slave terr.; (7) no more compromises with slavery; (8) free insts. for Cal., N. M., and Or.; (9) the motto "Free Soil, Free Speech, Free Labor, and Free Men." The Free-Soil party, which had organized at Buffalo in 1848, held its second national convention at Pittsburgh in Aug. 1852. Its platform was substantially the Buffalo platform. It nominated for Pres. Mr. Hale of N. H. At the election of 1852 the popular vote stood thus: Pierce, 1,601,274; Scott, 1,386,680; Hale, 155,825. Although in a popular vote of over 3,000,000 Pierce had less than 30,000 majority, and but little more than 200,000 plurality over Scott, the result, taken by the electoral votes, gave Pierce every State in the U. except 4. The Whig party appeared for the last time upon the stage of national politics in the Presidential canvass of 1852.

**The Republican Party.**—The leaders of the Free-Soil party and of the anti-slavery wing of the Whig party saw the propriety of not requiring either party to join the other, and agreed upon organizing a new party. They adopted the name of "Republican." Its national convention met at Phila. June 17, 1856, and nominated John C. Fremont as Pres. The platform was substantially that of Buffalo of 1848 and Pittsburgh of 1852, adapted to the questions of the day. It welcomed to the party, without regard to past differences, all who were opposed to the repeal of the Mo. compromise and the extension of slavery into free terr., and who favored the admission of Kan. as a free State. The resolves may be condensed in the following form: (1) The prohibition of slavery in all Terrs. of the U. S., and the denial of the authority of Cong. or of a Territorial legislature to give legal existence to slavery in any Terr., freedom being the public law of the national domain under the const.; (2) the right and duty of Cong. to prohibit in all Terrs. "those twin relics of barbarism, polygamy and slavery;" (3) a detailed recital of the wrongs and frauds practised upon the people of Kan.; (4) the immediate admission of Kan. as a free State into the U.

In 1854-55 a party calling itself the American party sprang into existence, which in 1854 carried nearly every State in the U., but by 1856 the slavery question had divided it. Still it held a convention and nominated Mr. Fillmore, but the contest, which was practically between Fremont and Buchanan, was a geographical conflict between the slave States and free States. Mr. Fillmore received the vote of Md. only; all the other slave States voted for Buchanan. Of the 16 free States, 11 voted for Fremont and 5 for Buchanan. In a popular vote of a little over 4,000,000, Buchanan was in a minority of 377,629, but his plurality over Fremont and his sweeping of the slave States gave him a considerable majority in the electoral college.

The administration of Mr. Buchanan saw the slave question become the paramount subject of national politics. During the course of this administration the secession party at the S. presented a bold front. They claimed a legal right in each State to withdraw from the U. at its discretion, and that its decision was legally binding upon the U. This doctrine was popularized in the phrase, "A State cannot be coerced." In 1858 was the memorable contest between Abraham Lincoln and Stephen A. Douglas for the Senatorship of Ill. It was becoming understood that the Presidential election of 1860 would depend upon the votes of Pa. and Ill. Mr. Lincoln advocated the right and duty of Cong. to prohibit slavery in the Terrs., while Mr. Douglas advocated the policy of abstaining from all legislation by Cong. on the subject, leaving the people of each Terr. to establish or prohibit it at their discretion. As Senators are elected by the legislature, the contest was for the election of members. In the aggregate popular vote of about 250,000 Lincoln had a plurality of nearly 4000, but Douglas had a small majority of the members of the legislature. The formal victory was with the Dems., but the result showed that the Reps. would probably carry the gen. ticket in the Presidential election.

The election of 1860 was now approaching. The Rep. party was well organized, unanimous, and hopeful. They felt reasonably sure of carrying the N. Eng. States, N. Y., O., and a range of the N. W. States. The large free States which were doubtful were Ind., Ill., and Pa. The whole number of electoral votes at this election would be 303, requiring 152 for a majority. The free States were entitled to 183 votes, so that the loss of 32 N. votes would be a defeat of the Rep. candidate. They could afford to lose any one of these doubtful States, but not 2 of them. The loss of N. Y. alone would defeat them. Had the Dem. party been united, they would have gone into the contest with 120 votes from the slave States secure, and would have needed only 33 out of the 183 N. electoral votes to carry the election. But the Dem. party was not united, even at the S. There was a secession party and a Union party. The former was represented by S. C. chief of all, and by Jefferson Davis in the Senate. There was a Union party, composed mostly of those S. Whigs who had not joined the Dem. party.

At the Chicago Rep. convention of 1860 Abraham Lincoln was nominated for Pres. The most moderate class of the Southerners, with some of the Whigs of the N., organized what they called the "Constitutional Union" party. They adopted no platform except the single phrase, "The Con-

stitution of the country, the Union of the States, and the enforcement of the laws," and nominated for Pres. Mr. Bell of Tenn.

The Dem. convention met at Charleston, S. C. The popular candidate was Mr. Douglas, who was the only Dem. with pro-slavery inclinations who had any chance of carrying any N. States. But the extreme party of the S. was not satisfied with him, and although he received a majority of all the votes, he failed to secure the requisite two thirds. This convention finally adjourned without making any nominations. A portion of the delegates had withdrawn, and in the end met at Richmond and nominated Mr. Breckenridge of Ky. for Pres. The others reassembled at Baltimore and nominated Mr. Douglas.

In the election of 1860 Lincoln received the electoral votes of all the free States except 3 in N. J. Douglas received but 12 votes in all—3 from N. J. and 9 from Mo. Bell received the votes of Va., Ky., and Tenn. Breckenridge received the votes of all the other slave States. This result gave Lincoln 180 electoral votes out of 303; but in the popular vote he lacked nearly 1,000,000 of having a majority over all the others, and the Rep. party was in a minority in both houses of Cong. The secession of the S. States, the formation of the Confederacy, the c. war, and the abolition of slavery followed close upon the election of Mr. Lincoln. (See ABOLITION OF SLAVERY.)

In the election of 1864 Mr. Lincoln received 212 electoral votes out of 314, Gen. McClellan, the Dem. candidate, receiving only 21. The popular vote was—for Lincoln, 2,216,067; for McClellan, 1,808,725. The Rep. party now had a large majority in both houses of Cong. The assassination of Pres. Lincoln, 40 days after his second inauguration, threw the executive authority into the hands of Andrew Johnson, who had been originally a Dem., whose course was displeasing to a majority of the Rep. party, by whom he was impeached.

In the election of 1868 Gen. Grant, the Rep. candidate, received 214 electoral and 3,015,071 popular votes; Mr. Seymour, Dem., receiving 80 electoral and 2,703,613 popular votes. In the election of 1872 Horace Greeley was nominated for Pres. by a portion of the Rep. party who took the name of "Liberal Republicans," and his nomination was indorsed by the Dem. national convention. Mr. Greeley died before the electoral vote was cast. Grant received 286 out of the 366 electoral votes actually cast. The opposition votes were scattered among several candidates. The popular vote was—for Grant, 3,597,070; for Greeley, 2,834,079.

In the election of 1876 the electoral votes (as declared by a special commission formed for the purpose of counting it) were 185 for Rutherford B. Hayes, Rep., and 184 for Samuel J. Tilden, Dem. The popular vote for Hayes was 4,033,950; for Tilden, 4,284,885. The Dems. had by this time secured a majority in the House of Reps. In 1880 James A. Garfield, Rep., received 214 electoral votes, and Winfield S. Hancock, Dem., 155. The popular vote for Garfield was 4,449,053; for Hancock, 4,442,053. The death by assassination (Sept. 19, 1881) of Pres. Garfield devolved the Presidency upon Chester A. Arthur, elected as V.-P. In the 46th Cong. (1879-81) the Senate consisted of 44 Dems. and 32 Reps.; the House, 148 Dems., 129 Reps., and 16 "Nationals." The Senate of the 47th Cong. (1881-83) originally consisted of 37 Reps., 37 Dems., and 2 Independent Dems.; the House, 147 Reps., 136 Dems., and 10 "Nationals." [From orig. art. in *J.'s Univ. Cyc.*, by RICHARD H. DANA, JR., LL.D.]

**Partition** [Lat. *partitio*], the legal phrase used to designate the division of land held in united ownership among the individual proprietors. There are 2 kinds—voluntary and compulsory. In the former the whole proceeding is consummated by the interchange of the proper deeds of conveyance. The latter is a judicial proceeding, instituted by one or more of the common owners against the others. The term is sometimes used to denote a similar process of dividing personal property, goods, and chattels among joint owners or owners in common. JOHN NORTON POMEROY.

**Partnership**, in law, consists in the association of 2 or more persons, who combine their labor or capital with a view to a common benefit or profit. It will be considered under the following prin. divisions: I. The contract itself; II. Its effect as to third persons; III. Its effect as between the partners themselves; IV. Dissolution and its consequences.

I. P. in goods is not to be confounded with joint tenancy or tenancy in common. In the former the survivor takes the whole interest, while in P. the share of a deceased member passes to his personal representatives. One partner is for certain purposes the agent of the other, so that he can sell the entire stock in trade to a third person, while in the case of joint tenancy or ownership in common each owner has no implied authority to sell more than his own share. As between himself and his associates, he is in a fiduciary position. The law of agency as to third persons, and that of trust as between themselves, are component parts of the legal rules affecting partners. The gen. principles of law governing contracts are to be extended to this relation. A P. may be constituted either by the respective partners contributing capital or skill, or one or more furnishing capital and others skill. The gen. presumption is, that they will share profits equally, though there may be a special arrangement to the contrary. The capital of a mercantile P. usually consists in the main of personal property, though there may be real estate when land is used for partnership purposes. An important inquiry arises as to the point whether it is to be governed by the technical rules applying to land or by those which prevail in the law of personal property. The courts do not wholly agree upon this point. A word should be added as to the "good-will" of a partnership. By this expression is meant "the hope or expectation that customers will continue to resort to the place where the business is transacted." It cannot be sold by a sheriff on an execution, as it is in its nature intangible.



It can only be made valuable through the peculiar remedies of courts of equity, such as an injunction.

Partners at common law have been classified into secret, dormant, nominal, and ostensible. A dormant partner is one who simply supplies capital and takes no active part in management. A secret partner is one who is not known, though he may be active. A "nominal" partner is one who has no real connection with the firm, but holds himself out as a partner. There is by statute in some of the States a P. known as limited. The theory of this is that there shall be one or more partners liable in the usual manner for the entire debts of the firm or *in solido*, and others who are only responsible for the amount of capital contributed. This result can only be accomplished by statute, and certain preliminary steps are required to be taken, such as publication in newspapers and filing notices in public offices. P. as to their subject-matter at common law may be either gen. or special—that is, they may be extended to nearly all kinds of trade or business in which persons engage, or they may be confined to a single item of property, such as the use of a race-horse for profit.

II. The great point of interest in P. law is the capacity of one member of a firm to bind his associates in respect to third persons. There has been much diversity of opinion among jurists as to the true ground of P. liability. Some have maintained that it rested upon participation in profits. Another theory is, that agency is the test of P. The ground from which liability springs is, that one of the partners is the agent of the other, and thus has the capacity to bind him. The reception of profits may be evidence to show that the agency exists, but the final inquiry in all cases will be whether there has been such an agency created as to constitute a P. It is well settled, as already suggested, that a person may be a partner as to third persons who is not such in fact as between himself and his supposed associates. It is on this ground that one who merely lends his name to a firm (nominal partner) is liable to those who have acted upon the supposition that he was in fact a partner. The kind of contracts which one partner under the gen. laws of agency can make so as to bind his associates depends upon the nature of the business. There is necessarily a much wider range in mercantile than in professional P. Usually, a partner in a mercantile firm can buy and sell goods on credit, borrow such money as is required in the firm business, and give the firm note, draw checks, pay debts with the firm's property, and do like acts usual and necessary in the business in which they are engaged. It is enough to bind the firm that the member acting in the contract had the appearance of authority, even though in fact it had been withdrawn from him or was wholly unauthorized. The ground of this principle is, that the partner has the apparent authority to issue the note. Still, if the person dealing with the firm knew, or had reason to know, that the partner was violating his duty, the firm would not be liable. Owing to the intimate relation between the partners, the act of one is for many purposes the act of all. Thus, notice to one of any fact affecting their business is notice to all. On similar grounds, a P. is liable for the torts or wrongful acts of one of its members connected with their business. Thus, if one of them is guilty of a fraud in making a contract the whole number is answerable. This rule cannot be applied when the wrongful act is wholly unconnected with his employment.

III. The relation of partners, though growing out of a contract, is one of trust and confidence, and courts will hesitate to compel a person to go into P. with another, though he may have agreed to do so. It is quite usual when a P. is formed to enter into a formal agreement prescribing the duties of the respective partners, restricting their powers, defining their rights to participate in the profits, and sometimes providing for a continuance of the firm in case of the death or withdrawal of a member. Such an agreement is principally useful in defining the rights of the partners as between themselves. It will not bind third persons dealing with the firm unless its terms are communicated to them. The rule of *delectus personarum* should be adverted to in this connection. The meaning of this is, that P. is so much a matter of trust and confidence that no new member can be introduced without the consent of all, or that the withdrawal of one destroys the P. It thus happens that on the withdrawal or death of one of the members the owners of the respective interests become mere tenants in common, unless they agree to the contrary. The agency to make new contracts is withdrawn, and the only power that remains to a member is to settle and adjust transactions already entered into. The accounts between partners can only be adjusted in a court of equity. Still, if they make a settlement and find an amount due from one to the other, there will spring up an implied contract on the part of the person found to be indebted to pay the amount due; and this contract is enforceable in a court of law. The view that their relation is one of trust and confidence prevents one of the firm from doing any act without his partners' consent in reference to the firm business which shall enure to his own individual advantage. A partner has no right to any additional compensation above his stipulated portion of the profits for extraordinary services unless such pay has been agreed upon.

IV. A P. may be dissolved in a number of modes. The leading modes are—(a) the express consent of the parties; (b) the sale by one of his interest; (c) death of one or more members; (d) bankruptcy; (e) marriage of a female partner; (f) insanity legally established; (g) the fact that one becomes by the law of nations an enemy to his associates; (h) the action of a court of equity decreeing a dissolution on such grounds as that the ends sought to be accomplished are impracticable, or that one of the firm is so conducting himself as to bring disaster upon the common interest, or is in such a state of mind that he cannot contribute to the common advantage; on the other hand, there are cases in

which the court may interfere and prevent a dissolution by one of the partners when the interests of the firm require that no dissolution take place; (i) the voluntary withdrawal of a member. Such a person as is last named is commonly called a "retiring" partner. Notwithstanding his withdrawal, if the other members continue to prosecute the business, he will be liable for new engagements of the firm to those who had no notice of his withdrawal. For the purpose of giving such notice it is common to send circulars to customers announcing the change in membership. The effect of a dissolution is to prevent any new contracts from being made. The agency of each partner for that purpose is terminated. It only remains to pay debts and to close existing transactions.

A question frequently arises on a dissolution as to the correct principle to be adopted in appropriating the funds of the P. to the payment of individual and firm debts when the assets are insufficient to discharge both. It is plain that each partner may have debts of his own growing out of the transaction of his private business. Creditors of this class have a right to be paid from his share of the firm property so long as there are no conflicting claims of partners or P. creditors. Where there is a contest for priority between the two sets of creditors, justice requires that the P. creditors should first be paid out of the P. estate.

It is proper to add some further considerations in respect to limited P. The statutes on this subject, as adopted in a number of the States, vary in their details. A leading feature of them is that there is a combination of 2 kinds of P.—general and limited. In other words, there is at least one active partner, liable on the principle of the common law *in solido*; there are other partners, who take no active part in the business, but contribute to the capital stock, who are liable only for the amount contributed. Publicity is another important element in the case. A certificate is to be signed by the partners and properly pub. in some newspaper, and recorded in some specified public office in the vicinity of the parties' residence or place of business. The office of the certificate is to set forth the nature of the business to be transacted, the names of the partners, distinguishing between those who are general and those who are special, the amount of capital contributed in cash by the special partners, the name of the P., and the date of its commencement and of its termination. After the P. has been formed, special rules continue to govern it. The special partner must not withdraw his capital; his name must not be used in a contract with his consent, nor must he be an active manager of the affairs of the firm. Should these rules be violated he becomes a general partner. This P. may expire by the lapse of a prescribed time, or it may be dissolved by the action of a court of equity. So it may be renewed by the observance of prescribed statutory forms analogous to those whereby it was created. T. W. DWIGHT.

**Parton** (JAMES), b. at Canterbury, Eng. Feb. 9, 1822, was brought to New York in early childhood; ed. in an acad. at White Plains, where he became a teacher at 19; subsequently taught school in Phila. and New York; was for some yrs. assistant editor of the *Home Journal*; has been a prolific author, chiefly in the field of biography. Since 1875 has resided at Newburyport, Mass. Among his biographical works are *Lives of Horace Greeley*, Aaron Burr, Andrew Jackson, Benj. F. Butler, Thomas Jefferson, Benjamin Franklin, and Voltaire.

**Parton** (SARAH PAYSON WILLIS), wife of the preceding and sister of Nathaniel P. Willis, b. at Portland, Me., July 7, 1811; married Mr. Charles H. Eldredge of Boston, a bank-cashier, on whose death she resorted to lit. as a means of subsistence; obtained great success by her short essays written under the nom. de plume of "Fanny Fern"; also wrote 2 novels, *Ruth Hall* and *Rose Clark*. Married Mr. P. in 1856. D. Oct. 10, 1872.

**Part-Owners** (law), in the most gen. sense, the owners of personal property—goods and chattels—in undivided shares, not being at the same time partners. The term is, however, almost exclusively confined to the ownership of shipping. A ship is often regarded as divided into a number of equal shares, held by different persons, not partners, who together constitute the P.-O. In such a case the will of the majority governs in the management of the vessel.

**Partridge** [Fr. *perdrix*; Gr. *πέδιξ*], the Eng. name for *Perdix cinerea*, a representative of the family Tetraonidae, and of a peculiar family; in U. S. it is applied in some sections to the *Ortyx Virginiana*, or bob-white, etc. (*Ortyxina*), and in others to the *Bonasa umbellus*, or ruffed grouse (*Tetraoninae*).

**Partridge** (ALDEN), b. in Norwich, Vt., about 1785, grad. at W. Pt. 1806; was retained at the Military Acad. as assistant prof. of math. until Apr. 1813, when he was appointed prof., and in Sept. 1813 prof. of engineering; commanded at W. Pt. Jan. 1815, Nov. 1816, and Jan. to July 1817; resigned Apr. 1818, and in 1819 was appointed prin. of the surveying party to determine the N. W. boundary of the U. S. In 1820 he founded a military school at Norwich, Vt., which was subsequently incorporated in the Norwich Univ., of which he was appointed pres. He also established military schools in N. H., Del. Pa., and Va., and delivered lectures on military matters throughout the U. S. Was appointed surveyor-gen. of Vt. 1822; was a member of the Vt. legislature 1833-34 and 1839. D. Jan. 17, 1854.

**Partridge** (GEORGE), b. at Duxbury, Mass., Feb. 8, 1740, grad. at Harvard 1762; taught school at Kingston for some yrs.; was an active member of the provincial cong. 1774-75; delegate to the Continental Cong. 1776-85; M. C. 1789-91, and sheriff of Plymouth co. several yrs. D. July 1828.

**Partridge** (JAMES R.), U. S. minister plenipotentiary and envoy extraordinary to Peru, was b. in Baltimore, Md., where he received a liberal education, adopted the profession of law, and became one of the most distinguished citizens. He did not enter public life until 1862, when he was appointed resident minister to Honduras by Pres. Lincoln;



in 1863 he was transferred, with the same rank, to Salvador, remaining there until 1866. In 1869 Mr. P. was nominated and confirmed as minister to Venezuela. He accepted the mission, but owing to the illness of his daughter he returned within a yr. In 1871 he went to Brazil as minister plenipotentiary, and was in office as late as 1875. In 1873 he acted as one of the arbitrators on the claim of the Earl of Dundonald at Rio Janeiro. Returned to the U. S. Sept. 1875; was appointed envoy to Peru on the death of Stephen A. Hurlbut, Apr. 5, 1882.

**Partridge-berry**, or **Checkerberry**, the common name of the *Mitchella repens*, a genus of edible berries found in the U. S., Canada, Mex., and some parts of S. Amer., belonging to the madder family. It is a trailing evergreen, bearing a fruit about the size of whortleberries, which remains on the stem through the winter. The wintergreen (*Gaultheria procumbens*) is sometimes incorrectly referred to this family.

**Partridge-wood**, a name applied to several handsome tropical woods used for veneering and for making small ornamental wares. It is more generally given to the wood of *Andira inermis*, a leguminous tree of the W. I. and S. Amer. This wood is hard, and in Brazil is used in ship-building.

**Party Wall** (law), a wall which stands at or on the line between 2 adjoining lots belonging to different owners, and in which both proprietors have common rights and a common use. JOHN NORTON POMEROY.

**Párvatí** [Sans. "mountain-born"], a female divinity of the anc. Hindoo pantheon, the consort of Shiva, and usually identified with Devi, Durga, Kali, and Bhaváni. Her worship is attended by the most repugnant and terrible ceremonies.

**Pascal** (BLAISE), b. at Clermont-Ferrand, Auvergne, June 19, 1623; very early showed himself possessed of the most extraordinary mental gifts. In his 16th yr. he wrote a treatise on *Conic Sections*, which attracted the attention of Descartes, and in his 19th yr., his father having accepted an office in Rouen as intendant of finance for the prov. of Normandy, he invented a calculating-machine to aid him in figuring out his accounts. Meanwhile Torricelli's theory of fluids drew him from the study of geom. to that of phys., and the results were 2 admirable dissertations, on the *Equilibrium of Fluids* and on the *Weight of the Atmosphere*, which were not pub. until after his death, but which mark the beginning of modern phys. science. He also undertook the first barometrical measurements, and the report of his experiences involved him in polemics with Father Noël, a scientist of the Aristotelian school, in which controversy the dialectics and definitions of the old school made their last efforts against the experiments and analyses of the new school. After his death a third treatise was found among his papers, in which he demonstrates the principles of the calculus of probabilities; and in 1659 he pub. under a *nom de plume* his celebrated essay on the cycloid, *Traité générale de la Roulette*. While in Rouen P. became acquainted with the Jansenists. He consequently abandoned science and determined to devote himself wholly to the study of religion and morals. Delicate and nervous by nature, overwork had early broken his health and strained his whole nervous system, but he nevertheless in his later yrs. practised a most rigorous asceticism. He denied himself the help of a servant; he abstained from any but the simplest and coarsest food; he wore an iron girdle around his loins, and whenever an unholly thought entered his mind he would drive the pointed edges into his flesh. He wished to live in prayer, charity, and sufferings, which he considered as the 3 forms of a true Chr. life; and his wish was fulfilled. The last 2 yrs. of his life were one long agony, broken only by prayers and charitable deeds.

His 2 great religious works are the *Provincial Letters* and the *Pensées*. The *Provincial Letters* were pub. in 1656-57. The first 3 letters are simply a vindication of Antoine Arnauld, the celebrated Jansenist prof. at the Sorbonne, whom the Jesuits had succeeded in driving from the school. But the following 14 letters form a direct attack on the Jesuits themselves. They criticize the morals and policy of the order with a calm, almost humorous irony, but beneath this calm, almost pleasant surface lies a deep, implacable hatred. They roused even the most indifferent, and the universal indignation which a century after P. caused the expulsion of the order from Fr. is generally ascribed to the *Provincial Letters*. D. Aug. 19, 1662. CLEMENS PETERSEN.

**Paschal I.**, ANTIPOPE, a Rom. archdeacon, appointed pope by the exarch of Ravenna in 687 A. D. He was imprisoned as a simoniac and pronounced a magician. D. in 694.—PASCHAL III., ANTIPOPE (*Guido di Crema*), b. in Lombardy, in 1164 was declared pope by Frederick Barbarossa, whose partisan he was. D. at Rome Sept. 20, 1168.

**Paschal I.**, POPE, b. at Rome; succeeded Stephen IV. in 817; crowned Lothaire as emp. 823. D. Feb. 10, 824.—PASCHAL II. (*Raniero*), b. at Bleda, It., about 1050, was a Cluniac monk; in 1099 succeeded Urban II.; was involved in life-long contests with the Henrys (IV. and V.) of Ger. and with Henry I. of Eng. D. Feb. 21, 1118.

**Paschal Chronicle** [Lat. *Chronicon Paschale*; Gr. *Πασχαλιον*], an epitome of events, by an unknown author, arranged chronologically from Adam to the 20th yr. of Heraclius (A. D. 629), so called from its being compiled in part from the paschal canons (relating to the festival of Easter) of various towns and provs.; it was also called *Alexandrinum*, from having been at one time supposed to be the production of Peter of Alexandria, or otherwise of George of Alexandria. The Chronicle ended originally, according to Holstein, in the reign of Constantius, with the death of his rival Magnentius (A. D. 354), and was continued thence, with interpolations in the former part, to 629 by a different compiler. Clinton, however, gives reasons for believing both parts to be by one and the same compiler.

**Pasha**, pa-shaw', or **Bashaw** [from the Per. *padishah*,

"powerful ruler"], in Tur. countries, a high civil, military, or naval functionary. P. are of 3 classes, distinguished as P. of 1, 2, or 3 tails, for their badge of rank is the tail of a horse or yak borne as a standard.

**Paspalae**. See MINOTAURE.

**Pasque** (pask) **Flower** [so called, probably, because its petals were used to stain Easter or *pasque* eggs], a name given to *Anemone pulsatilla*, a ranunculaceous herb of Europe and Asia, and also to some other species of *Pulsatilla* section of the genus. They are spring-blooming plants, with poisonous and medicinal qualities.

**Pasquinade** [Fr.], an anonymous attack, often in verse, and of bitter, caustic, and witty character. The name is derived from Antonio Pasquino, a cobbler, who lived at Rome toward the close of the 15th century, and who was famous for his sharp personal sarcasms. After his death it became customary to post up pasquinades upon a broken statue dug up near where he had lived. The torso is called by his name.

**Passaic**, city and R. R. centre, on Passaic River, Passaic co., N. J., 12 m. N. W. of Newark Bay. Pop. 1880, 6532.

**Passaic River** rises in Morris co., N. J., and after a tortuous course of 100 m. flows into Newark Bay, 3 m. from Newark. It is navigable some 13 m. At Paterson it has a remarkable fall of 72 ft., affording valuable water-power.

**Passamaquoddy Bay** lies E. of Washington co., Me., and S. W. of Charlotte co., N. B. It abounds in good and deep harbors and in fine views. Picturesque islands are numerous and the fisheries are important. Its tides average 25 ft. in rise. It receives the estuary of the St. Croix.

**Pas-senger Pig-geon**, the most common wild pigeon of the E. and Central U. S., *Ectopistes migratorius*. It is 16 inches long,  $\frac{1}{2}$  the length being composed by the tail-feathers. It is gregarious, and performs its rapid migrations solely for the sake of finding good feeding-grounds. The young birds are highly prized as food. Beechnuts, rice, acorns, buckwheat, and all sorts of grain and seeds are eagerly sought by the wild pigeons.

**Pas-sion-flower**, Eng. name of the genus *Passiflora*, climbing plants of tropical Amer., and 2 low species grow N. to Va. and O. Of the species cultivated for ornament, *P. corollæ* is best known. *P. edulis* bears the common *granadilla*; the fruit of our *P. incarnata*, called *May-apple*, is very like it. The name of passion-flower came from a resemblance fancied by the Jesuits in S. Amer. to nails, crown of thorns, etc. of our Lord's passion.

**Pas-sionists**, **Congregation of the**, an order of the R. Cath. Ch., founded at Ovado, Piedmont, in 1730 by Paul of the Cross (1694-1775). It was confirmed by Benedict XIV. in 1741 and 1746, and by Pius VI. in 1775. A house of women was admitted to the order before the founder's death. The P. devote themselves to local missions and the work of preaching. The mother-house is on the Celian Hill in Rome.

**Passion Plays**. See OBERAMMERGAU.

**Passion-Tide**, the last 2 weeks of Lent, the first week of which is Passion Week and the last Holy Week. But popularly Holy Week is called Passion Week also.

**Passive State** (or **Passivity**) of **Metals**. It is found that a number of the metals which are acted on and dissolved with energy by certain acids and other chemical solvents may under special circumstances become what is called "passive," the action of the acid or other agent being totally suspended, and the metal remaining immersed therein often with a clean, brilliant metallic surface, and having lost entirely the power to decompose the liquid. Strong nitric acid is the solvent that has been best investigated in this relation, though many other agents behave similarly.

**Passom-eter** [Lat. *passus*, "step;" Gr. *μέτρον*, "measure"], a little instrument in the form of a watch which, carried about the person of a pedestrian, registers the number of his steps in walking. It has a dial and 2 index-hands, which latter are driven by a ratchet movement actuated by the inertia of a small pendulous weight made to vibrate by the motion of the walker.

**Pass-over** [Heb. *pesach*; Gr. *πάσχα*], the first and the greatest of the 3 annual festivals of the Jews, was instituted by Moses in commemoration of the deliverance of the Israelites from Egyptian bondage, and celebrated from the 15th to the 21st day of Nisan, both inclusive, thus falling between our Mar. and Apr., at the time of the first full moon in the spring. The first and the last day of the festival were kept holy and observed by abstaining from all work, by prayers, hymns, thanksgivings, and other ceremonies, and during the whole period the bread was eaten without leaven, whence the name of the Feast of Unleavened Bread. On the evening of the 14th the P. lamb was killed by the head of the family. The animal should be 1 yr. old, male, without blemish, and it should be roasted entire, with unbroken bones, and consumed entirely in one meal. The blood was sprinkled on the door-lintel and side-posts in commemoration of the night preceding the exodus from Egypt, when the angel went through the country and slew all the first-born, but passed by the houses of the Israelites. The fat pieces were burned on the altar as a sacrifice, and the family gathered to partake of the roasted lamb, with prayers and hymns and claid in travelling garb. Many of the symbols, commemorations, and ceremonies of this Jewish festival passed into the Chr. Easter feast.

**Pass-ow** (FRANZ LUDWIG KARL FRIEDRICH), b. at Ludwigslust, Ger., Sept. 30, 1736, was ed. at Gotha and Leipzig; became in 1807 Gr. prof. at Weimar, and in 1815 prof. of anc. lit. in the Univ. of Breslau. D. there Mar. 11, 1833. Pub. texts and translations of *Persius*, *Musæus*, *Longus*, and prepared an admirable Gr.-Ger. lexicon founded on Schneider's Gr.-Ger. Lexicon; his *Opuscula Academica* was pub. after his death by Bach.

**Pass-port** [Fr. *passeport*], a permission to pass through a port, or, in general, to enter into a foreign country by sea



or land. In war a P., or safe-conduct, given to aliens, is given for special purposes, and must be strictly interpreted. In peace it is a police measure, often provided for in treaties; and, if safety requires, may be withheld in particular cases from obnoxious persons. It is only a *prima facie* evidence of character and nationality. T. D. WOOLSEY.

**Pastor**, a genus of starlings, having representatives in Europe and the Old-World tropical regions. They are useful as destroyers of insects, but sometimes they become destructive themselves to small fruits.

**Pasteur** (LOUIS). See APPENDIX.

**Patagonia**, the S. portion of S. Amer., bounded N. by the Rio Negro, separating it from rest of the Argentine Republic, E. by the Atlantic, S. by the Strait of Magellan, which separates it from Terra del Fuego, and W. by the Pacific. The W. part of P. is covered by the Andes, which, entering it from Chili, continue their course, parallel with the shore of the Pacific, down to the Strait of Magellan, but decreasing in height from 8500 to 3000 ft. A string of innumerable islands, high, rocky, barren toward the ocean, wooded toward the mainland, garnish the whole range of the coast. The climate of this whole region may be described as one continuous rain-storm. The E. part of P. consists of broad terraces, through which the Andes gradually slope down into the low plain which extends along the Atlantic. Numerous rivers descend from the Andes, cross the plains in an E. direction, and enter the Atlantic, such as the Rio Negro, 500 m. long and navigable throughout; the Chupat; the St. George, also navigable, and forming the outlet of the large lake of Viedma, in lat. 49° 30' S., and about 100 m. in circumference. The climate here is dry. Rain is rare. The soil is unproductive, in many places sandy, everywhere strewn with pebbles and boulders, and saturated with salt and saltpetre. Trees are few, but the pastures are in many places good. This country, comprising 350,781 sq. m., is probably not inhabited by more than 93,000 persons, all aboriginal Indians. The Patagonians are tall, bulky, and muscular, with black eyes and black, coarse hair, thick lips, and a skin of a reddish-brown color. They live as nomads, and in some places cattle are reared: their chief occupation, however, is hunting, and they are unsurpassed in horsemanship and the handling of the arrow, ball, and bow. The country was discovered by Magalhães in 1520; he called it *Patagonia* ("large-footed") from some huge footprints ascribed to the natives. In 1881 that part of P. E. of the Andes was ceded to the Argentine Republic.

**Patchogue**, N. Y. See APPENDIX.

**Patchouli**, pa-choo'ly, the *Pogostemon patchouli*, a labiate plant of S. Asia. It is used in perfumery and against the ravages of clothes-moths. The Orientals use it for stuffing mattresses and to ward off contagion and vermin. They also mix it with tobacco for smoking.

**Patent** [Lat. *patens*] **Laws**. A patent for an invention is a declaration by the govt., defining what an inventor may be protected in the use of, and for what length of time. P. laws are laws which prescribe under what formalities and conditions P. may be granted, and provide for enforcing the protection which the P. grants. A P. is not a grant of right to the invention. It is merely a grant of right to protection in the exclusive use of the invention. An inventor has a right to use his invention without a P. He needs a P. and the aid of P. laws only to vest him with power to exclude others from the use of the invention.

*For what Subjects-Matter Patents may be granted*.—The act now in force in the U. S. provides "that any person who has invented or discovered any new and useful art, machine, etc., . . . not patented or described . . . in this or any foreign country . . . and not in public use or on sale for more than 2 yrs. prior to his application, unless the same is proved to have been abandoned, may . . . obtain a patent therefor."

*To whom Patents may be granted*.—In this country, with one exception, he only is entitled to a P. who is the first inventor. The exception is that an applicant for a P. need not be the first inventor as against a mere prior knowledge or use in a foreign country, if he believe himself to be the first inventor at the time of making his application for a P.

*What constitutes Patentable Inventions*.—The mere conception of an idea is not patentable. An invention, to be patentable, must be completed ready for use without the addition of further invention or the necessity of further experiment. It must be so matured that the means of producing the result can be accurately and fully set forth. Mere experiments equivocal in their results are not patentable. New combinations of either new or old elements are patentable, but a combination of old elements, to be patentable, must produce some new result due to the co-operative or reciprocal action of the combined parts.

*Utility*.—Although the statute requires the invention to be useful, yet no particular degree of utility is necessary to render an invention patentable. Any invention injurious to health or public morals, or designed to facilitate the commission of crime, is not patentable.

*How an Inventor may lose his Right to a Patent*.—An inventor who has acquired a right to a P. may lose it: (1) By neglecting to apply for a P. for more than 2 yrs. after the invention has been put into public use or on sale. (2) He may so deal with his invention as to create an abandonment or dedication of it to the public at any time. This he may do by express declaration or by silence while with his knowledge its use is generally adopted by others.

*How Patents are obtained*.—P. are obtained by applications in the form of petitions to the com. of patents, accompanied by a description, including drawings and a model when the invention is of a kind admitting of drawings and model. When the invention is of a composition of matter, specimens must be furnished if required by the com. If no reason is found against granting the P. it is allowed and issued. If any cause is found against the grant, it is reported to the applicant; and if he can remove the objection the P. will still be issued, otherwise it will be refused. The term for

which P. for inventions issue in this country is 17 yrs.; but when an invention is patented in this country after being patented in a foreign country, the P. here will expire at the same time with the foreign P.; but in no case can the Amer. P. be in force for more than 17 yrs.

*Amendment of Patents*.—A P. may be amended by being surrendered to the com. and the grant of an amended one, called a reissue, in its stead, or by filing with the com. a disclaimer of so much of the thing patented as the patentee was not the first inventor of.

*Sale and Transfer of Patents*.—A patentee may sell his entire P. or any undivided part of it for the whole or any specified part of the U. S. The conveyance of such an interest, to be valid, must be in writing, and is called an assignment. Licensees under P. need not be in writing. They may be oral or implied.

*Remedies for the Protection of Patent Rights*.—The law provides that any person who, without authority from the patentee, shall in any manner imitate or counterfeit the mark or device of the patentee, for the purpose of deceiving the public, shall be liable for every such offence to a penalty of \$100. In case of an infringement of a P., the law gives its owner right to remuneration for past infringement and to have further infringement prevented.

*Relation of a Patentee to the Government*.—The relation between the public and the inventor is that of contracting parties. The inventor being in possession of the invention, it is his; he has created it; he is not bound to divulge it; but if, without law to protect it, he make it known, others may use it. The public is in possession of power sufficient to protect him against the use of the invention by others. The public by its law offers to give him the protection for a limited time in case he, in consideration thereof, explain his secret. Promised protection is what the public gives. A description of the invention is the consideration given in return by the inventor. [From orig. art. in *J.'s Univ. Cyc.*, by GEORGE GIFFORD.]

**Paterculus** (CAIUS VELLEIUS), a Roman historian, b. about 19 B. C.; entered early the Rom. army, and served from 2 to 14 A. D. under Tiberius in Germania, Pannonia, and Dalmatia. The yr. of his death is unknown, but his work, *C. Velleii Paterculi Historia Romana ad M. Vinicium Cos. Libri II.*, reached to 90 A. D.

**Pat'er Noster** [Lat. for "Our Father," the first words of the Lord's Prayer], the name given by R. Caths. to the Lord's Prayer. In the anc. Ch. it was regarded as so sacred that its formula was kept a secret from the uninitiated.

**Pat'erson**, city and important R. R. centre, cap. of Passaic co., N. J., on both sides of the Passaic River, 5 m. above tide-water navigation and 15½ m. N. W. of New York. The city is built upon a broad plain, whose W. extremity rises to a height of over 300 ft., known as "Garrett Mountain." Good drainage and valuable water-power are afforded by the Passaic River. The Passaic Falls, 72 ft. high, are within the city limits. P. has extensive manufactures, prominent among which are those of iron, locomotives, machinery, and silk. Pop. 1870, 33,579; 1880, 51,081.

**Pathological Anatomy**, the science which treats of the changes produced in the tissues and organs of the body by disease. It embraces the study of these diseased conditions during life and after death. To ascertain the character and nature of these changes, we are obliged to employ the naked eye, the simple and compound microscope, and chemical reagents. In many diseases the lesion of some one organ appears to constitute the disease; in others, general constitutional symptoms exist without the presence of any lesions which we are able to detect. The greatest obstacle to a real knowledge of such diseased conditions is our inability to observe diseased organs while still alive. We see changes after they have taken place, but not the process of change itself. F. DELAFIELD.

**Pathology** [Gr. from *πάθος* and *λόγος*], the doctrine of the diseases. Under this name is comprehended the science which treats of all the diseased conditions which affect the human body. It is also applied to the diseases of some of the lower animals. We use the terms general, special, surgical, medical, internal, external, and comparative P. By general P. we understand the knowledge of those general principles which govern all diseased conditions. Special P. applies these general principles in detail to the study of the laws and phenomena which belong to individual diseases. Surgical or external P. treats of diseases affecting the exterior of the body—the skin, the bones, the joints, etc. Medical or internal P. treats of the diseases of the viscera. Eng. authors restrict the term "pathology" rather to the principles of med. and surgery, while the Fr. include under it also what with us is usually embraced in the practice of med. and surgery. F. DELAFIELD.

**Pat'kul** (JOHANN REINHOLD), b. about 1660 of a wealthy and influential family of Livonian nobility; received a military education, but became famous as a diplomatist. Livonia was at that time a possession of the Swe. Crown, and in the controversies between the Livonian nobility and the Swe. king, P. played a conspicuous part. Accused of rebellion, he was summoned to Stockholm, but he escaped to Courland. He was sentenced to death, and his estates were confiscated. For some time he lived in Switz. and Fr., but in 1698 he entered the service of Augustus II. of Sax. and Poland, and the alliance which was formed against Charles XII. by Augustus II., Peter the Great, and Frederick IV. of Den. was principally P.'s work. It seems, however, as if he could serve no friend and no purpose with full faith. In 1705 Augustus II. arrested him and put him in the dungeons of Königsstein, and when Charles XII. made P.'s surrender one of the conditions of peace, Augustus II. consented. He was broken on the wheel and beheaded in the convent of Kazimierz, near Posen, Oct. 10, 1707.

**Pat'mos** [*patino*, called also during the Middle Ages *Palmoza*, "island of palms"], one of the Sporades, now belonging to Tur., about 30 m. W. of the coast of Asia Minor,



and 20 m. S. of the W. extremity of Samos. It is one mass of rock, rugged and barren, about 10 m. long, 5 m. broad, and 28 m. in circumference. The apostle John was sent there, either under Nero or under Domitian.

**Pat'na**, city of Brit. India, in the presidency of Bengal, stands on the right bank of the Ganges, 285 m. N. W. of Calcutta, and extends with its suburbs along the river for a distance of 7½ m. It is indifferently built, handsome brick buildings alternating with mud huts. But it has some manufactures of shawls, plate-cloths, lacquered ware, and, being situated on the E. I. Railway, it has become the centre of the opium-trade. It is the chief seat of Mohammedanism in India. Pop. 170,654.

**Pat'on** (Sir JOSEPH NOEL), R. A., b. at Dunfermline, Scot., in 1821; studied painting at Royal Acad.; became known to the public by his etchings in illustration of Shakspeare and Shelley; gained premiums by his fresco *The Spirit of Religion* and his oil-painting *Christ Bearing the Cross*; became a member of the Acad. 1856, queen's limner for Scot. 1865, and was knighted 1867.

**Patras**, town of Gr. in the Morea, on the Gulf of Patras, is fortified, and has a large harbor provided with a mole. It is a prosperous and well-built city and the seat of the foreign commerce of the country. Its chief export is currants. Pop. 25,494.

**Patriarch** [Gr. *πατριάρχης*, "father of a race" or "family"], often loosely used of any venerable person, but more especially (1) in Bible hist. the fathers of mankind and of the Heb. people, from Adam to the time of Moses, are called P., and their age is called the patriarchal age. (2) The pontiff whose authority centred at Tiberias, and who ruled over all the Jews westward of the Euphrates, from the latter part of the 2d century till 415 A. D., was called P. of the Jews. (3) In Ch. hist., during the 4th century, P. was the title of any and every bp., but by the Council of Chalcedon (451) was made the official title of the bps. of Rome, Alexandria, Antioch, Constantinople, and Jerusalem. This system extended only to the Rom. empire. From time to time other episcopal dignitaries have been called P.

**Patrician**, pa-trish'an. The word *patricius* in Lat. is derived from *pater*. "Whoever was begotten in an illegal marriage or out of marriage was excluded from the membership of the community. On this account the Roman burgesses assumed the names of the 'father's children' (*patricii*), inasmuch as they alone in the eye of the law had a father." The P. were the original burgesses of Rome, the "populus Romanus." In the earliest times there was no plebeian class inside the state. The P. were divided into clans (*gentes*), the *gentes* were divided into families. Attached to each household were the slaves and the clients. Sometimes a P. would marry a client's daughter, in which case the children would have no political rights, but would be independent. Thus there soon arose in Rome a third class, the plebeians. The civil hist. of Rome for more than 4 centuries presents a constant struggle between P. and plebeians. At the beginning of the struggle the whole political, judicial, and hierarchical power was in the hands of the P.; at the end of it a perfect equalization had taken place. [From *orig. art. in J.'s Univ. Cyc.*, by A. H. BULLEN.]

**Patrick** (SAINT), the apostle and patron saint of Ire. His baptismal name was *Succath* ("brave in battle"). His birthplace is not certainly known, and his dates are all disputed. He says of himself, in his *Confession*, that he was born "in the village of Bonavem of Tabernia," which some think to have been Kilkpatrick, near Glasgow in Scot., but others, more probably, Boulogne in N. Fr. Killen thinks he was b. about 373, went on his mission about 405, and d. 465. He d. on the 17th of Mar., the day now sacred to his memory. Ire. was then occupied by a great number of petty tribes, most of which were evangelized by P. Of P. himself much that has been related is fabulous. But his autobiographical *Confession* and his *Epistle to Coroticus*, both of which are unquestionably genuine, reveal to us a devout, simple-minded, unlettered man, and a most discreet and energetic missionary. (See JAMES HENTHORN TODD'S *St. Patrick*, W. D. KILLEN'S *Old Cath. Ch.*, and W. D. KILLEN'S *Ecclesiastical Hist. of Ire.*)

**Patrick** (SIMON), D. D., b. at Gainsborough, Eng., Sept. 8, 1626, ed. at Cambridge; became bp. of Chichester 1689, and of Ely 1691. D. May 31, 1707. Author of *Commentary and Paraphrase on the O. T.* and other works.

**Patrispas'ians** [Lat. *pater*, "father," and *patrios*, to "suffer"], or **Monarchians** [Gr. *μόνος*, "single," and *ἀρχή*, "principle"], Antitrinitarians of the anc. Chr. Ch., who taught or were charged with teaching that God the Father was incarnated and suffered in the person of Jesus Christ. The finest type of the heresy was developed by Sabellius of Ptolemais in Egypt, 250-260 A. D., whose system has frequently reappeared, especially in Occidental Christendom.

**Patrons of Husbandry**, the name of a secret order having for its object the promotion of the interests of tillers of the soil, socially, economically, and financially. After the close of the c. war agriculture and agricultural pursuits were greatly depressed. Of all the great working classes of society, the farmers alone had no common interests, no bond of union. Competition, the heavy charges of the R. Rs. for transporting their crops, and the enormous prices charged for agricultural machinery, as well as for all that they had to purchase, the occasional yrs. of bad crops and cyclones, had together produced great discouragement among the farming class, especially in the W. States. The farms were very generally mortgaged, and in many cases foreclosure drove hard-working farmers from their farms penniless, after yrs. of severe labor. Agricultural societies had been tried, but failed to render any material help, and the condition of the farmers was growing worse every yr. Relief came at last, from a little company of employees in the depts. at Wash., who had been farmers, and who thought they had found a remedy for these serious evils, in a

secret organization, which should bind the tillers of the soil together very closely, in efforts for their common benefit.

The plan was first conceived and put on paper by Mr. William Saunders, but it was modified and rendered more effectual by the suggestions and co-operation of Messrs. Kelly, Thompson, Ireland, Grosh, and Trimble, Jr., who united on a plan for an order Aug. 5, 1867. Their plan included a national organization, State, co., and town associations, each responsible to the next higher, and all to the national organization. In the fall of 1867 they decided upon "Patrons of Husbandry" as the name of the order, and upon "Grange" (see GRANGE), as the name of the town, State, and national associations. The National Grange was organized Dec. 4, 1867, only 9 persons being present, though it required 13 persons to fill the offices provided for in the const. This defect was subsequently supplied by the election of other members. Both sexes may be members of the granges, and the const. requires that 4 of the 13 officers shall be women. The ritual is simple, but sufficient for its purpose.

The progress of the order was for some yrs. exceedingly slow; from 1871 onward it began to grow rapidly, and the present number of organizations exceeds 50,000, with a membership of at least 4,000,000.

The advantages of membership are considerable. The granges help all their members to buy whatever they have to buy in the lowest market, and always for cash; and to sell whatever they produce in the highest market, and also for cash or its equivalent. The co. and State organizations make arrangements with manufacturers of agricultural machinery and all other large dealers to furnish, on the presentation of their tokens by the members of the granges, mowers, reapers, harvesters, threshing-machines, horse-hoes, horse-rakes, cultivators, ploughs, etc. at a very small advance from cost, the alternative being that they will set up their own manufactories for these articles. They also procure all the goods and fertilizers used by the farmers at wholesale prices. They keep records of crops in their respective States, of prices at the great shipping points, and of the foreign demand and prices, and at the most favorable time the advice to sell is transmitted to the members of each grange. Very few of the farms belonging to members of the order are now mortgaged, or, if a partial mortgage remains, it is in many cases held by the grange. At first they made war upon the R. Rs. which charged high rates for freight, and in some of the States procured the enactment of laws fixing the prices of freight, but after a long conflict they have come to an understanding, the R. Rs. finding it impossible to contend successfully against so powerful an organization, and the granges recognizing the injustice of requiring them to transport freight at prices which admitted little or no profit. The order is pledged not to participate as an organization in politics, but it is undoubtedly exerts an indirect influence, generally, it is fair to admit, in favor of justice, fairness, and low taxation.

L. P. BROCKETT.  
**Patten** (DAVID), D. D., b. Oct. 15, 1810, grad. at Wesleyan Univ. in 1834; prin. of the acad. at Wilbraham, Mass., 1834; held various M. E. pastorates in N. Eng.; was presiding elder of Providence dist. 1852-53; prof. of theol. in Biblical Inst., Concord, N. H., 1854-66; became in 1867 prof. of homiletics and pastoral theol. in theological school now connected with Boston Univ.

**Patterson** (CARLILE POLLOCK), son of the succeeding, b. at Shieldsboro', Miss., Aug. 24, 1816, appointed mdpn. 1830; served in the Mediterranean squadron; in 1836 returned to the U. S. in the line-of-battle ship Delaware, carrying his father's flag as com.; passed mdpn. June 1836; grad. at Georgetown Coll., Ky., as C. E. 1838; joined the U. S. Coast Survey, and served until 1841; as second lieut. of the U. S. brig Boxer cruised in the W. I. until Jan. 1844; again in Coast Survey in 1845, and conducted a hydrographic party in the Gulf of Mex.; took command of Pacific mail steamship Oregon in Jan. 1850; resigned as lieut. in the navy Sept. 1853, and remained on the Pacific coast until Mar. 1861, in private business and in command of steamships from Panama to Puget Sound. In May 1861 hydrographic inspector U. S. Coast Survey, and so continued until Feb. 17, 1874, when he was appointed supt. of that work. D. Aug. 15, 1881.

**Patterson** (DANIEL TOP), b. on L. I. Mar. 6, 1786, appointed mdpn. 1800; attached to the frigate Phila. when that vessel ran on a reef near Tripoli in Oct. 1803, and, being defenceless, surrendered to a flotilla of Tripolitan gunboats; remained a prisoner until peace was concluded in 1805; lieut. 1807, and master-commandant 1813. In 1814 he commanded naval forces at New Orleans, and for able co-operation with Jackson received the thanks of Cong. He commanded the flotilla which destroyed the forts of Lafitte on the island of Barataria; capt. 1815; commanded the frigate Constitution 1828-28 in the Mediterranean; served as navy com. 1828-32, commanded the Mediterranean squadron 1832-36, and from 1836 was commandant at the navy-yard, Wash. D. 1839.

**Patterson** (JAMES W.), b. at Henniker, N. H., July 2, 1823, grad. at Dartmouth Coll. 1848; prof. of math. in that coll. 1854-59, then prof. of astron. and meteorology; sec. of the board of education of N. H. 1858-61, M. C. 1862-66, U. S. Senator 1867-73; now supt. of schools of N. H.

**Patterson** (JOHN), b. at New Britain, Conn., 1744, grad. at Yale 1768; became a lawyer; removed to Lenox, Mass., 1774; was a member of the first and second provincial congs. of Mass. 1774-75; raised a Berkshire regiment of minutemen and started for Cambridge within 18 hours of receiving news of the battle of Lexington; took part in the expedition against Canada and in the battles of Trenton and Princeton; appointed brig.-gen. Feb. 21, 1777; rendered important services at the battle of Stillwater; was present at Burgoyne's surrender and at the battle of Monmouth; remained in service throughout the war; was engaged in the suppression of Shays's rebellion 1786; settled soon after-



ward at Lisle, N. Y.; became a co. judge, member of the State legislature and of the constitutional convention of 1801; M. C. 1803-05. D. July 19, 1808.

**Patterson** (ROBERT), LL.D., b. in Ire. May 30, 1743, removed to Phila. 1768; became in 1774 an instructor in Wilmington, Del.; was an officer of the Revolutionary army; for a time vice-provost of the Univ. of Pa. and prof. of math. 1779-1814; director of the U. S. Mint 1805; pres. of the Amer. Philosophical Society. Author of *The Newtonian System*, an *Arithmetic*, etc. D. July 22, 1824.

**Patterson** (ROBERT), b. in Pa. in 1753, emigrated to Ky. 1775; settled near Dayton, O., 1804; was the original proprietor of the site of Lexington, Ky., and of  $\frac{1}{4}$  of the site of Cin.; participated in Clarke's 3 expeditions against the W. Indians 1778-82, being col. in the latter; participated in Bowman's expedition against Chillicothe 1779; was second in command to Daniel Boone at the battle of the Lower Blue Lick, Aug. 19, 1782, and in Logan's campaign against the Shawnees 1786. D. Aug. 5, 1827.

**Patterson** (ROBERT), b. in Tyrone co., Ire., Jan. 12, 1792; at an early age came to the U. S., and subsequently became a merchant of Phila. On the outbreak of the war with Mex. was appointed a maj.-gen. of volunteers, and commanded a division under Scott, taking part in the battle of Cerro Gordo. On the breaking out of c. war in 1861 he was mustered into the service of the U. S. as maj.-gen. of Pa. troops assembled under the President's first call for 75,000 men for 3 months. Commanding the force on the Potomac near Harper's Ferry, opposed to the Confed. force under J. E. Johnston, he was charged with preventing its junction with Beauregard; but Johnston succeeded in effecting a junction. On the expiration of his commission (July 27, 1861) was mustered out of service. D. Aug. 7, 1881.

**Patterson** (ROBERT M.), M. D., b. in Phila. 1786, grad. at the Univ. of Pa. 1804; took his med. degree in 1808; studied chem. under Davy; became prof. of chem., natural philos., and math. in his *alma mater*; occupied a chair in the Univ. of Va. 1828-35; was director of the Mint at Phila. 1835-53; author of scientific papers, etc. D. Sept. 5, 1854.

**Patterson** (WILLIAM), LL.D., b. at sea of Irish parents in 1745, was reared in N. J.; grad. at Princeton 1763, admitted to the bar 1769, atty.-gen. of N. J. 1776-86, member of the national constitutional convention 1787, U. S. Senator 1789-91, gov. of N. J. 1794; revised the laws of N. J. 1798-99, and was a justice of the U. S. supreme court from 1794 to his death. D. Sept. 9, 1806.

**Patti**, pah'tee (ADELINA MARIA CLORINDA), b. at Madrid Apr. 9, 1843, was ed. at New York, where, on Nov. 24, 1859, she made her debut as a singer in Donizetti's *Lucia di Lammermoor*. On May 14, 1861, she made her first appearance in Lond. in *La Sonnambula*, and next yr. Nov. 16, 1862, she appeared at Paris in the same rôle. She afterward sang in Paris, Lond., St. Petersburg, and New York with great success.

**Pattison** (ROBERT EVERETT), D. D., b. at Benson, Vt., Aug. 19, 1800, grad. at Amherst 1826; was tutor in Columbia Coll., D. C., ordained to the Bap. ministry at Salem, Mass., 1829; became in 1830 pastor of the First ch., Providence, R. I.; held a professorship in Waterville Coll., Me., of which he was pres. 1836-40 and 1853-57; prof. of theol. in theological school at Covington, Ky., 1846-48; held a chair in the Newton (Mass.) Theological Inst. 1848-53; was for a time pres. of the Oread Inst., Worcester, Mass., and in 1871 became a prof. in the Chicago Univ. Author of a *Commentary on Ephesians*, and of addresses, reviews, etc. D. Nov. 21, 1874.

**Pattison** (WILLIAM WESTON), D. D., b. in New York Oct. 19, 1821; ed. at Univ. of City of New York and at Union Theological Sem.; became successively pastor of Congl. chs. in Boston, Hartford, and Chicago; afterward, for 5 yrs., prin. ed. of the *Advance*, at Chicago; lectured in theological sems. at Chicago and Oberlin. Wrote *Slavery and Infidelity*, *The Young Man*, and *Prayer and its Remarkable Answers*. Pres. of Howard Univ., D. C., 1880.

**Paul** (SAINT), the apostle, b. at Tarsus, the capital of Cilicia, of Jewish parents, but a Roman citizen, and ed. partly in his native city, partly in Jerusalem. We first hear of him as present at the martyrdom of Stephen, and a passionate adversary of Christianity. With a commission from the Sanhedrim, he was on the way to Damascus to stir up persecutions there too, when he became at once converted to Christianity. He retired to Arabia, where he remained for 3 yrs. in solitude. He then returned to Damascus, and began to preach. Barnabas brought him to Antioch, and from this city he started on his 3 great missionary journeys. The first included Asia Minor, Pamphylia, Pisidia, and Lycaonia, and ended about 51. The second extended to Europe: Philippi, Thessalonica, Athens, and Corinth were visited. The third, which commenced about 54, embraced nearly the same dist., and terminated at Ephesus, where the apostle remained 2 yrs. From Ephesus he went up to Jerusalem; but in order to save him from the fury of the Jewish pop., the capt. of the Rom. guard sent him to Caesarea, where he was detained in prison 2 yrs. Having appealed to the emp., he was sent to Rome, where he was treated kindly and allowed to dwell "for two whole years in his own hired house." It is generally believed that he made journeys both to the E. and W., and, returning to Rome, suffered martyrdom during the persecutions in the reign of Nero about 67.

**Paul I.**, Pope, a Rom., succeeded Stephen III. in 757, and d. at Rome June 28, 767. He was an able prelate.—**PAUL II.** (*Pietro Barbo*), b. at Venice Feb. 26, 1418; was chosen pope in 1464. He preached a crusade against George Podiebrad, king of Bohemia, who favored the Hussites. D. at Rome July 28, 1471.—**PAUL III.** (*Alessandro Farnese*), b. at Canino Feb. 29, 1468, succeeded in 1534. Among the events of his pontificate were the excommunication of Henry VIII. of Eng. 1538, the approval of the order of Jesuits 1540, and the convocation of the Council

of Trent 1545. D. at Rome Nov. 10, 1549.—**PAUL IV.** (*Gian Pietro Caraffa*), b. at Capriglio June 28, 1476, succeeded 1555; joined Fr. in the war for the conquest of Naples from Sp. 1555-57; strove for the elevation of his family, and his impolitic course regarding Eng. and Ger. strengthened the Prot. cause. D. at Rome Aug. 18, 1559.—**PAUL V.** (*Camillo Borghese*), b. at Rome Sept. 17, 1552, succeeded 1605. This pontificate was marked by the interdict laid upon Venice, the close of the Molist controversy, the establishment of the Congregation of the Oratory and the orders of the Ursulines and the Visitation, and by great activity in missions in heathen regions. D. at Rome Jan. 28, 1621.

**Paul**, czar of Russia, b. at St. Petersburg Oct. 1, 1754, was the son of Peter III. and Catharine II. Hated by both his parents and abused by his mother, he bore everything patiently, and in 1796 succeeded to the throne on Catharine's death. He immediately set about to reverse her policy in every particular. His reign began well. Kosciuszko and the other Polish prisoners were liberated and treated with generosity. In 1799-1800 his troops served in It. and Switz. against Fr., but in 1800 he changed sides, embraced the cause of Nap., and challenged to personal combat any prince who refused to join him in a league against G. Brit. The puerilities and tyrannies of his home rule begot a strong popular discontent, and he was murdered in his bedchamber by his nobles Mar. 24, 1801.

**Paul** (VINCENT DE), b. at Pony, Fr. in 1576, studied at Toulouse; took holy orders in 1600, and was captured in 1605 by pirates and carried as a slave to Tunis; escaped 1607; visited Rome and then Paris; was appointed chaplain to the ex-queen Margaret of Valois, and in 1622 chaplain to the galleys at Marseilles; repaired in 1627 to Paris, where he was active in the establishment of charitable insts. and in the foundation of religious fraternities, the Lazarists, the Sisters of Charity; was a member of the "council of conscience," by which all ecclesiastical preferences were distributed. D. Sept. 27, 1660. He was beatified by Benedict XIII. in 1729, and canonized by Clement XII. in 1737.

**Paulding** (HIRAM), son of John, b. in Westchester co., N. Y., Dec. 11, 1797, entered the U. S. N. as a midpn. Sept. 1, 1811; was engaged in McDonough's victory on Lake Champlain 1814; became lieut. 1816; accompanied Com. Porter in his cruise against the W. I. pirates 1823; capt. 1844; suppressed an intended expedition against Nicaragua, headed by William Walker, 1857; became rear-admiral on the retired list 1861; commanded Brooklyn navy-yard 1862-65; gov. of the Phila. Naval Asylum 1866. D. Oct. 30, 1878.

**Paulding** (JAMES KIRKE), b. in Pleasant Valley, Dutchess co., N. Y., Aug. 22, 1779; in early life removed to New York, where his sister had married a brother of Washington Irving, with whom he became associated in the authorship of *Salmagundi*, but the second series of *Salmagundi* was by P. alone; became in 1814 sec. of the board of navy cons.; sec. of the navy 1838-41, and for 12 yrs. was navy agent in New York. Author of *The Dutchman's Fireside*, *Life of Washington*, etc. D. Apr. 6, 1860.

**Paulding** (JOHN), b. in New York 1758; served through the Revolutionary war, being 3 times taken prisoner; was one of the captors of André, for which he received from Cong. a silver medal, inscribed on one side "Fidelity" and on the other "Vincit Amor Patria," and was granted an annuity of \$200. D. Feb. 18, 1818.

**Paulicians**, a Chr. sect of the E. Ch., originated in Armenia, probably in the middle of the 7th century. They rejected the worship of the Virgin and the saints, explained the sacraments spiritually, maintained no priesthood, and acknowledged only the N. T. as authoritative. After spreading quietly in Armenia for about 2 centuries, the empress Theodora (841-855) undertook to suppress the sect. More than 100,000 are said to have been put to the sword, and the rest were exiled.

**Pauline Congregation.** See PLARISTS.

**Paulist Fathers, or The Congregation of St. Paul the Apostle**, a missionary society of priests in the R. Cath. Ch., founded in 1858 by Rev. Isaac Thomas Hecker, and approved by Pope Pius IX.

**Paulus** (LUCIUS ÆMILIUS), surnamed **Macedonicus**, b. at Rome about 230 B. C., a son of the consul of the same name, who fell at Cannæ 216; was prætor in 191; commanded afterward as pro-consul in the prov. of Further Sp., where he put down an insurrection and defeated the Lusitanians; was consul the first time in 181, and a second time in 168; censor in 164. D. in 160. During his second consulship he finished the third Macedonian war by his victory over Perseus at Pydna.

**Paulus Ægineta**, a famous Gr. phys. and author, b. in Ægina at an unknown date, but probably in the 7th century A. D. His *De Re Medica Libri Septem* had great influence among European and Ar. phys. in the Middle Ages, and several Lat. and Arabic versions were made.

**Paulus Diaconus, or Levita**, b. at Cividale in Friuli about 730; became tutor to the daughter of King Desiderius, for whom he compiled his *Historia Romana*, parts of which are given in Muratori's *Rerum Italicarum Scriptores*; was ordained deacon, not later than 763; lived for several yrs. at the court of Charlemagne, where he collected his *Homiliarius* and wrote his *Gesta Episcoporum Metensium*, printed in Pertz's *Monumenta Germaniæ Historica*, vol. ii.; made an abridgment of Festus's *De Significatione Verborum* (see FESTUS). D. at Monte Casino about 797. His last and most important work was his *De Gestis Longobardorum Libri VI.*, which ends at 744, and is pub. in the above-mentioned collection by Muratori, and in *Hist. Gotth. Vandal. et Longobard.*, ed. H. Grotto.

**Paul Veronese** (PAOLI CAGLIARI), an eminent It. painter of the Venetian school, b. at Verona 1520. He was a pupil of his uncle, Antonio Badile, and he worked successively in Venice, Rome, and other cities of It. He was an excellent colorist, and was distinguished by the richness and fertility



of his imagination. Among his masterpieces are *The Marriage at Cana* (which is now in the Louvre), *The Calling of St. Andrew to the Apostleship*, *The Rupe of Europa*, and *The Presentation of the Family of Darius to Alexander*. He was a contemporary of Titian. D. Apr. 19, 1588.

**Pauperism in the U. S.** There is very little of native P. in this country. The great proportion of paupers in the U. S. are foreign-born or of foreign descent. Many v. and towns are known where not a single pauper exists. The comparatively equal distribution of property in the U. S., the cheapness of arable land, the dignity imparted by political privileges, the absence of strict Poor Laws, and, above all, the influence of popular education, have tended to prevent the growth of P. The only places where there is danger of its appearance is in the large cities. A Poor Law may be said to exist almost everywhere in the U. S.; that is, the local communities are required to support their own poor by taxation.

**American Settlement Laws for Paupers.**—In Mass. a married woman follows the settlement of her husband. Legitimate children follow the settlement of the father. Illegitimate children follow that of the mother. In Ind., Wis., and Kan. a married woman whose husband has no settlement in the State may acquire one on the same conditions with other persons. In Ia. and some other States a woman abandoned by her husband may acquire a settlement. In Ind., Ia., Wis., and Kan. minors whose parents have no settlements are allowed to acquire one on the same terms as adults. In N. Y. and Mich. "emancipated" minors may acquire settlements as follows: (1) If a female, by marriage and living with her husband a yr.; (2) if a male, by marriage and residence separately from his father's family for a yr.; (3) by being bound as an apprentice and serving for a yr.; (4) by being hired and actually serving for a yr. on wages paid to himself. In Ind., Ia., Kan., and other States an apprentice acquires a settlement at once on becoming bound. In regard to settlements from property and residence, the Mass. law (1868) provides that living on a freehold property for 3 yrs. shall constitute settlement, or the ownership of property valued by assessors at \$200, or whose income is set down at \$12 for five successive yrs., or residence in any place within the State for 10 yrs. and payment of all taxes for 5 yrs. Women may acquire settlement by a residence of 10 yrs. without payment of taxes. The only other States which make the ownership of property a means of acquiring settlements are Vt., N. H., R. I., Conn., Pa., and Del. The latter 3 States alone require that the person shall live upon the estate, and most of them provide a brief period of residence, with or without the payment of taxes. All the other States merely require a certain period of continuous residence, without consideration of property or the payment of taxes. The longest period is in Mo., 5 yrs.; the shortest in Neb., 30 days. Settlements are also derived from the holding of public office in Mass., Vt., Pa., and Del. In Mass. alone a clergyman acquires a legal settlement where he is settled as a minister. In 8 of the N. Eng. States a person acquires a settlement who is admitted an inhab. by any town at a legal meeting. Apprenticeship also gives settlement in many of the States, even to minors, though in Mass. the apprentice must be of age and continue in the same place at his trade for 5 yrs. In some of the States a soldier acquires a legal settlement wherever he enlists, so that a town becomes liable for the support of persons by whom its quota is filled.

The final extinction of P. can only come through individual improvement. Where education sharpens the mental faculties, where religion elevates the moral character, or political rights increase personal dignity, with a fair distribution of property or an easy acquisition of arable land possible to each, there the peculiar debasement, dependence, weakness, and misery which constitute P. will in all probability be avoided. [From orig. art. in *J.'s Univ. Cyc.*, by Rev. C. L. BRACE.]

**Palaun/a Imperialis**, a tree of the order Scrophulariaceae, a native of Japan. It has something the habit of a catapla, the leaves being large and heart-shaped, the branches crooked and nearly horizontal; the flowers, in large clusters of a pale violet color, precede the leaves. It rarely exceeds 40 ft. in height, and its trunk is usually less than 1 ft. in diameter. It is hardy as far N. as New York.

**Pausanias**, a son of Cleombrotus and regent of Sparta during the minority of his cousin, Plistarchus, the son of Leonidas; commanded the confederate Grs. at Platæa 479 B. C., and achieved several victories during the following yrs. But, elated by these successes and seduced by an exorbitant ambition and vanity, he entered into treasonous negotiations with the Pers. The Athenians denounced him and the Spartans suspected him. Twice he was recalled from the army and arraigned before the ephors, but no proofs could be presented. But at last a letter from him to Xerxes was discovered and his plan frustrated, he took refuge in the temple of Athene Chalciceus, where the people shut up the entrance by a pile of stones, to which his own mother carried the first, and he d. of hunger about 468 B. C.

**Pausanias**, probably a native of Lydia, Asia Minor, flourished in the middle of the 3d century after Christ. His *Ἑλλάδος Περιήγησις*, in 10 books, is an itinerary, in which he describes, often minutely and with great precision, the temples and other monumental buildings, the statues and pictures, the cities, rivers, mts., springs, etc. which he saw on his journey through Gr., and the local traditions about these objects. The work is a source for the hist. of the legends, objects of antiquity, and works of art of anc. Gr.

**Paulus**, a distinguished Gr. painter of Sicily, about A. C. 350; famed for skill in encaustic, house decoration, and in painting flowers.

**Pavement.** See ROADS AND PAVEMENTS.

**Pav/a** [anc. *Ticinum*; med. *Papia*]; town of N. It., on an elevation of the left bank of the Ticino, near its junction with the Po. A navigable canal connects the town with Milan; it has direct water-communication through the Po with the Adriatic, and through the Ticino with Lago Maggiore, and is easily accessible by rail from all the large It. towns. The view of P. seen from the Voghera railway where it passes over the new bridge is very striking. It is surrounded by a wall, and with bastions of great strength. Of its 500 towers of mediæval celebrity, only 4 remain, the highest 250 ft. The chs. of P. are of great historic and architectural interest. Of the old Castello little of interest is left except the grand half-ruined gateway. The Univ. of P., the *alma mater* of so many illustrious men, is said to have been founded by Charlemagne. The Museo Malespina contains some good pictures and a fine collection of engravings. The great attraction of the neighborhood is the magnificent Certosa of Pavia, 4½ m. from the town, founded by the famous Gian Galeazzo Visconti. P. has considerable internal trade in rice, hemp, silk, wines, etc. Pop. 27,493.

**Paving.** See ROADS AND PAVEMENTS.

**Pawnee City, Neb.** See APPENDIX.

**Paw Paw**, on R. R., cap. of Van Buren co., Mich., has good water-power. Pop. 1870, 1428; 1890, 1482.

**Pawtucket, R. R.** centre, Providence co., R. I., 4 m. N. of Providence, has a fine library and a handsome park. It was here that Samuel Slater, the father of Amer. cotton manufactures, commenced operations with water-power in 1790. Pop. 1870, 6619; 1880, 19,030.

**Paxton**, city and R. R. June., cap. of Ford co., Ill., is the seat of the Swe. Inst. called the Augustina Coll. of N. Amer., to the library of which the king of Swe. presented 5000 vols. Pop. 1870, 1456; 1880, 1725.

**Payment** (law) is the discharge of a legal obligation by a performance thereof according to its very terms. In its more ordinary sense it is the discharge of an obligation by the delivery of money or of some equivalent accepted instead thereof. P. may be made by the debtor or by a person acting on his behalf, and must be to the creditor or to his authorized agent. JOHN NORTON POMEROY.

**Payne** (JOHN HOWARD), b. in New York June 9, 1732; began to edit a weekly paper, *The Theopian Mirror*, when 13 yrs. old, and 2 yrs. later pub. 25 numbers of *The Pastime*; made a successful debut as an actor at the Park Theatre, New York, Feb. 26, 1800, in the character of *Norval*; appeared on the stage at Boston and other Amer. cities, also in Lond. 1812-13, where he produced dramas, chiefly imitated from the Fr., for one of which he wrote the song *Home, Sweet Home*; produced his tragedy *Brutus* at Drury Lane 1815; ed. in Lond. a dramatic paper, *The Opera-Glass*, 1821-27; returned to U. S. 1832; U. S. consul at Tunis 1841-45; again appointed 1851. Among his best writings were the plays *Agrippinus* and *Charles the Second*. D. at Tunis Apr. 10, 1853. His remains were removed to Washington, D. C., 1883.

**Payson** (EDWARD), D. D., b. at Rindge, N. H., July 25, 1783, grad. at Harvard 1803; was 3 yrs. teacher of an acad. at Portland, Me., where he was in 1807 ordained to the Congl. ministry as colleague pastor until 1811, when he became sole pastor. His sermons, etc. have been pub., together with a *Life* by A. Cummings, D. Oct. 22, 1887.—His uncle, PHILLIPS PAYSON, D. D. (1736-1801), for many yrs. Congl. minister of Chelsea, Mass., was one of the most scholarly and influential divines of the Revolutionary era.

**Pea**, the plant and seed of the common pulse, *Pisum sativum*. Cow-pea of the S. States is a *Dolichos*, from China; chick-pea is *Cicer*, from India.

**Peabody**, city, on R. R., Marion co., Kan., 118 m. S. W. of Topeka. Pop. 1880, 1087.

**Peabody** (formerly **SOUTH DANVERS**), R. R. centre, Essex co., Mass., 5 m. W. of Salem. Birthplace of George Peabody, who founded here in 1852 the Peabody Inst., to which he gave \$300,000. Pop. tp. 1870, 7343; 1880, 9028.

**Peabody** (ANDREW FLESTON), D. D., LL.D., b. at Beverly, Mass., Mar. 19, 1811, grad. at Harvard 1836; was 3 yrs. a teacher; studied divinity at Cambridge, Mass.; was pastor at Harvard 1832-33; was (Unit.) minister of the S. parish, Portsmouth, N. H., 1833-60, and was Plummer prof. of Chr. morals and preacher to Harvard Univ. 1860-81; edited the *N. Amer. Review* 1859-61. Author of *Lectures on Chr. Doctrine*, *Sermons of Consolation*, *Conversation*, *Christianity the Religion of Nature*, *Sermons for Children*, *Christianity and Science*, and many sermons, reviews, etc.

**Peabody** (ELIZABETH PALMER), b. at Billerica, Mass., in 1804; became a teacher at Boston 1822; wrote, chiefly on educational topics, for various periodicals; translated De Gerando's *Moral Self-Education*, etc. Author of *Records of a School*, *First Steps to Hist.*, *Chronological Hist. of the U. S.*, and other works, and, with her sister, Mrs. Mary (Peabody) Mann, of *Moral Culture of Infancy* and *The Kindergarten Guide*. She has been prominent in the introduction of "object-teaching" into infant schools.

**Peabody** (GEORGE), D. C. L., b. at S. Danvers (now Peabody), Mass., Feb. 18, 1795; was a clerk at Thetford, Vt., and Newburyport, Mass., and at Georgetown, D. C., where he became partner with Elisha Riggs 1814; removed to Baltimore 1815; soon afterward opened branch houses at New York and Phila.; became head of the firm 1829; removed to Lond. 1838, where he established a banking-house 1843; aided in fitting out Kane's Arctic expedition 1852; founded in the same yr. the "Peabody Institute" in his native town, the endowment of which he subsequently increased to \$300,000; visited the U. S. in 1857; gave \$300,000 for the establishment at Baltimore of an inst. of science, lit., and the fine arts; in 1862 gave \$2,500,000 for building lodging-houses for the poor in Lond.; gave in 1866 \$150,000 to establish at Harvard Coll. a museum and professorship of Amer. archaeology and ethnology, an equal sum for the endowment of a dept. of physical science at Yale Coll., and created a "Southern educational fund" of 2,100,000, beside devoting \$200,000 to various objects of public utility. Queen



Victoria offered him a baronetcy (which he declined), and presented him with her portrait; the corporation of Lond. conferred upon him the freedom of the city, and the citizens ordered a statue by W. W. Story, which was unveiled in the Royal Exchange July 23, 1869, by the prince of Wales, during P.'s absence on a final visit to the U. S. On this occasion he raised the endowment of the inst. at Baltimore to \$1,000,000; created the Peabody Museum at Salem, Mass., with a fund of \$150,000; gave \$60,000 to Washington Coll., Va., \$50,000 for a "Peabody Institute" at N. Danvers, \$30,000 to Phillips Acad., Andover, \$25,000 to Kenyon Coll., O., and \$30,000 to the Md. Historical Society. In the previous yr. he had endowed an art school at Rome. D. at Lond. Nov. 4, 1869, less than a month after returning from the U. S. His remains, after funeral honors in Westminster Abbey (Nov. 12), were brought to the U. S. in a Brit. vessel-of-war and buried in his native town. Several other bequests to objects of public utility were made by his will; his remaining fortune, about \$5,000,000, was left to his relatives.

**Peabody (NATHANIEL)**, b. at Topsfield, Mass., Mar. 1, 1741; settled at Plaistow, N. H., as a phys. 1761; became lieut.-col. of militia; was an influential member of the legislature and of the committee of safety during the Revolutionary war; became adjutant-gen. of the State militia 1777; delegate to the Continental Cong. 1779-80; filled nearly every State office during a long course of public service, and was one of the founders of the N. H. Med. Society 1790. D. June 27, 1833.

**Peabody (OLIVER WILLIAM BOURN)**, b. at Exeter, N. H., July 9, 1799, grad. at Harvard 1816; studied law and practised at Exeter 1819-30; served in the State legislature; ed. the *Rockingham Gazette* and *Exeter News-Letter*; removed to Boston 1830; aided Alex. H. Everett in editing the *N. Amer. Review*; for several yrs. ed. of the *Daily Advertiser*; register of probate of Suffolk co. 1836-42; prof. of Eng. lit. at Jefferson Coll., La., 1842-43; wrote the *Lives of Putnam and Sullivan in Sparks's Amer. Biography*; prepared an edition of Shakespeare, with a *Life* and notes; was licensed as a Unit. preacher, and became pastor of a ch. at Burlington, Vt. 1845. D. July 5, 1848.

**Peabody (WILLIAM BOURN OLIVER)**, D. D., twin-brother of the preceding, b. at Exeter, N. H., July 9, 1799, grad. at Harvard Coll. 1816; was assistant instructor at Exeter Acad. 1817; studied theol. at the Cambridge Divinity School; was licensed as a preacher 1819, and ordained in 1820 pastor of the Unit. ch. at Springfield, Mass., where he remained through life. He wrote on various branches of nat. hist.; was one of the coms. of the Mass. zoological survey, for which he prepared a *Report on the Birds of the Commonwealth*; wrote *Lives of Alexander Wilson, Cotton Mather, David Brainerd, and James Oglethorpe in Sparks's Amer. Biography*. His *Sermons*, with memoir by his brother, and his *Literary Remains* have been pub. D. May 28, 1847.

**Peace** not only suspends war, but opens intercourse such as existed before war, if nothing is said to the contrary. P. is a state of things created by treaty. There may be, if there are many parties, one treaty with each, or one with all together.

T. D. WOOLSEY.

**Peace, Breaches of** (law), violations of the public order and quiet done with force, actual or constructive. It is not necessary that the public peace should be broken in fact, if the unlawful act, or the attempt when carried out, directly tends to produce that result. In most instances the crime is defined, and the punishment, which consists of imprisonment or fine, is regulated by statute.

**Peace River**, of Brit. Amer., rises in the Coast Range Mts. N. of Brit. Columbia, and flows N. E. through the Rocky Mts. to Slave River near Athabasca Lake, more than 600 m. It is navigable through most of its extent.

**Peach** [Fr. *pêche*], a small tree and its fruit, the *Amygdalus persica*, of the order Rosaceæ, a native of Central Asia. There are 2 prin. varieties, the freestones and the clingstones, and very many valuable races of each. One of the most important of summer fruits, and one of the most precarious.

**Peacock**, the name given to species of the *Pavo* and family Phasianidæ. The several species are remarkable for the long and showy tail-coverts of the male. Three species are generally recognized: 1. The common P. (*Pavocristatus*); 2. The black-shouldered P. (*Pavo nigripinnis*); and 3. The Jason P. (*Pavo mulieus*). The common P. is a remarkably ostentatious bird, a native of S. and S. E. Asia, now naturalized in many parts of the world. The black-shouldered P. is by some regarded as a variety of the common P.

**Peacock-stone**, sometimes used by jewellers as a gem, is the dried and opalescent ligament of the pearl oyster's shell, or that of some other large conchiferous mollusk.

**Peale**, peel (CHARLES WILLSON), b. at Chestertown, Md., Apr. 16, 1741, was successively a saddler, silversmith, watchmaker, and carver; studied painting 1767; afterward under Copley at Boston and at the Royal Acad., Lond.; under West 1770-71; painted the first portrait of Washington as a Va. col. 1772; commanded a company at the battles of Trenton and Germantown; was a member of the Pa. Convention of 1777; painted the portraits of prominent officers of the Revolution; was a leading promoter of the Pa. Acad. of Fine Arts; was the first Amer. popular lecturer on nat. hist.; opened the first Amer. museum; was the first Amer. manufacturer of enamel teeth; invented a variety of machines, and wrote scientific essays. D. Feb. 22, 1827.

**Peale (REMBRANDT)**, son of the preceding, b. in Bucks co., Pa., Feb. 22, 1778, received an artistic training from his father; opened a studio at Charleston, S. C., 1796; studied under West at Lond. 1801-04; spent several yrs. at Paris, where he executed portraits of prominent characters for his father's museum; returned to Phila. 1809; achieved eminence as a portrait-painter; executed the pictures *The Roman Daughter* and *The Court of Death*; wrote *Biography of Charles W. Peale, Notes on It., Portfolio of an Artist*, and other works on art. D. Oct. 3, 1860.

**Peanut.** See GROUNDNUT.

**Pear** (*Pyrus communis*), one of the most common and most appreciated fruit trees of the N. temperate zone, belonging to the division Pomæe of the family Rosaceæ. It is a long-lived tree, with hard, close-grained wood, much used by turners; is found wild in S. and Central Europe and in the temperate regions of Asia. It was cultivated in antiquity, but seems not to have reached any high degree of development. Now it is known in over 1000 varieties, and some of them, such as the Bartlett, duchesse d'Angoulême, beurré, bergamot, etc., are reckoned among the most delicious fruits. It is cultivated both as a standard, budded or grafted on P. seedlings, and as a dwarf, grafted on the quince, the thorn, or the mountain-ash. When grafted on the apple tree it rapidly degenerates, while some varieties, such as the duchesse d'Angoulême, produce better fruit on the quince than on their own root. The fruit of most varieties is improved by being picked from the tree when mature and allowed to ripen in the house. The best perry is made from the coarser and austere varieties. (For further details see DOWNING, *Fruits and Fruit Trees of Amer.*; FIELD, *Pear-culture*; and QUINN, *Pear-culture for Profit*.)

**Pearce, peers (JAMES A.)**, b. at Alexandria, Va., Dec. 14, 1805, grad. at Princeton 1822; became a lawyer and agriculturist of Md.; M. C. 1835-39, 1841-43; U. S. Senator 1843-62; also law prof. in Washington Coll., Chestertown, Md. D. Dec. 30, 1862.

**Pea Ridge**, a range of hills in Benton co., Ark., near the N. W. corner of the State, where a battle was fought Mar. 6-8, 1862, between the U. forces and the Confeds., resulting in the defeat of the latter.

**Pearl.** See PRECIOUS STONES.

**Pearlash.** See POTASH.

**Pearl White.** See BISMUTH.

**Pearse (JOHN BARNARD)**, M. E., b. in Phila. Apr. 19, 1842, grad. at Yale in 1861; studied chem. till June 1863 with Booth and Garrett, Phila., and had charge of the chemical division of the U. S. A. laboratory in Phila. till July 1865. In Jan. 1868 he connected himself with the Pa. Steel Co. at Harrisburg, and in 1870 became its gen. manager. Here he improved the design and product of Bessemer steel plant, made various inventions (cupola, improved steel plant, etc.) since generally adopted, and was instrumental in first making Bessemer pig iron from native N. J. and Pa. ores. In June 1874 he was appointed a com. and sec. of second geological survey of Pa. In 1869 he translated from the Ger. a *Treatise on Roll-Turning for Manufacture of Iron*, and prepared a *Hist. of the Iron Trade of Amer.*

**Pearson (RICHMOND MUMFORD)**, b. in 1805, studied and practised law; was appointed judge of the superior court of N. C. in 1836, associate justice of its supreme court in 1848, and chief-justice of that court in 1858. His office having been vacated in 1865, he was reappointed in 1868. He prepared perhaps  $\frac{1}{10}$  of the lawyers of N. C. for the bar at his country residence, Richmond Hill, Yadkin co. D. Jan. 5, 1878.

**Peasants' War** is the name generally given to the revolutionary rising of the peasants which took place in 1525 throughout the whole of S. and Central Ger. The Ref. was the immediate occasion of this movement, but the real cause was the miserable social position of the peasants. It was quite natural that any such revolt should assume a religious coloring, for the whole mental life of the peasantry of that time was confined within the narrow pale of a few religious ideas. In 1524 a gen. fermentation spread among the Ger. peasantry; and when, Jan. 1, 1525, the convent of Kempton was captured and plundered by a swarm of revolting peasants, this event became the signal for a gen. rising of the peasantry from the Alps to the Hartz and from the Rhine to the Bohemian frontier. But with the exception of a few cases the peasants had no leaders and no organization. They gathered together in large, uproarious multitudes of from 8000 to 30,000, and roved around like huge gangs of robbers. Castles were burned, monasteries destroyed, cities plundered; the most disgusting excesses and the most atrocious cruelties were committed. As soon, however, as they fell in with regular armies—in the S. under Truchsess von Walburg, in the N. under Philip of Hesse—they were routed, dispersed, or massacred in spite of their fierce and often furious resistance; and the revenge which the ruling classes took upon them was as cruel and as barbarous as their own behavior. The whole war lasted only a few months, and the only result of it was an enormous loss of life and property. The social position of the peasantry remained the same, or became even worse.

**Pease (CALVIN)**, D. D., b. at Canaan, Conn., Aug. 12, 1813, grad. at the Univ. of Vt. 1835; was prof. of Gr. and Lat. in that inst. 1842-55; became its pres. 1855-61, and pastor of First Presb. ch., Rochester, N. Y. 1862. D. Sept. 17, 1863.

**Peaslee (EDMUND RANDOLPH)**, M. D., LL.D., b. at Newton, N. H., Jan. 22, 1814, grad. at Dartmouth in 1836; was tutor there 1837-39; grad. in med. at Yale in 1840, and in 1841 commenced practice at Hanover, N. H. He held professorships at Dartmouth, Bowdoin, and in New York, and was a member of many learned societies. In 1858 he took up his residence in New York. The degree of LL.D. was conferred upon him by his *alma mater* in 1859, and in 1870 he was made a trustee of the coll. He pub. *Human Histology, Ovarian Tumors and Ovariectomy*, beside numerous articles in the med. journals. D. in New York Jan. 21, 1878.

**Peat.** See FUEL.

**Pea Weevil**, or **Pea Bug**, the *Bruchus pisi*, a small dark beetle well known for its ravages among dried peas. It may be destroyed by scalding the peas before planting. The insect lays her egg in the flower, and the grub passes into the pea while it is still growing.

**Pebble** [A.-S. *pæbol*], a small water-worn stone of any variety. Scotch P. is simply agate. Brazilian P. is a very transparent rock-crystal sometimes used by spectacle-makers as a material for their lenses. It is, however, in-



ferior to good glass. Most of the so called P.-spectacles are of common glass.

**Pecan'** [*Fr. pecane*], a tree and its fruit, the *Carya oliviformis*, a species of hickory growing on river-banks from Ind. to Tex. It is well known for its nuts. The tree is tall, slender, and has a hard timber.

**Pecatonica**, on R. R. Winnebago co., Ill., midway between Freeport and Rockford. Pop. 1890, 1029.

**Pee'cary** (S. American name), the vernacular name of swine-like artiodactylate ungulates, composing the family Diotylidae. The collared P. (*Notophorus torquatus*) ranges from Ark. S. W. through Mex. and over a great part of S. Amer. It is 3 ft. long and sometimes weighs 60 lbs. It is of a dark gray color, and has a gland upon the loins which secretes a fetid substance. It is gregarious. The white-lipped P. (*Dicotyles labiatus*) is a larger S. Amer. species. Both kinds are swine-like in habits and appearance.

**Peck** (GEORGE), D. D., b. in Middlefield, N. Y., Aug. 8, 1797, was prin. of Oneida Conference Sem. 1835-39, then ed. of the *Meth. Quarterly Review* 1840, and of the *Chr. Advocate* 1848; wrote *Wyoming, its Hist.*, etc. D. May 1, 1876.

**Peck** (JESSE TRUESDELL), D. D., b. at Middlefield, N. Y., Aug. 4, 1811; joined the Meth. ministry in 1832; became prin. of the Meth. sem. at Gouverneur, N. Y., in 1836, and of Troy Conference Acad. at W. Poutiney, Vt., in 1840; in 1844 he was elected pres. of Dickinson Coll., but after 4 yrs. service returned to the pastorate. He occupied a pulpit in Wash., D. C., 2 yrs., when he was appointed sec. and ed. of the Tract Society of his Ch. He subsequently served several yrs. in pulpits in New York, Cal., Peekskill, Albany, and Syracuse, N. Y. In the latter he was active in founding the Syracuse Univ. of his Ch. In 1872 he was elected bp. Wrote the *Central Idea of Christianity, The True Woman*, and *The Hist. of the Great Republic*. D. May 17, 1883.

**Peck** (JOHN MASON), D. D., b. at Litchfield, Conn., Oct. 31, 1789, became a licensed Bap. preacher in Greene co., N. Y., in 1811; was ordained in 1813; removed in 1817 to St. Louis; was for 40 yrs. a pioneer preacher of Ill. and Mo.; organized in 1826 the first ch. of his denomination in St. Louis; was one of the founders of Shurtleff Coll., Upper Alton, Ill., and of the theological school at Covington, Ky. Author of *Guides for Emigrants, Gazetteer of Ill., Life of Boone*, and *Father Clark, the Pioneer Preacher*. D. Mar. 15, 1858.

**Peck** (WILLIAM G.), LL.D., b. at Litchfield, Conn., Oct. 16, 1820, grad. at the Military Acad. in 1844; promoted to the U. S. corps of topographical engineers, and served on the survey of Portsmouth harbor and in explorations under Fremont till the breaking out of the war with Mex.; was assigned to duty with the Army of the West under Gen. Kearny, and served till the end of the war, when he was detailed for duty at the Military Acad.; prof. of physics and civil engineering in the Univ. of Mich. In 1857 he was called to Columbia Coll., in which inst. he has since served as prof. of math., mechs., and astron. He is the author of a treatise on mechs., and Amer. ed. of Ganot's popular *Physics*, beside which he has pub. a complete course of mathematical text-books.

**Peck** (WILLIAM HENRY), b. in Augusta, Ga., Dec. 30, 1830, grad. at Harvard Coll., Mass., 1853; in 1856 was elected prof. of *belles-lettres*, hist., and elocution in the Univ. of La.; in 1860 pres. of the Masonic Female Coll. at Greenville, Ga.; in 1863 accepted the chair of natural sciences and modern langs. in the Le Vert Female Coll. at Talbotton, Ga., but near the close of the war betook himself to lit. as a profession. Wrote *Antoinette de Borelairs* and the *Brother's Vengeance*. Soon after the war Prof. P. became a regular contributor to the *New York Ledger*.

**Pectose** is a highly important proximate principle of vegetable bodies from which proceed all the *gelatinous* constituents of fruits and vegetables. P. exists largely in unripe fruits and roots, being, like cellulose, one of the "plastic" constituents, and giving, for instance, the hardness to green fruits. It is, however, a substance not only wholly insoluble, like cellulose, but, unlike the latter, extremely perishable or easily alterable. It exists in all parts of vegetable bodies.

**Peddlers**, also called **Hawkers** and **Chapmen**, are persons who travel from place to place, either with vehicles or on foot, carrying goods and merchandise which they sell at retail. In Eng. they have, from an early day, been subjected to strict statutory regulation, and must be licensed in order to engage in their traffic. The agents of manufacturers and of wholesale dealers, commonly called "commercial travellers," are, however, excepted from the operation of these statutes. Similar legislation generally prevails in the States of this country, and the U. S., as a part of its internal revenue system, requires a license fee from peddlers of tobacco. JOHN NORTON POMEROY.

**Pedee River**. See GREAT PEEDE RIVER.

**Pedro I.** (DOM ANTONIO JOSÉ DE ALCÁNTARA), emp. of Brazil, b. at Queluz, Brazil, Oct. 12, 1798, married the arch-duchess Leopoldina of Aus. 1817; was made regent of Brazil 1821; declared himself emp. 1822; was recognized as such by his father, Dom John VI. of Port., 1825; reigned as king of Port. (Pedro IV.) Mar. 10-May 2, 1826, when he resigned in favor of his daughter, Maria da Gloria; married in 1829 Amélie, daughter of Eugene de Beauharnais; abdicated in 1831 and retired to Eng., but in 1832 succeeded in expelling Dom Miguel, his usurping brother, from Port., and restored his daughter, whose regent he became. D. Sept. 24, 1834.

**Pedro II. de Alcantara** (JOÃO CARLOS LEOPOLD SALVADOR BIBIANO FRANCISCO XAVIER DA PAULO LEUCADIO MIGUEL GABRIEL RAFAEL GONZAGA), emp. of Brazil, b. at Rio Janeiro Dec. 2, 1825, succeeded his father, Dom Pedro I., in 1831; was crowned in 1841, and married in 1843 a daughter of the king of Naples. The prosperity of Brazil has been great under his rule, and the emp. is a humane, patriotic, and enlightened ruler. He has but one child, the crown-princess Isabella, wife of the count d'Eu, son of the duke de Nemours.

**Peeks'kill**, on R. R., Westchester co., N. Y., on the E. bank of the Hudson, 43 m. N. of New York, has an acad. and manufactures of stoves, etc. Pop. 1870, 6560; 1880, 6893.

**Peel** (SIR ROBERT), BART., b. near Bury, Lancashire, Feb. 5, 1788, was ed. at Harrow and Chr. Ch., Ox., where he passed B. A. as double first-class, the first who ever had the distinction. In 1809 he entered Parl. for Cashel; was made under-sec. for the colonies 1811, and was 1812-18 chief sec. for Ire., where his Tory principles led to the most severe criticisms from the opposition. He established the Irish constabulary. P. represented Ox. Univ. in Parl. 1818-22; introduced and carried (1819) a bill to return to specie currency; was home sec. 1822-27, 1828-30; introduced and carried important reforms in the administration of criminal law; remodelled the Lond. police; moved the bill for Catholic emancipation (1829), and thus broke with the Tory leaders. The Univ. of Ox. rejected him in the new election; he re-entered Parl. for Westbury, and again represented Tamworth 1832-50; was first lord of the treas. and chancellor of the exchequer 1834-35, and afterward headed the conservative opposition, having resisted the parliamentary reform of 1831-32 with all his power; was again premier 1841-46, during which time his position drifted slowly from that of a protectionist and strict conservative to that of a free-trader, and he at last supported the repeal of the corn-laws. He afterward acted generally with the Whigs. D. in Lond. July 2, 1850.

**Peepul**. See BO TREE.

**Peers** [*Fr. pair*, from the Lat. *par*, "equal"], in the old feudal law, all the vassals belonging to the same feudal lord; when the feudal system was broken down and the king became the sole master of the realm, P. became the common title of all the former vassals. In this sense the word is still retained in the Eng. lang.

**Peet** (HARVEY PRINDLE), LL.D., b. at Bethlehem, Conn., Nov. 19, 1794, grad. at Yale 1822; was the associate of Thomas Gallaudet as a teacher in the deaf-mute asylum at Hartford, Conn., 1822-31, and in 1831 became prin. of the New York Inst. for Deaf Mutes. Author of a *Course of Instruction for the Deaf and Dumb*, and of addresses and reports upon his specialty.

**Peg'asus** (Πήγασος), in the Gr. legend, a winged horse, the offspring of Medusa by Poseidon. His father lent him to Bellerophon when the latter slew the Chimera; but when Bellerophon attempted to fly to heaven on his back, the rider fell off and was killed. P. made the well Hippocrene by a stroke of his foot. Hence he is considered the horse of the Muses.

**Pegu, or Bagoo**, town of the Brit. dominion in Farther India, formerly the cap. of the famous empire of Pegu, stands on the delta of a river of the same name. It is now mostly in ruins, while a new city, Zangnong, rises on the opposite shore of the river.

**Pehli-vo Language**. See PERSIAN LANGUAGE.

**Pei-ho'**, a river of Chi., rises near the Great Wall, flows in a S. E. direction through the prov. of Pe-chee-lee, and falls into the Bay of Pe-chee-lee, an inlet of the Yellow Sea. Tien-Tsin is situated on its shores. Tung-hui, one of its affluents, traverses Peking. It is navigable for more than 34 of its course.

**Peirce**, peers (BENJAMIN), LL.D., F. R. S., b. at Salem, Mass., Apr. 4, 1809, was a pupil of Nathaniel Bowditch, and grad. at Harvard in 1829; taught 1829-31 at Routh Hill, Northampton, Mass.; became mathematical tutor in Harvard 1831, prof. of math., etc. 1839-42; prof. of astron., etc. 1842-67, and aided the construction and equipment of the observatory; supt. of the U. S. Coast Survey 1867-74; became in 1849 consulting astron. to the *Ephemeris and Nautical Almanac*; was a member of the leading Amer. and foreign scientific societies; author of a series of mathematical text-books and of many scientific papers. His work in pure and in applied math. is noteworthy for its novel and original methods. D. Oct. 6, 1880.

**Peirce** (BENJAMIN OSGOOD). See APPENDIX.

**Peirce** (BRADFORD KINNEY), b. at Royalton, Vt., Feb. 3, 1819, grad. at Wesleyan Univ. 1841; became a Meth. preacher 1843; was ed. of the *Sunday-School Messenger* and the *Sunday-School Teacher*; was a Mass. State senator 1855-56; obtained the establishment of the State Industrial School for Girls at Lancaster, of which he became supt.; was chaplain of the House of Refuge, Randall's Island, N. Y., 1867-72, after which he returned to Boston and became ed. of *Zion's Herald*. Author of Sunday-school question-books, a *Bible Scholar's Manual*, *Notes on the Acts*, a *Half Century with Juvenile Delinquents*, *Trials of an Inventor*, etc.

**Peirce** (CHARLES SANDERS), son of Benjamin, b. at Cambridge, Mass., Sept. 10, 1839, grad. at Harvard 1859; author of *The Logic of Relatives* in the *Memoirs of the Amer. Acad. of Arts and Sciences* for 1870; of various papers on logic, pub. in the *Proceedings* of that acad. and in the *Journal of Speculative Philos.* and of courses of lectures on logic and the scholastic philos. delivered before the Lowell Inst. at Boston and at Harvard Univ. about 1869; also of a *Memoir on Observations of the Light of the Fixed Stars*, presented to the Amer. Acad. in 1875. He entered the service of the U. S. Coast Survey, and engaged in pendulum experiments to determine the density of the earth.

**Peirce** (CYRUS), b. at Waltham, Mass., Aug. 15, 1790, grad. at Harvard Coll. 1810; studied theol.; was pastor of a Congl. ch. at N. Reading 1819-27, but preferred the vocation of teacher, in which he was engaged long at Nantucket; was prin. of the first normal school in Amer. at Lexington, Mass., 1839-42, and in 1844 resumed charge of the same removed to W. Newton. D. Apr. 5, 1860.

**Peirce** (CYRUS NEWLIN), D. D. S., b. at Phila. Mar. 5, 1829, grad. at the Phila. Dental Coll. 1854; commenced the practice of the dental profession 1858; was prof. of operative dentistry and dental physiology in the Pa. Coll. of Dental Surgery 1858-65; was dean of that inst. 1860-65; has contributed to the lit. of his profession.



**Peirce** (JAMES MILLS), son of Benjamin, b. at Cambridge, Mass., May 1, 1834, grad. at Harvard 1853; was tutor of math. in that inst. 1854-58, and became univ. prof. of math. 1869. Author of *A Text-book of Analytical Geom., Elements of Logarithms, and Three and Four Place Tables.*

**Peirce City, Mo.** See **PIERCE CITY.**

**Pe'kin**, city and R. R. centre, cap. of Tazewell co., Ill., on the Ill. River. Coal of excellent quality is mined here. Pop. 1870, 5896; 1890, 5993.

**Peking, or Pekin**, the cap. of the Chi. empire, situated in lat. 39° 56' N., lon. 116° 27' E., in the prov. of Pe-chee-lee, on the river Tung-hui, a tributary of the Pei-ho, about 35 m. from the Great Wall, has no great commercial or industrial importance, but forms, nevertheless, as the residence of the emp. and the seat of the govt., the centre of the whole Chi. world. The city consists of 2 parts—the N. or Tartar city, forming a parallelogram extending 4½ m. from E. to W. and 3½ m. from S. to N.; and the S. or Chi. city, also in the form of a parallelogram, extending 5 m. from E. to W. and 2¼ m. from S. to N.—the whole covering an area with a circumference of about 25 m. and surrounded with walls, beyond which only a few scattered suburbs are found. The Tartar city consists of 8 divisions, one surrounding the other—viz. the inner or prohibited city, inclosed by a red wall and containing the winter palace of the emp. and his family, to which no foreigner can get access; the celestial city, inclosed by a yellow wall and containing a number of magnificent temples and altars to Chi. divinities, the palaces of the imperial princes and the highest officials, and the imperial gardens, with an artificial mt. crowned with a gorgeous pavilion, an artificial lake bordered with groves and plantations, etc.; and the Tartar city proper, where the imperial stables, the govt. offices, the literary and educational insts. are located. Here reside the foreign ambassadors and here are the different missions, a R. Cath. cathedral, a Greek church, a Prot. chapel, and numerous Mohammedan mosques and Boodhist temples. The Chi. city is a densely crowded, exceedingly noisy, picturesque, and filthy beehive. Broad, straight streets run from gate to gate, and cross each other at right angles. It has been the residence of the emps. since 1410, and is one of the oldest cities of Chi., but was very imperfectly known to the civilized world until, in Oct. 1860, the Fr.-Eng. army arrived before its walls, occupied 2 of its gates, and compelled the emp. to conclude the Treaty of Tien-Tsin or have his cap. destroyed. The pop. is estimated at 1,500,000. The first European embassy which visited P. came from Port. in 1517. The ambassadors were imprisoned immediately on their arrival, and in 1523 they were put to death. A Dutch embassy of 1667 succeeded in concluding a commercial treaty. With the Rus. the intercourse began in 1619.

**Pela'gianism**, a system of anthropological doctrine which takes its name from Pelagius, but owes its shape rather to bolder if not abler men. Pelagius is spoken of by several of his contemporaries as a Briton; which is likely enough, in spite of his familiarity with Gr. authors. But that his Brit. name was Morgan ("sea-born"), rendered into the Latin *Pelagius*, is without sufficient anc. warrant. He was also called a monk, but perhaps this indicates only ascetic habits. He had been residing for some yrs. in Rome when, in 410, during Alaric's third siege of the city, he escaped with his convert and pupil, Coelestius, to N. Afr., and had gone from there to Pal. before the meeting of the Council of Carthage in 411 (some say 412), which condemned Coelestius. Pelagius was not heard of after 418. Coelestius, who appears to have been more of a Pelagian than Pelagius himself, had been an advocate in Rome, and was, perhaps, an Irishman by birth. He was younger and more impulsive than Pelagius. It was his application for ordination as a presbyter at Carthage (in 411 or 412) which led to the council already referred to. His application was denied on the ground of these 7 heretical opinions: (1) Adam would have died if he had not sinned; (2) Adam's sin injured himself only, not the race; (3) children are born as pure as Adam was before he fell; (4) men neither die because Adam fell, nor rise again in consequence of Christ's resurrection; (5) unbaptized as well as baptized infants are saved; (6) the law, as well as the gospel, leads to heaven; (7) even before Christ's advent there were sinless men. Coelestius was not heard of after 431. A still younger and bolder man was Julian, bp. of Eleanum, It., who was deposed in 418 and d. between 440 and 453. P., which was understood to be a denial both of original sin and of supernatural grace, was everywhere condemned. Semi-P., 100 yrs. later, shared the same fate.

**Pela'gius I.**, POPE, of Rom. birth, archdeacon and legate to Constantinople under Vigilius, his immediate predecessor, and like him, a mere creature of the Byzantine emp. Justinian. He was suspected of having hastened the death of Vigilius in 555. He was afterward consecrated at Rome by 2 bps. and a presbyter, and d. there Mar. 3, 560.—**PELAGIUS II.**, also of Rom. birth, the immediate predecessor of Gregory the Great, and the first independently elected pontiff after the Byzantine conquest of Rome in 536. He was consecrated Nov. 27, 573; d. about the middle of Jan., and was buried Feb. 6, 590.

R. D. HITCHCOCK.

**Pelargon'ic Acid**. This compound is one of the monatomic fatty acid series, a homologue of formic and acetic acids. It exists naturally in the volatile oil of rose-geranium, *Pelargonium roseum*, whence its name, and is obtainable artificially by several methods, one being the oxidation of essential oil of *Ruta graveolens*, or rue, by the action of nitric acid. P. A. is a colorless liquid, oily, and freezing by cold to a fatty mass; odor like that of butyric acid; boils at 200°; slightly soluble in water and very soluble in alcohol. By keeping it becomes yellow.

**Pelargon'ic Ether** (syn. *Eranth'ic Ether*) constitutes largely the aromatic principle or *bouquet* of most wines. It is prepared, in a crude state, from crude pelargon'ic acid by a prolonged digestion of the latter, at a gentle heat, with

alcohol. It is recommended to pass dry hydrochloric acid gas through an alcoholic solution of pelargon'ic acid, when it separates as an oily layer, which is subsequently purified. Pure, it is a colorless oil. It has a powerful odor resembling quinces, is insoluble in water, though soluble in alcohol even when rather dilute. An alcoholic solution constitutes the commercial artificial quince-essence.

**Pelas'gians, The**, are uniformly spoken of by all anc. Gr. authors as the oldest inhab. of Gr., but in details the notices which have come down to us about them are vague and contradictory. Some authors describe them as an extensive race, the parent-stock from which sprung the Hellenes; others consider them only one of the many kindred tribes which inhabited Gr. Of the Pelasgian lang. nothing has been preserved. Of architectural monuments found in Gr., certain constructions of an enormous massiveness and strength are ascribed to them, such as the so called tomb of Atreus in Mycene. They consist of huge blocks of stone placed one above the other, and held together by their own weight, without any mortar; on account of their size these structures are called cyclopean.

**Pe'lecan'idae** (*Pe'lecanus*), a family of birds whose species are familiarly known as pelicans; they are of large size; have a rather long, flexible neck, moderate head, a long, nearly straight, and rather broad bill, whose culmen is rounded at the base, and at the end produced into a strong hook; the lower mandible is broader than the upper, and provided with a naked membrane, which extends backward on the throat and is capable of great extension; nostrils linear; wings long and pointed; tarsi short and robust; toes 4, connected by a membrane, the 3 anterior largest, the fourth interno-posterior and smallest. The family includes 10 species. They live upon fish, which they take in their pouch to a place of rest, where they ingest and leisurely digest their meal.

**Pe'le'oid** [Gr. *πέλεκυς*, "hatchet," *εἶδος*, "form"], a geometrical figure of a hatchet shape. It is bounded by a semicircle and 2 quadrants, all having their concavities turned in the same direction; the quadrants are tangent to each other and to the diameter of the semicircle.

**Pe'leus**, son of Æacus, king of the Myrmidons in Thessaly. He married the sea-nymph Thetis, and was by her father of Achilles.

**Pelew' Islands**, a group of 20 islands situated in the N. Pacific, extending between lat. 7° and 8° 30' N. and lon. 134° and 136° E. They are high, mountainous, and surrounded by coral reefs, but the soil is fertile, and produces bread-fruits, bananas, sugar-cane, and oranges. Pop. about 10,000, of the Malay race.

**Pelican**. See **PELECANIDE.**

**Pel'ion**, the anc. name of the modern *Zagora*, a mt.-range on the E. coast of Thessaly. On the summit of its highest peak stood the temple of Jupiter Actæus, and near this was the cave of Chiron. It is celebrated for its magnificent forests of oak, chestnut, elm, and pine, and the impression which the anc. received of it found a fit expression in the myth of the giant sons of Aloeus, who in their wars against the gods placed Ossa on the top of Olympus, and Pelion upon Ossa.

**Pel'issier**, *pâ-le-se-A'* (JEAN JACQUES AMABLE), duke of Malakoff, marshal of Fr., b. Nov. 6, 1794, at Maromme, near Rouen, was ed. at Brussels, afterward at the military schools of La Flèche and St. Cyr; entered the artill. as sub-lieut. in 1814; served in Sp. in 1823, in the Morea in 1828, and in Algeria in 1830. Commanding in 1845 a corps as col., he entered the terr. of the Ouled Rihais, defeated them, shut them up in a cave, and applied burning fagots to the mouth of the cave, and about 600 Arabs were suffocated. In 1855 he was made commander-in-chief of the army in the Crimea, and took the Malakoff. He was gov.-gen. of Algeria from 1860 to his death, May 22, 1864.

**Pel'ia**, the anc. cap. of the Macedonian empire and the birthplace of Alexander the Great, was a magnificent city in the days of Philip and Alexander, but lost its importance under the Roms., and disappeared altogether during the Middle Ages.

**Pella**, on R. R. Marion co., Ia., 45 m. from Des Moines, contains Central Univ. of Ia. Pop. 1870, 1909; 1880, 2490.

**Pel'itory** [from Lat. *parietaria*]. (1) The *Parietaria officinalis* or wall P. of the Old World, an urticaceous herb, resembling the common nettle. It is used as a diuretic in domestic practice. *P. Pennsylvanica* is its N. Amer. rep. (2) More commonly this name is given to *Anacyclus pyrethrum*, a composite plant, whose root is brought from the Levant. It is used by dentists to relieve toothache and numb the nerves of the teeth, and is a powerful sialagogue and local stimulant in tic douloureux and facial paralysis; is often incorrectly called Spanish P.

**Pelop'idas**, b. at Thebes, a man of wealth and a friend of Epaminondas, was expelled in 382 a. c. from his native city by an oligarchic party supported by Sparta; returned in 379 a. c., slew the Spartan leader with his own hand, established a democratic govt., and broke the Spartan influence not only in Thebes, but in Gr. He distinguished himself in the battle of Leuctra, 371 a. c., and on a diplomatic mission to Susa he baffled the Spartan and Athenian intrigues at the Per. court, and Thebes was acknowledged as the first city of Gr. Sent in 368 a. c. as ambassador to Alexander of Phæra; he was seized and imprisoned by the tyrant, but rescued by Epaminondas. In the yr. 364 a. c. he defeated Alexander at Cynoscephalæ in Thessaly, but was killed while pursuing the enemy.

**Peloponne'sus** (the "island of Pelops"), the anc. name for the S. division of Gr., the peninsula now called the Morea. It was connected with Hellas proper by the Isthmus of Corinth, which separated the Saronic Gulf from the Corinthian (Lepanto). It was divided into 6 dists. or states—viz. Achæa, in the N., along the Corinthian Gulf; Argolis, in the E., between the Saronic Gulf and the Gulf of Argolis; Laconia, in the S. E., between the Gulfs of Argolis, Laconia,



or Kolokythia, and Messenia or Koron; Messenia, in the S. W., on the Gulf of Messenia; Ellis, in the W.; and Arcadia, in the middle.

**Pelops**, in Gr. mythology, the son of Tantalus and the father of Atreus and Thyestes; married Hippodamia, a daughter of King Enomaus of Elis; became king after the death of his father-in-law; renewed the Olympian games, and gave his name to the S. division of Gr. by sending a colony thither.

**Pemberton** (JOHN C.), b. in Pa. Aug. 1814, grad. at W. P. 1837; served in Fla. against the Seminoles; in the war with Mex. on the staff of Gen. Worth, gaining the brevets of capt. and major for Monterey and Molino del Rey; on the N. frontier, etc. until Apr. 29, 1861, when he resigned. Joining the S. cause, he was appointed a col. of cav., and attached to the staff of Gen. J. E. Johnston; rose to the rank of lieutenant-gen., and in 1863 commanded in Miss., where he was defeated. May 16, at Champion Hills and Big Black (May 17); falling back on Vicksburg, he defended that place against assault, but was compelled to surrender July 4, 1863. He was subsequently inspector of artill. D. July 13, 1881.

**Pembina**, Dak. See APPENDIX.

**Pemmican**, a concentrated food, originally made by the N. Amer. Indians by drying and powdering the lean meat of the buffalo or deer, mixing it with service-berries, stirring all into boiling fat, and making it into cakes.

**Penalty** (Lat. *pœna*), law. In a broad sense all punishment inflicted for the commission of crime; but as a word of strictly technical import in the criminal law, the sum of money the payment of which is required by a statute as a forfeiture from the person who violates its prohibitions is called a penalty. It also signifies, in the law of contracts, a certain sum of money fixed upon by the parties in one portion of an agreement, to be paid in case of a failure to perform the substantial stipulations contained in another part of the same instrument. JOHN NORTON POMEROY.

**Penance** [from Lat. *pœnitentia*] is one of the 7 sacraments of the R. Cath. Ch. It means a penalty imposed by the ecclesiastical authority, but voluntarily accepted by the sinner, by which atonement is made for sins actually committed and the divine punishment averted.

**Penang**, or **Pulo-Penang**, an island in the Strait of Malacca, belongs to the presidency of Bengal, Brit. India, and comprises an area of 107 sq. m., with 59,956 inhabs. The ground is mountainous, the soil is fertile, and well adapted to the cultivation of pepper, cloves, nutmegs, and other spices. Sugar, coffee, indigo, and cotton are raised; tin is abundant. Cap. Georgetown.

**Pena'tes** (Lat.), the household gods of the anc. Roms., including the private Lares, as well as Jupiter, Juno, Vesta, and other gods. Beside these there were reckoned public P., who protected the state and city.

**Pendleton**, Or. See APPENDIX.

**Pendleton** (EDMUND), b. in Caroline co., Va., Sept. 9, 1721; became a lawyer at 21; was one of the leaders of the Va. legislature, and often its speaker; was the political antagonist of Patrick Henry; was in the first Continental Cong. 1774-75; drew up the resolutions by which Va. instructed her delegates to propose the Dec. of Ind.; he presided over the courts of chancery and of appeals, and over the convention of 1788 by which Va. indorsed the U. S. const. D. Oct. 23, 1808.

**Pendleton** (EDMUND MONROE), M. D., b. at Eatonton, Ga., grad. in the Med. Coll. of S. C. 1838; practised med. in Warrenton and Sparta, Ga., 35 yrs. At the organization of the Oglethorpe Med. Coll. in Savannah he was elected prof. of surgery, which he declined because of feeble health, as also the chair of chem. in another inst. He turned his attention to agriculture, and first developed the fact that phosphoric acid and nitrogen are the 2 plant-constituents first exhausted from soils by cereals and cotton-culture; in 1872 was called to the chair of scientific agriculture in the Univ. of Ga. Wrote a text-book on this subject.

**Pendleton** (GEORGE H.), b. at Cin., O., July 25, 1825; became a lawyer; M. C. 1857-65; in 1864 Dem. candidate for V. P. of the U. S.; U. S. Senator 1879-85. Became U. S. minister to Ger., 1885.

**Pendulum Observations**. By this term are designated observations to determine the force of gravity at various points on the earth's surface by means of a pendulum, which is a suspended body oscillating under the influence of gravity. Since the squares of the times of vibration of a pendulum of constant length are inversely proportional to the accelerating force, it is only necessary to ascertain by observation the time of one small vibration of the same P., corrected for the temperature and density of the medium in which it oscillates, in order to obtain the relative values of the force of gravity at the several places of observation. If observations be made at places in widely different lats., the earth's eccentricity may be deduced from the same. The ellipticity of the earth derived from many experiments is  $1/299$ , while that from geodetic measurements is  $1/295$ .

But there are very sensible differences in various parts of the world between the computed and the observed times of the oscillations. These doubtless result mainly from the different densities of the matter in the proximate vicinity of the several places of observation. They correspond to similar differences found in the observed amplitudes of measured arcs of the meridian. This subject has of late received much attention. A marked deflection of the plumb-line having been observed in the vicinity of Moscow, P. experiments disclosed a corresponding deficiency of attraction over a well-defined area. Experiments made by Airy in the Harton mine, Durham, Eng., have shown an increase of the force of gravity by its  $1/12500$  part at the bottom of a shaft 1256 ft. in depth. A comparison of the force of gravity between Geneva and Righi-Kulm, by Plantamour, has shown that the attraction of the mt. is  $1/12500$  part of that of the whole earth, the station on the mt. being 4526 ft. higher than that on the lake.

When we desire to ascertain the absolute length of a seconds P., it becomes necessary to measure the distance between its point of suspension and its centre of oscillation, for which purpose instruments of extreme accuracy have been devised. The length of a seconds P. at Geneva is found to be 0.993833 of a metre (about 39.9 inches); at New York it is 39.10 inches.

**Penelope** [Gr. Πηνελόπη], in the Gr. legend, was the daughter of Icarus, the wife of Odysseus (Ulysses), and the mother of Telemachus. While her husband was absent at Troy she was beset by numerous suitors, whom she put off by declaring that she must first finish weaving the shroud of Laërtes. Accordingly, she wove by day and unwove by night, and thus prolonged the work. She was relieved by her husband's timely return.

**Penguin**, the name of a bird with imperfect wings, derived from "penguin," a corruption of "penwing" or "pinwing," "meaning a bird that had apparently undergone the operation of pinioning or pinwinging," as it is in at least one part of Eng. still commonly called." In recent times the name has been transferred almost entirely to birds representing a peculiar family (Spheniscidae), exclusively inhabiting the ocean and coasts of the S. hemisphere.

**Penhallow** (SAMUEL), b. in Cornwall, Eng., July 2, 1665; came to Mass. 1686, settled at Portsmouth, N. H., and was treas. of the prov., judge of the superior court, and chief-justice from 1717 to his death. Wrote a *Hist. of the Indian Wars of N. Eng.* from 1703 to 1726. D. Dec. 2, 1726.

**Penn** (JOHN), b. in Caroline co., Va., May 17, 1741; read law, and became a successful barrister; removed in 1774 to Greenville co., N. C.; was in Cong. 1775-76, 1778-80; signed the Dec. of Ind.; served with ability in various important public positions. D. Sept. 1788.

**Penn** (JOHN), LL.D., grandson of William Penn, b. in Eng. in 1759; ed. at Clare Hall, Cambridge, and succeeded his father, Thomas Penn, as gov. of Pa., 1775. D. in 1834.

**Penn** (RICHARD), brother of the preceding, b. in Eng. in 1734; was proprietary gov. of Pa. 1771-73; was liberal, scholarly, and highly popular; when examined by the House of Lords regarding the colonies, his liberal views drew forth a rebuke from the ministry. D. May 27, 1811.

**Penn** (THOMAS), son of William, b. in Eng. Mar. 8, 1702; resided many yrs. in Pa.; returned to Eng. 1741; became proprietor and gov. of Pa. on the death of his brother John, 1746; was the prin. founder of Pa. Coll. and a benefactor of many public insts. at Phila. D. Mar. 21, 1775.

**Penn** (WILLIAM), a celebrated member of the Society of Friends and the founder and first legislator of the State of Pa., was b. at Lond. Oct. 14, 1644, a son of Admiral Sir W. Penn; studied at Christ Ch., Oxford, but having met here with Thomas Loe, he was converted to Quakerism, and shortly after expelled from the univ. The father sent him on travels in Hol. and Fr., and on his return in 1666 he was set to manage the estates of the family in the co. of Cork, Ire. He fulfilled this task with great success, but in Cork he met for the second time with Thomas Loe. He was imprisoned for attending a Quaker meeting, and although he was very soon liberated he had to leave Ire. On his return to Lond. he began to preach and work in different ways for the society to which he belonged, and after the publication of *The Sandy Foundation Shaken* (in 1668) he was thrown into the Tower. Here he wrote *No Cross, no Crown* and *Innocency with her Open Face*, but by the interference of the duke of York he soon obtained his freedom again. P. continued, however, to preach and work for what he considered to be the highest truth, and in 1671 he was once more thrown into prison. As he would not take an oath at his trial, he was sent to Newgate for 6 months, and while here he wrote the celebrated defence for toleration, *The Great Cause of Liberty of Conscience*. Having been liberated, he made a tour to Hol. and Ger., and on his return in 1672 he married Gulelma Maria Springett. From his father he had inherited a claim on the govt. for £16,000. In settlement of this claim the govt. granted him large terr. in N. Amer., the present State of Pa., with right to found a colony or society with such laws and insts. as expressed his views and principles. In 1682 he went over to Amer. A great number of settlers, not only Quakers, but members of all denominations, Englishmen, Swedes, and Gers., gathered together; a charter of liberties was issued, a democratic govt. instituted, and the city of Phila. was planned. Toward the close of the reign of Charles II. P. returned to Eng., intent on bettering the social position of the Quakers. During the reign of James II. his connection with the court became very intimate. After the overthrow of James he was twice accused of entertaining treasonous communications with the exiled king, and an order of council (Mar. 14, 1692) deprived him of his title to the Pa. govt. After a most searching trial he was fully acquitted in 1693, and another order of council restored his title to him in 1694. After the death in 1693 of his first wife, he married (in 1695) Hannah Callowhill, and went in 1699, for the second time, to Amer., where he stayed till 1701. His return to Eng. was chiefly caused by the deranged state of his affairs there. He was even thrown into the Fleet for some time in 1708. These vexations affected his health; in 1712 he was struck by apoplexy, and although he recovered, his mental faculties were greatly impaired after that time. D. July 30, 1718.

**Pennington** (WILLIAM), son of the succeeding, b. at Newark, N. J., May 4, 1796, grad. at Princeton 1813; was clerk of his father's dist. court 1815-26; became chancellor of N. J.; gov. 1837-43; declined the governorship of Minn. Terr. and other federal offices; M. C. 1859-61, and was chosen speaker of the House. D. Feb. 16, 1862.

**Pennington** (WILLIAM S.), b. in 1757, was major of the 2d N. J. artill. in the Revolutionary army; became a lawyer in 1802, associate justice of the State supreme court in 1804; was for a time chancellor of the State; gov. 1813-15, U. S. dist. judge 1815-26. D. Sept. 17, 1826.



**Pennsylvania**, pen-sil'vā'ne-a, one of the Middle States of the Atlantic slope, and one of the original 13, between 39° 43' and 42° 15' N. lat. and 74° 43' 36" and 80° 31' 36" W. lon.

Obverse.



S., 175.6 m.; its land-area is 45,215 sq. m. or 28,937,600 acres.

*Face of the Country, Mountains, Rivers, Lakes, Etc.*—The surface falls into 3 divisions—viz. (1) The S. E. section or dist. extending from Del. River to the Blue or Kittatinny Mts.; near the river a narrow plain of level land, but a few miles inland a rolling or undulating tract with gently rounded hills. This region, while containing much mineral wealth, is admirably adapted for the growth of cereals. (2) The mt.-dist. adjoining this, which crosses the State in a belt varying in width from 75 to 160 m., and trending from N. E. to S. W. All the mt.-chains which go to make up the Appalachian system are here in their full breadth, though not attaining a great altitude. The mts. of the Appalachian system in the State, aside from their gen. division into 2 great ranges, the Blue or Kittatinny and the Alleghany range, are subdivided into a host of minor chains, intersected by numerous valleys, broad and fertile, with the precipitous E. face of the Alleghany range overhanging them. (3) The W. table-land, which occupies about  $\frac{1}{2}$  the area of the State, is a broad, rolling plateau, with occasional ranges of hills, but sloping N. and W. toward N. Y., Lake Erie, and O. River. It extends from the summits of the Alleghanies W. to the N. W. and W. boundaries of the State. The N. W. portion has several isolated summits. It is the region of pine and hemlock lands, and furnishes vast amounts of lumber to E. markets. *Rivers.*—There are 6 distinct water-basins, which, with their tributaries, drain the entire State—viz. the Del. and its affluents, the Susquehanna and its tributaries, the Genesee, the Potomac, Lake Erie, and the O., with its large and numerous affluents. The O. is formed by the union of 2 large rivers, the Alleghany and Monongahela, at Pittsburgh. Both have numerous tributaries. The Monongahela receives the Youghiogheny and several smaller streams. Aside from Lake Erie there are no lakes of importance. There are several islands in the Del., and 2 or 3 in Lake Erie, belonging to P.

*Minerals and Mineralogy.*—Gold, silver, copper, tin, and sulphur in a native state have been discovered in P., but none of them in such quantities as to make their working profitable. Iron does not exist in a native state, but the iron ores of the State embrace every known ore, and many not found elsewhere. The iron furnaces of P. have hitherto made about  $\frac{1}{2}$  of the pig iron manufactured in the U. S., though having only  $\frac{1}{4}$  of the whole number of stacks. The most valuable of the minerals of P. economically is her coal. Of anthracite coal about 20,000,000 tons are annually sent to market or used in the vicinity of the mines. The amount of bituminous coal is constantly increasing. P. furnishes nearly  $\frac{1}{2}$  of the entire amount used, or about 6,000,000 tons. Petroleum is another mineral product of P. of great value and importance. The other mineral products of economic value are building-stone, including granite, brownstone (sandstone), trap or porphyry, and marble, slate, the production of which is rapidly increasing; zinc, nickel, and copper. Attempts have been made to produce salt, but the brines are more valuable for the chlorine, bromine, and iodine, and the compounds of these elements which they contain, than for the salt. There are numerous mineral springs, some of them of great medicinal value. Of the minerals possessing only scientific value the number is very great, embracing almost every mineral of note in our largest catalogues.

*Soil, Vegetation, and Botany.*—The State has yet a large amount of forests. The forest trees of the State include several species of pine, hemlock, spruce, fir, cedar, and cypress, as well as some other coniferous trees: 6 or 7 species of oak and 4 of hickory, the black walnut and butternut, 3 or 4 species of maple, the chestnut, chinquapin, beech, buckeye, linden, tulip tree, dogwood, hornbeam, birch, ash, willow, elm, aspen, sycamore, Amer. poplar, mulberry, persimmon, gum, sassafras, locust, wild cherry, papaw, catalpa, magnolia, crabapple, etc. The flora is varied. The soil of the valleys and plains is generally fertile, and some of it very rich, yielding large crops for a succession of yrs.

*Zoology.*—The number of wild animals is very large—bears, panthers, wild-cats, lynxes, wolves, otters, the red and the gray fox, the raccoon, marten, mink, weasel, skunk, opossum, muskrat, porcupine, woodchuck or ground-hog, and occasionally the beaver; the flying, red, striped, and

gray squirrel, the hare or rabbit, and among the larger game the Virginian deer, and rarely the elk. Birds are numerous—of prey, the bald and the golden eagle, the turkey-buzzard, fish and other varieties of hawk, owls, the whip-poorwill, the night-hawk, the swallow, etc.: these and the reptiles are the same as those of N. Y. and N. J.

Reverse.



key-buzzard, fish and other varieties of hawk, owls, the whip-poorwill, the night-hawk, the swallow, etc.: these and the reptiles are the same as those of N. Y. and N. J.

*Climate.*—There are considerable differences in the climate of different portions of the State. The mean annual temperature, which is 52° in the S. E.

cos., decreases to 48° in the central cos. and 44° in the N. E. and N. W. The amount of rainfall is usually greatest in the S. E., and decreases N. and W.

*Agricultural Productions.*—This State produced, by the census of 1880, 45,821,531 bushels of Indian corn, 19,462,405 bushels of wheat, 33,841,439 bushels of oats, 3,683,621 bushels of rye, 3,593,326 bushels of buckwheat, and 4,881,000 bushels of barley. The wool clip of 1880 yielded 8,470,273 lbs. The tobacco crop was 36,943,272 lbs., P. ranking third among the States in this staple.

*Farm Animals.*—By the census of 1880 there were in P. 533,587 horses, 22,914 mules and asses, 1,730,237 cattle, 1,775,598 sheep, and 1,187,968 swine.

*Fisheries.*—The aggregate yield of the river fisheries for 1880 was returned at \$43,450.

*Manufactures.*—Among the foremost manufacturing States in nearly all articles, P. stands easily pre-eminent in her iron and steel industries. The aggregate value of products of these for 1880 was \$145,576,388, being nearly 5 times that of any other State. Her immense coal-mines (having the monopoly of anthracite, beside vast fields of bituminous coal) and her facilities for marketing every product have led to the investment of very heavy capital in the production of machinery, hardware, steam-engines, R. R. cars and locomotives, household utensils, farm implements, building supplies, etc. In cotton manufacture P. had, in 1880, 10,541 looms, with 446,379 spindles, employing 11,871 persons, and using 86,355 bales of cotton. Of salt P. produced, in 1880, 851,450 bushels, valued at \$17,415. No less than 20,000,000 tons of coal were mined in 1881.

*Railroads and Canals.*—There were in operation, Jan. 1, 1882, within P. 6,690 m. of railway, costing \$485,424,688, with net earnings of \$38,796,697, and paying in interest and dividends \$38,415,098. Many of these are important trunk lines or the feeders of such. The Pa. (with its numerous branches), the Del., Lackawanna and Western, Phila. and Reading, Lehigh Valley, Lehigh and Susquehanna, Del. and Hudson, Phila. and Erie, N. Central, and Allegheny Valley roads are the prin. lines. There are 9 canals in P.; total length, 875 m.

*Finances.*—The assessed valuation of personal property in P. for 1880 was \$143,451,059. Real estate is not taxed by the State, but most of her large revenue (about \$6,000,000 annually) is derived from special taxes on corporations, including bank stock, foreign insurance cos., corporation stock, gross receipts, incomes, commutation of tonnage, licenses, etc. Rate of State tax on personal property, 30 cents on \$100. The net State debt, Dec. 1, 1880, over and above assets, was \$13,794,324; aggregate indebtedness, State, co., and municipal, \$114,084,759; total amount raised by taxation, local and State, \$28,604,394.

*Commerce.*—P. is a large importing and exporting State: aggregate exports for fiscal yr. 1881, \$44,762,677, all of domestic productions; aggregate imports, \$32,668,410. The largest exports consist of petroleum, which has developed an enormous commerce. The internal commerce by railway and rivers is very extensive, but no full statistics are obtainable. The carriage of coal alone forms a prodigious element of wealth to the transportation companies. P. had in 1881, 855 sailing and 460 steam vessels; total, 367,491 tons.

*Banking Institutions, Etc.*—There were in operation in P., Oct. 1, 1881, 223 national banks, having a capital of \$46,668,340; circulation, \$35,852,134; U. S. bonds to secure circulation, \$41,256,300; aggregate deposits, \$119,634,344. There were also 119 State banks and trust cos., having a capital of \$7,408,420 and deposits of \$51,191,281; 10 savings banks, with \$35,295,753 deposits, and 231 private bankers, with \$7,093,303 capital and \$28,178,847 deposits. P. had 65 insurance cos. in 1881 which paid losses, \$3,956,600 that year.

*Education.*—The number of children of school age (6-21 yrs.) in P. in 1873 was 1,200,000; number enrolled in public schools in 1880, 950,300, with average daily attendance of 622,351. Aggregate expenditure for public schools in 1880, \$7,306,692, of which \$4,504,932 was for salaries of teachers. P. has 27 colls. and univrs., with 354 instructors and 4414 students, paying tuition fees in 1880 of \$179,932. Phila., Pittsburg, and other cities have schools of law, med., theol., commerce, etc., which are largely attended, the med. colls. of Phila. being especially noted. Normal schools, acads., and female sems. abound. In 1882 there were 695 newspapers and periodicals pub. in P., of which 102 were daily.

*Churches.*—The M. E. leads, with 1545 chs., 728 ministers,



and 169,311 members: Presb., 806 chs., 862 ministers, 127,310 members; Lutheran, 1015 chs., 566 ministers, 124,520 members; Reformed Ch., 672 chs., 352 ministers, 72,057 members; Bap., 531 chs., 436 ministers, 63,483 members; R. Cath., 464 chs., 536 priests, and about half a million Catholic pop.; Prot. Epis., 299 chs., 366 ministers, 38,938 members; United Presb., 258 chs., 205 ministers, 33,339 members; United Brethren, 386 chs., 238 ministers, 23,633 members; Evangelical Association, 472 chs., 372 ministers, 32,513 members; the Brethren (Dunkards), 140 chs., 327 ministers, 20,000 members; and 30 other denominations, with from 13,000 to 100 members each.

**Population.**—In 1860, 2,906,215; 1870, 3,521,951; 1880, 4,282,891 (white 4,197,016, colored 85,875, including 148 Chl., 8 Japanese, and 184 Indians).

**Principal Cities and Towns.** Pop. 1880.—Philadelphia, 847,170; Pittsburg, 156,389; Allegheny, 78,682; Scranton, 45,850; Reading, 43,278; Harrisburg (cap.), 30,762; Erie, 27,737; Lancaster, 25,769; Wilkesbarre, 23,339; Altoona, 19,710; Williamsport, 18,934; Allentown, 18,063; Chester, 14,997; York, 13,940; Pottsville, 13,253; Norristown, 13,063; Easton, 11,924; Shenandoah, 10,147; Bradford, 9197; Titusville, 9046; Meadville, 8860; Lebanon, 8778; New Castle, 8418; Johnstown, 8380; Danville, 8346; Columbia, 8312; McKeesport, 8212; Shamokin, 8184; Carbondale, 7714; Pittston, 7472; Oil City, 7315; Mahanoy, 7181.

COUNTIES.	*Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
Adams	6-F	30,315	29,245	Pittsburg	2,814
Allegheny	5-B	262,304	355,569	Pittsburg	156,389
Armstrong	4-B	43,382	47,441	Ridgely	2,624
Beaver	4-A	36,148	39,065	Beaver	1,178
Berks	6-D	29,635	34,929	Berford	2,011
Bucks	5-D	106,701	122,597	Reading	43,278
Butler	5-E	38,051	59,740	Hollidaysburg	3,150
Cambridge	2-G	55,204	65,541	Academy	2,814
Carbon	4-B	64,236	68,656	Doyelstown	2,070
Centre	4-A	36,510	52,536	Butler	3,163
Chester	5-D	38,569	46,811	Ebensburg	1,123
Clarion	3-D	4,273	5,159	Emporium	1,136
Clearfield	4-I	28,144	31,922	Lock Haven	3,752
Clinton	4-E	34,418	37,922	Bellefonte	3,096
Columbia	6-E	77,005	83,481	West Chester	7,046
Crawford	3-C	26,537	40,328	Clarion	1,169
Cumberland	4-D	25,741	43,408	Clearfield	1,809
Dauphin	3-E	29,211	46,378	Lock Haven	5,845
Delaware	3-E	28,766	32,409	Bloomsburg	3,702
Elk	4-H	6,832	68,607	Meadville	8,860
Erie	6-A	43,912	45,977	Carlisle	20,769
Fayette	5-G	60,740	76,148	Harrisburg	30,762
Forest	6-J	38,403	56,101	Meda	1,919
Franklin	6-E	8,488	12,890	Ridgely	1,480
Fulton	4-H	6,973	74,698	Erie	27,737
Greene	6-B	43,284	58,342	Uniontown	3,265
Huntingdon	4-C	4,010	4,385	Tionesta	469
Indiana	6-E	45,368	49,875	Chambersburg	6,557
Jefferson	6-E	9,360	10,149	McConnellsburg	584
Johnston	6-A	25,877	28,273	Waynesburg	1,208
Lackawanna	5-E	31,251	33,954	Huntingdon	4,125
Lancaster	5-C	36,128	40,527	Indiana	1,907
Lawrence	3-C	21,632	27,935	Gettysburg	2,736
Lebanon	4-F	17,390	18,227	Niffentown	449
Lehigh	3-C	89,269	89,269	Scranton	45,850
Luzerne	6-H	121,340	139,447	Lancaster	25,769
Lycoming	4-A	27,298	33,312	New Castle	8,418
McKean	5-H	34,096	38,476	Lebanon	8,778
Merger	5-F	56,796	65,569	Allentown	18,063
Mifflin	3-H	160,915	133,065	Wilkesbarre	23,339
Monroe	3-F	47,626	57,486	Williamsport	18,934
Montgomery	2-D	8,825	42,565	Smethport	872
Morristown	4-A	49,977	56,161	Greer	2,244
Northampton	3-A	17,508	19,577	Lewisburg	3,222
Northumberland	4-I	18,362	20,175	Stroudsburg	1,660
Perry	6-I	81,612	96,944	Norristown	13,063
Philadelphia	4-G	15,344	15,468	Danville	8,346
Pike	4-J	61,432	73,791	Brookville	11,934
Potter	4-F	41,444	52,133	Sunbury	4,077
Schuylkill	5-F	95,447	97,522	New Bloomfield	577
Snyder	3-J	674,022	847,170	Philadelphia	847,170
Somerset	6-J	8,436	9,663	Millard	983
Sullivan	2-E	11,965	13,791	Coudersport	677
Tioga	5-I	116,498	129,574	Pottsville	13,253
Union	4-F	15,606	17,797	Middleburg	398
Venango	6-C	28,226	33,110	Somerset	1,197
Warren	3-G	6,191	8,073	Laporte	192
Washington	2-H	37,553	40,354	Montrose	1,722
Wayne	5-I	35,097	45,814	Wellsville	2,228
Westmoreland	4-F	13,565	16,905	Lewistown	3,080
Wyoming	3-B	47,925	43,670	Franklin	5,010
York	2-C	23,897	27,981	Warren	2,810
	3-A	48,463	55,418	Washington	4,292
	2-D	35,184	37,513	Honesdale	2,420
	5-B	58,719	76,036	Greensburg	2,500
	2-H	14,585	15,598	Tunkhannock	1,116
	6-G	76,134	87,841	York	13,940
Total.		3,521,951	4,282,891		

**History.**—Del. Bay was discovered by Hendrick Hudson in 1609, and Del. River ascended in 1616 by Cornelius Hendricksen. The first settlement within the bounds of P. was at Tinicum Island by Swe. colonists, under John Printz's administration. In 1655 the Dut. from New Amsterdam, led by Stuyvesant in person, marched upon these Swe. settlements, and took formal possession of the country. In 1660 a Dut. settlement was planted at the Minisinks, the settlers being colonists from New Amsterdam. When the Eng. captured New Amsterdam in 1664 the colony on the Del. followed its fortunes, and remained under the govt. of N. Y. (except for a part of 1673-74, when the Dut. recaptured it) until Mar. 4, 1681, when Charles II. granted to William Penn the "tract of land in America lying N. of Maryland, on the E. bounded with Delaware River, on the W. limited as Maryland, and northward to extend as far as plantable." This tract King Charles named Pennsylvania. Penn landed at New Castle (now in Del.) Oct. 27, 1682. Thence he went to Upland on the 29th, and in Nov. visited Phila., and made his famous treaty of amity with the Indians. During 1683 he organized his new govt. and provided places for the many immigrants (mostly Friends) who began to flock thither. He returned to Eng. in 1684 for

settlement of the boundary between P. and Md. In 1698 Penn again visited his prov., remaining till 1701, and gave the colonists a new const. and Phila. a charter. From this time to 1720 emigration to P. constantly increased. Penn d. in 1718 and his heirs succeeded him as proprietors. The war between Fr. and G. Brit. in 1744 led to apprehensions of trouble with the Indians, whom the Fr. were stimulating to hostility against the Eng. colonists. Great efforts were made to retain the friendship of the Indians, but all in vain. The Shawanees were the first to break faith with the colonists. The Fr., having secured them as allies, constantly increased their aggressions. The repeated battles, in which Washington participated, the defeat of Braddock, and the ravages of the Indians in 1755 and 1756, belong properly to the hist. of the U. S. In 1758 a treaty with the Indians secured peace till 1763. Then came Pontiac's war, and throughout nearly the whole yr. there were terror and bloodshed along the frontier, but the Indians were severely punished in Dec. The boundary between P. and Md. was run in 1767-68 by Charles Mason and Jeremiah Dixon. In 1763, by a treaty with the Six Nations, a large tract of land, called the New Purchase, embracing most of the cos. of N. and N. W. P., was conveyed to the proprietaries, and at once induced an enlarged immigration. P. took an active part in the movement for independence; her merchants signed the non-importation agreements and destroyed the taxed tea in 1774. The first Continental Cong. was held in Phila. in Sept. 1774, and P. was well represented. A provincial convention was held on Jan. 23, 1775, and after the battle of Lexington a committee of safety appointed. Within 10 days after receiving intelligence of the battle of Bunker Hill the first P. rifle regiment was on its way to Boston. The Dec. of Ind. was made public at Independence Hall, Phila., July 4, 1776, and on the 8th it was read to the thousands assembled in front of that building. On July 15, 1776, a convention was called to prepare a const. for the State of P., and on Sept. 28 it was ratified by the people. The battle of Brandywine occurred Sept. 11, 1777, the massacre at Paoli on the 20th, and the battle of Germantown Oct. 4, 1777. The Brit. troops occupied Phila. from Sept. 26, 1777, to June 18, 1778; the State and national authorities returned soon after the latter date. The massacre of the Wyoming settlers by Brit. soldiers, Tories, and Indians occurred in July 1778, and was summarily avenged by the McIntosh and the Sullivan expeditions. In 1778 the charter was annulled, and the Penns were allowed £180,000 for their unsettled lands in the State. P. furnished more than her full quota of troops for the Revolutionary war. Slavery was abolished in 1780. The State const. was revised in 1790. The "whiskey insurrection" in the W. cos. occurred in 1794; it occasioned great excitement, but was put down without bloodshed. Another but less considerable insurrection was attempted 4 yrs. later, but was promptly suppressed. In 1799 the State cap. was removed to Lancaster, and in 1812 to Harrisburg. After the war of 1812 the State was largely engaged in colossal enterprises of internal improvement—canals and R. Rs.—which some yrs. embarrassed her finances. In 1859 the petroleum discoveries were made. The State was 3 times invaded by the Confeds.—first on Oct. 10, 1862, when Chambersburg was captured and military stores burned; second, by Gen. Lee, when the battle of Gettysburg was fought on her terr.; third, in July 1864, when Chambersburg was burned. In 1873 her const. was again revised.

## COLONIAL.

Colonial.	Patrick Gordon (dep. gov.)	1726
	Council (J. Logan, pres.)	1736
	George Thomas (deputy gov.)	1738
	Council (A. Palmer, pres.)	1747
	James Hamilton (dep. gov.)	1748
	Robert Hunter Morris (d. g.)	1764
	William Denny (deputy gov.)	1766
	Jas. Hamilton (deputy gov.)	1769
	John Penn (lieut. gov.)	1763
	Council (J. Hamilton, pres.)	1771
	Richard Penn (lieut. gov.)	1771
	John Penn (lieut. gov.)	1776
	In the Revolution.	
	Com. of Safety (B. Franklin, ch'n.)	Sept. 1776-Mar. 1777
	Pres. of Supreme Ex. Council.	
	Thos. Wharton, Jr.	Mar. 6, 1777
	Joseph Reed	Dec. 22, 1778
	William Moore	Nov. 15, 1781
	John Dickinson	Nov. 7, 1782
	Ben. Franklin	Oct. 17, 1785
	Thomas Mifflin	Nov. 5, 1788

## STATE.

Under the Constitution of 1790.		
Thos. Mifflin	1790	
Thos. McKean	1799	
Simon Snyder	1808	
William Findlay	1817	
Joseph Helster	1820	
John Andrew Shulze	1823	
George Wolf	1829	
Joseph Ritner	1835	
Under the Constitution of 1838.		
David R. Porter	1839	
Francis E. Shunk	1845	
Wm. F. Johnston (acting)	1848	
William Bigler	1852	
James Pollock	1855	
William F. Packer	1858	
Andrew G. Curtin	1861	
Ben. F. Fletcher, governor	1863	
New York (governor)	1868	
Wm. Markham (lieut. gov.)	1868	
Wm. Markham (deputy gov.)	1868	
William Penn (proprietor)	1869	
Andrew Hamilton (dep. gov.)	1701	
Council (E. Shippen, pres.)	1703	
John Evans (deputy gov.)	1704	
Charles Gookin (deputy gov.)	1709	
Sir Wm. Keith (deputy gov.)	1717	
Under the Constitution of 1873.		
John F. Hartranft	1876	
Henry M. Hoyt	1880	
Robert E. Pattison	1882-87	

REVISED BY A. R. SPOFFORD.

\* Reference for location of counties. See map of Pennsylvania.













# MAP OF PENNSYLVANIA

Drawn and Engraved on Copper-Plate  
EXPRESSLY  
FOR  
JOHNSON'S CYCLOPAEDIA

Scale of Miles  
0 10 20 30

W. 77 from G Greenwich H 76 I J75 K 74

Y R K J I H G

1 2 3 4 5 6 7 8

Long. 1 East J 2 K 3

ATLANTIC OCEAN

Delaware River

Susquehanna River

Philadelphia

Lancaster

York

Harrisburg

Scranton

Reading

Lebanon

Carlisle

Shippensburg

Gettysburg

Frederick

Conowingo

Washington

Annapolis

Baltimore

Camden

Phila.

Montgomery

Princeton

Trenton

Newark

Jersey City

Elizabeth

Long Branch

Kreehold

Woodbury

Swedesboro

Pennsgrove

Salem

Warrenton

Bridgeport

Somers

Cape May

Denton

Centerville

Westertown

Clayton

Bay Side

Bay Side View

Bel Air

Harre de Grace

Westminster

Manchester

Joeville

Lebanon

Ellicott City

Annapolis

Rockville

W. 77 from G Greenwich H 76 I J75 K 74







**Pennsylvania College**, Gettysburg, Pa., was founded in 1832, and is under the auspices of the Lutheran Ch. By an act of the legislature in 1850  $\frac{1}{4}$  of the value of the funds of Franklin Coll. of Lancaster, Pa., was transferred to Pa. Coll. to establish in it a professorship known as the "Franklin professorship." A preparatory dept. is connected with the inst., designed to afford a suitable training for admission into coll. The instruction is given in the coll. proper entirely by the professors in the different depts., who constitute the faculty and administer the govt. and discipline under the board of trustees. Professorships of the Ger. lang. and lit., of the Eng. lang. and lit., and of the natural sciences have lately been founded.

**Pennsylvania Dutch** (more correctly *German*) is not a corrupt dialect of Ger. formed in Amer., nor is it akin to broken Eng., but is a legitimate S. Ger. dialect, due to the fusion of forms existing on the upper Rhine in Rhenish Bavaria, Baden, Darmstadt, Würtemberg, Ger. Switz., and Alsace, and taking up an Eng. element, as Eng. itself took up native words like *hickory*, or Fr. forms like *prairie*, *bayou*, and *ville*. The characteristics of the dialect may be learned from the excellent poems in it by H. Harbaugh, D. D., and in Haldemann's *Pa. Dutch*. Careless speakers of Eng. unconsciously corrupt their lang. with Ger. idioms, as in the use of "dumb" for dull or stupid, and "red beet" for beet, translating *die rothe rübe*, because in Ger. a "white" beet (*weisse rübe*) is a turnip.

**Pennsylvania, University of**, originated as a charity school 1745, founded as an acad. 1749, incorporated as a coll. 1755, and erected into a univ. 1779. The med. dept. was founded in 1765, and the law dept. 1789. In 1872 the inst. was located at the junction of 36th st., Darby road, and Locust st., in 4 squares of about 26 acres, in W. Phila., and having separate buildings for the med. hall, for the univ. hospital, and for the depts. of arts, science, and law, veterinary medicine, biology, and school of finance and economy. The dept. of arts embraces the collegiate branches, and the dept. of science those of arch., chem., drawing, engineering, geol., metallurgy and assaying, mineralogy, and mining. Connected with the dept. of science are a mineralogical cabinet and a collection of Amer. fossils, containing 10,000 specimens. The law dept. has a course of 2 yrs.; the med. dept. has a 3 yrs.' course. Adjoining the med. hall is a hospital for nearly 200 patients.

**Pen'ny** [Gr. *pfennig*], an Eng. coin, first mentioned in the laws of Ina, king of Wessex, about 695 A. D. It was at first of silver, the 12th part of a shilling, designated by *d*, the initial of the Lat. *denarius*. The first copper penny were introduced in 1797. At present the Eng. P. is of bronze.

**Penn Yan** [so called because originally settled by Pennsylvanians and Yankees], on R. R., cap. of Yates co., N. Y., at the foot of Keuka Lake, near Seneca Lake, has good water-power and an acad. Pop. 1870, 3488; 1880, 3475.

**Pen'nybacker** (ISAAC S.), b. in Shenandoah co., Va., in 1806; studied law, and entered upon the practice of his profession; M. C. 1837-39; afterward a judge of the dist. court of Western Va., and was in 1845 elected U. S. Senator for Va., but died before the end of the term. D. Jan. 12, 1847.

**Pen'nypacker** (GALUSHA), b. in Pa.; entered the service as private on the outbreak of the c. war, was in Aug. 1861 appointed capt. in the 97th Pa. Volunteers, and in Oct. major, attaining the colonelcy of that regiment in Aug. 1864; served in the dept. of the South to Apr. 1864; engaged in operations in Fla. and against Charleston; participated in the attack on Drury's Bluff, May 1864 (thrice wounded), and engaged in operations on the N. side of James River and in front of Petersburg to Sept. 1864; commanded a brigade in the assault and capture of Ft. Harrison (wounded) and action of Darbytown Road. In the final attack upon Ft. Fisher he received wounds which confined him to the hospital till Apr. 1866, when he resigned, being meanwhile (Feb. 1865) appointed brig.-gen. In July 1866 he became col. of 34th Inf., U. S. A.; transferred to 16th regiment in 1869; brevet brig.-gen. for Ft. Fisher, and maj.-gen. for gallant services during the war. Retired July 3, 1883.

**Pennyroy'al**, a popular name for *Mentha pulegium*, a fragrant labiate herb of Old World, and of *Hedeoma pulegioides* (low P.) and *Mentha Canadensis* (high P.) in U. S.

**Penobscot Bay** penetrates the coast of Me. for 30 m., having Waldo and Knox cos. on the W. and Hancock co. on the E. Its deep waters abound in islands and good harbors; prin. tributary, Penobscot River.

**Penobscot River**, the largest river of Me., and the most important navigable stream in the N. Eng. States, rises in Somerset co., near the Canada line, flows E. into Chesuncook Lake, thence S. E. to its union with the Matamoras, having 12 m. above united with the Sebobe or E. branch of the P. Afterward its course is S. by W. to Penobscot Bay. It is navigable for large ships to Bangor, 60 m., where the tide rises 17 ft. Above this point small steamers run for many miles. Its upper waters afford valuable motive-power, and great numbers of logs are floated from the forests of N. Me. to Bangor. Its length is 300 m. The valley of the P. has an area of 8200 sq. m. Its enormous water-power is only in small part utilized. It is the most important salmon-stream in the U. S., its product excelling in value and quality of fish, though not in quantity, that of the Columbia River.

**Pensacola**, city and R. R. centre, cap. of Escambia co., Fla., on Pensacola Bay, 10 m. from the Gulf of Mex. and 64 m. E. of Mobile; has an excellent harbor, with 21 ft. of water on the bar, and was a place of considerable importance during the Sp. and Eng. govt. of Fla. It has a navy-yard and forts, and was the scene of important military and naval operations during the c. war. The ruins of the old Sp. fortresses San Miguel and San Bernardo are near the rear of the city. Pop. 1870, 3347; 1880, 6645.

**Pensacola Bay**, an inlet of the Gulf of Mex., at the W. extremity of Fla., extending inland N. E. about 85 m., affording a deep and commodious harbor. It is divided into

Escambia Bay on the W. and the Bay of Santa Maria de Galvez on the E., and receives Escambia, Black Water, and Yellow Water rivers. The entrance is 1 m. wide between Santa Rosa Island, on the E. defended by Ft. Pickens, and the entrance point of the mainland on the W., on which stands Ft. McRee. Less than 2 m. N. of the latter stands the old Sp. fort of San Carlos de Barrancas, and in its vicinity a naval hospital, extensive barracks, and a light-house, while a short distance N. E. is the navy-yard, which was surrendered to the Fla. militia Jan. 12, 1861, but recovered by the Union forces early in 1862.

**Pensions** [Lat. *pensio*, "payment"], allowances of money made by the govt. to certain individuals or to their families and representatives, in consideration of public services performed by them. In the U. S. the provisions of the existing laws which determine the various classes of the national beneficiaries and the amounts of their respective pensions are contained in the U. S. *Rev. Stat.* (§§ 4692-4731).

**Pentacrinus** [Gr. *πέντε*, "five," and *κρινος*, "lily"], an interesting genus of encrinites remarkable as containing, beside many fossil species, the *P. caput medusae*, long considered to be the only species of living encrinite, but several others are now known.

**Pentateuch**, pen'ta-tūk [from *πέντε*, "five," and *τεῦχος*, "book"], the collective name of the first 5 books of the O. T.—Gen., Ex., Lev., Num., and Deut. It originated from the Gr. translators and Fathers; the Jews themselves called this division of the O. T. *Torah*, "the Law."

**Pentathionic Acid**, one of the sulphur-acids, formed, like common sulphuric acid, by combination of sulphur, oxygen, and water.

**Pentecost** [Gr. *πεντηκοστή*, "fiftieth"], one of the 3 prin. festivals of the Jews, celebrated on the 50th day after the Passover. In the Chr. chs. the word Pentecost has a different meaning, derived from the occurrences related in Acts ii.—viz. the descent of the Holy Spirit upon the infant Ch. 10 days after the Ascension, the gift of tongues, and the conversion of 3000 persons. In the Eng. Ch., P. is known as Whitsunday or Whitsuntide, from the white garments formerly worn by candidates for baptism.

**Pent Water**, Mich. See APPENDIX.

**Peo'ria**, city and important R. R. centre, cap. of Peoria co., Ill., on the Ill. River at the foot of Peoria Lake, an expansion of the river  $\frac{1}{2}$  to 1 m. wide and 20 m. long, 160 m. S. W. from Chicago. It lies along the W. bank of the river and lake about 4 m., and covers an elevated plateau extending back  $\frac{3}{4}$  m. to a bluff rising 120 ft. above the lake. An abundance of coal is found near by, and its receipts of corn are very great. It has a co. normal school, a fine c. h., 2 opera-houses, a chamber of commerce, several parks, and 4 artesian wells yielding an abundance of white sulphur water. Pop. 1870, 22,849; 1880, 29,259.

**Pepin**, pip'in, Lake, an expansion of the Miss. River, 27 m. long and from 2 to 3 m. wide, having Pierce and Pepin cos., Wis., on the N. E., and Goodhue and Wabashaw cos., Minn., on the S. W.

**Pepin le Bref**, b. in 714, son of Charles Martel and father of Charlemagne, became in 741 major-domus of Neustria and Burgundy, and in 747 of Austrasia and the Rhine country, including Thuringia and Suabia. In 749 he defeated the Bavarians, and in 752 was crowned king of the Franks; conquered Septimania from the Saracens 752-760; broke the power of the Lombards in It. 754-756, and gave the exarchate of Ravenna and the Pentapolis to the Holy See, the origin of the temporal power of the popes; overcame the Sax. 757; took Narbonne from the Saracens 759; waged a war with Guafar, duke of Aquitania, 760-768. D. Sept. 768.

**Pepin of Héristal**, founder of the Carolingian line of Frankish kings, became duke of the Austrasian Franks 680; in 687 conquered Burgundy and Neustria, and subdued the Frisians and ravaged Suabia. D. Dec. 16, 714 A. D. Charles Martel was his natural son.

**Pepoli**, pā'po-le (CARLO), COUNT, b. in 1801 at Bologna, was a member of the provisory govt. of 1831, and on its fall emigrated first to Switz., then to Fr., and finally to Eng., where he lectured on the fine arts in It. and wrote the libretto for *I Puritani*. In 1839 he was appointed prof. of It. lit. in the Lond. Univ., a post which he held till his return to It. in 1848. He was v.-p. of the Rom. republic, and on its overthrow by the Fr. again retired to Eng., where he devoted himself to lit. till 1859, when he was appointed senator of the kingdom of It.

**Pep'per** [Lat. *piper*] is a climbing shrub and its fruits, a native of the E. I., but now extensively cultivated in most tropical countries; now one of the most common spices.

**Pep'perell** (Sir WILLIAM), BART., b. at Kittery Point, Me., June 27, 1696, of Welsh descent; became a merchant and a distinguished Indian fighter; was a member of the Mass. council 1727-59; chief-justice of the common pleas court 1730; captured Louisbourg 1745; made a baronet 1746, a col. of the Brit. army 1749, maj.-gen. 1755, lieut.-gen. 1759, acting gov. of Mass. 1756-58. D. July 6, 1759.—W. P. SPARHAWK, his grandson, took his name, title, and his great estates in 1774, but lost everything in consequence of his Tory principles in 1778. D. Dec. 17, 1816.

**Pepperidge**. See BLACK GUM.

**Peppermint**, the *Mentha piperita*, a labiate herb, a native of the Old World, but completely naturalized in the New. It and its essential oil are extensively used in confectionery, and in med. as a carminative and to conceal the flavor of nauseous drugs.

**Pep'sin** [Gr. *πέψις*, "digestion"], an active principle of the gastric juice, precipitated by alcohol or lead-acetate. It has never yet been perfectly isolated, but is known to be one of the albuminoids or nitrogenous organic substances. Substances called P., and usually containing more or less of the active principle, are often prescribed in dyspepsia for the relief of the irritated stomach.



**Pepys**, *peps* (SAMUEL), F. R. S., b. Feb. 23, 1633, the son of a Lond. tailor; was ed. at Magdalen Coll., Cambridge; became a Roundhead, but turned royalist under Monk, and held important offices in connection with the admiralty. He was (1673-79) sec. for the affairs of the navy; was imprisoned 1679-80 for alleged complicity in the popish plot; was afterward sec. to the admiralty until 1689; pres. of the Royal Society 1684-86, and was in 1690 imprisoned for a time as a Jacobite. D. at Lond. May 26, 1703. P.'s *Diary* is instructive and entertaining, giving us a valuable insight into the every-day life of the times of the later Stuarts. Wrote *Memoirs of the Royal Navy, Port. Hist.*, etc.

**Pera**, *pā'rah* (Gr. *πέρας*, "beyond"), a suburb of Constantinople, beyond (N. of) the Golden Horn, over against the old Stamboul, and connected with it by a floating bridge. It crowns a bold promontory, and is the diplomatic and Frankish quarter of the Tur. metropolis.

**Perea** (Gr. *Περαία*, from *πέρας*, "beyond"), the name of several dists. lying beyond a river, strait, or sea, but used especially of that part of trans-Jordanic Pal. which extended from Pella on the N. to Macharus on the S., and from Philadelphia on the E. to the Jordan on the W.; has also been applied to the whole of Pal. beyond the Jordan.

**Perch** [Lat. *perca*], a name primitively applied to the species of *Perca* or yellow perches (*P. fluviatilis* of Europe and related Amer. forms), but also extended to many other, often quite distantly related types; e. g. *Stizostedion Americanum*, etc. (pike P.), *Morone Americana* (white P. of Atlantic border), *Haplodonotus grunniens* (white P. and buffalo P. of O., etc.), *Sebastes norvegicus* (red P. of Eastport), etc.

**Perchlorates**, compounds of perchloric anhydride (see PERCHLORIC ACID) with bases. Perchloric acid reacts powerfully with bases, forming well-defined and perfectly neutral salts. Most of these are very deliquescent, as those of soda, baryta, strontia, lime, and magnesia. Potassic P. is the most important one as the source of perchloric acid. P. of potash is anhydrous, and decomposes like the chlorate, though only at a temperature over 400°. Into chloride and free oxygen. It does not appear to be deliquescent, unlike nearly all the other P.

**Perchloric Acid**. Perchloric monohydrate is a liquid acid of great energy, comparable well in some respects with oil of vitriol, being a colorless liquid. With 2 equivalents of water it combines to a solid crystalline compound, with great evolution of heat in the combination. Perchloric monohydrate cannot be kept in the liquid form, as it sooner or later explodes spontaneously. By contact with some organic substances it also instantly explodes with terrible energy.

**Perceival** (JAMES GATES), M. D., b. at Berlin, Conn., Sept. 15, 1795, grad. at Yale 1815, and took his med. degree in 1820; resided for a short time in Charleston, S. C., and wrote several small vols., chiefly of poetry; was appointed assistant surgeon in the army in 1824, and detailed as prof. of chem., mineralogy, and geol. in the W. Pt. Acad., but at his own request was soon transferred to Boston, where he engaged in literary and editorial work; removed in 1827 to New Haven, Conn., and for a time assisted Webster in preparing his *Dictionary*; engaged in 1835 in the geological survey of that State; was a distinguished linguist, and wrote much poetry. In 1854 he became State geologist of Wis. D. May 2, 1857.

**Percy**, a historical family of Eng., descended from William de Percy, a companion of William the Conqueror, who derived his name from the village of Percy in Normandy. The barony of Alnwick was acquired by Henry de Percy in the reign of Edward I. The first 4 earls of this family took prominent parts in the "Wars of the Roses." The title became extinct in 1537, but was revived in 1557 in favor of Thomas Percy, who was beheaded at York 1572 for conspiring against Elizabeth. His brother Henry, 8th earl, was charged with conspiring in favor of Mary queen of Scots, and was murdered in the Tower of Lond. June 21, 1585; Henry, the 9th earl, was imprisoned many yrs. in the Tower for alleged participation in the Gunpowder Plot of 1605. The title having again become extinct in 1670, it was revived in 1749 in favor of Seymour, duke of Somerset, a grandson of the last earl. His son-in-law, Sir Hugh Smithson, took the name of Percy, succeeded by permission of Parl. to the earldom in 1750, and was made first duke of Northumberland 1766. His son Hugh (known as Earl Percy) was engaged in the battle of Lexington, succeeded to the dukedom June 6, 1786, and d. July 10, 1817.—The present representative of the family is ALGERNON GEORGE PERCY, LL.D., 6th duke, b. May 2, 1810, who succeeded to the title Aug. 22, 1867; lord of admiralty since 1858.

**Percy** (HENRY), surnamed HOTSPUR, son of the first earl of Northumberland, b. in Eng. May 20, 1364; became famous in the wars of Fr. and of the Scot. border; defeated and killed Douglas at Otterburn (Chevy Chase) 1388; joined Henry of Lancaster 1399, aiding him to obtain the Eng. throne; was rewarded with the wardenship of the E. Marches and the gift of the Isle of Man; was distinguished at the battle of Homildin Hill 1402; took up arms with his father to place Mortimer, earl of March, on the throne, and was killed at the battle of Shrewsbury, July 21, 1403.

**Percy** (THOMAS), D. D., b. at Bridgenorth, Salop, Eng., Apr. 13, 1728, was ed. at Christ Ch., Ox., where he took his master's degree 1753; became vicar of Easton Maudit and rector of Wilby 1756, domestic chaplain to the duke of Northumberland 1766, chaplain in ordinary to the king 1769, dean of Carlisle 1778, bp. of Dromore 1782. D. at Dromore, Ire., Sept. 30, 1811. Pub. *The Reliques of Anc. Eng. Poetry*; translated Mallet's *Northern Antiquities*, and collected anc. tales and poetry.

**Perdiccas**, a Macedonian gen. to whom Alexander the Great on his death-bed gave his ring, the symbol of the royal power; held the empire together for a short time, but a coalition was formed against him by Antipater, Crateros, and Ptolemy, and on his expedition against Ptolemy he was assassinated in 321 B. C.

**Per'egrine Falcon** (*Falco peregrinus*), a hawk formerly much used in falconry. It is bold, graceful, swift, docile, strong, and destructive, and was the favorite among the noble falcons, though less powerful than the lanner and the gerfalcon. The female P. is the bird which is, *par excellence*, called falcon; the male is the tercel, and is smaller.

**Perez**, *pā'reth* (ANTONIO), b. at Monreal de Ariza, Aragon, Sp., in 1541, was ed. at the Univ. of Louvain; became sec. of state to Philip II. 1567; was the chief agent of that monarch in many of his secret crimes; was arrested for the assassination of Juan de Escovedo in 1590, confessed the act, but accused the king of complicity; escaped to Aragon in Apr.; was twice seized by royal command and handed over to the Inquisition, but on both occasions released by the people, thus giving rise to a rebellion which ended in the suppression of the privileges of Aragon. P. escaped to Fr. Nov. 1591; resided in Eng. as secret agent of Henry IV. 1593-95; wrote *Relaciones*, *Cartas Familiares*, etc. D. at Paris Nov. 3, 1611.

**Perez** (JOSÉ JOAQUÍN), b. at Santiago, Chili, in 1801; was sec. of legation in Fr. 1829-31, minister to Buenos Ayres 1832; deputy in Cong., councillor of state, minister of finance, of the interior, and of foreign affairs; pres. of the chamber of deputies and of the senate, and was pres. of the republic during 2 terms (1861-71). During his administration that republic enjoyed internal peace and prosperity, and great material improvements were carried out.

**Perfumes** [Lat. *per*, "through," and *fumus*, "smoke"], **Chemistry of**. It may be said that as a gen. thing volatile bodies are odorous, but there are numbers of exceptions to this, one of the most eminent exceptions, *water*. Other exceptions are certain gases, which are held to be but the vapors of liquids that are volatile at temperatures below the normal range. It must be admitted, nevertheless, that the inodorous gases are among those which have never been positively proved to be convertible into liquid form, such as oxygen, hydrogen, and nitrogen. Two other inconvertible gases, however—carbonic oxide and marsh-gas—are asserted by some to possess distinct though feeble odors. The division of odors into 2 classes, those to be called *perfumes*, and those which are not such, presents also much difficulty in a scientific sense. Odors which are most repulsive to some are enjoyable to others. This is even true with the same individual, in the case of many odors, with reference to the degree of *intensity* of the odor, many volatile bodies existing which almost all consider fragrant when diffused in very minute proportion throughout the air, but are most offensive and even nauseating when concentrated. The probability seems to be that many vapors have their odors fully developed only when diffused thinly throughout a large mass of air, as if this development were really due to some agency—for example, *ozone*—in the air itself; in other words, that the odorous power over the sense of smell is only developed by chemical action.

The whole mass of what are technically called *perfumes* belongs chemically to the compounds having a basis of carbon and hydrogen. Among chemists there has grown up a mode of classifying all carbo-hydrogen compounds in 2 great series—the "fatty series" and the "aromatic series," the latter comprising the homologues of benzene and their derivatives, with a great mass of coal-tar products and natural essential oils. The term "aromatic" is certainly unfortunate, in appearing to imply that the distinction is thereby defined, and that the bodies possessing agreeable aroma are to be placed in the series thus designated. Whereas, among the alcohols, and particularly among the compound ethers of the fatty series, are found bodies of the most exquisite aromas and perfumes of the most delicious fragrance. Indeed, almost all the artificial fruit-essences, which are now quite important articles of trade as used for flavoring foods, drinks, and confectionery, as well as in perfumery, are of the fatty series. [From *orig. art. in J. S. Univ. Cyc.*, by PROF. HENRY WURTZ, Ph. D.]

**Pergeinus**, an anc. city of Mysia, Asia Minor, was founded by Gr. colonists on the N. bank of the river Caicus, 120 stadia from the sea. After the death of Alexander the Great, P. became the stronghold of Lysimachus. His gov., Philotas, made himself independent, and Attalus I. (341-197 A. C.) established a kingdom of which P. became the cap., and one of the greatest and most magnificent cities of Asia Minor. On his death (133 B. C.) King Attalus III. bequeathed his possessions to the Romans, and they made P. the focus of all the great routes of Asia Minor. Under the Byzantine rule it rapidly declined.

**Perham** (SIDNEY), b. at Woodstock, Me., Mar. 27, 1819, was for some yrs. a teacher, afterward a farmer; served in the legislature and on the State board of agriculture; was co. clerk of Oxford 1858-61, M. C. 1863-69, and gov. of Me. 1871-71.

**Pe'ri** [a Per. word, identical with *fairy*], in the folk-lore of Oriental lands, the male or female spirits or *jins*, the offspring of fallen spirits, themselves guiltless, beautiful, happy, and beneficent immortals. They are hostile to the *devs*, or wicked ones, but friendly to man. They can never enter Paradise.

**Pericarditis**. See HEART DISEASES.

**Pericles**, *per'-klēz*, b. at Athens about 495 B. C., served with distinction in the army, and entered, about 469 B. C., on his political career as a member of the democratic party. He proposed or aided in carrying laws according to which the funds of the public treasury were employed for the benefit of the poorer classes. By these laws P. gained the attention and favor of his party, and soon he attained the absolute leadership of it by his eminent talents, his impressive or rather irresistible eloquence, his shrewdness and adroitness in party maneuvering, his grand and wise plans, etc. A great victory was achieved over the aristocratic party in 461 B. C.; its position was undermined and its leader was crushed. In 444 B. C. P. was accused of squandering the public money or employing it for inappropriate



purposes, but the attempt to overthrow him failed. He was arraigned once more for embezzling some of the gold destined for the statue of Athens in the Parthenon; his friends were repeatedly attacked; Phidias died in prison, Anaxagoras was banished, and Aspasia was saved only by great exertions. But these and other similar events were nothing more than the outbursts of a desperate envy and maliciousness. There are no instances in which any important measure of P. was frustrated by an internal opposition. Athens stood at the head of Gr. under his administration, but when he d. (429 b. c.) the decline began, first in political power, then in lit. and art, and soon also in commerce and industry.

**Perigee**, *per'-jee* [Gr. *περί*, "about," and *γη*, "earth"], in astron. that point of the moon's orbit which is nearest to the earth. Anciently, when the sun and planets were supposed to circulate around the earth, the term was also applied to them.

**Perihelion**, *per-i-hē'-le-on* [Gr. *περί*, "about," and *ἥλιος*, "sun"], in astron. that point in the orbit of a planet or comet which is nearest to the sun. Its position or lon. is one of the elements by which the orbit is determined.

**Periodic'ity**, a physiological and pathological term denoting the regular or nearly regular recurrence of certain phenomena in animal life. In the healthy state the menstruation, and in the state of disease the paroxysms of intermittent fever, are obvious instances of P., and all phenomena of animal life seem to have a tendency to P., such as sleep, hunger, the relieving of the bowels, etc. At all events, any function of animal life is greatly impaired by a high degree of irregularity in its exercise, and the first indication of a diseased state is generally a disturbance of the natural or acquired P. of the various functions of life.

**Periœ'el** [Gr. *περιοικοί*, "dwellers round about"], in Laconia and other anc. Dorian lands, the descendants of the anc. inhabs. of the country. The P. were freemen, but they were inferior in social rank and political rights to the Spartiate. They occupied the inferior kind of lands, were artisans, merchants, and sailors, and had, at times, a share in the govt.

**Periostitis** [Lat.], the inflammation of the periosteum, is sometimes caused by a syphilitic, scrofulous, or perhaps rheumatic dyscrasia, but is very commonly induced by a sudden exposure to severe cold, as by bathing in very cold water after violent exercise, by standing long in cold water, and the like. It is a very painful disease, and is best treated by local poultices, by opiates, and by free incisions. Cases due to any specific cause will require special constitutional treatment.

**Peripatetic Philosophy.**—See ARISTOTLE.

**Perip'plus** [Gr. *περιπλους*, "a sailing round"], a Greek compound word meaning circumnavigation, but applying particularly to the circumnavigation of Afr. by Hanno, the Carthaginian. Hanno was absent from Carthage 5 yrs., and when he returned he delighted the people of that city with marvellous accounts of the dangers he had experienced by land and by sea, and of curious birds, beasts, and fishes. His log-book was deposited in the temple of Saturn. It was entitled *An Account of the Voyage of Hanno, Commander of the Carthaginians, round the parts of Libya, beyond the Pillars of Hercules*.

**Peristaltic** [Gr. *περισταλτικός*, "compressing"] **Motion**, certain movements which take place in the alimentary canal, the term being generally restricted to the wormlike action by means of which the food is carried to and fro over the mucous membrane of the stomach and intestines. The food after its entrance into the stomach is first moved about in this organ, and then, having passed into the small intestine, is carried onward by the gradual contraction and relaxation, which, starting from above, is continued downward. The contraction of the circular fibres diminishes the calibre of the gut, and at the same time the shortening of the longitudinal layer tends to the onward movement of the alimentary substances. Not only does the muscular wall carry the food toward the outlet of the canal, but often after the mass has been pushed, or rather squeezed, for a certain distance downward, it is carried back again in the opposite direction (anti-peristaltic movement). There is probably little if any P. action while the intestine is empty, it being the stimulus of food which causes it. The alimentary mass, coming in contact with the periphery of the nerves situated in the mucous membrane, imparts a certain amount of irritation which is followed by muscular movement—i. e. contraction and relaxation—and this slow, gradual passage of the food backward and forward is required for the processes of digestion.

**Peristeria.**—See HOLY SPIRIT PLANT.

**Peritonitis** [Gr. *περιτεινίτις*, "stretch over"], inflammation of the peritoneum, a serous membrane investing the viscera of the abdomen; popularly designated "inflammation of the bowels." Traumatic P. is the result of bruises, wounds, and surgical operations. Idiopathic P. is a primary inflammation; it may result from perverted conditions of the blood or from checked perspiration and chilling of the abdomen or lower extremities. Local P. is a frequent occurrence, the inflammatory process being limited to the peritoneal investment of a single viscus, as the liver, uterus, or ovary. Puerperal P. or metro-P. is inflammation of the uterus and peritoneum occurring in women following confinement. (See PUERPERAL FEVER.) Tubercular P. is chronic and slowly progressive, consisting in the deposition of successive strata of inflammatory lymph, alternating with milky tubercles, with interspersed masses of caseous matter or yellow tubercle; tubercle usually coexists in the lungs and other organs. P. is always a dangerous disease. When incipient, it may be aborted or limited by local use of ice or cold water, local dry cupping, cardiac sedatives, as veratrum and digitalis, and a single prompt saline purge. If fully developed, opium is the supreme remedy, to allay pain and secure absolute rest of

the intestines from their physiological peristaltic action. In P. the tolerance of opium is very great. The cold water or ice-pack, if judiciously used, will be of value during the acute period of the disease, but later warm and anodyne applications are preferable. The diet during the disease should be liquid, and cathartics should be avoided.

E. DARWIN HUDSON, JR.

**Per'iwinkle**, a popular name of various half-shrubby and herbaceous erect or trailing plants of the genus *Vine* and order Apocynaceæ. The *V. major*, *minor*, and *herbacea* of the gardens are hardy European plants. *V. rosea*, a fine greenhouse evergreen shrub, grows wild in most tropical regions, and also in Fla., where it was not improbably introduced. But it is probably a native of the W. I., etc., rather than of the Old World.

**Periwinkle**, a name applied to the numerous species of *Littorina* and similar genera. The *L. littorea* is in G. Brit. extensively used as food, but in the U. S. is hardly ever so employed.

**Per'jury** (law). Lord Coke defines P. as: Where a lawful oath is administered by any one who hath authority to a person in any judicial proceeding, who swears wilfully, absolutely, and falsely in a matter material to the issue or cause in question, either by his own act or by the subornation of others. In the U. S. the effect of an affirmation has been made the same as that of an oath. The crime has also been extended so as to embrace proceedings not judicial, wherever the law requires an oath to be administered to protect public or private right. Conviction for P. cannot be had on the unsupported testimony of one witness.

JOHN NORTON POMEROY.

**Perkins** (ELISHA), b. at Norwich, Conn., Jan. 16, 1741. He established an acad. at Plainfield, where he practised med. In 1796 he announced the invention of metallic tractors for the cure of rheumatism, gout, and the like diseases, which for a time attracted much attention in the U. S. and in Europe. He afterward invented a remedy of great alleged value in the cure of fevers, and during a yellow-fever season in New York went there to test its value, but himself fell a victim to the disease, Sept. 8, 1799.

**Perkins** (GEORGE ROBERTS), LL.D., b. in Otsego co., N. Y., May 3, 1812; was teacher of math. at the Clinton Liberal Inst., 1831-38; prof. of math. in the State Normal School 1844-48, prin. of that inst. 1848-52; superintended the erection of the Dudley Observatory; deputy State engineer 1858, and State surveyor; wrote mathematical text-books, and contributed to scientific periodicals. D. Aug. 22, 1876.

**Perkins** (JACON), b. at Newburyport, Mass., July 9, 1766, was apprenticed to a goldsmith; invented a new method of plating shoe-buckles; was employed in 1797 to make dies for the State coinage; invented soon afterward a machine for cutting and heading nails at a single operation; was the originator of the use of steel instead of copper plates for engraving bank-notes. After residing some yrs. in Boston and New York, he engaged in business in Phila. as a bank-note engraver in 1814; went to Eng. in 1818; obtained a contract for supplying plates to the Bank of Ire., and originated many curious experiments. He was the inventor of the steam-gun, of the bathometer for measuring the depth of water, of the pleometer for registering the speed of vessels, and largely aided in perfecting the steam-engine. D. July 30, 1849.

**Perkins** (JONATHAN COGSWELL), b. at Ipswich, Mass., Nov. 21, 1809, grad. at Amherst 1832; studied at the Cambridge Law School; was admitted to the bar 1835; practised law; edited and annotated several legal text-books; State senator 1847, judge of the court of common pleas 1858. Practised law at Salem, Mass. D. Dec. 12, 1877.

**Perkins** (JUSTIN), D. D., b. at W. Springfield, Mass., Mar. 12, 1805, grad. at Amherst 1829 and Andover Theological Sem. 1832; was tutor at Amherst 1832-33; went to Per. as a missionary of the A. B. C. F. M. 1833; laid the foundation of the Nestorian mission at Oromiah Nov. 1834; established schools; created a modern lit. in the Nestorian dialect of Syria, into which he translated the whole Bible and several religious and educational books; visited the U. S. with Mar Yohannan, a Nestorian bp., 1842; made another visit 1848; returned to the U. S. Aug. 1869. Author of *Syriac Commentaries on Gen. and Dan., of Eight Yrs. in Per., and Missionary Life in Per.* D. Dec. 31, 1869.

**Perkins** (THOMAS HANDASYD), b. at Boston Dec. 15, 1764; went as a supercargo to Batavia and Canton 1789; formed a partnership with his elder brother, and was for many yrs. engaged in trade to Canton, Calcutta, and the N. W. coast of Amer.; was a strenuous opponent of Madison's administration during the war of 1812-15; represented Boston nearly 20 yrs. in both branches of the State legislature; retired from active business about 1823; was the largest contributor to the Mercantile Library Association; took a prominent part in the erection of the Bunker Hill Monument, and subsequently in that of the Washington Monument; was the projector of the Quincy R. R. (1827), the first built in the U. S.; gave his mansion, valued at \$40,000, as an asylum for the blind; was a liberal benefactor of Mass. Gen. Hospital, and with others of his family contributed \$60,000 to Boston Athenæum. D. Jan. 11, 1854.

**Perman'ganates**, compounds with bases of *perman'ganic anhydride*. P. have in crystalline form a dark-red or brownish color. With combustible bodies they deflagrate like the nitrates and chlorates. They are all soluble in water, and many are deliquescent. P. of silver is the least soluble salt. The solutions of these salts have an intense red color and enormous tinctorial power. They are reduced and destroyed with rapidity by oxidizable matters, especially of the organic kind.

**Permu'tations** [Lat. *permutatio*], the results obtained by writing a certain number of letters, or factors, in every possible order, so that all the letters shall enter each result, and each letter but once. Thus, the letters a, b, and c may be written *abc, acb, bac, bca, cab, and cba*. Here there are 3



letters and  $1 \times 2 \times 3$ , or 6, P. In gen. it may be shown that the number of P. of  $n$  factors,  $n$  being any positive whole number whatever, is equal to the continued product of the natural numbers from 1 to  $n$  inclusive. If the actual product indicated by each P. is found, it will be equal to a fixed quantity in each case. The theory of P. finds an important application in the deduction of formulas for combinations and arrangements, and these in turn are used in developing the theory of probabilities. W. G. PECK.

**Pernambuco**, city of Brazil, with respect to size the third, with respect to commercial importance the second of the country, is at the mouth of the Biberibe, on a low but fertile plain covered with sugar and cotton plantations, and producing all varieties of tropical fruits. It has an excellent harbor. The city itself, which was founded by the Dutch, shows a Dutch influence, and its gen. appearance is neat, and in many parts even beautiful, on account of the promenades and gardens with their wonderful tropical vegetation. The two prin. articles of export are sugar and cotton. Beside these 2 articles, large quantities of rum, hides, dyewood, and coffee are shipped. Pop. 116,671.

**Perpetual Motion**, a term employed to denote an assumedly possible form of mechanism, which, having been set in motion by some natural force, should continue always to move, and should at the same time be capable of at once constantly restoring the force expended in moving it, and of performing useful work beside. The mechanical absurdity involved in this notion is to ordinary minds self-evident the moment the proposition is distinctly stated. In spite of this, however, there have been found a surprising number of individuals so completely and incorrigibly blind to the error as to have devoted their whole lives to attempts to solve the fascinating problem. The history of the subject may be found in Dirck's *Perpetuum Mobile*, Lond., 1861. Montucla's *Histoire des Mathématiques* contains also notices of the delusion.

**Perry** [Lat. *pirum*, "pear"], a drink made extensively in Eng. from the juice of the coarser kinds of pears, in much the same way as cider is made.

**Perry**, on R. R. and Coon River, Dallas co., Ia., 34 m. N. W. of Des Moines. Pop. 1880, 952.

**Perry**, on R. R., Wyoming co., N. Y., at the outlet of Silver Lake, has an acad. Pop. 1870, 867; 1880, 1115.

**Perry** (ARTHUR LATHAM), b. at Lyme, N. H., Feb. 27, 1830, grad. at Williams Coll. 1852; became prof. of hist. and political economy in that inst. 1854, and in 1875 pastor of a ch. at Williamstown, Mass.; author of *The Elements of Political Economy*, which is considered the scientific exponent of free-trade doctrines.

**Perry** (CHRISTOPHER RAYMOND), b. at S. Kingston, R. I., in 1761; served in privateers and in the Amer. navy during the Revolutionary war; was taken captive and thrown into the prison-ship Jersey, where he was kept for some months; again entered the merchant service, and was appointed post-capt. in the U. S. N. in 1798. Retiring from the navy in 1801, he was appointed collector of Newport. His 5 sons were all officers in the navy during the war of 1812. D. June 8, 1818.

**Perry** (MATTHEW CALBRAITH), son of the preceding, b. at S. Kingston, R. I., 1795, entered the navy as mdpn. Jan. 16, 1809; was promoted to lieut. July 24, 1813; cruised on the coast of Afr. in the Cyane 1819, and fixed the locality of the first settlement in Liberia; commanded the schooner Shark in the W. I. 1821-24; was made commander Mar. 21, 1826, and capt. Feb. 9, 1837; served many yrs. on foreign stations; took an important part in the introduction of steam as a motive-power in vessels of the navy; commanded successively the navy-yard at Brooklyn, the W. Afr. squadron, and the W. I. squadron during the war with Mex., in which he occupied nearly all the Mex. seaports of the Gulf, captured Tabasco, and co-operated in the siege and bombardment of Vera Cruz. In 1852 he was sent to Japan at the head of a naval expedition, and succeeded in opening that country to foreign commerce. A full *Report of Com. Perry's Expedition to Japan* was pub. by order of Cong. A bronze statue has been dedicated to his memory on the public square of Newport, R. I. D. Mar. 4, 1858.

**Perry** (OLIVER HAZARD), elder brother of the preceding, b. at S. Kingston, R. I., Aug. 23, 1785, entered the navy as mdpn. 1799; cruised with his father in the W. I. 1799-1800; was engaged in the war against Tripoli 1804-05; became lieut. 1807, and at the outbreak of the war of 1812 was in command of a flotilla of gunboats on the Atlantic coast, when in Feb. 1813 he was transferred at his own request to serve under Com. Chauncey on Lake Ontario; took part in the attack upon Ft. George; was appointed to fit out a squadron upon Lake Erie, and, having equipped 9 small vessels, attacked and captured the Brit. fleet Sept. 10, 1813, announcing his victory in the dispatch, "We have met the enemy, and they are ours." Cong. rewarded him with a vote of thanks, a medal, and the rank of capt. He commanded the Java in Decatur's squadron in the Mediterranean 1815; was sent to the Sp. Main in command of a squadron June 1819; ascended the Orinoco in July; was seized with yellow fever, and d. on the island of Trinidad, the day of his arrival there. His remains were removed to Newport in a ship of war by order of Cong., and buried in the cemetery there, Dec. 4, 1826, where an obelisk was erected by the State of R. I. In Sept. 1860 a marble statue of P. was erected at Cleveland, O. (See his *Life*, by MACKENZIE.) D. Aug. 23, 1819.

**Perry** (WILLIAM STEVENS), D. D., b. at Providence, R. I., in 1832, grad. at Harvard in 1854; studied theol.; became rector of an Epis. ch. at Geneva, N. Y., about 1869; sec. of the house of clerical and lay deputies of the Gen. Convention of the Epis. Ch. Author of *Connection of the Ch. of Eng. with Early Amer. Discovery and Colonization, Documentary Annals of the Colonial Ch.*, etc. Was elected bp. of the diocese of Ia. 1876.

**Persecutions, The Ten**, of the Chr. Ch., certain

periods in which new enactments were passed against Christianity, refer specially to the P. under Nero (64), Domitian (95), Trajan (107), Hadrian (125), Marcus Aurelius (165), Septimius Severus (202), Maximinus (235), Decius (249), Valerianus (257), and Diocletian (303).

**Persopolis**, the Gr. name of the anc. capital of Per., whose Per. name is not known, stood in a fertile and beautiful plain (now called *Merdusht*), 35 m. N. E. of Shiraz, near the confluence of the Araxes (now Bendamir) and the Medus (now Pulwân). Of the age and hist. of the city very little is known. Xerxes and Darius Hystaspis resided here, and in their time the city was a wonder of splendor. By Alexander the Great it was completely destroyed. Of the city itself no traces can now be found, but of the palaces some very interesting ruins are still extant. (See P. V. N. MEYERS, *Remains of Lost Empires*.)

**Persæus**, in Gr. mythology, the son of Zeus and Danaë, a grandson of Acrisius, king of Argos; was driven into exile together with his mother; conquered Medusa by the aid of Hermes and Athene, and cut off her head; returned to Argos, from which Acrisius fled to Thessaly, and settled afterward at Tyrus.

**Perseus**, a son of Philip V., succeeded to the Macedonian throne in 179 a. c.; commenced war against Rome. The incompetent Rom. gens. were repeatedly defeated, but P. did not understand how to use his victories. At last L. Paulus Æmilius was sent as commander-in-chief to the theatre of war. He finished the war after a campaign of 13 days, by the battle of Pydna, June 22, 168 a. c. The Macedonian army was routed, and P. fled with his money-chest to Samothrace. He was delivered up to the Roms, and held in captivity at Alba, in It., where he d. He was the last king of Macedonia.

**Persia**, pers'-she-a [Per. *Iran*], country of Western Asia, bounded N. by Caucasus, the Caspian Sea, and Asiatic Rus., E. by Afghanistan and Beloochistan, S. by the Indian Ocean, the Strait of Ormuz, and the Per. Gulf, and W. by Asiatic Tur.; comprises an area of 610,000 sq. m., divided into 11 provs., which provs. are subdivided into 25 govts.

The surface forms a vast plateau elevated 4000 ft. above the sea to the E., 3000 ft. to the W., and 2000 ft. in the centre, and surrounded on all sides, except to the E., where it continues uninterruptedly into Afghanistan and Beloochistan, by high, wild mt. ranges. From Mt. Ararat, skirting the valley of the Tigris, and sending down into its plains a number of torrents which generally dry up during the hot summers, runs a bleak but lofty range of mts., which soon splits into several parallel ranges, and forms along the S. border of the plateau a wild alpine region, leaving between its foot and the Per. Gulf, only a narrow belt of coast-land, low, sandy, hot, and arid. On the N. edge of the plateau, from 10 to 50 m. from the Caspian Sea and continued into Afghanistan, runs the Elbrooz range, whose highest peak, Mt. Demavend, an extinct volcano, situated N. E. of Teheran, rises about 20,000 ft., and is noted for the hot sulphur springs at its S. foot and the frequent earthquakes which visit the surrounding country. The coast-land along the Caspian Sea is low, hot, but well watered and covered with a tropical vegetation.

The climate is very dry everywhere in the country except in the Caspian coast-lands. In the valleys it is hot, with mild winters. In the plateau the winter, from the middle of Dec. to the middle of Feb., is generally severe and the snowfall heavy, while during the summer, from the middle of June to the middle of Aug., the thermometer sometimes rises to 110° in the shade. On account of the dryness both of the climate and the soil the country bears in many places a naked and barren aspect, but wherever sufficient water can be procured and irrigation is carried on the life of nature develops immediately into a fairy-land. In the valleys the cypress and myrtle abound, the fig grows wild, the mulberry and olive are cultivated in large plantations, the vineyards yield strong and highly flavored wines; apples, pears, apricots, peaches, cherries, oranges, and pomegranates of unsurpassed quality are raised in the orchards, and the gardens teem with roses and geraniums. The date-palm grows in the oases of the desert, and dates are a common article of food. The cereals are wheat of excellent quality, rice, maize, and barley. Vegetables and leguminous plants, especially beans and cabbages, abound, and the melon of Isfahan is as celebrated as the Messina orange and the Malaga grape.

**Population**, 7,653,000. About 1,000,000 are in the cities, of which Teheran, the cap., and Tabreez are the largest; Meshed, the holy city; Isfahan, the former cap.; Kerman-shah, the manufacturing centre; Reshd and Balfour on the Caspian Sea, and Bushire on the Per. Gulf, the prin. ports. The prevailing religion is Mohammedanism of the Shahi form; Sufism and other forms are found and tolerated. The Parsees or Guebres, followers of Zoroaster, are few—only about 7000—and, like the Jews, whose number is estimated at 16,000, they are often subjected to persecution.

The present dynasty, the Kajars, which ascended the throne in the latter part of the 18th century with Aga Mohammed, has not been successful in war: Feth Ali (1797-1834) lost in his two wars with Rus. (1813 and 1824) Georgia, Mingrelia, Erivan, Nakhitchevan, and Talish; and Nasr-ed-Din, who ascended the throne in 1848, was deeply humiliated by the Eng. in 1857. But the shah's journey in Europe in 1873 has opened P., at least to some extent, to European ideas and European enterprise, and great results are anticipated.

CLEMENS PETERSEN.

**Persian Berries**, the berries of *Rhamnus infectiorius*, and used by calico-printers and dyers as a source of a yellow coloring-matter.

**Persian Gulf**, an inlet of the Ar. Sea through the Gulf of Oman and the Strait of Ormuz, and between Ar. and Per. It is 650 m. long, 250 m. broad, receives the water of the Shat-el-Arab, and contains many islands. The pearl fisheries are celebrated.



**Persian Insect Powder.** See **FEVERFEW.**

**Persian Language.** Next to the Arabic, Persian is the most important of all the Mohammedan langs. At the time of Mohammed's birth Amshirwan the just reigned over Per. There were then two langs. current in the empire—*Deri*, or the court lang., and *Pehlevi*, the learned lang. Pehlevi poetry no longer exists. When the Arabs conquered Per., and the govt. fell into the hands of men of that race, it was only natural that the lang. of the conquerors should be forced upon the people. Until the time of the Seljookian princes Arabic continued to be the official lang. of the court, and to make use of any other in composition was considered illiterate and vulgar. The first who broke through this restraint in opposition to his pedantic contemporaries was Amid el Mulik el Kendi, vizier of Toghril Beg.

The Per. lang. is essentially an Aryan speech. As at present used it contains a vast number of Arabic words; indeed it possesses an unlimited power of drawing upon that lang. whenever it becomes necessary to enlarge its own vocabulary, and this, of course, gives it a peculiar richness and copiousness of expression. The construction is simple and the accent soft and musical.

**History.**—For the hist. not only of Per., but of the whole E. world, P. lit. possesses the amplest materials. Under the monarchs of the Sassanian dynasty (beginning 226 A. D.) materials had been collected for a hist. of Per., and Yazdigird I. early in the 5th century ordered an abstract of them to be made. This was translated from the Pehlevi. From these old records the poet Firdausi (b. 940 A. D., d. 1021), composed the *Shah-nama*, or "Book of Kings," embracing the whole of the legendary hist. of Per. from the remotest times until the death of Yazdigird. The book is remarkable for the pure Per. in which it is written. The oldest of the prose historians is Tabari (b. 838 A. D., d. 922), who wrote a hist. of Per. down to the times of the caliphate. In the 14th century Yahya b. Abd-ul-latif, Cawini (d. 1351 A. D.), pub. a comprehensive gen. hist. entitled *Lubb-el-tawarikh*, or "Pith of History;" Mohammed ibn Khavend-shah Mirkhond (b. 1432, d. 1493 A. D.), author of the *Rauzat ul Safa*, or "Meadow of Purity," a hist. of Per. from the Creation to A. D. 1471. His son, Khondamir, who was attached to the court of Baber soon after the invasion of India (1528), wrote an abridgment of his father's work under the title *Khulasat el Akhbar*, "Abstract of Information;" the *Habib ul Siyar*, or "Biographer's Friend," is another esteemed historical work, by the same author. There is a very excellent hist. of Per., written about 1300 A. D., by Wassaf of Shiraz. I have confined myself to purely Per. works, but in addition to these there is a large number of works written in that lang. in India, and relating for the most part to the affairs of that country. Of these, the most important are the *Ayin i Akbari*, or "Institutes of Akbar the Great," emp. of Hindostan; *Tarikh i Ferishta*, a gen. hist. of India by Muhammad Kasim Hindu Shah, surnamed Ferishta (d. about 1612 A. D.); and the *Siyar ul Mutaakkerin*, or "Modern Biography," a hist. of India down to recent times.

**Poetry.**—Of the various forms of Per. poetry, the most important are—(1) the *Masnawi*, or "Rhyming Couplets," which answer to our own "heroics," epic, narrative, and didactic pieces being generally written in this metre. (2) The *Ghazal*, or "Ode." These are for the most part ostensibly anacreontic songs, love and wine being the constant theme, but they are really highly metaphorical religious writings, expounding the peculiar theosophic views of the Sufi dervishes. (3) The *Qasidah*, or "Idyl," which is generally employed in panegyric. The prin. poets of Per. are the following: Rudaki, lived in the reign of Nasr, grandson of Ismael Samani, founder of the Samany dynasty (circa 940); he was born blind, but wrote magnificent lyrics, some few of which have come down to us. Firdausi wrote a bitter satire on his ungrateful master, Mahmud, which is usually prefixed to the epic itself; and a poem entitled *Yusuf u Zuleikha*, or "The Loves of Joseph and Potiphar's Wife," a favorite subject with the Per. bards. One of the most original and extraordinary poets of Per. was Omar Khayyam (d. 1123). He was a great astronomer and math., and to him we owe the work called *Al-Jabr u el Mukabalah*, on the science which still bears the name "algebra" which he gave it. His poems consist entirely of *rubaiyat*, or quatrains; they breathe a spirit of advanced free thought, which sometimes, indeed, verges on atheism; but they have at the same time a strange mixture of refined sentiment, philosophical cynicism, and manly feeling, which makes them unlike any other composition of the kind. Anvari (d. 1190 A. D.) Anhad-ud-din Anvari, b. at Mahna in Khavaran, was an astrologer as well as poet, but relinquished the former profession. His prin. works are *Qasidahs*, or "Odes," which are full of fine and sublime conceptions, nervous and elegant lang., and original conceits. Saadi Muslih-ud-din Saadi of Shiraz (b. about 1176 A. D., d. 1275 A. D.), next to Hafiz enjoys the greatest reputation of any Per. poet. That by which he is best known in Europe is the *Gulistan*, or "Rose-garden," a beautiful collection of moral stories in prose and verse. Ferid-ud-din Attar (d. at a very advanced age 1230 A. D.) was an eminent Sufi and poet. His prin. work is a collection of tales and parables in verse entitled *Mantik ul Tair*, or "The Language of Birds." Abu Mohammed ibn Yusuf, generally called Sheikh Nizami of Ganjah Nizami (d. about 1200 A. D.), wrote a *Khamseh*—i. e. a collection of 5 didactic poems embodying Sufistic doctrines. Of these the most celebrated are perhaps the *Laila u Majnun*, an Ar. love-story, and the *Sikandar-Nameh*, or "History of Alexander the Great." Maulavi Rumi, Jelal-ud-din Rumi, the founder of the sect of Mevlaviyeh dervishes (b. 1207, d. 1272), is the great exponent of the mystic doctrines of the Sufis. He was a contemporary of Saadi, the author of the *Gulistan*. His immortal work, the *Masnawi*, consists of 6 long books in rhyming couplets. It contains a complete exposition of the Sufi doctrines, and forms a perfect *repertoire* of all the tales, legends, fables, and apologies current in the E. In addition

tion to the *Masnawi*, Jelal-ud-din wrote a *divan* of beautiful lyrics. Shems-ud-din Mohammed, Hafiz (d. 1389 A. D.). (See art. *HAFAZ*.) Jami (b. 1414 A. D., d. 1493 A. D.) wrote a *Khamseh* in imitation of Nizami, including a *Sikandar Nameh*, a "History of Alexander the Great," and *Yusuf u Zuleikha*, a subject also treated by Firdausi. Hatifi (d. about 1590 A. D.) was a nephew and pupil of Jami, and wrote many beautiful poems, among them one entitled *Laila u Majnun*. Khakani, Afzal-ud-din Ibrahim, called after his royal patron, Khakan Manuchehr Shirwan Shah, Khakani, d. about 1186 A. D., is perhaps the most forcible writer in the Per. lang. He is best known by his odes and satires, and by a poem containing an account of the countries through which he passed on his way to Mecca, and called *Tuh fat ul Irakain*, "A Present from Persian and Arabian Irak." Emir Kheorud of Dehli (b. 1253 A. D., d. 1324 A. D.), of Tartar origin, came to Hindostan, and settled at Pattiala, near Dehli. He was a very voluminous writer, best known by 5 Sufistic romances after the model of the *Khamseh* of Nizami. We must not omit to mention the stirring improvisations of the robber-poet Kurroglou, who flourished about the middle of the 17th century. The present reign has produced a poet of no mean pretensions, Hakim Kaani, poet-laureate to the shah.

**Ethics, Science, Fiction, and Miscellaneous Works.**—The number of these works which Per. lit. contains is so numerous that it would require a large vol. to give anything like an adequate account of them. The modern Pers. have been stimulated into intellectual activity in recent times by their increased communications with the W. The old standard authors, however, still hold their ground, and are studied with as much ardor as ever. [From orig. art. in *J's Univ. Cyc.* by PROF. E. H. PALMER, LL.D.]

**Persimmon**, a tree and its fruit, the *Diospyros Virginiana*, a tree of the U. S. and of the order Ebenaceae. The common P. tree has a fruit which is excessively astringent until over-ripe, but after hard frosts have brought it near decay is a very agreeable fruit. The wood is used for last-making and other turnery. (See *Diospyros*.)

**Persius** (AULUS PERSIUS FLACCUS), b. at Volaterra, in Etruria, Dec. 4, 34 A. D., of a rich equestrian family; received a careful education in the schools of Rome; became a pupil of Cornutus the Stoic; moved in the most elegant circles of the capital; was acquainted with Lucanus and Seneca. D. very young, Nov. 24, 62. Six satires by him, comprising 650 hexameter lines, are still extant, and it is probable that he wrote no more, and even left these in an unfinished state, as he wrote seldom and slowly.

**Personal Property**, in law, denotes property or right of ownership in things personal as contradistinguished from things real. The inherent phys. differences between immovables (lands) and movables (chattels) are so great that some distinction between the rules of law concerning them has existed among every civilized people. This double kind of property in the Eng. law was entirely due to feudalism. The feudal system dealt wholly with lands. Property in chattels was left to be regulated by more simple and natural methods.

Things personal are separated into (1) chattels, (2) chattels-real, and (3) things—(or *choses*) in-action; but to the first of these divisions alone the name "thing" is strictly applicable, for the other 2 are properly species of rights, and not the phys. objects of rights. (1) Chattels include all tangible material objects which are in their nature movable, and are not permanently affixed to the soil so as to become in contemplation of law a part thereof. (2) Chattels-real are simply the leasehold interests in land held by tenants for yrs.—not the land itself, but the temporary estate therein conferred upon a tenant by means of a letting. (3) Things—(anciently called *choses*) in-action are claims or demands in favor of one person to recover something of value due upon contract or other obligation from another person. Under this head are embraced all debts and all claims for damages resulting from the breach of contracts or from the commission of torts.

The most important legal element which distinguishes P. P. from real is its mode of devolution on the death of a proprietor. Lands are inherited directly by the heirs or are transferred immediately to the devisees. All personal property passes in the first instance to executors or administrators, and from them the creditors, next-of-kin, and legatees derive their possession and title. The whole process of distribution is regulated by statutes. The modes by which P. P. may be acquired may be classified as follows: I. Where a person acquires by his own act, without connection with or transfer from any other immediate owner, often called "original" acquisition. This class embraces (1) Occupancy; (2) prescription; (3) natural increase; (4) one's own labor, or, in the nomenclature of the Rom. jurists, "accession." II. When the property is acquired on the occasion of the death of the former owner. This class includes succession by will and through intestacy. III. When the property is acquired from a former living owner. This gen. class is separated into 2 subdivisions: *First*, when the transfer is made by the act and with the consent of the former owner—viz. (1) by donation, (2) by contract, (3) by marriage. *Second*, when the transfer is made without the former owner's consent. The most important are sheriffs' sales on execution, assignments in bankruptcy or insolvency proceedings, and transfers to receivers under a judicial order or decree. Property in things personal may be absolute or qualified. Qualified or special property is limited in respect to its duration and the capacity to use and transfer which it confers.

JOHN NORTON POMEROY.  
**Persons, or Parsons** (ROBERT), b. at Nether Stowey, Somersetshire, Eng. June 24, 1546, ed. at St. Mary's Hall and at Balliol Coll., Ox., where he grad. 1568, and became dean; left Ox. in 1574, in consequence of his conversion to Rom. Catholicism; resided for a time in the Netherlands; studied med. and law at the Univ. of Padua; entered the Society of Jesuits at Rome July 1575; studied divinity in



the Jesuits' coll. at Rome; took orders as a priest; was sent by Pope Gregory XIII. to Eng., along with other Jesuits, July 1580, to attempt the conversion of that kingdom to Rom. Catholicism; became the object of energetic measures on the part of the Eng. govt.; escaped to the Continent 1581; opened a sem. for Eng. youth at Eu in Normandy 1584; became rector of the Eng. coll. at Rome and provincial of the Eng. missions; communicated with James VI. of Scot. in behalf of his mother, Mary queen of Scots, then awaiting execution, and visited in her behalf the courts of Fr., Sp., and Port.; became a second time rector of the Eng. coll. at Rome 1594, and made an unsuccessful attempt to be appointed cardinal 1596. D. at Rome Apr. 18, 1610. Wrote *A Brief Discourse, The Chr. Directory, A Conference about the next Succession to the Crown of Eng., and A Treatise of the Three Conversions of Eng.*

**Perspective** [Lat. *perspicio*], the art of representing an object on a surface so that it shall present to an eye situated at a particular point the same appearance that the object itself would present if the surface were removed. Such a representation of any object is called its perspective. To conceive what is meant by the P. of an object, imagine a transparent plane to be placed between the eye and the object, and let straight lines be drawn from every point in the visible portion of the surface to the eye. Each of these lines pierces the transparent plane in a point, and if each point thus determined is properly tinted, the resulting picture will present the same appearance as the object itself. This picture is the P. of the object as just defined. The art of P. is divided into 2 parts: (1) the correct delineation of the prin. lines of the object; and (2) the proper shading and coloring of the picture to produce the desired effect of distance and tint. The first part is called *linear P.*, and the second part *aerial P.* The true *panorama* is a P. drawing, made on the inner surface of a vertical cylinder with a circular base, the point of sight being taken at some point of the axis of the cylinder.

Certain meteorological phenomena may be explained by means of the principles of *celestial* or *spherical P.* The dome of the heavens, which we call the celestial sphere, has its centre at the eye, and consequently every straight line not passing through the eye is projected upon it in the arc of a great circle. It often happens that clouds are thrown into parallel lines by currents in the atmosphere; they are then seen projected on the sky in great circles, intersecting each other at 2 points of the horizon diametrically opposite to each other. The line giving these points is parallel to aerial currents. In the warm and moist air of the tropics the parallel rays of the setting sun are often visible as they pass through our atmosphere; when projected against the sky they appear to be arcs of great circles, intersecting at the sun and at a point diametrically opposite to it. W. G. PECK.

**Perth Amboy**, R. R. Junc., Middlesex co., N. J., at the mouth of Raritan River, on Staten Island Bay, has a good harbor and a female sem. Pop. 1870, 2861; 1880, 4808.

**Peru**, pe-roo', republic of S. Amer., extending along the Pacific Ocean from lat. 3° 20' to 22° 20' S., with a maximum length on the coast-line of about 1600 m., a maximum breadth of 800 m. on the frontier, with Ecuador on the N., chiefly formed by the river Marañon, and a frontier, with Brazil and Bolivia on the E., extending irregularly about 1500 m., chiefly formed by the Javary and Purus rivers and the summit of one of the ranges of the Andes. Area, about 500,000 sq. m. Pop. about 2,600,000. Cap. Lima, pop. 101,488.

**Physical Geography**.—P. is traversed from N. to S. by 2 parallel ranges of the Andes, by which it is naturally divided into 3 regions—the *Coast*, the *Sierra*, and the *Montaña*. The Coast region is for the most part a sandy desert. Rain is unknown, but cool winds and heavy dews maintain an equable temperature. The Sierra, or region between the 2 ranges of the Andes, is a series of valleys broken by many small spurs of mts., and embraces  $\frac{2}{10}$  of the cultivated area and  $\frac{1}{10}$  of the pop. The Sierra consists of—(1) the great plain of Tlilacaca on the S. E. comprising the basin of the lake of the same name; (2) the *Nudo*, or "knot" of Vilcanota, formed by the union of the 2 ranges of the Andes; (3) the valley of the Apurimac, the most populous part of P.; (4) the knot of Pasco, noted for its mineral wealth; and (5) the tropical valleys of the Marañon and its great tributary the Huallaga. To the N. of Pasco is a 3d more E. range of the Andes. The Montaña embraces the vast region E. of the Andes, traversed by great navigable rivers, but almost unexplored, and occupied by barbarous tribes of Indians. The rivers of P. all form part of the Amazon system. The Marañon itself flows N. W. 500 m. between the ranges of the Andes until it bends abruptly eastward and forms the N. boundary of the republic for nearly 1000 m. The Huallaga is navigable for steamers 600 m. of its lower course. The Ucayali, formed by the union of the Apurimac and Uribamba, is a river of the first magnitude, and navigable through most of its course. The Purus, rising near Cuzco, is said to be navigable for 2000 m. The Lobos and Chichna islands, lying in the Pacific near the Peruvian coast, are remarkable for their vast deposits of guano. Earthquakes are frequent throughout the Sierra and Coast regions.

**Productions and Resources**.—The soil of the Peruvian Sierra is extremely fertile. In the forests of the N. valleys are found scores of valuable cabinet woods, as also the cinchona tree (which yields the precious "Peruvian bark" or quinine), the coca, caoutchouc, the bread-fruit tree, and many varieties of spices. The potato is supposed to be a native of the Peruvian table-lands, where also the sweet potato and the valuable esculent root called *quinua* abound. Cotton, cacao, the sugar cane, grapes, and olives are leading objects of cultivation, and many exquisite varieties of fruit are indigenous to the country. Silkworms and cochineal-insects are successfully reared. Beside an abundance of the European domesticated animals, the llama, vicuña, alpaca, and guanaco are found in the upper regions of the Sierra. Fish and fowl abound in the Montaña, and gayly

plumaged birds of numberless species are found in every part. Sea-birds have for ages been so numerous as to have deposited millions of tons of guano at places on the coast. The guano-beds, as well as the vast deposits of nitrate of soda recently discovered in the prov. of Tarapaca, constitute govt. monopolies of sufficient value to have paid for the construction, within a recent period, of more than 1000 m. of railways.

**Antiquities**.—Anc. P. included also the terrs. of the modern republics of Ecuador and Bolivia (formerly called Upper Peru), and it is the latter region, around the Lake of Titi-caca, which is designated by tradition and by extant monuments as the original centre of aboriginal Peruvian civilization. On the island of Coati, at Tiahuanaco and Huanaco, may be seen the ruins of large structures of hewn stone in a tolerable state of preservation. About 20 m. S. of Lima are extensive ruins of the anc. city of Pachacamac. Vast remains of aqueducts and of paved roads are found in several parts of P.

**History**.—P. was occupied, when discovered by Spaniards early in the 16th century, by 2 comparatively civilized races of cognate origin, the Quichuas and Aymaras, governed by the so called Inca dynasty. P. was conquered and plundered in the 4th decade of the 16th century by a small band of Sp. adventurers headed by Francisco Pizarro and Diego Almagro. For many yrs. the country was in constant anarchy. A viceroyalty was ultimately established in P., which continued to govern that country until July 21, 1821, when independence was proclaimed as a consequence of a successful invasion by a liberating army under command of the Argentine gen. José de San Martín, already the liberator of Chili. San Martín was made protector, but soon was replaced as dictator by the Colombian chieftain Simon Bolívar. In 1836 the Peru-Bolivian confederation was formed under the presidency of the Bolivian Santa Cruz, but it was overthrown in 1839. Numerous c. wars and changes of const. followed. Col. Prado was pres. 1865-68, and was succeeded by Col. Balta, who was murdered July 1872. Don Manuel Pardo was thereupon elected pres. for a period of 4 yrs., expiring in 1876, when Col. Prado became chief magistrate a second time. A war with Chili began in April 1879, and resulted in the conquest of the southern provinces and the occupation of Lima (1881) and the whole sea-coast. On the flight of Prado, Dec. 1879, Nicolas de Pierola seized the presidency, which he resigned in 1881. By Chilian influence F. García Calderon was chosen president at Lima, July 10, 1881, but he was carried prisoner to Chili in Nov. of the same year, being succeeded by Admiral Lezardo Montero. P. possessed, on a peace-footing, an army of about 6000, but the army and navy have been well-nigh annihilated in war with Chili.

PORTER C. BLISS.

**Peru**, city on R. R., La Salle co., Ill., at the head of navigation on Ill. River, and at S. W. terminus of Ill. and Mich. Canal. Extensive coal-mines are found in the vicinity, and steamers ply in the summer to St. Louis and Peoria. Pop. 1870, 3650; 1880, 4632.

**Peru**, R. R. Junc., cap. of Miami co., Ind., 75 m. N. of Indianapolis. Pop. 1870, 3617; 1880, 5280.

**Peru Balsam** is obtained from *Myroserperum Peruvianum*, a tree of the natural order Leguminosae, growing in the state of San Salvador, Central Amer. Portions of the bark are bruised by beating with blunt instruments, and subsequently charred by flame. A week or so later the bark comes away, and the balsam is collected on cloths, from which it is separated by gentle boiling in water. It is a dark-brown, viscid substance, of a rather fragrant odor and a warm, bitterish taste. It is insoluble in water, but mixes perfectly with absolute alcohol and chloroform. It is combustible, giving forth white fumes and a fragrant balsamic odor. It contains a resin, a volatile oil, and cinchonic and benzoic acids. EDWARD CURTIS.

**Perugia**, pá-roo'-jah [anc. *Perusia*], town of Central It., which gives name to the prov. It is situated 75 m. S. E. of Florence and 8 m. from Lake Trasymene, on a hill near the right bank of the Tiber, 1600 ft. above the sea-level. The air is healthy, and the view of the surrounding country extremely beautiful. The town itself, as seen from below, is most striking. It is well walled, and entered by gates mostly medieval or modern, but among them is one of the Etruscan period. The streets, though often steep, are broad, and the squares are flanked by imposing edifices. In the very large Piazza del Duomo there is a superb fountain. The chs. are numerous (at least 100) and very noteworthy. Some of the palaces contain choice works from the hands of renowned artists. The Palazzo Pubblico (1333) is a building of great interest. Many of the 50 convents of P. have been suppressed recently, and from these and other sources a most interesting and highly instructive collection of pictures from the best masters of the Umbrian school has been brought together in the Acad. of Fine Arts near the univ. P. has always been renowned for love of art and lit., and its univ. (established in 1330) is still flourishing. Without the gates there are some remarkable antiquities. P. manufactures silks, velvets, woollens, liquors, etc. Pop. 51,354.

**Perugino**, pá-roo-jee'-no, **Pietro** (PIETRO VANNUCCI DELLA PIEVE), friend of Leonardo da Vinci, teacher of Raphael, head of the so called Umbrian school, which Raphael perfected, b. in Città della Pieve, a small Umbrian town, 1446; d. 1524; began his studies in Perugia, completed them in Florence, returned to Perugia at the age of 40. His works mark an era in painting. His school is characterized by softness, gentleness, tender grace, and richness of color. The devoutness of expression verged on sentimentality, and, being a manner rather than a feeling, easily became monotonous, affected, and wearisome.

**Peruvian Bark**. See CINCHONA.  
**Peruzzi**, pá-root'-se (UBALDINO), descendant of an old and distinguished family of Florentine bankers, b. in Florence Apr. 2, 1822. In 1848 he was appointed gonfaloniere of Florence. After the overthrow of the grand duke in 1859



he was elected member of the Tuscan Assembly, afterward deputy from Florence to the It. Parl. In 1861 Cavour offered him the post of minister of public works, an office which he retained until the fall of the Ricasoli ministry. While Ratazzi was in power P. threw himself into the opposition, but under the presidency of Minghetti he took the portfolio of the interior, and thus became a member of the ministry which negotiated with Nap. III. the convention of Sept. 15, 1864, for the transfer of the cap. from Turin to Florence. P. succeeded Count Cambray Digny as syndic of Florence, and he has shown great energy in suggesting and executing important embellishments of the city.

**Peschiera** (pes-ke-rah) **sul Lago di Garda**, an It. fortress situated at the point where the Mincio issues from the Lake of Garda, and on the railway from Brescia to Verona, about 14 m. W. of the latter city. The fortress is surrounded by high, strong walls and bastions, and by broad and deep trenches filled with water from the lake. P., chiefly important as forming a part of the military system known under the name of the "Quadrilateral," commands the approaches by the Mincio and the navigation of the lake. From the natural strength of its position it was occupied during the Middle Ages by a fort held now by one faction, now by another. Pop. 4218.

**Peshawar**, a terr. formerly belonging to Afghanistan, but now annexed to the dominions of Punjab, Brit. India. The soil of the country is exceedingly fertile, producing annually 2 crops of the finest rice in the world. The cap., Peshawar, is situated on the frontier of Afghanistan, at the E. terminus of the Khyber Pass, which forms the prin. road of commerce between India and Per. Pop. 73,982.

**Pesh'to** [Syr. for "simple"], the standard Syriac translation of the O. and a part of the N. T. It was probably made in the 2d and 3d centuries of the Chr. era. Jude, 2 Peter, 2 and 3 John, and the Apocalypse are wanting.

**Peshigo**, Wis. See APPENDIX.

**Pestalozzi**, pes-tah-lot'se (JOHANN HEINRICH), b. at Zurich, Switz., Jan. 13, 1746; studied first theol., then law, but, obeying his inner calling, he burned his books, settled as a farmer at Neuhof in the canton of Aargau, married, and commenced the development of his educational ideas. He pub. *The Evening Hours of a Hermit*, *Leonard and Gertrude*, a sort of romance; *Christoph und Elise*, *Das Schweizerblätt für das Volk*, *Herr Gertrude teaches her Children*, *Buch der Mütter*, *Anschauungslehre der Zahlenverhältnisse*, etc. The ideas which these books set forth, and most of which seem to us to be mere truisms, because they form the very foundation of our views of education, were at that time new and startling, and the attention which they attracted was increased by the practical application which the author at the same time gave them. He wrote also *Schwauengerg* and *Meine Lebensgeschichte*. D. Feb. 17, 1827.

**Pesth**, pest, city of Hungary, situated in a sandy plain on the left bank of the Danube, opposite Buda, with which it is connected by a magnificent suspension bridge and several other bridges; originated as a Rom. colony (*Transacinum*); was devastated by the Mongols in 1241; recovered and rose rapidly into prosperity; sank again under the Tur. rule (1526-1686), but recovered; once more was made a free city of the empire, and greatly favored by Maria Theresa and Joseph II., and is now the most splendid and populous city of Hungary. The quays along the Danube and the new boulevards are very elegant, broad, and lined with palatial houses. Among its insts. the most remarkable are—the univ., the national library of 200,000 vols., the museum, the theatre, the acad. of music, the casino, etc. Beside the R. Cath. cathedral there are 30 places of worship, among which is a magnificent synagogue; it also has a great number of excellent educational insts. The prin. branches of manufacturing industry are leather, tobacco, brandy, silk, cloth, hats, and shoes. The chief articles of commerce are grain, wine, wool, potash, and soda. Pop. with Buda, 360,551.

**Petaluma**, on R. R., Sonoma co., Cal., at the head of navigation on Petaluma Creek, 42 m. N. of San Francisco, with which it is connected by steamers. Pop. 1880, 3326.

**Petard** [Fr. *petard*], a stout iron or wooden case filled with powder, affixed to the gate or palisades of a beleaguered place, and exploded for the purpose of making a breach. Bags of powder have been found equally effective.

**Peter**, SAINT, the first in the list of the 12 apostles, was b. in Galilee, at Bethsaida, on the shore of the Lake of Genesaret, whence he removed to Capernaum. He was a fisherman, and he followed Christ immediately when called. His original name was Simon, which Christ changed, declaring, "Thou art Peter, and upon this rock I will build my Church" (Matt. xvi. 18). From his call to the office of apostle, and up to the time of the apostles' council in Jerusalem, the events of his life are told in the Gospels and the Acts, and are familiar to all. But of the facts of his hist. after the apostles' council in Jerusalem tradition is the only authority. At present most critics agree in accepting the tradition in its prin. traits—viz. the residence of Peter in Rome and his suffering martyrdom there, of which events the most probable date is 66 or 67. Of the two Epistles in the N. T. which bear St. Peter's name, the genuineness of the former has commonly not been doubted, while some consider the second, or at least a large part of it, to be spurious.

**Peter I., the Great**, czar of Russ., b. at Moscow June 12, 1702, son of the czar Alexis Michailowicz; in 1682 succeeded Feodor, his brother, but his brother, Ivan V., being lawful heir, was soon after announced as joint-sovereign under the regency of their sister Sophia; but P., after 7 yrs. of tutelage, thrust the princess-regent into a convent, while Ivan in 1689 abdicated. P. reorganized the army, built a small naval force, went to sea in person on Dut. and Eng. ships, took Azof from the Turks 1696, lived abroad (1697-98), chiefly at Saardam in the Netherlands and at Deptford and Lond., and with his own hands worked as a ship-carpenter and blacksmith, and for some months studied the sciences, so that Ox. gave him the degree of D. C. L. In 1698 he took

500 Eng. mechanics, engineers, etc. to Russ., and in the same yr., the Strelitzes having revolted, he ordered them all to be put to death. In the same yr. died Le Fort, P.'s wisest counsellor, a Swiss by birth. The czar now reformed the calendar, founded schools, introduced arith., compelled rich merchants to engage in foreign commerce, and enacted rules for dress and deportment; entered upon a war of conquest against Swe., supported by Den. and Poland, 1700, and in the same yr. was badly defeated by Charles XII. at Narva; founded St. Petersburg 1703; invaded Courland 1705, overthrew the Swedes at Poltava 1709; seized the Baltic provs. 1710, and Finland 1713; married Catharine I., his mistress, 1707, and declared her czarina 1711; waged an unfortunate war against the Turks 1711; finally gave up most of Finland in the peace of 1721; made the tour of Europe 1716-17, and returned with many books and works of art; put to death his son Alexei 1718, on the ground of his treasonable conduct; conquered 8 Caspian provs. from Per. 1722, but in 1730 Per. recovered a great part of them, after P.'s death, which occurred Feb. 8, 1725.

**Peter II., Alexelvitich**, b. at St. Petersburg Oct. 23, 1715, a grandson of Peter the Great, a son of Alexei; succeeded Catharine I. on the Rus. throne May 17, 1727. D. suddenly Jan. 29, 1730.

**Peter III., Feodorovitch**, b. at Kiel, in Holstein, Feb. 21, 1728, a son of Peter the Great's daughter Anna, who had married a duke of Holstein; was designated as heir to the Rus. crown in 1742 by his aunt, the empress Elizabeth; married, in 1745, Princess Catharine of Anhalt-Zerbst, afterward Catharine II.; ascended the throne Jan. 5, 1762, and was deposed and strangled July 8, same yr.

**Peterborough**, Hillsborough co., N. H., on R. R. and Contoocook River. Pop. tp. 1870, 2296; 1880, 3206.

**Peterborough** (CHARLES MORDAUNT), EARL OF, b. in Eng. about 1658, was a son of Lord Mordaunt of Reigate, Viscount Avalon, to which titles he succeeded 1675; served in boyhood in the navy against the Barbary corsairs in the Mediterranean; was engaged under Admirals Torrington and Narborough in the expedition against Algiers 1678-79; exchanged into the army; took part in the defence of Tangier against the Moors 1680; was an opponent of the govts. of Charles II. and James II. in the House of Lords; indulged in a lavish prodigality, which involved him in debt and made it expedient for him to retire to Hol. 1686; used every opportunity of inciting William, prince of Orange, to undertake the overthrow of James; accompanied that prince in his Eng. campaign 1688; became first lord com. of the treas., and was created earl of Monmouth Apr. 1689; soon found himself in conflict with his ministerial colleagues and with the king through his ardent Whiggism; retired from office Jan. 1690; served under William in Flanders 1691; succeeded in 1697 to the earldom of Peterborough; became privy councillor Mar. 1705; obtained the command of the land-forces sent to the aid of the archduke Charles of Aus. in asserting his claim to the Sp. crown; sailed May 1705; took on board the archduke at Lisbon; occupied Valencia without resistance; took the citadel of Monjuich by a night assault and captured Barcelona; overran Catalonia, Aragon, and Valencia with the greatest rapidity, and defended Barcelona against the army of Philip V. (1706), but resigned in 1707. Employed for some yrs. in diplomatic posts, he became gov. of Minorca 1713, sided with the Tories during the last yrs. of Anne, and became gen. of the marine forces of G. Brit. 1722. D. at Lisbon Oct. 25, 1735.

PORTER C. BLISS.

**Peter, Epistle of St., The First**, one of the catholic or gen. Epistles, was written from "Babylon" about 64 A. D.—PETER, EPISTLE OF ST. THE SECOND, has suffered more from doubts as to its authenticity than any other book of the N. T.

**Peter the Hermit**, b. at Amiens in the middle of the 11th century, was ed. at Paris and in It.; served in the army in Flanders, but gave up the military career and married; became a monk after the death of his wife, and finally a hermit; made in 1093 a pilgrimage to Jerusalem, and began immediately on his return to Europe to preach a gen. war for the delivery of the Holy Sepulchre. A crusade was actually determined upon by the Council of Clermont in 1095. P. himself led the first army toward the Holy Land—an undisciplined and disorderly throng. After unspeakable sufferings they were routed and massacred at Nice by Sultan Solymán. Next yr. an army, comprising the flower of European chivalry, undertook the second Crusade, under the command of Godfrey of Bouillon. P. accompanied also this expedition, and after the conquest of Jerusalem in 1099 he preached to the crusaders on the Mount of Olives. Shortly after he retired to Huy in Belg., where he founded a monastery, and d. July 7, 1115.

**Peterhof**, an imperial palace in the govt. of St. Petersburg, Russ., on the Bay of Cronstadt, was built by Peter the Great. A small town has grown up around it.

**Petermann** (August), b. at Bleicherode, in Prussian Sax., Apr. 18, 1822, was ed. in the gymnasium of neighboring Nordhausen, and entered in 1839 the geographical inst. of Prof. Berghaus at Potsdam. In 1845 he went to Edinburgh to superintend the Eng. edition of the *Physical Atlas*, and in 1847 to Lond., where he became a member of the Royal Geographical Society, and contributed a number of geographical essays and Articles to the *Athenaeum*, *Encyclopaedia Britannica*, etc. In 1854 he returned to Ger. as director of Justus Perthes' geographical inst. in Gotha, and next yr. began the publication of his celebrated *Mittheilungen*. Practically P. interested himself in several Afr. and Arctic expeditions. D. Sept. 27, 1878.

**Peters** (ABRAHAM), D. D., b. at Wentworth, N. H., Sept. 19, 1793, grad. at Dartmouth 1816, at Princeton Theological Sem. 1819; was pastor of a Congl. ch. at Bennington, Vt., from 1820 until 1825, when he became sec. of the Domestic Missionary Society; was the first sec. of the Amer. Home Missionary Society, holding that position until 1837;



became in 1838 ed. of the *Amer. Biblical Repository*; was prof. of pastoral theol. in Union Sem., New York, 1842-44, pastor of a ch. at Williamstown, Mass., 1844-57; wrote several theological and polemical treatises and a vol. of poems. D. May 18, 1869.

**Peters** (CHRISTIAN HENRY FREDERICK), Ph. D., b. at Coldenbüttel, Ger., Sept. 19, 1813, grad. at the Univ. of Berlin; travelled for several yrs. in It. and the E.; engaged in scientific researches, after which he settled in the U. S.; was employed upon the Coast Survey; became prof. of math. and astron. at Hamilton Coll., 1858, where he took charge of the Litchfield Astronomical Observatory; made extensive investigations concerning comets and asteroids, having discovered more than 30 of the latter bodies; catalogued 16,000 zodiacal stars and recorded over 20,000 solar spots. Under the auspices of the regents of the Univ. of the State of N. Y. he determined the exact lon. of several points within that State, especially upon the W. boundary; took a prominent part in the observation of the total solar eclipse of Aug. 7, 1869, at Des Moines, Ia.; was chief of the party sent by the U. S. govt. to New Zealand to observe the transit of Venus of Dec. 9, 1874, and was the only observer on that island who had complete success.

**Peters** (RICHARD), b. at Blockley (now part of Phila.), Pa., Aug. 22, 1744; became a lawyer; was a capt. in the Revolution; sec. to the board of war 1776-81; was in Cong. 1782-83; U. S. dist. judge 1789-1828; was one of the first Amer. farmers to use gypsum, upon the valuable qualities of which he pub. a memoir; author of 2 vols. of *Admiralty Decisions*. D. Aug. 21, 1828.

**Peters** (SAMUEL ANDREW), D. D., LL.D., b. at Hebron, Conn., Dec. 12, 1735, grad. at Yale 1757; became Ch. of Eng. minister at Hartford; was compelled to flee to Eng. as a Tory in 1774, and his property was confiscated; pub. *A Gen. Hist. of Conn.*, a satire on his native State, which was severely denounced in the U. S. He was chosen bp. of Vt. in 1794, but the abb. of Canterbury refused him consecration; returned to the U. S. in 1805, and in 1817 endeavored to get possession of a tract of land in what is now Minnesota. D. Apr. 19, 1826.

**Petersburg**, R. R. junc., cap. of Menard co., Ill., 30 m. N. W. of Springfield, has deposits of coal, flouring mills, and good water-power. Pop. 1870, 1792; 1880, 2332.

**Petersburg**, city, R. R. centre, and port of entry of Dinwiddie co., Va., 23 m. S. of Richmond, on the S. bank of Appomattox River, 12 m. above its mouth, near the falls which constitute the head of tide-water and of navigation for large vessels, and supply abundant water-power. Above the falls the Appomattox is navigable more than 100 m. for flat-boats. P. is picturesquely situated on the declivities of a hill sloping gradually to the river-bank, affording natural drainage, and has a beautiful public park called Poplar Lawn. It has a large trade in tobacco, flour, cotton, etc. The heroic defence of P. during the closing scenes of the c. war rendered it memorable as the "last citadel of the Confederacy." The Army of the Potomac, under Gen. Grant, being induced by the result of the second battle of Cold Harbor to abandon its advance upon Richmond by the line of the Chickahominy, crossed the James River below City Point June 12, 1864, and made formidable assaults upon P. June 15 and 16, which were repulsed with a loss, as stated by Gen. Grant, of 10,268 men, after which he proceeded to invest the city. The actual siege began June 19, after which the Weldon R. R. was torn up by the U. S. cav., and an attempt was made to isolate the city from its supplies. Mines were constructed and exploded on an extensive scale, and the "bloody battle of the crater," July 30, was but one of a series of unsuccessful attempts to take the city by storm. The siege was prolonged until Apr. 3, 1865, when a week of bombardment and active engagements, including Sheridan's success at Five Forks, determined Gen. Lee to evacuate the city, and his surrender at Appomattox 6 days later terminated the war. Pop. 1870, 18,950; 1880, 21,656. [From orig. art. in *J. s. Univ. Cyc.*, by Hon. ROGER A. PRYOR.]

**Peters' Comet**, so called because the elements of its orbit were first determined by Prof. C. H. F. Peters, director of the Litchfield Observatory at Clinton, N. Y. Of the 14 ascertained periodic comets whose mean distance from the sun is less than that of Saturn, this has the greatest distance and the longest period, Pigott's comet being the next. Its motion is direct; mean distance from the sun, 6.3206; eccentricity of orbit, 0.8464; inclination of orbit, 13° 2' 14"; period of revolution, 15,990 yrs.

**Petersen** (CLEMENS), b. in the island of Seeland, Den., Oct. 2, 1834, studied theol. and philos. at the Univ. of Copenhagen; had charge of the critical dept. of the prin. Dan. paper in that city 1853-69; lectured on lit. and art.; wrote *On the Performance of the Gr. Tragedy and The Contest between the Old and the New in Dan. Lit.* on the Appearance of *Ehlersdager*, pub. by the Literary Society of Copenhagen; came to New York in 1869, and has been a contributor to the *Atlantic Galaxy*, and other periodicals. He was one of the assistant eds. of *J. s. Univ. Cyc.*

**Peter's Pence**, or **Romescot**, an anc. tax for the benefit of the pope. P. P. was paid the pope, with some interruptions, until 1534, when, during the reign of Henry VIII., it was finally abolished. The levy of P. P. was attempted in various other countries at different times. In 1848 the attempt was made to renew the contribution of P. P. in every part of the Ch., and since that time the pope has derived a good part of his revenue from this source.

**Peter's, St., Church**, at Rome, the largest cathedral in the world, consists of a Lat. cross 613 ft. long and 450 ft. across the transept, surmounted by a dome which rises 434½ ft. above the pavement, with a diameter of 195½ ft. The façade is 368 ft. long and 145 ft. high. The building was commenced under Pope Nicholas V., after a plan by Rossellini, in 1450. Under Julius II. Bramante prepared a new plan, which was followed out in the main. The ch. was consecrated by Urban VIII. Nov. 18, 1626.

**Peterwardein**, town of Aus., the cap. of the Slavono-Servian military frontier, on the Danube, is one of the strongest fortresses of the Aus. empire.

**Pet'igru** (JAMES LOUIS), b. in Abbeville co., S. C., May 10, 1789, grad. at Columbia Coll., S. C., in 1809; admitted to the bar in 1812; went to Charleston, S. C., and became atty.-gen. of the State, though he was a very decided adherent to the principles of the Federal party under the elder Adams, in opposition to those taught by the disciples of the school of Mr. Jefferson, which then constituted the gen. creed of S. C. In the days of nullification he was the acknowledged leader of the U. party in the State. In 1860 he was strongly opposed to the doctrine of secession, but yielded a quiet obedience to the ordinances and laws of his State. The great work of his life was the codification of the laws of S. C. D. in Charleston Mar. 9, 1863. A. H. STEPHENS.

**Pétion**, pé-te-ôn' (ANNE ALEXANDRE Sabes), b. at Port-au-Prince, Hayti, Apr. 2, 1770, was a quadroon; was ed. in the military school at Paris; entered the Fr. army; joined the Haytian rebellion, and strove to protect the whites of the island. In 1799 he abandoned the cause of Toussaint; re-entered the Fr. service as col., serving in Hayti, but the cruelties of Leclerc led him in 1802 to head a new revolt against the Fr. He finally became the leader of the mulatto party against the blacks, and in 1807 P. was declared pres. of Hayti. But, impeded in his patriotic plans by the almost savage condition of his people, P. became insane, and starved himself to death. D. Mar. 29, 1818.

**Petition**, pe-tish'un [Lat. *petitio*], a representation of a grievance for which the ordinary judiciary courts can give no redress, accompanied with a supplication for the relief by legislation of said grievance, addressed to an authority capable of granting it. In all free countries the right of P. is considered a most valuable right. In the Eng. const. it is of old standing.

**Petőfi** (SÁNDOR), b. at Kun-Szent-Miklos, in Little Cumania, Hungary, in humble circumstances; was baptized at Kiskörös Jan. 1, 1823, and received a very poor education, growing up as a private soldier and as a strolling actor. Nevertheless, as early as 1843 his numerous songs had attracted so much attention that he was enabled to take a place in the young lit. whose brightest ornament he soon became. In 1848 it was he and his song, "Now or Never," which gave the first impulse to the Hungarian rising. In the following yr. he fought in the army as aide-de-camp to Gen. Bem, and in the encounter at Szegesvár, July 31, 1849, he disappeared.

**Petosekey**, on R. R. and Lake Mich., Emmet co., Mich. Pop. 1880, 1815.

**Petra** [Gr. Πέτρα, "rock"], the Selah of 2 Kings xiv. 7, taken from the Edomites by Amaziab (839-810 B. C.), in the hands of the Moabites about 700 B. C., and the cap. of the Nabatheans (descendants of Nebaioth, the eldest son of Ishmael) about 300 B. C., when the Grs. first knew it as Petra. A good description of the ruins may be found in Robinson's *Biblical Researches*. The present name of the little valley is *Wady Musa*, about 28 hours N. E. of Akabah, the E. head of the Red Sea. The city, shut in by cliffs from 150 to 300 ft. high, occupied an area of about ¼ m. square. A stream still flows through the valley. The ruins of tombs, a theatre, and perhaps a temple are exceedingly picturesque.

**Petrarch**, pé'trark [It. *Petrarca*], (FRANCESCO), b. at Arezzo July 20, 1304, of an exiled Florentine family; ed. at Pisa 1312, Avignon 1313, and Carpentras 1315, and studied law at Montpellier 1319-23 and Bologna 1323-26. From 1327 to 1353 his residence was principally at Avignon and in the neighboring valley of Vaucluse, though he made numerous journeys in Sp., Fr., Ger., and It., both for literary purposes and on diplomatic missions. In 1353 he returned to It., where he resided first at Venice to 1370, and then at Arqua, near Padua, where he d. July 18, 1374. But long before he left Avignon he had acquired great fame as the first poet and scholar of the age. Apr. 18, 1341, he was crowned as *poeta laureatus* at the Capitol in Rome; and that movement in European civilization which is characterized as the revival of letters received one of its most powerful impulses from P. He wrote both Lat. and It. poetry; all his prose writings are in Lat. But his *Africa*, a Lat. epic on the Punic war, procured for him the laurel crown, while his *Rime*, his sonnets to Laura, in our time make him admired as one of the greatest lyric poets that ever lived.

**Petr'el** [from *Peter*, because they were believed to walk, like St. Peter, on the waves], a name applied to various species of the family Procellariidae, and to some extent conflicting with the names Fulmar and Mother Carey's Chickens.

**Petrifactions**. See PALEONTOLOGY.

**Petroleum**, Naphtha, Mineral Oil, Kerosene, Coal Oil, Shale Oil, Photogen, Solar Oil, etc., is an inflammable liquid which exudes from the earth in various parts of the world.

**History**.—Although P. has been known from time immemorial, and has been collected in considerable quantities in various parts of the world for ages, it was not until Amer. enterprise in 1859 successfully bored an artesian well for the express purpose of procuring oil from the rocky strata below, that this cheap and beautiful illuminating oil became an important article of commerce. It is impossible to go back to the time when P. was first discovered. The earliest evidence of the use of it is found in the ruins of Nineveh and Babylon. In building both of those cities an asphaltic mortar was employed, the asphalt for which was a partially evaporated P. Herodotus, 500 yrs. before Christ, spoke of the oil-wells of Zante, and Pliny and Dioscorides described the oil of Aggrigentum, which was used in lamps under the name of "Sicilian oil." In one of the Ionian Islands there is a spring which has yielded P. more than 2000 yrs. The wells of Amlano, on the banks of the Taro, formerly supplied oil for lighting the city of Genoa. In Per., near the Caspian Sea at Baku, numerous springs of P. have been known from the earliest times. The springs of Rangoon, on the



Irrawaddi, have been worked for ages. The Amer. Indians collected P. which was sold for various purposes under the name of Seneca oil. But it seems probable now that, before the Indians, the race of people who worked the copper deposits of Lake Superior and lead ores of Lexington, Ky., and built the mounds in the W. States, also dug numerous wells in Pa., O., and Canada to collect the oil which flowed into them. One of these, at Titusville, was found after it was cleared out to have been 27 ft. deep and 5 or 6 ft. in diameter, and to be cribbed up with logs to the top. In 1819 oil was accidentally obtained in boring 2 salt-wells on Muskingum River, O. In 1829 a flowing well was accidentally obtained at Burkesville, Ky. As early as 1836 from 50 to 100 barrels of P. were collected annually in the valley of the Kanawha and sold as a medicine. It was not, however, till oil from coal and shale had been successfully introduced, with lamps specially adapted for this class of oils, that attention was directed to the P. springs as likely to furnish a cheap supply of material. In the U. S., as early as 1850, Luther Atwood experimented on this class of oils, and succeeded in perfecting his "coup oil" made from coal-tar. The first factory established in the U. S. was that of the Kerosene Oil Co., built at Newtown Creek in 1854. In 1855 or 1856 the Breckenridge coal of Ky. was used as a material for making oil. Trinidad pitch, chapopot from Cuba, candle-tar, menhaden oil, and various other materials were used for making this oil, but it was found to be more economical to import the boghead coal from Scot. than to use the cheaper but poorer materials found in this country. The only exception to this statement is the albertite of N. S. The industry rapidly expanded, and on Jan. 1, 1860, there were 40 coal-oil factories on the Atlantic border, all of which used the Scotch boghead coal, with the exception of two, where albertite was employed. Besides these there were 25 factories in O.

In 1858 Col. G. L. Drake, the supt. of the company, began to bore, on Oil Creek, Venango co., Pa., an artesian well for oil. When, on Aug. 28, 1859, he "struck oil" at a depth of 71 ft., and obtained 400 gals. of oil a day, which sold for 55 cents per gal., there was a great excitement. Every one who could leave his home rushed to the oil-region, a forest of derricks soon appeared in the valley, and numerous wells were bored. Wells were also bored in W. Va., O., etc. No mining enterprise had ever offered such sudden fortunes. A well costing a few thousand dollars might yield, if successful, from 100 to 2000 barrels of oil daily, with no expense for pumping. When the P. of S. Cal. first attracted attention, it was thought that the deposit would far exceed in quantity that of Pa. Before the wells were bored on Oil Creek there was very little oil to be seen; here and there a little seum on the pools of water was the only indication of oil. A few artesian borings were made, but it appears that this research was not wisely conducted. Several tunnels run into the hills across the broken and upturned strata of Tertiary rocks were, however, fruitful of considerable quantities of oil of a quality which warranted its manufacture, and for a time excellent oil of Cal. manufacture was produced and sold in San Francisco in successful competition with the Pa. P. But the price of the raw material fell at the Pa. wells from \$8, and even \$12, per barrel (40 gals.) in 1863, to a merely nominal price in 1865, and this fact has suspended indefinitely the time when the oil-producing regions of Cal. can be successfully developed.

**Geographical Distribution.**—By far the most extensive deposits of P. occur in the N. W. corner of Pa., on and near Oil Creek, Venango co., and in the vicinity of Bradford city, McKean co. These parts of Pa. furnish more than  $\frac{3}{4}$  of all the P. of commerce. Other dists. are the Mecca, Grafton, Vermilion, and Mapen Valley in O.; Smith's Ferry, on the boundary between O., W. Va., and Pa.; Parkersburg, W. Va.; Glasgow and Burkesville, Ky.; Ennisville and Gaspe, Canada; Santa Barbara and Humboldt cos. in Cal. The island of Trinidad furnishes in large quantities thick asphalt. Large deposits of P. occur on the banks of the Caspian, at Baku; in Burmah, at Rangoon; on the Taro, in It.; in the Caucasus; and especially in the Dutch E. I. Limited deposits occur in Mex., San Domingo, Peru, Chili, Japan, Ger., etc.

**Geological Position.**—P. occurs in rocks of nearly all geological ages, from the Lower Silurian to the present epoch. It is associated with shales and sandstones, and often permeates limestones. It often collects in cavities along gentle anticlines, whence it issues in jets when an outlet is made by boring.

**Oil-wells** are drilled to the proper depth with the aid of the derrick and the same drilling-tools which are used in boring for water. In some instances the well is a flowing one, but in most cases the oil must be pumped. It is received in large wrought-iron tanks, which are often sunk in the ground and covered with gravel to diminish the danger from fire. The oil is then transported to the refiners in barrels, glued to make them tight, in tank-barges, tank-cars, or through lines of iron pipe laid under ground, often for miles, by the pipe companies.

**The properties of petroleum** vary at different localities. Pa. P. is generally of a dark greenish-brown color; thin, of a somewhat offensive odor, varying in specific gravity from 0.830 to 0.782, or from 40° to 45° Baumé. Oils, differing from that which occurs so abundantly at Oil Creek, Pa., are obtained in more limited quantities at various localities. The oil passes by insensible gradations into thick maltha and then into semi solid or solid asphalt, which is an oxidized compound.

**Composition.**—P. is a mixture of a great number of hydrocarbons, compounds of carbon and hydrogen, the average proportion of the 2 elements in the mixture being, carbon 85, hydrogen 15. These hydrocarbons differ from each other in volatility. Some are so volatile as to evaporate rapidly at ordinary temperatures, making it dangerous to approach an open tank of P. with a flame; others are much less volatile, some requiring a temperature of 700° to 800° F. to vap-

orize them. The light volatile oils ignite on the approach of a burning match, no matter how cold they may be, while the heavy, less volatile oils can only be ignited when they are heated above the ordinary temperature of the air. Neither of the groups has been fully studied, and the exact constitution of the heavier portions of P. has yet to be determined.

**Alteration** of P. occurs in 2 ways: (1) by the evaporation of the lighter portions, by which the heavier, thicker constituents alone are left; (2) by oxidation, by which asphalts and bitumens are produced. Generally, both operations occur simultaneously, the various malthas, asphalts, albertite, grahamite, bitumen, etc., being the final results.

**The origin of petroleum** is generally attributed to the decomposition of vegetable and animal remains, diffused in a finely divided condition in fine mud or clay. The theory which attributed P. to a process of distillation from coal, etc. is untenable, as there is no evidence of heat to be found in the oil-bearing strata.

**Refining Petroleum.**—The dark, offensive crude P. is subjected to a process of refining in order to separate from the portion designed for burning in lamps—(1) the lighter oils, naphthas, which are very inflammable, and, owing to their volatility, evolve vapors at ordinary temperatures, which, when mixed with the proper proportions of air, constitute explosive mixtures; (2) the heavier oils, which do not burn well in lamps, but are excellent lubricators; (3) the tarry matter, which would crust the wicks of the lamps; (4) the coloring-matters; (5) the compounds which cause the offensive odors of the crude oil. Refining, as usually practised, involves 3 successive operations: (1) fractional distillation; (2) agitation with sulphuric acid; (3) agitation with hydrates of soda or ammonia.

**Fractional Distillation.**—The apparatus employed consists of an iron still, connected with a coil or worm of wrought-iron pipe, which is submerged in a tank of water for the purpose of cooling it. When the still has been filled with crude oil the fire is lighted beneath it, and soon the oil begins to boil. Soon the vapors begin to condense in the worm, and a stream of oil trickles from the far end of the coil into the receiving-tank. The first oils obtained have a gravity of about 35° Baumé. In most establishments it is customary to run the product into one tank till the gravity reaches 65° B. to 50° B.; the product, known as *crude naphtha*, being subsequently separated by redistillation into (1) *gasoline*, the lightest, condensed in worm by cold water, used in "air-gas machines" and gas "carbonizers;" (2) *naphtha*, for oil-cloths, cleaning, etc., so called "safety oil," "Danforth's oil," "American safety gas," etc., for adulterating kerosene, cleaning oil-wells, etc.; (3) *benzine*, for paints and varnishes. By cooling the condensing-worm with ice and salt, the very volatile liquid "rhigolene" is obtained, which is used as an anæsthetic. By the use of a condensing-pump a still more volatile liquid, "cymogene," is obtained, which has been used in ice-machines. When the stream of oil runs from the coil with a gravity from 65° to 50° B., it is diverted into the *kerosene*-tank, and continues to run into this receiver till the gravity reaches about 38° B., or until the color deepens to a yellow. This second fraction is the burning oil or *kerosene*, and is subsequently purified by sulphuric acid and alkali. After taking off the burning oil the stream is directed to the *paraffine* oil tanks, and continues to run there till nothing remains in the still save coke. The last products have a gravity of about 25° B. This oil is chilled to crystallize the paraffine, and is then folded in cloths and exposed to pressure to squeeze out the oil. The solid paraffine is purified by repeatedly melting it in naphtha, chilling, and pressing; the oil separated from it is purified with sulphuric acid and alkali, and used for lubricating purposes.

**Treatment with Acid.**—After the oil has been fractionated it is subjected to the action of sulphuric acid to remove a little color, but more particularly to *sweeten* it—i. e. to remove the disagreeable odor which it still retains. About 2 per cent., by measure, of acid, is poured into the oil, the mixture is thoroughly agitated, and on standing a dark, tarry sediment separates; this is removed, and the clear oil is then agitated with water, then with alkali, either caustic soda or ammonia. This neutralizes the last traces of acid, and, after removal by water, leaves the oil "sweet."

**The kerosene** or burning oil is the most important product of P. It is a mixture of many hydrocarbons. It has the consistency of the essential oils, a burning taste, and aromatic odor. When properly refined it is nearly colorless by transmitted light, and slightly fluorescent by reflected light. Its density should be about 43° B., or 0.810. At ordinary temperatures it should extinguish a match as readily as water. When heated it should not evolve an inflammable vapor below 110° F., or, better, 120° F., and should not take fire below 125° to 140° F. As the temperature in a burning lamp rarely exceeds 100° F., such an oil would be safe. It would produce no vapors to mix with the air in the lamp and make an explosive mixture; and if the lamp should be overturned or broken, the oil would not take fire.

**Why most of the Kerosene in the Market is Unsafe.**—The crude naphtha sells at from 2 to 5 cents per gal., while the refined P. or kerosene sells for 10 to 15 cents. As great competition exists among the refiners, there is a strong inducement to turn the heavier portions of the naphtha into the kerosene-tank, so as to get for it the price of kerosene. They change the direction of the stream from the coil of the still when it reaches 65° to 63° B., instead of waiting till it reaches 58°. Thus the inflammable volatile naphtha or benzene is allowed to run into the kerosene, rendering the whole highly dangerous.

**Testing kerosene** is a very simple operation. It is merely ascertaining the temperature at which the oil evolves an inflammable vapor, the "flashing-point," and the temperature at which the oil takes fire, the "burning point." Although the operation is simple, results may yet in ignorant



hands deviate 30° or 30° from the truth, while in skillful hands 4° or 5° will cover the most divergent results. (1) A suitable apparatus is required, consisting of a cup to hold the oil, surrounded by a vessel of water, which is heated by a small spirit-lamp: the bulb of a thermometer is immersed in the oil. (2) The oil should be heated very slowly; the temperature should not rise faster than 2° per minute. Whenever the test is to be used in a prosecution against the dealer, it should be duplicated with special care. The length of time occupied depends, of course, on the size of the flame beneath the tester. (3) The thermometer should not descend far below the surface of the oil; if the bulb is well covered it is sufficient. There is often a difference of a number of degrees in the temperature of the oil at different depths; it is well, therefore, to stir the oil before applying the flame. (4) Care should be taken, in making the test, to use a very small flame for trying the oil. This flame should merely be fitted quickly across the surface after noting the thermometer.

**The Standard of Quality.**—There are 2 distinct tests for oil—(1) the *flashing test*, (2) the *burning test*. The flashing test determines the flashing-point of the oil, or the lowest temperature at which it gives off an inflammable vapor. The burning test fixes the burning-point of the oil, or the lowest temperature at which it takes fire. The burning-point of an oil is from 10° to 50° F. higher than the flashing-point. The 2 points are quite independent of each other; the flashing-point depends upon the amount of the most volatile constituents present—naphtha, etc.—while the burning-point depends upon the general character of the whole oil. One per cent. of naphtha will lower the flashing-point of an oil 10° without materially affecting the burning test. The burning test does not determine the real safety of the oil—that is, the absence of naphtha. The standard which has been generally adopted as a safe one fixes the flashing-point at 100° F. or higher, and the burning-point at 110° or higher. What flashing-point should be selected as a standard of safety is a question on which there is some difference of opinion. The higher the flashing-point the safer the oil. The flashing-point should be somewhat higher than the highest temperature the oil ever reaches in the lamps or cans. Our highest summer temperature does not far exceed 90° F., though a can of oil placed in the sun or near a fire might become much hotter. The point of 100° F. does not seem to be high enough to secure immunity from danger; 120° F. would not be too high a standard for safety, and its adoption would add but a few cents per gal. to the cost of the oil.

**Advantages of Petroleum.**—The great advantages of P., which led to so sudden a revolution in the system of artificial illumination all over the world, causing the old lamps designed for whale, sperm, and vegetable oils and for camphine to be thrown aside and to be replaced by the new lamps, are the cheapness of this oil, the brilliancy of the light, and the freedom of the flame from smoke. In addition to the advantages of economy, brilliancy, cleanliness, and absence of smoke, it should be mentioned that kerosene never freezes and never becomes rancid. The only real objection raised against kerosene is the danger arising from its inflammability and the combustible vapors which are evolved at ordinary temperatures by most of the oils in common use. But every refiner has it in his power to manufacture a safe oil at an expense of not over 3 to 5 cents per gal. more than it costs him to make the dangerous oil now generally sold, and the difference in the cost of the same amount of light when obtained from safe or unsafe oils, burned in flat-wick lamps, between "standard kerosene," which flashes at 115° F. and is safe, and common oil, which flashes at 80° F., is only  $\frac{1}{100}$  of a cent per hour, or 1 cent for 16 hours.

**Naphtha and Benzine under False Names.**—Processes have been patented and vendors have sold rights throughout the country for patented and secret processes for rendering gasoline, naphtha, and benzine non-explosive. Thus treated, these explosive oils, just as explosive as before the treatment, are sold throughout the country under trade names, such as "liquid gas," "aurora oil," "safety gas," "petroleum," "puroline," "black diamond," "septoline," "anchor oil," "sunlight non-explosive burning fluid," etc. These processes are not only totally ineffective, but they are ridiculous; roots, gums, barks, and salts are turned indiscriminately into the benzine, to leave it just as explosive as before. No wonder we have kerosene accidents, with agents scattered through the country selling county rights and teaching retail dealers how to make these murderous "non-explosive" oils. It is not possible to make gasoline, naphtha, or benzine safe by any addition that can be made to it. Nor is any oil safe that can be set on fire at the ordinary temperature of the air. Special lamps, some of them of very elegant design, have been introduced for burning the liquid gas (naphtha). They are all provided with a reservoir for the dangerous fluid, and a burner by which it is vaporized and burns like gas. The apathy of the public in regard to this matter is beyond comprehension. Nothing but the most stringent laws, making it a State-prison offence to mix naphtha and illuminating oil, or to sell any product of petroleum as an illuminating oil or fluid to be used in lamps, or to be burned except in air-gas machines, that will evolve an inflammable vapor below 100° F., or better, 120° F., will be effectual in remedying the evil. In case of an accident from the sale of oil below the standard, the seller should be compelled to pay all damage to property, and if a life is sacrificed should be punished for manslaughter. It should be made extremely hazardous to sell such oils.

**"Vapor" and other Naphtha Stoves** are contrivances for burning the cheap naphtha for warming and cooking. The naphtha, sold under various names for the purpose, flows from a reservoir at one side to the burner. These stoves are extremely dangerous, and often give rise to explosions and conflagrations.

**The so called Safety-Lamps.**—An indefinite number of safety-lamps have been patented with a view to make it possible to burn the explosive, inflammable naphthas without danger. No matter how well they realize the idea of protecting the oil they contain from explosion, they are treacherous friends. They allay one's fears of explosive oils, and the accident, which is always much more likely to occur outside than within the lamp, is just as likely to take place. The lamp is dropped and broken; it is filled while burning; the servant neglects to screw in the wick-tube; the oil-can is upset or left uncorked, or the servant uses the oil to kindle the fire. In some way fire gets to the vapor of oil and an explosion occurs. Even when the "safety lamp" has an ally in the form of a "safety-can," it fails to make naphtha safe. It is an axiom that no lamp is safe with dangerous oil, and every lamp is safe with safe oil.

**Petroleum as Fuel.**—Numerous efforts have been made to employ P. and the crude oils from coal, shale, etc. as fuel. The heating power of these oils is 2 or 3 times that of coal, and furnaces have been invented in which they can be readily and completely consumed under steam-boilers. But the practical difficulty is, after all, the cost of the P. (See *The Manufacture of Photogenic or Hydrocarbon Oils*, etc., T. ANTISELL; *Notes on the History of Petroleum or Rock Oil*, T. S. HUNT; *Petroleum and its Products*, A. NORMAN TATE; *Die Mineralöle*, OTTO BUCHNER.) C. F. CHANDLER.

**Petroleum and Naphtha Gas.** Many processes have been patented, and put in practice to a greater or less extent, for the preparation of illuminating gas from P. and its products, as well as from coal and shale oils. These processes involve either (1) simply charging atmospheric air with the vapors of the lighter portions of P., etc., gasoline, and using the mixture, *air-gas*; or (2) subjecting either of the above-mentioned materials to destructive distillation at or above a red heat, and thus converting them into permanent gases of high illuminating power, to be used either (a) alone, or (b) mixed with air or other gases. *Air-gas* is now extensively manufactured, generally on a small scale, for the lighting of dwellings, hotels, factories, etc. The introduction of P. gave a new impetus to this system of illumination by supplying gasoline in large quantities at about 25 cents per gal. Inventors at once turned their attention to the subject, and a great variety of "gas-machines" were soon patented. All consist, however, of at least (1) a contrivance for securing a current of air, "the blower," and (2) a vessel to hold the gasoline, "the generator," more or less complicated, so as to expose a very large quantity of liquid, either in shallow trays or on cotton wicking, shavings, etc. Some have in addition (3) arrangements for warming the generator to increase the evaporation. The evaporation of the gasoline lowers the temperature of the generator very rapidly if it is small, and the low temperature retards the evaporation. This difficulty is met by warming or by increasing the size and capacity of the generator. Air-gas requires burners with large openings specially constructed for it, and must be burned under a low pressure. If the current is too rapid, the flame is cooled too much and is readily extinguished.

Special precautions are necessary to make the use of these machines safe. Gasoline is such an inflammable liquid that it will take fire at any temperature, and is so volatile that it evolves a combustible vapor at all temperatures, which, mingling with the air, forms an explosive mixture. All danger can be obviated by placing the machine, or at least the generator which contains the gasoline, in a separate and carefully locked building or vault at a considerable distance (100 ft. from the building to be lighted).

**Gas from Petroleum, Etc. by Destructive Distillation.**—Permanent gas of high illuminating power can be readily obtained from P. and its products by exposing them to a red heat. There is but one condition necessary to accomplish this result; that is, the actual exposure of the oily vapors to a full red heat for a sufficient length of time, a few seconds only. The product may contain some condensable vapors, but after the separation of these there will remain a large percentage of rich permanent gases, consisting of marsh-gas, ethane, butane, etc., with olefines, acetylene, etc. The higher the temperature and the longer the exposure the simpler the products and the lower the illuminating power. The real difficulty is in regulating the temperature so as to secure a constant product. A deposit of carbon will be found in the retort, but this should not be so abundant as to cause inconvenience. Stratification could result in only 2 ways: (1) either by the heavier, richer gases settling from the lighter ones, or (2) from an irregular production due to variations in the heat, by which heavy gas is produced at one time and light gas at another. The first way is impossible, as gases never separate after they have once mixed. By the second method temporary stratification may occur, but a uniform mixture will be sure to result finally, as gases diffuse into each other, no matter how great the difference in their densities.

**Crude petroleum** is readily converted into gas by causing it to pass through a red-hot retort filled with fragments of coke, fire-brick, or similar porous body to increase surface, or fitted with tray-like iron plates. The material being free from sulphur, the gas requires little purification. Ten gals. of crude P. yield 1000 ft. of gas.

**Petroleum-residuum** may be used in place of crude P. *Crude shale and coal oils* give results similar to those obtained with P. *Cresote soda*, the refuse product obtained in purifying coal and shale oil with caustic soda, has been suggested as a cheap material for the manufacture of a rich gas. *Naphtha*, the cheapest and most volatile available product from P., is, however, the material which has found most favor as a substitute for coal. Numerous processes have been patented in the U. S., and some of them are now in use on a considerable scale. (1) The naphtha is passed alone, generally in vapor, through a red-hot retort, and converted into gas which is (a) used alone, (b) diluted with air, (c) added to



pure coal-gas as an enricher, (d) diluted with both air and coal-gas, (e) diluted with water-gas, a mixture of hydrogen and carbonic oxide, produced by passing steam over red-hot charcoal, coke, or anthracite, or by passing a mixture of naphtha-gas and steam through a red-hot retort; or (2) a portion of the coal-gas made in the ordinary way is passed through heated naphtha, and when loaded with its vapors is sent through a red-hot retort. All of these methods may be made to yield permanent gases of high illuminating power. Some can, however, be carried out with much more regularity and certainty than others.

C. F. CHANDLER.

**Petroleum, Geology of.** Petroleum is the common name for mineral oil, whatever its phys. characters or chemical composition. These vary greatly, some kinds being dark, viscid, and tar-like, others almost transparent, very fluid, and volatile. More generally P. has an oily consistence, is brown, green, or yellowish by reflected, often red by transmitted light, and has a strong, characteristic odor. It cannot be regarded as a mineral species, as it has no fixed formula of composition, but is a variable mixture of several substances, which differ much in their phys. characters and in the ratios of their constituents. The different varieties of P. form a continuous series of hydrocarbons, which begins with asphaltum, a hard, black solid, and ends with naphtha, an ethereal fluid. These, with water, carbonic acid, marsh-gas, etc., are the evolved products of a natural or spontaneous decomposition of organic tissue; lignite, peat, coal, anthracite, and graphite being the residual products. The diversity observable in P. is probably due in part to differences in the vegetable and animal matters from which they have been produced, and in part to changes they have suffered through evaporation and oxidation.

According to the theory of the present writer, P. where it occurs in nature should be associated with carbureted hydrogen, and be traceable to some deposit of organic matter; and such may probably be always found to be the case. P. shows itself at the surface flowing out, usually with water, from some subterranean source, and all *copious* springs of this description are found to be located at no great distance above some considerable mass of bituminous material. Where obtained in large quantities it is found in reservoirs of broken or porous strata, which overlie carbonaceous deposits. These open strata form great reservoirs that are filled with water, gas, and oil, and above is spread a sheet of impervious matter that serves as a cover. When by boring through this cover the reservoirs are tapped, either water, oil, or gas is forced out, according as the bottom, middle, or top of the reservoir is pierced. What are called fountain or flowing wells must be connected with subterranean reservoirs in such a way that the elasticity of the gas in some upper chambers forces out the oil. This is the structure of our most productive oil-districts; and something similar must exist wherever great accumulations of P. appear and where flowing wells are attainable.

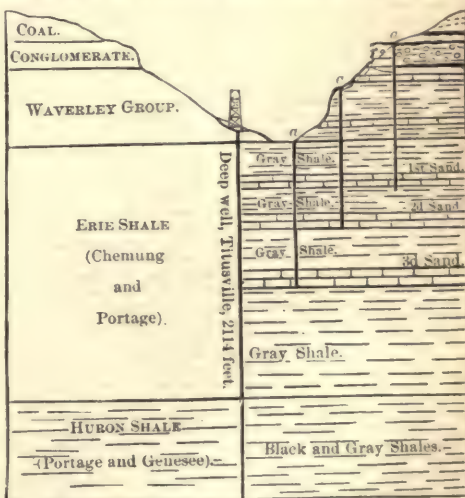
From these and other facts we learn that Petroleum is being constantly produced, and that the oil in any oil-dist. will not be exhausted until all the hydro-carbonaceous matter from which it comes is distilled. But it has been learned by experience that the enormous productiveness of some oil-wells (1000 to 3000 barrels per day) is short-lived, and also that the supply from any one oil-dist. may be so nearly exhausted that the current production will not pay its cost. Hence we may expect that at no distant day all the now productive and the yet-to-be-discovered oil-dists. — of which the number is unknown, but is probably small — will be practically, though not perfectly worked out, and P. cease to be one of the great staple products of the country. Fortunately, it has been demonstrated that the work nature is doing so slowly can be taken out of her hands, and be done artificially far more rapidly than and almost as cheaply as she does it. The Huron shale and other oil-producing rocks can be distilled so as to furnish oil at a cost not greater than double that now paid, and the supply obtainable from this source is practically inexhaustible. We may therefore congratulate ourselves that the present over-stimulated production and wasteful use of this valuable portion of our national estate is not so ruinous an extravagance as it at first sight would seem; for after this stock of the manufactured article shall be squandered by the heirs there will still remain a vast amount of raw material from which industry, and not speculation, will supply the wants of the people, and forever maintain a legitimate and flourishing business.

**Distribution of Petroleum.**—P. occurs at all geological horizons above the Eozoic system. The metamorphic rocks of this series and the later ones of N. Eng. contain graphite and anthracite, but the hydrocarbons have been entirely expelled from the vegetable tissue of which these are residues. In the later and unchanged sedimentary rocks P. is usually to be found flowing in greater or less quantity from every considerable mass of carbonaceous material. It seems, however, to be produced in the greatest abundance from bituminous shale, and it is probable that all the great accumulations of rock-oil are derived from strata of this character. In ascending the geological scale, the first oil-horizon is found in the upper part of the Lower Silurian series. Here the Utica shale is highly bituminous, and is the source of oil and gas springs over a large area. In N. Y. oil and gas issue from the Utica shale in many places, and they are here probably derived from sea-weeds and graptolites. At Collingwood, Canada, this formation is saturated with P., but it is here a bituminous, earthy limestone, filled with the remains of trilobites, and it doubtless owes much of its carbonaceous impregnation to the animal matter of these crustaceans. In the region about Burkesville, Ky., famous for its oil springs and flowing wells, the oil apparently emanates from strata of the age of the Utica shale, and is confined by sheets of impervious limestone which represent the Hudson River group. Though now "land-locked," and from its isolation neglected, the Cumberland oil-region is

probably capable of producing a large amount of P. In W. Canada, between Lake Erie and Lake Huron, is a district which from the quantity of oil it has produced is known as the Canada oil-region. The country is here low and level, and is underlaid by a thick sheet of clay. Beneath that, the surface-rocks are the Hamilton limestones and shales, smoothly planed off by glacial action. The oil obtained here has been mainly derived from the line of junction between the clay and rock, and so much had accumulated there that when the clay was pierced many thousand barrels of oil flowed from a single orifice. When these reservoirs were emptied the oil was found to issue in relatively small quantity from fissures in the rock below. The current supply in the shafts sunk was too small to be remunerative, and the wells bored, though yielding considerable oil, were on the whole not successful, and this oil-region has been practically abandoned. The oil of Canada is probably derived from 2 horizons—the Marcellus and Hamilton shales, and the underlying Collingwood shales, to which reference has already been made. This dist. lies in the line of the Cincinnati axis, and it is highly probable that the strata are slightly disturbed or broken in such a way as to favor the emission of oil, even from deep sources. The Canadian P. is nearly black in color, has a gravity of 36° to 43° Baumé, and a peculiar acrid and nauseous smell, probably in virtue of a small amount of sulphur it contains.

The next higher oil-horizon is by far the most productive one in this country. It lies in the Upper Devonian rocks, and is that in which all the oil-wells of Pa. are located. The geological structure of this dist. is as follows: The hills and table-lands are formed of patches of coal-measures, the conglomerate, and 300 to 400 ft. of Waverley shales. The streams generally cut through these strata and expose the Chemung. The wells bored in the valleys begin in the shales of the Chemung; those of the table-lands pass through the Waverley. The underlying Chemung and Upper Portage rocks are here composed of alternations of clay shale, with 3 or 4 bands of sandstone and conglomerate. The oil is found in the latter saturating the porous material and filling an extensive system of fissures which traverses them. These are records of slight disturbances which have affected the region, and which have shattered and opened the harder strata, while the shales—as is the constant habit of such rocks—have settled back into compact masses. That the P. of W. Pa. has not originated in the mechanical strata just mentioned is certain, as there neither is nor has been any constituent of this rock which could be transformed into it; and we must look below the reservoirs that contain it for its place of origin. We there find a great thickness of bituminous shales, which furnish all the conditions necessary for the solution of the problem. The carbonaceous beds referred to consist of the Marcellus, Genesee, and Gardeau black shales, of which the upper ones combine toward the W. and form in O. the Huron shale. This has the thickness of over 300 ft., all colored black by carbon, and containing 10 to 20 per cent. of combustible matter. That these black shales can and do produce P. is demonstrated by the facts that they have been extensively and successfully used in the artificial manufacture of oil, and that a series of gas and oil springs mark their line of outcrop all the way from Central N. Y. to Ala. It may also be said that all the most important gas springs and wells of the country are located in strata immediately overlying this great black shale formation, and from these in N. Y., Pa., and O. sufficient inflammable gas is daily escaping to light all our cities.

In N. E. O. the Waverley series contains a sheet of bitu-



Section of oil-bearing rocks on Oil Creek, Pa.: a, a, a, oil-wells, minous shale (Cleveland shale) from 20 to 60 ft. in thickness, from which a large amount of gas and oil is constantly escaping. These show themselves in gas and oil springs along its lines of outcrop, and in the complete saturation of the overlying Berea sandstone in several localities. Two of these—Mecca, Trumbull co., and Grafton, Lorain co.—are local oil-dists. At Mecca at least 1000 wells have been bored from 60 to 100 ft. deep, many of which have at times yielded considerable oil; but as the reservoir-rock had no imper-



vious cover over it, no great accumulation of oil had taken place in it, and the supply was soon exhausted. It has been discovered, however, that a slow but constant reproduction of P. is going on, and many of the wells have been successfully pumped for a few days each yr. for the last 10 yrs. The oil of this horizon is thick and heavy, and is used for lubricating machinery—a character which it probably owes to the fact that it has been exposed to evaporation, by which the lighter portions have been lost.

The oil-dist. which is next in importance to that of Pa. is that of W. Va. and S. E. O., in the vicinity of Parkersburg and Marietta. There the surface-rocks are the coal-measures, but a marked line of disturbance passes through this region, and there is very little doubt that the P. comes from a deeper source. The oil of W. Va. is generally green in color and of excellent quality. It is heavier than that of N. W. Pa., and much of it is used for lubricating purposes. Though the production of this dist. has greatly diminished, it still yields a large quantity of oil.

In the preceding notes the more important oil-regions of the valley of the Miss. have been enumerated, but there are others in the far West which demand a passing notice. The Palaeozoic rocks W. of the Miss. contain little carbonaceous matter, and so far as known no P. flows from them. In the Cretaceous and Tertiary formations, however, are beds of lignite and sheets of bituminous shale, which rival in extent and thickness those of the E. States, and we also find there numerous springs of P. In W. Col. and E. Ut. is a region where P. mineral wax, and asphalt occur in considerable quantities. Some P. is also obtained on the upper Ark., south of Denver, Col. In S. Cal. the Cretaceous and Tertiary rocks are very extensively saturated with oil, tar, and pitch, but no great quantity of oil has been obtained there, as the structure of the region has not been favorable to its accumulation. The asphalt derived from it exists in enormous quantities and has considerable economic value.

Although the oil-wells of Amer. have had no rival in productivity, they are not entirely without parallel in the hist. of the world. In the Old World P. has been known and used for ages. The Chl. have obtained it from wells bored much like ours. On the banks of the Irrawaddi in India a large number of oil-wells have yielded P. for several hundred yrs., and it was sold in the markets of Europe under the name of "Rangoon petroleum" long before it was known that any such thing existed on this continent. At Baku, on the shores of the Caspian, oil has been collected in large quantities during many centuries, and wells recently sunk there, according to the Amer. method, are already producing very largely. The formation in which the oil occurs on the plain and promontory of Baku is Miocene-Tertiary, but this is underlain by Jurassic rocks which contain beds of coal. At various localities in It. oil has been found in Tertiary strata, and the towns of Parma and Amiano were lighted with it long before it was used in Amer. Perhaps the most remarkable oil-spring known is the "Pitch Lake" on Trinidad Island. This is really a P. lake, of which the shores are formed by asphalt produced by its evaporation and oxidation. J. S. NEWBERRY.

**Petrolia**, on R. R., in Fairview tp., N. E. part of Butler co., Pa. Pop. 1880, 1186.

**Petronius Arbiter**, the author of a Lat. romance, *Satyricon*, which in a half-comical manner gives a description of the vices and debauchery of Rom. society under the first emp., now in prose, now in verse, sometimes witty, generally obscene. Of the work, which seems to have been very large, only fragments are still extant. One of these, well known under the name of the *Supper of Trimalchio*, was first discovered in the middle of the 17th century. A most minute and thorough collation of the MSS. was made by Charles Beck (Cambridge, 1863). Of the author of this book nothing is known. Beck ("The Age of Petronius Arbiter," *Proc. Amer. Acad.*, 1856) puts the work, on historical and linguistic grounds, between 6 and 34 A. D.

**Petropaulovski**, the official Rus. name of the peninsula of Kamchatka, and the name of its capital.

**Petigrew** (CHARLES), D. D., b. probably in Pa. about 1750, removed with his family to N. C.; became a teacher at Edenton 1773; was ordained in the P. E. Ch. at Lond. 1775; was chosen first bp. of N. C. 1794; took a leading part in establishing the Univ. of N. C. D. 1807.

**Petty** (SIR WILLIAM), b. at Romsey, Hampshire, Eng., May 16, 1623, was the son of a clothier; ed. in the school of his native town and at Caen in Fr.; was for a time an officer in the Eng. navy; afterward studied med. at Paris; obtained from Parl. in 1647 a patent for his invention of a copying-machine; practised med. at Ox., where he became assistant to the prof. of anat.; obtained a fellowship at Brasenose Coll. 1648; chosen prof. of anat. in the Univ. of Ox. 1650, prof. of med. in Gresham Coll. 1651; became phys. to the army in Ire. and sec. to Henry Cromwell 1652; was made surveyor of forfeited lands in Ire.; entered Parl. 1653, and at the Restoration was knighted and made surveyor-gen. of Ire. He was one of the founders of the Royal Society; made several curious inventions and discoveries in physics, and was author of *The Political Anat. of Ire.*, *Tazee and Contributions, Political Arith.*, a treatise on money entitled *Quantulumcunque*, D. Dec. 16, 1687.

**Petunia** [from the Brazilian name of tobacco, *petun*], a genus of annual, biennial, or perennial plants of the order Solanaceae, natives of the hot regions of Amer. The *P. nyctaginiflora* and *violacea* have been for 50 yrs. cultivated in European and N. Amer. gardens, and have afforded numerous hybrid and other varieties, some of which are very beautiful.

**Peutinger** (KONRAD), b. at Augsburg Oct. 14, 1465, d. Dec. 24, 1547; wrote several works on antiquities, and was the possessor of the so called *Tabula Peutingeriana*, a map of the military roads of the W. Rom. empire from the 4th century. It was first discovered in a Benedictine monastery at Tegernsee, and remained there for nearly 2 centuries in the

family of Peutinger, but was bought by Prince Eugene, who presented it to the imperial library of Vienna, where it is now preserved.

**Pew** [Old Fr. *puî*], a seat in a ch. inclosed and separated from others, dating from the 15th century. In Eng. a right to a pew may be held as appurtenant to a manor. In the U. S. different customs prevail in different chs. Occasionally pews of a ch. are free, but more frequently they are leased for a yr. at a specified rent. In the last instance the right to a pew is property.

**Pewee**. See PHOEBE BIRD.

**Peyton** (JOHN LEWIS). See APPENDIX.

**Phædra**, in Gr. legend, the wife of Theseus and the step-mother of Hippolytus, with whom she fell desperately in love. When he refused to comply with her wishes, she accused him to his father of an attempt upon her honor, but when she heard that he had perished in consequence of his father's wrath, she committed suicide.

**Phædrus**, b. in Thracia or Macedonia, was brought to Rome as a slave, but was made free by Augustus, and became famous by his 5 books of fables, most of which are verifications of the fables of Æsop.

**Phæthon**, in Gr. mythology, the son of Helios, obtained permission of his father to drive the chariot of the sun across the heavens, but the horses ran off, and the chariot was just about settling the earth on fire when Zeus struck down the driver with a thunderbolt. He fell into the river Eridanus (Po), and his sisters, the Heliades, who stood mourning by his corpse, were transformed into poplars and their tears into amber.

**Phalanx**, *phalanks* [Gr. *φάλαγξ*], in the military organization of anc. Gr., the tactical unit of the heavy-armed troops, a body of foot soldiers armed with spears and shields. The number of men was various. They were arranged from 4 to 16 men deep. In later times the great P. under the Macedonians comprised 16,384 men.

**Phalaris**, proverbially the most cruel tyrant known to antiquity, was the ruler of Agrigento in Sic. for about 16 yrs. in the middle of the 6th century B. C. Of his hist. hardly anything is known with certainty, most of it being enveloped in fables. A prominent feature in these fables is the brazen bull, invented by one Perillus, in which P. roasted his enemies, inaugurating the ingenious instrument of torture by the roasting of its inventor. The famous *Epistles of Phalaris*, 148 in number, were proved by Bentley to be spurious, a product of a much later time.

**Pharaoh**, the term applied in the Bible to the kings of Egypt. Many P. are mentioned in the Bible. The first known is the P. reigning in the days of Abraham. The next P. is the one of the time of Joseph (Gen. 1, 4-6), whose court appears to have been at Heliopolis, and in whose reign Joseph was elevated to the post of gov. of Egypt. The next P. is the one under whom the Israelites were in bondage, and who compelled them to build the treasure-cities of Pithom and Rameses of bricks; and it was under him or his successor that Egypt was afflicted with the 10 plagues, and that Moses and Aaron led the Israelites out of Egypt. The other P. mentioned in the Bible are the father of Hadad the Edomite; the father-in-law of Solomon; one of the predecessors of Sheshanka or Shishak; that monarch himself, who overran the Holy Land and pillaged Jerusalem; Tirhakah the Ethiopian, who for a time wrested Egypt from the Assyrians; Nekau or Necho II., who invaded Pal. to reduce to subjection, then in alliance with the Assyrians, but was finally defeated at Carchemish by Nebuchadnezzar, then at a youthful age, B. C. 605; and Uah-pa-ra, Hophra, or Apries, of the 26th dynasty, who marched to relieve the siege of Jerusalem, causing the Babylonians to retire for a while, although it was finally taken by Nebuchadnezzar, B. C. 588. [From orig. art. in *J.'s Univ. Cyc.*, by SAMUEL BIRCH, LL.D.]

**Pharisees**, *far'e-séz* [generally derived from the Heb. *perushim*, "the separated"], originated as a political and religious party among the Jews during the time of the Macabees in opposition to the invasion of Gr. ideas and Gr. customs. While the Sadducees and the ruling aristocracy had yielded to the idea of a distinction between religion and politics, the P. still maintained the old and genuinely Jewish view of a theocracy; and while the Sadducees adhered rigorously to the literal conception of the words of the sacred books, the P. adopted the tradition as a means by which to interpret Script. Thus, the P. stood at the time of Christ at once as the national party in politics and as the progressive school in theol., and their influence with the mass of the people seems to have been very great.

**Pharmacopœia**, *far-ma-ko-pœ'ya* [Gr. *φάρμακον*, "a medicine," and *ποιέω*, "to make"], a dispensatory or book of directions for the composition of med., approved by med. practitioners or pub. by authority. Recently discovered MS.—the *Papyrus Ebers*—establishes the existence of books of formulae among the iatro phys., the med. priesthood of Egypt, as far back as the 16th century before the Chr. era. The remedies advised by Galen may be considered the only code of therapeutics until the origin of the Ar. school. The first systematic attempt at methodical collection and classification of recognized formulae was made by Sabor'ebn Sabel in the latter part of the 9th century. The It. school of the 12th to the 15th centuries produced the extensive work of Nicolaus de Salerno. The first P. issued by authority was compiled by Valerius Cordus in 1542, under sanction of the senate of Nuremberg. The *P. Germanica*, authorized May 1872, is to-day employed throughout Ger. and in Rus. The P. of Amsterdam and Brussels are celebrated. That of Paris is authority in Fr. and Switz. The first edition of the *London P.* was issued in 1618, that of Edinburgh in 1699, that of Dublin in 1807. These 3 were employed in the U. S. until the second quarter of this century. In the U. S. the first effort to secure an official P. was made in 1818 by the N. Y. Co. and N. Y. State Med. societies. Other State societies united, and a convention of delegates from



State med. societies and med. colls. met in Wash. Jan. 1, 1830. The result was the issue in 1830 of the first *P. of the U. S. of Amer.* Its adoption was not general. The convention provided for further conventions every 10 yrs. to revise the work. Such conventions were held in 1830, 1840, 1850, and the revised editions issued in the following yrs. The convention of 1860 had delegates from colls. of pharmacy and pharmaceutical societies and from the med. corps of the army and navy. The convention for the 5th decennial revision of the work met in Wash. in 1870. It made 2 essential modifications of the previous gen. plan—first, to substitute for measures of capacity expressions of weight for the quantities in all formulae; secondly, to extend the scope of the work by adding articles with reference to the local peculiarities of the pop. and climate. Twenty-seven new articles were added, 5 were dropped as obsolete; 87 new preparations were added, 7 dismissed. Many entirely new meds. were designated for the first time in this edition, as the benzoate, bromide, and iodide of ammonium, digitalinum, extract of Amer. hemp, extract of Calabar bean, citrate of iron and strychnia, yellow oxide of mercury, arseniate of sodium, etc. The terminations of chemical meds. have been changed to correspond with the new nomenclature and terminology of chem.

**Pharmacy** (Gr. *pharmakon*, "a medicine"), the art of preparing, compounding, and dispensing meds. with reference to their phys. properties, their compatibilities, and chemical combinations. It includes a knowledge of the different parts of plants, the method and season of their collection, their desiccation and preservation; a knowledge of the chemical structure of mineral and artificial inorganic drugs, as well as of their crystalline and other obvious phys. appearances. The pharmacist employs a scale of weights and measures especially adapted for his art. The "apothecaries' weight" of the U. S. corresponds with the troy weight in its pound, ounce, and grain, having additional definite terms of weight—the scruple and drachm. The measure of liquids employed, in P. is wine measure.

Crude drugs are reduced to a powdered state by various methods. Having been previously dried, they are ground in the drug-mill, triturated by hand with mortar and pestle, or, in the case of soluble saline substances, obtained by the process of granulation, constantly stirring the solution, while evaporated by heat, to prevent recrystallization. Drugs in their powdered state, unchanged by chemical combinations, are incorporated in the form of pills, suppositories, ointments, and plasters. The preparation of pills consists in incorporating either crude powdered drugs or their inspissated extracts and active principles with some inert soluble substance to make the pill-mass. More recently, by machine-power, the active ingredients are compressed into very small bulk, being retained in pill form by gelatine or mucilage, with which the articles are saturated. Pills are dusted with aromatic powders to prevent exposure to the air and disguise taste; they are also coated with sugar, gelatine, and tin-foil. Cerates and ointments are made of variable consistency by employing separately or in combination simple cerate or purified fat and wax, in which the active ingredients are disseminated by fusion or trituration. Plasters may consist of the inspissated extracts spread for use, or of medicinal substances added to emplastrum plumbi (lead plaster), which is the base of many official plasters. Of liquid preparations or solutions there are, first, *liquores* and *aquæ*, containing meds. soluble in waters; secondly, *spirits* and *tinctures*, solutions in alcohol; thirdly, *vini*, solutions in wine; and fourthly, ethereal solutions. The simplest solution is an infusion, by pouring on of cold or hot water; next, the decoction, the product of boiling.

In continental Europe and G. Brit. the standard of scientific qualification to practise P. is high and enforced by law. In the U. S., until recently, there were no restrictions, and in many parts of the country meds. are prepared and dispensed and prescriptions compounded by the ignorant and unskilled. Schools of P. have, however, been established in New York, Phila., and other large cities, and an earnest effort made by the med. profession and Amer. Pharmaceutical Association to secure an enforced standard. In New York city since June 1872 all persons not grad. from recognized colls. of P. are required to pass a satisfactory examination before the board of P.

**Pharsalus**, an anc. city of Thessaly, on the Enipeus, famous for the battle which was fought here Aug. 9, 48 b. c., between Caesar and Pompey, and in which Pompey was utterly defeated.

**Phasis**, the anc. name of the *Rion* or *Faz* River, in the Rus. prov. of Transcaucasia, considered by the classical geogs. as the boundary between Europe and Asia. The Argonauts were fabled to have landed at its mouth.

**Phasianus**, *faz'ant* [from Lat. *Phasianus*, itself derived with reference to *Phasis*, a river of Colchis, now called *Rion*, a name originally belonging to the *Phasianus Colchicus*, a gallinaceous bird of the family Phasianidæ. It is now naturalized in a great part of Europe. It is very beautifully marked with a great variety of changing colors.

**Phelan** (JOHN D.), entered public life as a representative in the Ala. legislature in 1838, while ed. of the *Huntsville Democrat*; atty.-gen. of Ala. 1838-39, speaker of the house 1839, a judge of the State circuit court 1841-51, of the supreme court 1851-53 and 1863-65, clerk of that court 1853-63 and 1865-68, and then law-prof. in the Univ. of the South, Swannee, Tenn.

**Phelps**, on R. R., Ontario co., N. Y. Here is a very extensive depot for peppermint and other essential oils. Pop. 1870, 1355; 1880, 1369.

**Phelps** (AUSTIN), D. D., b. at W. Brookfield, Mass., Jan. 7, 1820, grad. at the Univ. of Pa. 1837; studied divinity at Andover and New Haven; was pastor of the Pine st. ch., Boston, Mass., 1842-48, and Bartlet prof. of sacred rhetoric in the Andover Theological Sem. 1848-79; author of *The Still Hour*, *Hymns and Choirs*, *The New Birth*, *The Theory of*

*Preaching* (1881), *Men and Books* (1882); was one of the compilers of the *Sabbath Hymn-book*, etc.

**Phelps** (EDWARD J.). See APPENDIX.

**Phelps** (ELIZABETH STUART), b. at Andover, Mass., Aug. 13, 1815, was daughter of Prof. Moses Stuart, and in 1842 married Prof. Austin Phelps. Under the anagrammatical name of "H. Truista" she wrote *The Sunny Side*, *Peep at Number Five*, etc., mostly for the young. D. Nov. 30, 1852.

**Phelps** (ELIZABETH STUART), daughter of Prof. Austin Phelps and of the foregoing, b. at Andover, Mass., Aug. 31, 1844; author of *Ellen's Idol*, *Up Hill*, *The Gates Ajar*, *Men, Women, and Ghosts*, *The Silent Partner*, etc.

**Phelps** (JOHN SMITH), LL.D., b. at Simsbury, Conn., Dec. 22, 1814, ed. at Trinity Coll., Hartford; studied law; removed to Springfield, Mo., 1837; chosen to legislature 1840; M. C. 1845-63; was for a short time col. of volunteers 1861; appointed military gov. of Ark. 1862; was a delegate to the Loyalists' convention at Phila. 1866, and became a com. to settle war-claims of Ind. 1867. Gov. of Mo. 1877-81.

**Phelps** (JOHN W.), b. in Vt. Nov. 13, 1813, grad. at W. Pt. 1836; capt. 1850; was engaged in the Fla. war, and in garrison and on frontier duty until the war against Mex. 1846-48; brevetted capt. for gallantry at Contreras and Churubusco, but declined. Resigned Nov. 1859. In the c. war he was appointed col. of the 1st Vt. Volunteers May 2, 1861, and 2 weeks later brig.-gen. U. S. volunteers. In Nov. he accompanied Butler's expedition to the Gulf of Mex.; co-operated with the navy in the capture of the forts below New Orleans, after which he was stationed above that city, where he was the first to organize and arm negro slaves as soldiers, for which act he was declared an outlaw by the Confed. govt. His action not being approved, he resigned Aug. 21, 1862, and returned to Brattleboro', Vt. Wrote *Secret Societies, Anc. and Modern*. D. Feb. 2, 1885.

**Phelps** (OLIVER), b. in 1749 at Windsor, Conn.; became a merchant of Granville, Mass., and was in the commissary service of Mass. during the Revolution. He was one of the partners in the "Phelps and Gorham purchase" of 1786, by which the State of Mass. sold for \$1,000,000 a tract of 2,600,000 acres now in 8 cos. of W. N. Y. This was a portion of about 6,000,000 acres which N. Y. ceded to Mass. in 1789. P. and Allen were to pay for the land in the "consolidated securities" of that time, but a rise in the price of these securities prevented the complete fulfilment of the agreement, and they gave up part of the lands. P. opened at Canandaigua (1789) a land-office, and invented a system of tps. and ranges, which, with modifications, has been generally adopted in surveying U. S. govt. lands. In 1795 he and others bought of Conn. the "Western Reserve" in O., about 3,300,000 acres. He became a judge in a State court, and was M. C. 1803-05. D. Feb. 21, 1809.

**Phelps** (SAMUEL SETHUR), b. at Litchfield, Conn., May 13, 1793, graduated at Yale 1811; was appointed a paymaster in the army 1814; became a lawyer of Middlebury, Vt., a judge of the State supreme court 1831-38, U. S. Senator 1839-51 and 1853-54. D. Mar. 25, 1855.

**Phelps** (SYLVANUS DRYDEN), D. D., b. at Suffield, Conn., May 15, 1816, grad. at Brown Univ. in 1844; studied divinity at New Haven; was ordained pastor of the First Bap. ch., New Haven, in 1846. Author of *Eloquence of Nature and other Poems*, *Bible Lands*, etc., and proprietor and ed. of the *Chr. Sec.*, Hartford, Conn.

**Phelps** (WILLIAM FRANKLIN), b. at Auburn, N. Y., Feb. 15, 1822, graduated at the State Normal School, Albany, 1845, and at Union Coll. 1851; was for several yrs. an instructor at the normal school; in 1855 was elected prin. of the State Normal School at Trenton, N. J., and in 1856 was also placed in charge of the Farnum Preparatory School at Beverly, a branch of the normal school, holding these positions until 1864, when he was elected pres. of the First State Normal School, Winona, Minn. His reports on normal schools in N. J. and Minn. have attracted much attention. In 1875 he wrote the *Teachers' Handbook*, and subsequently undertook the preparation of a *Manual for Country School Teachers*, and *The Art of Illustration*, for the use of teachers. In 1875 he became pres. of National Educational Association for the centennial yr., and was also pres. of International Educational Cong. at Phila. 1876.

**Phelps** (WILLIAM WALTER), b. at New York Aug. 24, 1839, grad. at Yale 1860; studied in Europe; grad. at Columbia Coll. Law School; practised law; chosen fellow of Yale Coll. 1872; M. C. from N. J. 1873-75; subsequently minister to Austria, and again M. C. 1883-85.

**Pheniline**, fen't-sin, or **Phenyl Brown**, a coloring-matter first prepared in 1865 by the action of nitro-sulphuric acid on phenol (carbolic acid). It is a brown amorphous powder, slightly soluble in water, very soluble in alcohol, ether, and acetic acid. With alkalis it forms a fine violet-blue solution, which is changed to brown by the slightest excess of acid. It consists of 2 coloring-matters—one a yellow dinitro-phenol, the other a black, humus-like body, both possessing the same tinctorial properties. P. dyes silk and wool without mordants. Cotton mordanted with sodic stannate or tannin readily absorbs P. Strong nitric acid changes P. into a resinous paste, which dissolves in ammonia, forming a brown solution which dyes silk and wool.

**Phenol**, **Phenic Acid**, **Carbolic Acid**, **Phenyl Hydrate**, **Phenyl Alcohol**, or **Coal-Tar Cresosote**, discovered in coal-tar, produced by the dry distillation of salicylic acid, either alone or mixed with caustic lime or baryta; of gum-benzoin, of the resin of *Xanthorrhoea hastilis*, of quinic acid, or of chromate of pelosine. It is formed when amniacal is heated with concentrated hydriodic or hydrochloric acid to 130°-140° C.; by boiling the sulphate, nitrate, or hydrobromide of diazobenzene with water; by fusing potassic phenyl-sulphite with excess of potash; by heating acetylene with fuming sulphuric acid, and by heating monochlorobenzene with sodic hydrate. It is found in small quantity in the products obtained by passing the vapor of alcohol or acetic acid through a red-hot tube, or



by distilling glycerine with calcic chloride or zinc chloride. Castoreum owes its peculiar odor to P. The urine of the cow, horse, and man yield it in small quantities.

**Preparation.**—P. is prepared from coal-tar. The tar is separated by fractional distillation into (1) light oil of coal-tar, crude coal-tar naphtha; (2) heavy oil of coal-tar, "dead oil;" (3) anthracene oil; (4) pitch which remains in the still. From the light oil the P. is most easily prepared. The oil is rectified by distilling with a current of steam, and leaves behind a portion known as "naphtha tailings," which contain about 15 per cent. of P., with very little of its homologue cresol. These tailings are agitated with caustic soda, the sodic compound is decomposed by an acid, and the crude P. thus obtained as a separate layer is rectified by distillation. To remove the last portions of water the P. is heated to near its boiling point, and dried by passing a current of dry air through it. The crystallization is accelerated by dropping into the liquid P. a few crystals or fragments of the solid P. From dead oil it is more difficult to obtain pure P., owing to the presence of much cresol. But the mixture of the two, which is better than pure P. for disinfecting purposes, is readily obtained. The dead oil is agitated with caustic soda, and the heavy layer of the sodic compound is decomposed by an acid. The mixture thus obtained is subjected to fractional distillation, rejecting the first and last portions of the distillate.

**Properties.**—P. occurs in long colorless needles or in white crystalline masses, sp. gr. 1.065, melts at 93°–95° F., and boils at 368°–370° F. The crystals deliquesce on exposure to the air by absorbing a trace of water. A lump of fused calcic chloride causes the liquid to solidify. P. does not redden litmus. It smells like wood-tar creosote, and attacks the skin like that substance. It dissolves in about 20 parts of water, and mixes in all proportions with alcohol, ether, and strong acetic acid. It unites with camphor, forming a liquid. Shaken with  $\frac{1}{4}$  its weight of water and exposed to 40° F., a hydrate crystallizes in large 6-sided crystals. The aqueous solution of P. coagulates albumen and preserves animal substances from decomposition. It even removes the fetid odor from meat which is already in a state of decomposition. Fish and leeches die when immersed in the aqueous solution, and their bodies subsequently dry up on exposure to air without putrefying. These properties have led to the extensive use of P. as an antiseptic and disinfectant. P. is highly poisonous except in an extremely dilute solution. The best antidote is olive oil, administered in large quantities. Sulphuric acid converts P. into phenyl-sulphuric acid. Strong nitric acid converts it into trinitrophenic acid, picric acid, an important dye. Weaker acid forms mono- and dinitrophenic acid. By the action of nitro-sulphuric acid, added in small quantities to an excess of P., phenicline is formed. Chlorine and bromine act upon P., forming substitution-products. Standardized bromine-water is used as a quantitative test for P. An alcoholic solution of P. is turned brown by an alcoholic solution of ferric chloride; wood-tar creosote gives an emerald green color under like conditions. P. solutions boiled with a solution of mercurous nitrate assume a deep red color. A solution of P. mixed with  $\frac{1}{4}$  its vol. of ammonia and a few drops of a  $\frac{1}{20}$  solution of bleaching-powder, and gently warmed, becomes blue (green if very dilute); sulphuric and hydrochloric acids change to red;  $\frac{1}{4000}$  of P. gives a strong blue. When a solution of 6 per cent. of potassium nitrite in concentrated sulphuric acid is added to a mixture of equal vols. of P. and concentrated sulphuric acid, the solution becomes first brown, then green, and finally deep blue. By the action of potassic cyanide on P. a potassic isopurpurate is formed, which is the beautiful dye "grenate brown." By treating P. with sulphuric and oxalic acids an important scarlet dye is obtained, known as coralline, aurine, rosolic acid, pæonine, etc. By heating pæonine with aniline a blue dye, azuline, is obtained.

C. F. CHANDLER.

**Phenols**, a class of bodies formerly called secondary alcohols. They are derived from the aromatic hydrocarbons by substituting hydroxyl for hydrogen. Benzol yields the primary phenol. Toluol or methyl-benzol yields cresol, which is not identical with benzyl alcohol.

**Phenyl**, a monatomic radical in aniline, phenol, etc.

**Phenylamine**. See ANILINE.

**Phenyllic Acid**. See PHENOL.

**Phere**, an anc. city of Thessaly, in a fertile plain near Mt. Pelion, 10 m. W. of its port, on the Pagasæan Gulf, on the site of the modern *Velesino*. It was a prosperous town, and under the govt. of the tyrant Alexander it became the controlling power of the whole of Thessaly. But the treachery of Alexander induced the Thebans to aid the oppressed Thessalians, and after the battle of Cynoscephalæ his dominion was again confined to the city and dist. of P. He was, nevertheless, still strong enough to land troops in Attica and plunder Piræus. In 359 b. c. Alexander was murdered, and in 352 b. c. P. passed with the rest of Thessaly into the hands of Philip of Macedon.

**Pherecydes** of LEROS, a Gr. logographer, flourished in the 5th century b. c. and lived in Athens. His great work on Gr. mythology is often quoted by anc. writers.

**Pherecydes** of SYROS, a Gr. philos. of the 6th century b. c., was a rival of Thales and the teacher of Pythagoras. His work bears the mystical title *Ἐρμῆς*.

**Phidias**, *fid'-as*, the greatest sculptor of Gr., perhaps of all ages and lands, b. at Athens about 500 b. c., was taught by Hegias and Ageladas; his career as a sculptor began under Cimón, but reached its glory under Pericles. The great statue of Athene in the Parthenon, of gold, ivory, and precious stones, was there is little room for doubt, executed by him. It was finished 437 b. c. Later he completed the colossal statue in gold and ivory of Jupiter in the temple of Olympia at Elis. It sat enthroned in the temple for 300 yrs., and was finally destroyed by fire about 475 a. d. He is supposed to have had a long life, and to have d. from poison about 432 b. c.

**Philadelphia**, *fil-a-del'-fe-a*, an important R. R. and commercial centre, the prin. city of Pa., is situated on the W. bank of the Del. River, 136 m. N. E. of Wash. and 87 m. S. W. of New York. The S. W. boundary is at Bow Creek, below the mouth of Schuylkill River; and the city front trends along the Del. in a N. and N. E. direction 23 m.; N. boundary, portions of Bucks and Montgomery cos.; W. and S. by Montgomery and Delaware cos.

**Original Site.**—The co. of P., in which was the city of P., as laid out by William Penn, included all the ground between Chester and Bucks cos., and ran between them northwardly to an indefinite extent. By the creation of Montgomery co. in 1784 the gap was closed, and P. co. was confined in the Schuylkill valley to its present area. In the upper portion of the terr. the ground is elevated, with rocky hills along the banks of the streams, notably upon the Schuylkill, which flows through the city and empties into the Del. at League Island; also upon the Wissahickon, thence gradually descending in terraces. At Fairmount the ground becomes level, and the plateau continues down to Pt. Breeze upon the Schuylkill, 2 m. above the mouth, where there is a fall of several feet to ground which is now known as "The Neck." The prin. streams flowing into the Schuylkill are the Wissahickon, Nangansy or Mill Creek. Into the Del. flow the Poquessing, Pennypack, Wissinoming, Frankford, Gunner's, Cohokosink, Hollander's, and Bow Creek. The area is 129,352 sq. m., or 82,608 acres; greatest length in straight line, 20 m.; greatest width, 10 m.

**Modern Changes.**—Substantially the original features of the terr. remain. Alterations of grade by levelling hills or filling up valleys are not many. From Chestnut Hill to the extreme southern border the natural lay of the land has been substantially undisturbed. A few creeks which are within the thickly built portions of the town have been culverted and streets run over them. The city laid out by Penn in 1682 was a parallelogram, extending nearly in due E. and W. lines from the Del. to the Schuylkill, 1 m. in breadth along the rivers, 2 m. E. and W. All the rest of the ground of the co. was under a different govt. By degrees, as population advanced, the adjoining suburbs became thickly settled, and were incorporated as dists. with municipal privileges. The system became cumbersome and inconvenient, and in 1854 a law called the Consolidation Act was passed, which extended and enlarged the boundaries of the old city so as to take in every dist. and tp. of the former co. of P. In this terr. were several v. of considerable size, which, although now comprised in the wards of the city, popularly bear their old names. The prin. of these were Germantown, Frankford, Holmesburg, Chestnut Hill, Mt. Airy, Manayunk, Falls of Schuylkill, W. Philadelphia, which included Hamilton and Mantua v., and Hestonville and Haddington.

**Streets and Bridges.**—The streets in the old portions of the city generally run in a N. by N. E. and S. S. W. course, and are intersected by streets at right angles. The direction is varied in certain dists., but the plan of streets cutting each other at right angles is almost universally followed. Market st., 100 ft. wide, was the central street of the old city, and still divides "up-town" from "down-town." All the N. and S. streets commence their numbers at Market st. Broad st., which runs from League Island through the entire city up to the N. boundary at Montgomery co., is 113 ft. wide; Spring Garden st. is 130 ft. wide. The prin. streets in other parts of the city are 50, 60, 80, and 100 ft. wide. From the size of the city the property is urban, suburban, and rural. Portions of the ground are taxed at full rate, rural at reduced rate, and farm land at the lowest. There are 1100 m. of roads and streets unpaved, and 900 m. paved. The Schuylkill is crossed by 14 bridges, among which are Girard avenue bridge, of iron, 1000 ft. long and 100 ft. broad; Spring Garden or Callowhill st. bridge, for 2 streets upon a double deck—material iron, length 1200 ft., width 48 ft.; Chestnut st. bridge, iron and stone, length 1528 ft.; South st. bridge, 2419 ft. long; and Market st. bridge, the oldest.

**Means of transportation** for local travel are by Pa. R. R., the lines of which run N., W., and S. to rural portions of the city and adjoining cos.; by Reading R. R., N. W.; North Pa. R. R., N. There are 19 horse R. Rs. running upon 341 m. of streets; they carried in 1881, 116,374,300 passengers, The Pa. R. R. is brought into the heart of the city on an elevated road, built upon brick arches, to a station at Broad and Market sts., opposite the City Hall. It operates and controls the lines to the W., roads to Baltimore and New York, and in N. J. between Jersey City and Cape May. The Reading R. R. is the great coal-carrying road, and extends to the coal-regions of Pa. and to the N. W. N. Pa. R. R. extends to Bethlehem and Lehigh Valley, and the co. operates the Bound Brook line to N. Y. To Atlantic City, N. J., there are 3 R. Rs. running from Camden, opposite P., and one to Cape May. Nearly all the R. Rs. bring coal to the city.

**Education.**—For popular education there are 461 public schools, with 2113 teachers and 102,185 pupils; cost of schools in 1881, \$1,431,235.03; value of school buildings, lots, and furniture, \$6,176,750. The finest school buildings are the Boys' Central High School, on Broad st., which has a well-furnished astronomical observatory, and the Girls' Normal School, of greenstone, at Spring Garden and 17th sts. The Univ. of Pa., which originated from the acad. founded by Franklin and others in 1749, occupies about 9 acres of ground in W. P., in new and elegantly arranged structures of green serpentine and gray stone in collegiate Gothic style. There are 4 principal buildings—the main one for science and art depts., the med. dept., the dental dept. and Univ. Hospital, which, although a public inst., is managed by the univ. In the dept. of arts, med., law, science, dentistry, finance, economy, and music there are 90 profs. and assistant teachers; number of students in 1882, 1002. Girard Coll., for white male orphans, at Ridge avenue and 19th st., occupies 41 acres. The main building, of marble,



160 ft. long, 111 ft. wide, surrounded on all sides by fluted columns, is the finest example of the Corinthian style of arch. in the country. There are 4 med. colls. of the allopathic school—the Univ. Jefferson, Medico-Chirurgical, and Women's Med. Coll.; 1 homœopathic, the Hahnemann; Coll. of Pharmacy for the instruction of apothecaries and druggists, 3 dental colls., and a Polytechnic coll. for a technical education. The prin. scientific insts. are the Coll. of Phys., owning a museum and library; Acad. of Natural Sciences, possessing an immense museum; Franklin Inst., for the promotion of mechanic arts; Wagner's Inst. of Science, with free museum and lectures; Spring Garden Inst., with library and free schools for mechanical and technical instruction; Pa. Museum of Industrial Art, with technical schools attached; and School of Design for women, devoted to instruction in the arts as applied to manufactures and industry. The Acad. of Fine Arts, instituted in 1805, has a splendid building and galleries and a valuable collection of statues, busts, paintings, and prints. The study of natural science is promoted at the Zoological Gardens, Fairmount Park, which contain 33 acres, and embrace a large collection of living animals, birds, and reptiles. The Horticultural Society occupies a fine building with sandstone front on Broad st., 75 ft. front and 300 ft. deep. The Amer. Philosophical Society, established by Dr. Franklin and others in 1743, occupies a building on Independence Square, 5th st. below Chestnut, and has a valuable library and museum. The Phila. Library, founded July 1, 1731, occupies a new building at the corner of Juniper and Locust sts., and also the Ridgway branch building, at Broad and Carpenter sts., managed under bequest of Dr. James Rush. This structure is of granite and of splendid proportions, 230 ft. front, 105 ft. deep. The Mercantile Library Co., Athenæum, and Apprentices' Library Co. have large collections of books. The Pa. Historical Society has a considerable library of MSS. and rare books of historical value, paintings, relics, etc.

The prin. hotels are the Continental, Girard, Lafayette, Aldine, Colonnade, Bellevue, St. George, and Washington.

The press is active. There are 23 daily newspapers, 4 tri-weekly, 84 weekly, and 13 Sunday papers; 4 semi-monthly, and 80 monthly, quarterly, and half-yearly periodicals.

**Commerce and Finance.**—Although P. is situated upon a river about 100 m. from the sea, it has from the time of its foundation maintained a commerce. At one period its shipping interests were larger than those of any other city in Amer. The channel is deep enough for the largest ships, and vessels drawing over 25 ft. of water have come to the city wharves. The use of steam for towage shortens the time for the river voyage. The arrivals from foreign ports in 1881 were 1343 vessels, 1,086,425 tons; cleared, 1151 vessels, 92,296 tons; coastwise entrances, 836 vessels, 531,222 tons; clearances, 1254 vessels, 764,351 tons. Beside there is a large coasting trade, which requires neither entrance nor clearance. Exports for 1881, \$41,162,957; imports, \$33,764,278. Immigrants arrived in 1881, 36,235. The grain trade gives employment to 6 permanent elevators, with capacity for 3,785,000 bushels; 4 floating elevators, capable of handling 19,500 bushels per hour, and 1 large storage-house of 250,000 bushels capacity. There are 2 steamship lines to Europe. One Amer. line, composed of iron ships built at P., sails weekly, and is (1882) the only steamship line to Europe which flies the Amer. flag. The Red Star line from P. to Antwerp sails every week alternately from P. and New York. The Clyde steam lines employ a large number of steamers in the domestic trade. According to the census of 1880 there are in P. 8377 mechanical and manufacturing establishments, with a capital of \$170,495,191; the material used was worth \$187,169,375; products, \$304,591,725; hands employed, 173,862; wages paid, \$60,606,287. P. has 32 national banks, with a cash capital of \$17,358,000, and a surplus in May 1882 of \$8,392,503; 6 State banks, with a capital of \$1,300,000; 7 safe deposit and trust cos., which receive and pay out deposits and money—capital, \$5,000,000; also, 2 life annuity and trust



Main Exhibition Building.

cos., with capital of \$800,000, and several life insurance cos., with marine, fire, accident, and other forms of insurance. The funded and floating debt of the city Aug. 1, 1882, was \$67,888,116.24, toward the redemption of which there were securities in sinking fund of \$23,167,373.45. The valuation of property subject to taxation, Aug. 1, 1882, was—real estate, \$562,687,555; personal, \$8,795,700. The revenues in 1881 were—from taxes, \$10,704,331.98; other sources, \$3,190,548.62; total, \$13,894,880.60; expenditures, \$13,788,070.50. The tax-rate for 1882 was \$1.90 per \$100; for 1883, \$1.85.

**History.**—It is believed that the first European who saw the ground upon which P. is built was Capt. Hendrickson of the yacht Onrust, which sailed from Manhattan (New York) in 1623 and entered the South River, called at a later period the Delaware. The Dutch settled upon the river shortly afterward, and the Swedes in 1638. There were for yrs. disputes between these settlers. The Dutch built Ft. Casimir, near New Castle, in 1651, which was taken by the Swedes in 1654, retaken by the Dutch under Peter Stuyvesant in the same yr., captured by the Eng. in 1664, and surrendered to the Dutch in 1673, but relinquished to the Eng. by the treaty of 1674. William Penn received a charter for Pa. Mar. 4, 1681; P. was commenced to be laid out in the same yr. Penn came to P. in the latter part of Oct. 1682, remained 22 months, went back to Eng., and did not return until 1689. He remained until 1701, when, granting a charter to P., he returned to Eng. In 1747 regiments of volunteers were raised for the defense of the city by approbation of the proprietary govt. and against the strong opposition of the Quakers. In 1765 the opposition of the people to the tariff act was earnest and patriotic. In 1768 the act of Parl. imposing duties upon paper, tea, etc. was resisted, and a non-importation agreement was entered into by the citizens. In 1773 the tea-ship Polly, Capt. Ayres, from Lond., coming up the river was stopped at Gloucester Pt. by committees sent from P. and compelled to return to Lond. The first Continental Cong. met at Carpenter's Hall Sept. 5, 1774, and adjourned in Oct.; the second met at the State-house

May 2, 1775, adopted the resolution of independence July 2, 1776, and the written Declaration of the reasons for that act 2 days afterward. The Declaration was read to the people July 8 by John Nixon, from the observatory erected in the State-house yard in 1770 to observe the transit of Venus. After the battle of Brandywine the Brit. troops under Lord Howe crossed the Schuylkill at Fatland and Gordon's fords, Sept. 26, 1777, and entered the city Sept. 26. The battle of Germantown took place Oct. 4; attack on Red Bank and defeat of Count Donop, Oct. 21; fight between the Pa. galleys and Brit. frigates on the same day; frigates Augusta and Merlin took fire and were blown up; Mud Fort, after enduring a terrific bombardment for 6 days, was abandoned by the Amers. Nov. 16, 1777; Brit. evacuated P. June 1778; Cong. came back, and remained until June 1783. Convention to frame a const. for the U. S. met at the State-house in May 1787, and adjourned Sept. 18; George Washington was pres. and William Jackson was sec.; the ratification of the adoption of the const. was celebrated by a grand procession July 4, 1788. The steamboats of John Fitch navigated the Del. in 1787-90. Cong. under the new const. came to P. in 1790 and remained until 1800, during which time George Washington and John Adams were inaugurated Pres. and V.-P. for a second term, and also John Adams and Thomas Jefferson as Pres. and V.-P. Yellow fever raged with fatal violence in 1793, 1797, and 1798. The deaths in 6 yrs. were over 12,000. The first water-works were opened for use Jan. 1, 1801; the Schuylkill Navigation, the first great internal improvement, finished 1825; first R. R. to Germantown opened 1832; gas first burned in the public streets Feb. 18, 1836; abolition riots 1834-35 and 1838; Pa. Hall, built by abolitionists, burned by a mob May 17, 1838; Native Amer. riots against R. Caths. in May and July 1844, in which 2 R. Cath. chs. and a female sem. and other property were burned and many persons killed and wounded. During the c. war P. adhered strongly to the Union, and sent to the field for 3 yrs. 46 regiments, 5 for 1 yr., and 29 for shorter periods. The Union Volunteer and



Cooper Shop refreshment saloon fed gratuitously during the c. war over 1,000,000 soldiers passing through the city. The U. S. Sanitary Fair in Logan Square in 1864, for the relief of wounded, sick, and dying soldiers, netted \$1,080,000.

In 1876 the U. S. Centennial Exhibition was held in Fairmount Park, upon a plot of ground occupying 236 acres. There were 5 prin. exhibition buildings constructed by the Centennial Board of Finance, and about 200 others were erected upon the ground. Industrial Hall, the main exhibition building, was in the form of a parallelogram extending E. and W., 1880 ft. long and 460 ft. wide. It was of stone, brick, glass, and iron, with towers and central projection, and covered in floor and gallery space 21.47 acres. The cost

was \$1,600,000. Machinery Hall, of stone, brick, glass, iron, and wood, was 1402 ft. long, 360 ft. wide, with an annex on the S. side of 208 by 210 ft. It covered, with the upper floors, 14 acres of floor space; contract price, \$792,000. Agricultural Hall was constructed of wood and glass in the Gothic style; nave 826 ft. long by 100 wide; height from the floor, 75 ft. to the point of the arch. Memorial Hall, which was appropriated for the fine-art exhibition, was an elegant building for permanent occupation, built of granite, glass, and iron, at the joint expense of the State of Pa. and the city of P. It is now occupied by the Pa. Museum of Industrial Art, and is 365 ft. long, 210 ft. wide, 59 ft. in height, and surmounted by a dome of glass and iron rising 150 ft. from the ground.



Machinery Hall.

There are 75,000 sq. ft. of wall and 20,000 sq. ft. of floor; cost, \$1,500,000. Horticultural Hall, of stone, glass, and iron, in the Moresque style of arch., was built entirely by the city at a cost of \$251,387; length, 383 ft.; width, 193 ft.; height to top of lantern, 72 ft. This building, which still remains, is used for a conservatory, and is surrounded by splendid flower gardens. The U. S. govt. had a large building for exhibition of articles connected with the administration of the govt. in its military, naval, and civil departments. There were special buildings constructed by the govts. of G. Brit., Fr., Ger., Japan, Tur., Sp., Brazil, and Swe., with many buildings erected by the different States for the accommodation of their coms. and people, and exhibitions and

buildings for special purposes. The exhibition was open to visitors every day except Sunday from May 10 to Nov. 10; total number of admissions, 9,910,966 persons, of which 1,906,692 were free, representing exhibitors, officers, employes, etc.

**Municipal Government and Buildings.**—The city was chartered by William Penn in 1701, its govt. consisting of a mayor, recorder, aldermen, and a common council. This govt. existed until the events of the Revolutionary war prevented an exercise of municipal powers. For some time previous to July 4, 1776, there was practically no city govt., and there was an intermission of thorough municipal control until 1789, when the legislature granted a new charter



Agricultural Hall.

to the mayor, aldermen, and citizens of P., the legislative power being vested in a select and common council. In time the suburbs became populated in equal density to the old city, and various dists. were incorporated with municipal govts. In 1854 all these powers and authorities were consolidated by act of assembly. The city was divided into wards; the mayor is chief officer; legislation is composed of 32 members, 1 member for each ward; in the common council the representation is greater; there are 26 prin. depts. of municipal administration. The new City Hall, commenced at Broad and Market sts. in Aug. 1871, will probably not be completed before 1885. It is of granite and marble, 470 ft.

long from E. to W. and 486½ ft. from N. to S. The tower, to be surmounted by a statue of William Penn, will be 450 ft. high, one of the highest towers in the world. The police force is under control of the mayor, and numbers 1200 men and 140 officers. The fire dept. is composed of 401 officers and men; there are 28 steam fire-engines and 5 trucks.

There are 4 courts of common pleas, served by 12 judges, who have criminal jurisdiction in courts of quarter sessions; 24 magistrates, with courts for police and civil causes; an orphan's court, with 3 judges. The supreme court of Pa. sits in the new City Hall during the greater portion of the yr.; the U. S. circuit and dist. courts are held in the P. O. building. The prisons are the Eastern Penitentiary, of gran-



ite and stone, occupying a lot of about 11 acres; co. or Moyamensing prison, of Quincy granite, in the Tudor style of Gothic castle arch.; the House of Correction at Holmesburg, of stone, with cells to hold 3000 persons; House of Refuge for the reformation of boys and girls, with 3 buildings; almshouse, with Phila. Hospital, insane and children's dept., with accommodations for more than 4000 persons.

*Benevolent insts.* are numerous. There are 32 hospitals, the best known of which is Pa. Hospital, founded in 1750, and also extensive buildings for use of the insane, on the W. side of the Schuylkill. There are 17 free dispensaries, 30 asylums for orphans and abandoned children, 15 houses for aged men and women, an asylum for the deaf and dumb. 3 insts.

for the instruction, education, and relief of the blind, 5 asylums for the relief of fallen women, and many other benevolent insts. sustained for special objects. The Masonic order occupies a granite temple at Broad and Filbert sts., one of the finest buildings occupied by any society in the world, and which cost \$1,300,000. There are 6 other Masonic halls, 9 Odd-Fellows' halls, halls for the United Order of Amer. Meechs., Independent Order of Red Men, Knights of Pythias, and other organizations. The Union League has a splendid club-house at Broad and Sansom sts. The leading social club is the Philadelphia, established in 1834. There were, Jan. 1, 1882, 536 religious congregations, including Israelites, worshipping in the city, nearly all of which were



Memorial Hall.

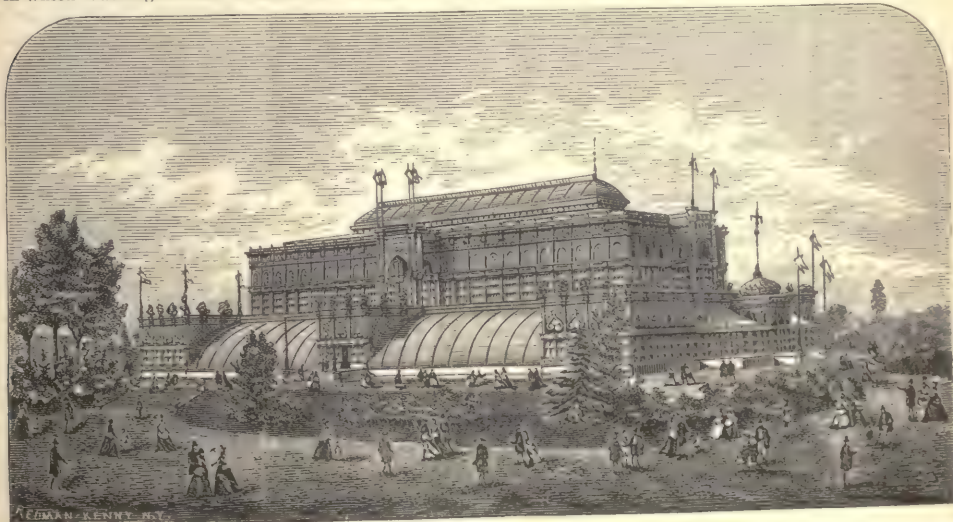
provided with buildings and chs. for worship, some of them splendid in architectural style and costly. There are about 20 cemeteries, ch. burial grounds not included. The prin. of these grounds are Laurel Hill, on the E. bank of the Schuylkill; W. Laurel, on the W. bank; Woodlands, and Mt. Vernon.

The Academy of Music is a rich, elegant building in the interior, and has seating capacity for 2960 persons.

Among the buildings of historic note are Independence Hall (the old State-house), in which the Dec. of Ind. was adopted, and Congress Hall, on Independence Square, at the corner of Sixth st., in which Cong. sat from 1790 to 1800, and in which Washington and Adams were inaugurated as

Pres., and Adams and Jefferson as V.-P. Carpenter's Hall, standing S. of Chestnut st., between Third and Fourth, was the place of assembling of the first Continental Cong.

*Fairmount Park*, situated on both sides of the Schuylkill and extending up Wissahickon Creek to Chestnut Hill, is about 13 m. in length, and varies in breadth from  $\frac{1}{4}$  to 2 m. The grounds were principally composed of old country seats, and were remarkable for their natural features, the fine old forest trees, the shaded glens, ravines, and valleys, the springs and streams, and the beautiful views, which are enriched by the scenery of the Schuylkill and Wissahickon. Hunting Park, 45 acres, is a large inclosure which belongs to the city, and there are 13 public squares and parks.



Horticultural Hall.

The establishments connected with the U. S. govt. are the custom-house and sub-treasury, which occupy a marble building on Chestnut st. between 4th and 5th sts., a fine specimen of Greek-Doric arch.; the U. S. appraiser's building, of brick and iron, and thoroughly fire-proof; the Post Office, with marble front, arch. in the French style, on Chestnut st., adjoining the custom-house, the upper stories occupied by the U. S. courts and officers. A new and splendid building for the accommodation of the P. O. and U. S. courts has been under construction for several yrs., on a large lot fronting on Chestnut, Market, and 9th sts., to be occupied in 1883 or 1884. The style of arch. is Fr. renaissance; length, 428 ft.; height to top of dome, 184 ft. U. S. Mint, cor. of Juniper and Chestnut sts., marble building, Greek-Corinthian style.

U. S. Naval Asylum, Gray's Ferry road, occupying about 8 acres, is a shelter for old sailors; the U. S. Naval Hospital adjoins it. The U. S. navy-yard is at League Island, near the mouth of the Schuylkill, about 7 m. from Independence Hall. It is 2 m. in length from E. to W. and  $\frac{1}{4}$  to  $\frac{1}{2}$  m. wide; area, including the back channel, 923 acres. The ground was bought by the city in 1862, and was presented to the U. S. govt. in the same yr. There are 2 U. S. arsenals, one at Frankford, which is principally used for manufacturing cartridges, and the other upon Gray's Ferry road, as a depot for military clothing and equipments other than arms and ammunition.

Pop. of P. 1800, 65,787; 1830, 114,445; 1850, 360,305; 1870, 674,022; 1880, 847,170.

THOMPSON WESTCOTT.



**Philbrick** (JOHN DUDLEY), LL.D., J. U. D., b. in Deerfield, N. H., May 27, 1818, grad. at Dartmouth 1842; taught during the next 10 yrs. in the Roxbury Lat. School, in Boston as instructor in the Eng. High School and as master of the Mayhew and Quincy schools; was prin. of State Normal School and State supt. of schools in Conn. 4 yrs.; supt. of the public schools of Boston 1857-74 and 1876-78; educational com. of Mass. to the Vienna Exposition 1873, where he was a member of the international jury; U. S. com. of education and member of international jury at Paris Exposition of 1878, receiving the decorations of the cross of the Legion of Honor, and the gold palm of the Univ. of Fr.; received the honorary degree of LL.D. from St. Andrew's Univ., Scot.; pres. of State educational associations of Conn. and Mass., of Amer. Inst. of Instruction, and of the National Teachers' Association; for 10 yrs. a member of the Mass. board of education, its agent in 1875, and from its origin a member of govt. of Mass. Inst. of Technology; was ed. of *Conn. Common School Journal* and of *Mass. Teacher*; wrote many lectures and papers on education.

**Philemon**, a Gr. play-writer, b. at Soli in Cilicia or at Syracuse in Sic. about 360 B. C.; lived mostly in Athens, where he often composed successfully with Menander; visited Alexandria. D. 262 B. C.

**Philemon, Epistle of St. Paul to**, was written at the same time as the Epistles to the Ephesians and Colossians. It is a private letter, begging forgiveness and acceptance as a brother beloved for a runaway servant, Onesimus, who had been converted through the apostle's teachings.

**Philidor** (FRANÇOIS ANDRÉ DANICAN), b. at Dreux, dept. of Eure-et-Loire, Fr., Sept. 7, 1726; received his musical education in the royal chapel, afterward in Hol. and Ger., where he resided from 1745 to 1754; composed between 1754 and 1774 a number of operas, comic and serious, which were well received; but became most famous as an unrivalled master of chess-playing. D. in Lond. Aug. 20, 1795.

**Philip**, the fourth called to the apostleship by Christ, b. at Bethsaida, is often mentioned in the Gospels, especially by John (vi.; xii. 20-22; xiv. 8), but must not be confounded with Philip the Evangelist, mentioned in Acts vi. D. at Hierapolis.

**Philip**, the name of 5 Macedonian kings, of whom 2 became very celebrated. **Philip II.** (359-336), b. at Pella in 382, a son of Amyntas II. At the moment he ascended the throne the young king immediately began to work at the acquisition of the supremacy over all Gr. He conquered Fydnæ and Methone, the peninsula of Chalcidice, with the prosperous cities of Olynthus, Potidea, Amphipolis, etc.; a part of Thrace, with the rich gold-mines, and the town of Crenides. Meanwhile he had also defeated the tyrant of Phærgæ and reduced the whole of Thessaly, and during the 2 sacred wars in 346 and 339 he acquired a foothold in Gr. proper, called in by the Grs. themselves. Alarmed at his successes, Athens made a coalition with Thebes and other Gr. states against him, but he routed the allied army at Chæronea in 338. By his admission as a member of the Amphictyonic Council he and the Macedonians were recognized as belonging to the Gr. nation, and by the cong. at Corinth (in 337) he was chosen commander-in-chief of all the Grs. under a projected invasion of Per. But during his preparations he was assassinated at *Ægæ* by Pausanias. — Under **Philip V.** (220-179), b. in 237, Macedonia relapsed into insignificance. His whole attention was taken up by the E., by Pergamus, Bithynia, Syria, etc., and meanwhile the danger arose from the W., from Rome. The war with Rome, the first Macedonian war (210-205), he carried on without energy, though generally successfully. But in 200 the war began again, the second Macedonian war; the Macedonian army was completely routed by Titus Quintus Flamininus at Cynoscephalæ in 197, and the country reduced to a submissive ally of Rome.

**Philip**, the name of 6 kings of Fr., of whom the most remarkable are — **Philip II., Augustus** (1180-1223). (See *CRUSADE, FRANCE, HISTORY OF*, and *RICHARD CŒUR DE LION*). — **Philip IV., the Fair** (1285-1314), b. in 1268, a son of Philip III., was an avaricious and cruel man, but eminently successful in extending the boundaries of Fr. and consolidating the power of the Crown. In order to procure money the king taxed the clergy. The pope, Boniface VIII., forbade the clergy to pay the tax, and the king answered by forbidding the exportation from Fr. of money or other valuables, thereby cutting off one of the richest sources of the papal revenue. The pope sent a legate, who remonstrated in an insolent manner with P., and P. threw the legate into prison. He now convoked the States-General and confiscated the property of those prelates who sided with the pope. Boniface excommunicated the king, but a Fr. army under William de Nogaret captured Rome and imprisoned the pope. In 1304, at the election of Clement V., the papal residence was transferred to Avignon. Clement V. sold the Knights Templars to Philip IV., who treated them in a most cruel manner in order to get possession of their wealth. — **Philip VI.** (1328-50), the founder of the house of Valois, b. in 1293. Edward III. of Eng. laid claim to the Fr. throne, and when P. undertook to support David Bruce of Scot. the Eng. king made an alliance with Flanders and declared war in 1337, thus opening that contest between the Fr. and Eng. dynasties which lasted for 100 yrs., exhausted Eng. and devastated Fr. The 2 prominent events of the war during the reign of P. were the battle of Cressy (1346), in which the Fr. army was totally routed, and the capture of Calais by the Eng. (1347). In the following yr. the so called *Black Death* entered Fr.; but in spite of all these calamities P. went on with his carousals, squandering the money which was extorted from the people.

**Philip**, the name of 5 kings of Sp., of whom 2 deserve a special notice. — **Philip II.**, b. at Valladolid May 21, 1527, d. at the Escorial Sept. 13, 1598, succeeded his father, Charles V., in the Netherlands Oct. 25, 1555, and in the other posses-

sions of the Sp. crown Jan. 16, 1556. He ruled over Sp., its vast dominions in Amer., the E. I., and Afr., the Two Sics., and Milan, Burgundy, and the Netherlands, to which in 1581 he added Port. From his father's reign he inherited a war with Fr., the pope, and the Tur. sultan, who had made an alliance for the purpose of depriving the Sp. crown of its Italian possessions; but the duke of Alba, viceroy of Naples, drove the Fr. out of It. and compelled the pope to sue for peace under the walls of Rome, while the brilliant victories of St. Quentin and Gravelines, won by Egmont, enabled P. to conclude an advantageous peace with Fr. at Câteau-Cambrésis, Apr. 2, 1559. Nevertheless, the 40 yrs. reign which now followed bears throughout the character of a failure. On leaving the Netherlands he confirmed the political privileges of the provinces, but he set to work to extirpate heresy in the Netherlands by means of the Inquisition. He met with energetic resistance, and the resistance grew into a revolution, and under the organization and leadership of William of Nassau the union of the 7 provs. was formed at Utrecht in 1579, and a protracted war was carried on against Sp. by land and sea. In his wars against the Turks or the Mohammedans in gen. he gained a brilliant success by the battle of Lepanto, Oct. 7, 1571; but P. felt a jealous distrust of Don John of Aus., his illustrious half-brother, and the situation of the Mediterranean pirates remained the same after the battle as it had been before. The disastrous expedition against Eng., the destruction of the Invincible Armada, were mortifications which he bore with dignity, but the unfortunate war against Henry IV. of Fr. and the disadvantageous Peace of Vervins (May 2, 1598) he felt as a deep humiliation. He shut himself up in sullen despair in the pompous palace-tomb he had built, and d. shortly after, leaving Sp. exhausted almost to prostration. — **Philip V.** (1701-46), the founder of the house of Bourbon in Sp., b. at Versailles Dec. 19, 1683, the second son of the dauphin Louis, son of Louis XIV. by the Sp. princess Maria Theresa, was declared heir to the Sp. throne by the will of Charles II., who d. childless Nov. 1, 1700. There was, however, another claimant to the throne—Archduke Charles of Aus.—and war began almost immediately. By the Peace of Utrecht (1713) P. retained the Sp. crown, but he was compelled to surrender his possessions in It. and the Netherlands to Aus., and Gibraltar to Eng. He was indolent, weak-minded, and always controlled by his surroundings. D. at Madrid July 9, 1746.

**Philip, or Metacomb**, usually called **King Philip**, youngest son of Massasoit, sachem of the Pokanoket Indians of Mass., succeeded to the chieftainship on the death of his brother Alexander 1662, when he visited Plymouth and promised friendship to the colonists, but in 1675 headed the war known by his name, in which 13 towns were destroyed and 600 colonists lost their lives. He was killed at Mount Hope Aug. 12, 1676, by a party under Capt. Benjamin Church, after his tribe had been nearly annihilated.

**Philip the Bold**, b. Jan. 15, 1342, a son of John, king of Fr., distinguished himself in the battle of Poitiers (1356), where he saved his father's life. Sept. 6, 1363, King John gave him, as a fief of the Fr. crown, the duchy of Burgundy, which became one of the most prominent powers of W. Europe. During the minority and insanity of Charles VI., P. assumed the regency of Fr., which involved him in many feuds with his brother and his nephew, but which he held to his death, Apr. 27, 1404.

**Philip the Good**, b. at Dijon June 13, 1396, a grandson of Philip the Bold, succeeded his father, John the Fearless, as duke of Burgundy after his assassination on the bridge of Montereau in 1419. In order to avenge the murder of his father, which had been perpetrated at the instigation of the dauphin, afterward Charles VII., P. acknowledged by the Treaty of Troyes (1420) the Eng. king as the legitimate heir of the Fr. crown after the death of Charles VI. The arrogance of the Eng., however, provoked him afterward to break the alliance, and in 1435 he concluded a separate peace with Charles VII. and aided him in expelling the Fr. from Fr. He governed his possessions with great wisdom, and was much loved by his subjects. D. June 15, 1467.

**Philippi**, an anc. town of Macedonia, was built, or at least enlarged, by Philip, from whom it received its name. Here the battle was fought in 42 B. C. between Brutus and Cassius on the one side and Antony and Octavianus on the other. Brutus and Cassius were routed.

**Philippians, Epistle of St. Paul to the**, was written to the ch. at Philippi, probably toward the end of the first Roman imprisonment (61-68 A. D.). It is not theological or dogmatic, but a generally friendly and encouraging letter. An Epistle of St. Polycarp to the Philippians is extant in the Gr.

**Philippics**, a name properly belonging to 3 orations of Demosthenes against King Philip. The first was delivered in 352 B. C., the second in 344, the third in 342. The 14 orations of Cicero against Mark Antony are also called P. They were delivered in 44 and 43 B. C. The name is applied to any severe personal attack in speech or print.

**Philippine** (fil'p-pin) **Islands**, a group of about 1200 islands, situated between the Pacific Ocean to the E. and the Chl. Sea to the W., and forming the N. part of the Malay Archipelago. The largest are Luzon, 51,300 sq. m.; Mindanao, 25,000; Samar, 18,020; Mindoro, 12,600; Panay, 11,330; Leyte, 10,080; Negros, Masbate, and Zebu. The total area is estimated at 114,326 sq. m., of which about 1/4 is under Sp. rule; the rest is divided into small independent states governed by native chiefs. Pop. 5,559,020. The P. I. are of volcanic origin. Active volcanoes are found throughout the whole group, but the soil is exceedingly fertile. The mts., rising to a height of 7000 ft., are covered to their very tops with forests of immense trees, yielding excellent timber and many of the most valuable sorts of wood. On the extensive slopes and in the valleys are cultivated abaca or manila hemp; tobacco, which the Sp. govt. keeps as a monopoly; cotton, sugar, coffee, indigo, rice, wheat, maize,



pepper, ginger, vanilla, cinnamon, cocoa, etc. The animal and mineral kingdoms are splendidly represented.

The P. I. were discovered in 1521 by Magellan, and a few yrs. after the Spaniards took possession of the whole group. The inhabs. consist partly of negroes, who live in the interior, are repulsive in aspect, and savage. The Malays are R. Cath., settled in v., and engaged in agriculture and fishing. They possess many fine branches of industry, and they imitate European industry with great success. The Chl. and the mestizoes, generally descending from Chl. fathers and native mothers, are mostly engaged in commerce. Very few Spaniards reside in the islands.

**Philippins** [from Phil. *Puestoviat*, one of their former leaders], or **Staroverski** ("old-faith men"), a sect of Rus. origin settled since 1700 in E. Prus. and Lithuania. They reject oaths and the priesthood, refuse to do military service, rebaptize all converts from other sects, and have a celibate eldership. They cling to the ancient liturgy of the Rus. Ch., which has been officially discountenanced for more than 200 yrs. The P. are a branch of the Raskolniks.

**Philippopolis**, town of European Tur., eyalet of Adrianople, on an island in the river Maritza, which here becomes navigable. It has manufactures of silk, cotton, and leather, and carries on an active trade and banking business. It is rather indifferently built, but has large and well-stocked bazaars. The surrounding plain is fertile, and produces wine and rice. Pop. 24,509.

**Philips** (AMBROSE), b. in Leicestershire, Eng., about 1671, grad. at St. John's, Cambridge, 1696; settled in Lond. as a writer; wrote 6 *Pastorals*, which appeared in Tonson's *Poetical Miscellany*; produced on the stage 3 tragedies, *The Distressed Mother*, *The Briton*, and *Humphrey, Duke of Gloucester*; commenced in 1718 a serial paper, *The Free-Thinker*, which attained great popularity; sec. to the primate and to the chancellor of Ire. 1738; member of the Irish Parl.; registrar to the prerogative court 1734. D. June 8, 1749.

**Philipsburg**, Centre co., Pa., on R.R. and Moshannon River, 30 m. from Tyrone. Pop. 1870, 1068; 1880, 1779.

**Philistines**, a people who occupied the S. sea-coast of Palestine during most of the period of biblical hist., and were almost constantly at war with the Israelites. It is inferred that they were later invaders who came from Crete (Caphtor) during the early period of the Judges. Their land was the low plain called the *Shefelah*, and their superiority in the arts of war several times enabled them to conquer the Israelites. The 5 chief cities of the P. Gaza, Ashdod, Ashkelon, Gath, and Ekron, had each their princes, who were united in a confederacy. Their chief divinities were Dagon, Ashtaroth, and Baal-Zebub. They shared the fate of the Israelites in successive subjection to Assyria, Babylon, and Egypt, and disappeared altogether from hist. previous to the Chr. era.

**Phillips** (JOHN), LL.D., b. at Andover, Mass., Dec. 6, 1719, grad. at Harvard 1735; was for a time a preacher; became a merchant of Exeter, N. H., where in 1781 he founded Phillips Acad. at a cost of \$134,000; gave \$81,000 to Phillips Acad., Andover, and liberal sums to Dartmouth Coll. and Nassau Hall, N. J. D. Apr. 21, 1795.

**Phillips** (JOHN), b. at Boston, Nov. 26, 1770, grad. at Harvard 1788; became a lawyer, and in 1809 a judge of common pleas; State senator 1803-23, pres. of the State senate 1813-23, first mayor of Boston 1822-23; father of Wendell Phillips. D. May 29, 1823.

**Phillips** (SAMUEL, JR.), LL.D., b. at Andover, Mass., Feb. 7, 1751, grad. at Harvard 1771; was a prominent legislator of Mass., in whose senate he sat for 20 yrs., being for 15 yrs. its pres.; was a judge of common pleas 1781-98, and afterward lieut.-gov.; was a merchant and manufacturer, and the prin. founder of Phillips Acad., Andover, Mass. D. Feb. 10, 1802.

**Phillips** (STEPHEN CLARENDON), b. at Salem, Mass., Nov. 1, 1801, grad. at Harvard 1819; became a merchant and a State legislator; M. C. 1834-38, mayor of Salem 1838-42, Presidential elector 1840, and twice a Free-Soil candidate for gov., beside holding various public offices; was many yrs. connected with State board of education. D. June 26, 1857.

**Phillips** (WENDELL), the Tyrtæus of the anti-slavery cause in Amer., b. in Boston, Mass., Nov. 29, 1811, is the son of John Phillips, the first mayor of Boston, and was sent to Harvard, from which he grad. in 1831; entered the Cambridge Law School, and after completing his studies in that inst. in 1833 was admitted to the Suffolk bar in 1834. The times in which he entered upon the stage were clouded with political anxieties of the most serious character; the struggle was already begun between the forces of liberty and slavery. William Lloyd Garrison, by his clear-headed, courageous, and uncompromising declaration of anti-slavery principles, had brought that struggle about, and taken so bold a stand that it was impossible it should end until one side or the other should conquer. In 1835 the "Broadcloth mob"—so called because it was set on foot, and even led, by men of wealth and social position—broke into a meeting of the Women's Anti-Slavery Society and obliged it to disperse. Mr. Garrison, who was assisting at the meeting, was seized by the mob, a rope was put about his body, he was dragged through the streets, and his life was only saved by the subterfuge of putting him in jail as a disturber of the peace. The women of the society behaved on this occasion with heroism. W. P., not at that time 25 yrs. of age, witnessed the extraordinary spectacle of this mob of gentlemen, and he saw the courage of a band of women delicately bred. From those earliest days the cause of the rights of woman held an almost equal place in his mind with that of the rights of the slave, and when the one cause was gained, the cause of woman found in him one of its sturdiest supporters. Mr. P. made his first distinguished mark as an orator in 1837. A meeting had been called in Boston to protest against the murder, at Alton, Ill., of the Rev. Elijah P. Lovejoy, the editor of an anti-slavery newspaper, who had been killed by a mob in that place while attempting to save his

printing-press and his office from their fury. This meeting would have ended in the smoke of a few perfumery resolutions, when W. P., in a manly, logical, and yet fiery speech, took the meeting out of the hands of the Sauls who held the clothes of the slayers of the martyrs and were consenting unto their death. From this time Mr. P. gave up his commission as a lawyer. In taking this step he made a sacrifice of social position such as few young men have ever made in any country. With unflinching energy he devoted himself to the advocacy of the anti-slavery cause. His characteristics as a speaker were a logical, lawyer-like setting out of his subject and great closeness in his argument. He had no pathos, nor ever tried to move that way; he had not Mr. Lincoln's Eastern gift for story-telling; but he knew well the charm of anecdote, of illustrations from hist. and biography, and his speeches were rich in the objective charm that comes from the apt introduction of these. No speaker was more welcome, and when the storm of the anti-slavery agitation was somewhat subsided, no name was surer to draw out the pop. of the towns to the lyceum than that of W. P. In New York and Boston he was always sure of a crowded house, and he was always ready to speak for any cause he held dear, especially for temperance and for woman's rights. Since the abolition of slavery Mr. P. has been busier than before in the lyceum. Beside temperance and women's rights, he has lectured often and written much on finance, the relations of labor and capital, and the effort to secure a fairer division between the capitalist and workmen of the fruits of their joint toil. He has advocated prohibitory legislation in regard to the sale of liquors, maintaining that thus far the attempt to govern great cities on the basis of universal suffrage has been a failure, owing to the influence of the dramshop. He has urged that the national banks be deprived of the right to issue bills, and that the gov. furnish all the national currency, separating it wholly from any coin basis, and let the currency rest solely on the credit of the gov. D. Feb. 2, 1884. See G. W. Curtis' *Funerary Oration*. CLARENCE COOK.

**Phillips** (WILLIAM), b. in Boston Apr. 10, 1750, was a successful merchant, an ardent patriot, and a liberal benefactor of Phillips Acad., Andover, and Andover Theological Sem.; lieut.-gov. of Mass. 1812-23. D. May 26, 1827.

**Phillips** (WILLIAM WIRT), D. D., b. in Montgomery co., N. Y., Sept. 23, 1796, grad. at Union Coll. 1815; studied at the New Brunswick Sem.; became pastor of the Pearl st. Presb. ch., New York, 1818; was transferred to the Wall st. ch. 1826; prominent in the public concerns of the Presb. Ch.; was trustee of the coll. and sem. at Princeton, member of the council of the New York Univ., pres. of the board of foreign missions, and moderator of the Gen. Assembly 1865. D. Mar. 20, 1865.

**Phillipsburg**, city and R. R. centre, Warren co., N. J., on Del. River opposite Easton, Pa., has large iron manufactures. Pop. 1870, 5983; 1880, 7181.

**Phil'o Jude'us**, b. at Alexandria about 20 B. C., spent his whole life there, except 2 journeys he made—one to Jerusalem, and one to Rome. D. about 50 A. D. Of his life very little is known. In Alexandria he devoted all his time to studies, and although as a philos. he is without original genius, and as an author without original style, the peculiarity of his situation as mediator between Gr. and Oriental wisdom, between Platonism and Judaism, between polytheism and monotheism, gave his writings a great influence in his own time, and makes them many Jews had gathered at Alexandria. But having come into close contact here with Gr. civilization and Gr. philos., it became difficult for them to maintain their original character as Jews unalloyed. They naturally endeavored to reconcile that which in their sacred books they considered as divine revelation with that which in the Gr. speculation they felt to be true. From this intermixture of Gr. and Oriental views sprang Gnosticism, Neo-Platonism, and that school of Chr. theol. which is generally called the Alexandrian. But the first representative of this spiritual atmosphere of Alexandria is P. J. His many writings are generally divided into 3 classes—those defending his countrymen, those interpreting and explaining the sacred books of the Jews and their ideas, and those treating metaphysical subjects. Of these 3 classes the second and third are the most interesting with respect to his standpoint. His method of interpretation is the allegorical.

**Philology**. See LANGUAGE.  
**Philopogon**, fil-o-pee'men, b. at Megalopolis, Arcadia, in 252 B. C.; distinguished himself in the battle of Selasia (221 B. C.) as chief of the horse, and was chosen commander-in-chief of the Achean League in 208 B. C. It was his policy to put down all internal dissensions in order to deprive the Roms. of any opportunity of interfering in Gr. affairs; and although his plan was finally baffled, he achieved many brilliant successes. He was in Gr. hist. the last character of a heroic cast. When the Messenians revolted against the league he was 70 yrs. old and sick in bed, but he rose immediately and put himself at the head of the army of the league. In the ensuing battle he fell into the hands of the enemy, and their commander sent him a cup of poisoned wine, which he emptied (163 B. C.).

**Philosophy** [Gr. φιλοσοφία, from φίλος and σοφία, "love of wisdom"].

*Its History.*—The history of P. contains the record of all thinking which refers the manifold of experience to an ultimate principle; this explanatory principle being materialistic on the one hand in the elementary stages of thought, and idealistic in the more advanced stages, while it becomes a principle of method (or a principle at once ontological and psychological) in the highest thinking. The Orient has generally been excluded from the domain of the hist. of P., on the ground that its thinking is not emancipated from religious authority. Gr. P. begins with the Ionic school in religious authority. Heraclitus, Anaximander, Anaximenes, and Heraclitus being its chief names. They set up material principles



—(a) water, (b) the indefinite (matter), (c) air, and (d) fire—as the origin of things. Pythagoras, an Ionian by birth and taught in its school of P., founds a society in Lower It., and proclaims numerical harmony as his principle. The Eleatic school (also of Lower It.) sets up the principle of pure being; it included Xenophanes, Parmenides, and Zeno. Empedocles of Sic. taught that love and hate are the ultimate principles, while Anaxagoras at Athens announced the important doctrine that Reason (*voûs*) arranges and orders all things. Leucippus and Democritus of Thrace founded the atomic P. The Sophists, of whom the most important were Protagoras, Gorgias, and Prodicus, discovered and applied the principles of ratiocination, or the dependence of conviction upon grounds or reasons. Socrates investigated universals, seeking ultimate grounds for conviction in order to establish moral principles on a firm basis. The *voûs* of Anaxagoras becomes with the Sophists individual reasoning—with Socrates universal reason as conscience. Plato, continuing the investigation, finds the theoretical universals, the ideas or archetypes, antecedent to and dominant over the world of experience. Aristotle, finally, takes an empirical inventory of the world, and completes the demonstration that *voûs* is the principle of things in detail, being their final cause. He finds that all universals are phases of one universal Reason (*voûs ποιητικός*), which is the highest principle. His doctrine of first and second entelechies defines the relation of individuals to this absolute Reason and the grounds of the immortality of man. He maps out the paths of the several particular sciences, and makes important investigations in many of them. His pupils, Eudemus and Theophrastus, and his commentators, Alexander of Aphrodisias, Porphyry, Theophrastus, and Simplicius, deserve mention. The Stoic school of Zeno of Citium, whose system is ethical in its tendency, the school of Epicurus, whose system is an atomic materialism, belong to the decline of Gr. P. The revival of Gr. P. at Alexandria after the Chr. era was occasioned by the contact of Gr. thought with Orientalism. Alexandria was the focus or centre for the E. and the W. Neo-Platonism, accordingly, is the struggle to define the relation of Gr. thought to spiritual religion. Its distinguished names are Ammonius Saccas, Plotinus, the 2 Origenes, Porphyry, Iamblichus, and Proclus. In the 9th century the translation of the writings of the pseudo-Dionysius by Scotus Erigena gave rise to scholasticism. The controversy of nominalism and realism, in which Roscellinus, Anselm, Abelard, and William of Champeaux were the chief disputants, occupied the first period of scholasticism. The mastery of Aristotle and the refutation of the pantheistic commentary of Averroës were the chief business of the second period, in which appeared the great theol. Alexander of Hales, Bonaventura, Albertus Magnus, Thomas Aquinas, and Duns Scotus. Aristotle became the “*preceptor Christi in naturalibus*,” as John the Baptist “*in gratuitis*.” Beside Averroës should be named Avicenna, Alfarabi, Alkindi, and Algazel among the Ars., and Avicrombr, Ben David, and Moses Malmonides among the Jewish phillos. Roger Bacon and William of Occam did not follow the prevailing tendencies. Nominalism under Occam destroyed the tendency to rationalize the dogma, and scholasticism went down altogether. About the yr. 1600 began the epoch of emancipation from authority, in which the leading spirits were Giordano Bruno, Francis Bacon, and René Descartes. The first of these attacked the ecclesiastical authority in matters of science; the second founded the empirical method of philosophy; the third completed the emancipation from scholasticism by bringing the principles of P. to the test of consciousness and by discarding the authority of tradition. Thomas Hobbes applied Bacon's principle to politics; Goulinx and Malebranche explained the relation of mind and matter in the Cartesian dualism; Spinoza avoided the Cartesian dualism altogether by adopting the principle of One Substance, with the two attributes, thought and extension. Locke attempted a critical survey of the powers of the mind to cognize truth, and found sense-perception and reflection to be the sources of all ideas. Berkeley drew from Locke's doctrine the inference that we know only ideas and not the external world. Leibnitz opposed the mechanical system of Descartes, and his doctrines, systematized by Wolf, held sway down to the time of Kant. David Hume is the point of departure for the chief systems of P. which have appeared during the past hundred yrs. His criticism on the idea of causality, reducing it to the mere “habit of surveying things constantly conjoined with each other,” sapped the foundations of all dogmatic P. current at his time. Le Mettrie, Voltaire, Rousseau, Condillac, Diderot, D'Alembert, Robinet (who anticipated Darwinism and the Spencerian “evolution”), and Von Holbach are noted thinkers in the same movement in Fr. Lessing began the struggle for literary independence in Ger., and Kant completed the reaction in P. and freed his country from its subservience to Fr. ideas. The *Critique of Pure Reason* established on the ground of their universality and necessity the *a priori* character of causality and other categories, and demonstrated the self-activity of the mind in sense-perception. The *Critique of Practical Reason* showed that God, free will, and immortality are necessarily postulated by all acts of the individual as “regulative ideas”; they are the logical conditions of human action. These two *Critiques* rescued religion and morality, and the Insts. founded on them, from the attacks of scepticism, but they denied the possibility of theoretical cognition in the realm of objective existence. This inability the later schools of Ger. P. labored to remove. Fichte's *Science of Knowledge* showed in a systematic form the origin of the categories in the self-activity of the mind, and proved that the will is therefore presupposed everywhere as a conditioning factor in cognition. The sensuous factor of knowledge is accordingly subordinated, and the moral world is almost the only world that exists for Fichte. Schelling, however, reacts to the opposite extreme, and

lays great stress on the evolution of unconscious organism in nature and human hist. The central object of his system is therefore aesthetic art, wherein the unconscious reason reaches its completest expression. Hegel, in opposition to Schelling's tendency to emphasize unconscious evolution, endeavored to grasp the content of nature and mind with self-conscious method. His “unity of thought and being” means that universal and necessary ideas, being the logical conditions of the world of experience, are as objective as they are subjective, any denial of this principle being self-contradictory, inasmuch as it assumes to pronounce *a priori* upon the objective possibility of existence—the very thing it repudiates. Hegel's P., like that of Aristotle, takes an encyclopaedic inventory of the world of nature and man, reconciling and interpreting all phases. Herbart reproduces Leibnitz as modified by the psychology of Kant and Fichte. His school is prolific in distinguished writers. Lotze's system is an independent reproduction of Herbartianism. Trendelenburg's system is based chiefly on Aristotle. Schopenhauer's pessimism has exercised much influence on the recent lit. of Ger. The ablest It. phillos. of the present century are Galluppi, Rosmini, Gioberti, Mamiani (who publishes at Rome a journal devoted to speculative P.), and the Hegelians Vera, Mariano, and Spaventa. In Fr., Laromiguière, Royer-Collard, Maine de Biran, Victor Cousin, Jouffroy, Paul Janet, Rémusat, represent the psychological tendency; St. Simon, Fourier, the socialistic; Comte, Littré, Taine, the positivist direction. The Scotch school of Reid, Stewart, Brown, and Sir William Hamilton begins with a reaction against Hume, and tends toward the adoption of a modified Kantianism. The school of Locke and Hume is represented in the present century by Stuart Mill, Lewes, Spencer, and others. Ger. P. in G. Brit. has been introduced and interpreted by Coleridge, Carlyle, Hutchison Stirling, Jowett, Flint, T. H. Green, Ferrier, and others. Amer. P. counts (a) in its theological school such names as Edwards, Dwight, Taylor, Tappan, and Finney; (b) in its transcendentalist school, Marsh, Emerson, Margaret Fuller, A. B. Alcott, Theodore Parker, George Ripley, O. A. Brownson (who became a “Thomist”), and F. H. Hedge; (c) in its psychological school (after the Scotch or after the Fr. eclectics), Porter, McCosh, Bowen, and Mahan; (d) in its school based on original study of Kant or his successors, J. B. Stallo, L. P. Hickok, C. C. Everett, and E. Mulford.

WILLIAM T. HARRIS.

#### Philosophy, Moral. See MORAL PHILOSOPHY.

**Philtre** [Gr. *φίλτρον*], a love-potion. P. were much used in anc. Gr. and Rome, and the Thessalians had special eminence in their preparation. Many of their ingredients were harmless, others were violent poisons. The use of these potions is prevalent in almost all barbarous and half-civilized lands.

**Phips** (Sir WILLIAM), b. at Woolwich, Me., Feb. 2, 1851, was one of a family of 26 children by one mother; when 13 was apprenticed to a shipbuilder and learned to read; went in 1864 to Eng., and obtained means to fit out a vessel to recover the silver of one of the Sp. plate-fleet wrecked off the Bahamas, but was not successful until 1867, when he obtained treasure worth some \$1,500,000 (some accounts say \$3,000,000), for which he got some \$80,000, beside receiving knighthood and the office of high sheriff of N. Eng.; captured Port Royal, N. S., and went unsuccessfully against Que.; was the first royal gov. of Mass. 1892-94; built the fort of Pemaquid, Me., 1692; co-operated with Mather in the witchcraft trials, until at last his own wife was accused; was suddenly called to Eng. 1694 to answer charges against him. D. in Lond. Feb. 18, 1695.

**Phlogiston** [Gr. *φλογιστός*, “burnt,” from *φλογίζω*, “to burn”), a term introduced into chem. by George Ernest Stahl in 1697. Stahl's P. was an imponderable principle contained in metals and combustible bodies, combustion consisting in its evolution. Burnt bodies and metallic oxides were “dephlogisticated” bodies. Incombustibility on the part of any substance indicated that it had been burnt and had lost its P. The phlogistic theory at once took a deep hold upon the chemical world, which it retained for nearly a century. The depth of this hold is shown by the fact that Priestley, the discoverer of oxygen in 1774, called his new and wonderful gas “dephlogisticated air.”

**Phlox** [Gr. *φάξ*, “flame”], a genus of a few annual and nearly 30 perennial herbs of the order Polemoniaceæ, all but one Siberian species N. Amer. There are many fine artificial varieties in flower-gardens, all natives of the Atlantic U. S.

**Phocæa**, an anc. city of Asia Minor, an Ionian colony situated on the peninsula between the Cymæan and Hermean gulfs, 25 m. N. W. of Smyrna; its inhabs. were the founders of Massilia in S. Fr., Alalia in Corsica, Rhegium on the Sicilian Strait, and other flourishing settlements. Unable to defend themselves against the Pers., they brought their women, children, and property on board their ships, and set sail for Corsica.

**Phocidæ**. See SEAL.

**Phocion**, pho'se-on, an Athenian general, b. about 402 B. C., commanded against Philip II. of Macedonia in Eubœa, Megara, Byzantium, and other places. In politics he sided with the Macedonian party. After the death of Antipater he became implicated in the intrigues between Cassander and Polyperchon, fled to Phocis, was delivered up to the Athenians, who condemned him to take poison (317 B. C.).

**Phocis**, an anc. division of Gr. In Hellas proper, was bounded S. by the Corinthian Gulf, E. by Boeotia, N. by Doris, and W. by Locris. It was very mountainous, and its N. E. part was traversed by the river Cephissus. Delphi, Elatea, and Cirrha were its prin. towns. It derived its chief historical interest from the famous oracle of Delphi. But a verdict of the Amphictyonic Council ordered the Phocians to pay a fine for having used a tract of land which belonged to the oracle. When the Phocians refused to pay, a 10 yrs.' war, from 355 to 346 B. C., broke out, in which they



The above analysis of speech-sounds results from the

*Examplez of Unaccented Inglish Glossik - Objekts. — Too fasilitait lerning too reed. Too maik lerning too spel unneseseri. Too asimilait reeding and reiting too heerring*



and speaking. Too maik dhl risevd proanunsiaishen ov liturari Ingglish akseisib too aul reederz, proavinshel and foren. Meenz.—Leev dhl oaid speling untucht. Intraudeus along seid ov dhl oaid speling a neu aurtthografi, kunsisting enteirl ov dhl oaid letters, and mainli ov dhl oaid kombinaishenz, euzd invairriabl in aulreidi familier sensez. Emplai dhl neu speling in skoolz too teech klee aartikeulaishen and distinkt reeding in boath aurtthografiz. Alou eni reiter too reit in dhl neu speling oail on aul okaizhenz without loozing kaast, proaveld hee euzez a risevd proanunsiaishen. Dhat is, *aknoej dhl neu speling konkurentli with dhl oaid.* [From orig. art. in *J.'s Univ. Cyc.*, by ALEX. J. ELLIS, F. R. S.]

**Phonograph**, an instrument invented in 1878 by Mr. Thomas A. Edison of Menlo Park, N. J., for impressing upon a metallic surface an exact copy of the vibratory movements of a stretched membrane acted on by sonorous undulations in the air; so that, by using this impression to react upon the membrane as a fiddle-bow acts upon the string, the vibrations, and consequently the sounds, are reproduced in their original order. When the instrument is used to record articulate sounds, the large funnel is removed, and the mouth of the speaker placed very near to the membrane. The operator then turns the crank uniformly, and enunciates his words in a bold tone while turning. The record being completed, the mouthpiece is withdrawn from the cylinder, and the crank turned backward until the original position is reached. The mouthpiece is then restored to its place, the large funnel attached to it for the purpose of reinforcing the sound, and the crank is turned forward as before. The words previously spoken by the operator are now repeated by the instrument with all their peculiarities of accent, emphasis, and pitch.

**Phonography** [Gr. *phōnē*, "sound," and *gráphein*, to "write"], or **Phonetic Shorthand**, any system of brief writing which expresses more or less fully and accurately the vocal elements of speech.

**The Phonographic Alphabet.**—The consonants, with their appropriate signs and names, are illustrated in Fig. 1. The vowels are represented by means of dots and dashes, and the diphthongs by a combination of 2 dashes. They are written by the side of a consonant stroke, and the vowel-scale is made extensive by giving a different vowel-significance to the dot or dash according as it is written opposite the beginning, middle, or end of the stroke. The vowels are read before or after an adjacent consonant, according as they are written before or after perpendicular or inclined, or above or below horizontal strokes. (See Fig. 2.)

**Modifications of the Consonant Strokes.**—The primary consonant strokes are variously modified to indicate the addition of other consonants; thus, a small initial hook indicates the addition of *l* or *r*, according to the side on which it is written. A large initial hook indicates the addition *br* (as in *ter, lor, lar*), or *rl* (as in *rel, ral*, etc.), according to the side on which it is written. A small final hook indicates the ad-

FIG. 1. The Consonant Signs.

Sign.	Sound.	Name.	Sign.	Sound.	Name.	Sign.	Sound.	Name.
	p	pee.		f	ef.		l	el.
	b	bee.		v	vee.		r	ar.
	t	tee.		th	ith.		m	em.
	d	dee.		thee.			n	en.
	ch	chay.		es.			ing	ing.
	j	jay.		zee.			y	yay.
	k	kay.		shay.			w	way.
	g	gay.		zhay.			h	hay.
<b>Additional Consonant Signs.</b>								
	r	ray.		w	wēh. wuh.		y	yēh. yuh.
	h	hzh dot.		s	iss circle, ses circle.		st	steh loop.
				ss	circle.		str	ster loop.

FIG. 2. The Vowel Scale.

	be.		nay.		are.		all.		own.		food.
	it.		pet.		pat.		not.		up.		foot.
	eye.		ofl.		out.		mute.				

FIG. 3. The Consonant Strokes variously Modified.

Initial hooks.	Final hooks.	Lengthening.	Widening.
p.	p-l.	p-r.	p-lr.
p-r.	p-rl.	p-f-v.	p-n.
p-sh.	p-tive.	b-d.	b-dr.
m-p-b.			

The *iss* circle, *ses* circle, *steh* and *ster* loops, initially and finally:

p.	s-p.	s-pl.	s-pr.	ss-p.	ss-pr.	p-s.	p-f-s.	p-n-s.	p-ss.	pn-ss.	p-st.	p-str.	p-nst.	p-nstr.	st-p.	st-pr.

FIG. 4.

Prefixes.	Affixes.	Phrase-Writing.	Word-Signs.	Phrase-Sign.
ply, comply.	bent, incumbent.	when, whenever.	I am sure, sir.	I am sure, sir.
			by.	be.
			to.	to.
			possibility.	possibility.
			in their own.	in their own.

FIG. 5. The Corresponding Style.

The harmony of the spheres.	Dear sir: Your received; con- noted.	I will state this propo- again, as it is un-
	favor	tion sir, doubtfully important.

dition of the sound of *f*, *v*, or *n*; and a large final hook the addition of *shn* (*tion, sion, cion, cian*, etc.) or *tive*, according to the side on which it is written. The *iss* circle when written at the beginning of a stroke (hooked or not) implies that the stroke is preceded by *s*; when written at the end of a stroke (hooked or not), that the stroke is followed by *s*. The *ses* circle occurring initially or finally implies the precedence or succedence of *cis*, *ces*, *siz*, *ses*, *sus*, *sas*, etc. The *steh* loop initially or finally indicates *st*. The *ster* loop indicates *str* (as in *ster, stor*, etc.), but is not written initially. These circles and loops when written finally, on the side of the *n* hook (by making the hook into a circle or loop), signify the addition to the stroke, of *n-s*, *n-ss*, *cis*, etc., *n-st* or *n-str*. The sound of *s* may be added to a stroke modified by an *f* hook by writing the *iss* circle within the hook. *S* may be made to precede a stroke modified by an *l* or *r* hook by writing the *iss* circle within the *l* hook, or by making the *r* hook into a circle. By halving a stroke (writing it half length) *l* or *d* is added, according as the stroke is light or heavy; by lengthening (writing it double length) *tr*, *dr*, *th*, or *Thr* is added, according as the stroke is light or heavy; by widening, *p* or *b* is added. (See Fig. 3.)

**Expedients for increasing Speed.**—Various other expedients

are made use of, as an initial dot or tick or small circle to imply a prefix, as *con*, *com*, *cog*, *circum*, *contra*, *self-con*, or *self-com*; a final dot or tick (light or heavy), or circle, to indicate the imperfect participle of verbs, an adverbial or other affix, as *ing*, *ings*, *ing -the*, *a*, *an*, or *ly*; *self*, *selves*, *bleness*, *fulness*, etc. Other affixes are indicated by an abbreviated termination, as *so* for "soever" in *whosoever*, *whenever*, etc. By "nearness" (writing two words near together) the omission of the connecting preposition "of," or of the prepositional phrases "of the," "of a," is implied. An outline just touching the under side of the line of writing implies the precedence of "to," or "two." (See Fig. 4.)

Two other expedients for increasing speed remain to be noticed—phrase-writing and word-signs. By phrase-writing is meant the junction of several words without lifting the pen. The junction of words does not diminish, but rather increases, the legibility of the writing where the words are grammatically closely related, as in the phrase "I am certain." By word-sign is meant a primary character, simple or modified, which is memorized as an arbitrary and abbreviated expression of a certain word or words. (See Fig. 3.)

The average rate of public speaking is about 120 words per minute. To acquire this speed the phonographic student



needs to devote to the art about 1 yr. of practice of 2 or 3 hours daily. The impassioned utterances of public orators sometimes reach as high as 250 words per minute. Fig. 5 illustrates the corresponding and reporting styles of P. (See also STENOGRAPHY.) [From orig. art. in *J.'s Univ. Cyc.*, by JOHN FRANCIS MEYER.]

**Phormion**, a celebrated Athenian gen., b. of a distinguished family; was sent in 440 B. C. with reinforcements to the Athenian troops blockading Samos, and in 432 he commanded the troops which were sent to reinforce Callias, besieging Potidea. Here, after completing the circumvallation of the city, he led the rest of his troops against the Calcidians. In 430 he led the Acarnanians against the Ambraciots, and in the same yr. he was sent with 20 ships to Naupactus, to stop all vessels bound for Corinth. A Peloponnesian fleet was sent out to help the Corinthians, but P. defeated the enemy in 2 engagements.

**Phosphorus** (fos'jen) **Gas** [Gr. *phos*, "light," and *γενναειν*, to "engender"], (syn. *Chloroacarbonic Acid*, *Chloride of Carbon*; Ger. *Chlor-Kohlenoxyd*). Equal volumes of chlorine and carbonic oxide gases, mixed and exposed to sunshine, unite without explosion, the greenish color of the chlorine disappearing, and the vol. of the product (if the atmospheric pressure has access to it) becoming exactly  $\frac{1}{2}$  that of the mixture. P. is a colorless gas, of an odor more suffocating and unpleasant than chlorine gas itself, drawing tears from the eyes. It does not fume in the air, though contact with water decomposes it. It has acid characters and reddens litmus. Water converts it into a mixture of muriatic and carbonic acid gases.

**Phosphates**, compounds, with basic bodies, of the phosphoric anhydride. Of all classes of the oxygen-salts as yet studied by chemists, this class presents the greatest difficulties and complexities. This is due to the existence of a number of hydrates of phosphoric pentoxide, which contain the latter in such molecular forms as to possess different basicities, corresponding to the water in each hydrate. Moreover, even among the ordinary or orthophosphates, complexity, or at least great multiplicity is occasioned by the fact that the 3 molecules of base are interchangeable—that is, in normal or neutral orthophosphates there may be 3 of one base, or 2 of one and one of another, or one each of 3 different bases. Of the orthophosphates, the following possess importance:

**Ordinary Phosphate of Soda**, *Twenty-four Hydrate of Monohydric disodic orthophosphate*.—This is the common commercial salt. It is an ingredient of blood and found in urine. It is prepared commercially by adding a slight excess of carbonate of soda to the crude phosphoric acid obtained from bones, and crystallizing. It forms fine large transparent prisms, oblique rhombic in form. On exposure to the air it undergoes rapid efflorescence. Its taste is saline like common salt; alkaline to test-paper; soluble in 4 parts of cold and half as much boiling water.

**Microcosmic Salt**, also called *Phosphorus Salt*, *Octohydrate of monohydric monosodic monammonic orthophosphate*, is found abundantly in putrid urine, and as *stercorite* in guano.

**Struvite** is another mineral P. from guano, which seems to be *monammonic dimagnesian orthophosphate*, identical with the precipitate formed by a solution of microcosmic salt in a magnesian solution, the form in which magnesia is determined in chemical analysis.

**Tricalcic Phosphate—Bone-earth**.—This compound is the most important of the phosphorus compounds, and the source of all the rest. (See BONE, CHEMICAL COMPOSITION OF, and OSSEIN.)

**Superphosphate of Lime**, which is so important an artificial fertilizing material, is prepared by treating ground bones with a somewhat diluted sulphuric acid. It contains, mixed with sulphate of lime, an acid calcic orthophosphate.

**Phosphate of Alumina** occurs in nature as the mineral *icavellite*, which is the *dodecahydrate of triammonic diorthophosphate*; *turguioite*, another mineral, is *pentahydrate of dialummic orthophosphate*, stained to the peculiar green color with cupric phosphate.

**Phosphates of Iron** occur native. The mineral *vivianite* is *trihydrate of triferrous orthophosphate*. Magnificent crystals are found in the greensand formation of N. J. *Coccoenite* is a hydrated *diferrous orthophosphate*, and there are several others. The orthophosphates of iron and alumina, with P. of lime, are almost universally diffused, in more or less minute proportion, throughout all rocks and soils.

**Phosphate of Lead** occurs native, in combination with *chloride of lead*, in the beautiful mineral species *pyromorphite*, 3 molecules of *triptumbic orthophosphate* to 1 molecule of *plumbic dichloride*.

In view of the fact that the animal framework or skeleton is built mainly of *tricalcic phosphate*, P. become almost of paramount importance as mineral constituents of the food of man, and within the last 20 yrs. great efforts have been made to introduce P. as ingredients of human food. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. HENRY WERTZ, Ph. D.]

**Phosphorescence**, a term applied to a very wide range of chemical or physico-chemical phenomena, including all those in which *light*, resulting from some process within the body that emits it, is unaccompanied by heat, or at least by an amount of heat perceptible to the sense of touch. The word is derived from *phosphorus*.

**Phosphoric Acids**. Phosphoric pentoxide or anhydride combines with water in a number of different proportions; and there is this peculiarity about several of these hydrates, that when the water in them is displaced by a metallic oxide to form a salt, the nature of the salt varies with the hydrate, its basicity being in proportion to the number of equivalents of water in the latter. No other acidogenic oxide has this character so far as known.

**Phosphoric Anhydride** (*Phosphoric Pentoxide*) is the product of the burning of phosphorus with flame in the air. It appears as a white smoke.

**Phosphoroscope**, a device invented by E. Becquerel

for showing the phenomenon of phosphorescence in bodies which shine but for a very minute portion of time after their insulation. By suitable perforations in a disk revolving over a box in which is the substance to be examined, sunlight is allowed to fall upon it and to be cut off before the observer can see it through another aperture. By giving to the disk a sufficiently rapid rotation observations may be made after an interval of less than  $\frac{1}{400}$  of a second after light has ceased to shine upon the substance.

**Phosphorous Anhydride and Phosphites**. Phosphorous trioxide is formed when phosphorus undergoes *slow* combustion, without flame, at the ordinary temperature in perfectly dry air. It forms volatile white flakes having an alliaceous odor and highly deliquescent. It combines with water, with a hissing noise, to form *phosphorous acid*.

**Phosphorus** [Gr. *phos*, "light," and *γενναειν*, "bringing," from *γενναι*, to "bring"], one of the most important and interesting of the elements of matter, and one of those most essential to animal life. It was discovered more than 200 yrs. ago, in 1669, by Brandt of Hamburg, who obtained it in experimenting on the distillation of extract of urine with charcoal. In 1740 Marggraf identified phosphoric acid as a peculiar acid. Gahn in 1799 proved that bones contain this acid, and Scheele discovered how to prepare it from them. P. is now manufactured by first making from bones a soluble acid phosphate of lime through the agency of sulphuric acid, and mixing and distilling this with charcoal in earthen retorts at a red heat. Bone-ash contains nearly 30 per cent. of P. this being the precise proportion in pure *tricalcic phosphate*; but the amount of P. obtained in practice is only from 8 to 11 per cent. The process is also extensively consumptive of fuel and destructive of apparatus, as well as of the health of the operatives, these facts much enhancing the cost of P. The importance of this product to man is, however, so great—chiefly as a material for making matches—that the production is carried on on a very large scale and with great skill in all civilized countries, and P. is a comparatively cheap and quite abundant article of commerce. Common commercial P. is a slightly yellowish body of wax-like consistence, and translucent. It is generally cast into the form of sticks, which, on account of their dangerous inflammability, must be preserved under water.

**Phosphorus Bronze**. This term is used to designate a bronze or alloy of tin and copper with which a small amount of phosphorus—less than 2 per cent.—has been combined. The discovery was made about the beginning of 1871 by MM. Montefiori, Levi, and Keuzel.

**Phosphorus, Medicinal Uses of**. Pure P. is locally an intense irritant and caustic to animal tissues, and taken internally is a virulent poison, whether in large single dose or in repeated administration of small quantities. Given medicinally in doses of a minute fraction of a grain, P. is sometimes of benefit in conditions of nervous debility, and especially in neuralgias. Under its use the patient's general state may improve and the special morbid symptoms abate. A hypothetical explanation of these therapeutic effects is based on the existence of a phosphorized fat as a normal ingredient of nerve-substance. In nervous exhaustion this is supposed to be deficient, and the giving of P. is assumed to supply the want. P. is most commonly given in pill form, the minute dose being dissolved by warmth in some form of fat which concretes on cooling. It may also be given in solution in appropriate fluid mixture, but most of these solutions have a very offensive taste.

**Photius**, fo'she-us, held a high position in the civil service of the Byzantine govt., when in 858 he was hurried through all the grades of the ecclesiastical order in 6 days, and on the 7th installed by the emp. Michael III., as patriarch of Constantinople. A quarrel having arisen between the Rom. and the Constantinopolitan sees concerning the jurisdiction over the newly converted Bulgarians, Pope Nicholas I. deposed and excommunicated him. For the sake of self-defence, P. gave the conflict a doctrinal turn, and the Council of Constantinople (867) condemned and excommunicated Pope Nicholas I. because he held heretical views, thereby laying the foundation of the schism between the E. and W. chs. In 867, when Basilus the Macedonian succeeded Michael III., P. was bereft of his office and sent into exile, and Ignatius was reinstated; but after the death of Ignatius he returned to Constantinople and was once more placed on the patriarchal throne. In 886 Leo the Philosopher again exiled him, and he d. a few yrs. after in an Armenian monastery. Wrote *Myriobiblon* or *Bibliotheca*, *Lexicon*, *Nomocanon*, and letters.

**Photogene** [Gr. *phos*, "light," and *γενναειν*, to "produce"], the Ger. term for the portion of shale, coal, or petroleum oil suitable for burning in lamps.

**Photographic Engraving**. See PHOTOGRAPHY.

**Photographic Printing Ink, or Artotypes**.

The great drawback with photographs produced by placing paper coated with nitrate of silver in contact with a negative, and exposing it to the action of light, which changes the color of the silvered paper and makes the picture, is their liability to fade. By the artotype this fault is remedied by means of printing ink in the following manner: A plate of glass coated with gelatine and bichromate of potash is placed in contact with a negative and exposed to the action of light. The effect of light on gelatine is to make it insoluble in water, and when the glass plate, after being exposed for a certain time to the action of light, is soaked in water, the picture is found impressed on the plate. Thus a printing plate is prepared which, by the application of printing ink and the printing-press, produces unfading pictures.

**Photography** [Gr. *phos*, "light," and *γραφειν*, to "write"]. This art dates back to the beginning of the present century. In 1802 Thomas Wedgwood, an Englishman, first produced photographic pictures by exposing paper impregnated with nitrate of silver to sunlight under a silhouette or similar dark object. Davy succeeded in ob-



taining copies of objects by combining the solar microscope with a camera obscura. In 1814 Nicéphore Niepce of Châlons succeeded in taking pictures in a camera by exposing for hours a silvered plate of copper coated with asphaltum dissolved in oil of lavender. Daguerre, his associate for some yrs., exposed a polished silver plate, coated with iodine by means of iodine vapors, to the light in a camera; no image was visible until the plate was exposed to vapors of mercury, when that metal was precipitated upon the parts most affected by the light. The superfluous silver iodide was removed with hyposulphite of soda. In 1841 Talbot succeeded in obtaining a paper negative in the camera by using paper prepared with iodide of silver, solution of nitrate of silver, and gallic acid, and developing with a mixture of the 2 latter agents. In 1847 Niepce de St. Victor substituted glass coated with albumen containing iodide of potassium. In 1850 Legray attempted, and in 1851 Archer and Fry of Eng. made a more successful effort, to replace the albumen with collodion. The paper used for positives was improved by being coated with albumen, and through several more or less important inventions P. became established as an art. Barreswil, Lemerier, Niepce de St. Victor, and others introduced processes for using lithographic stone and steel plates coated with asphaltum, exposed under negatives, treated with solvents to remove the unaltered asphaltum, and then with acids to etch the plates so that they could be used with ink for printing impressions. Mungo Penton, Talbot, Pretsch, and Poitevin laid the foundation for some of the most important photographic processes. Labeck in 1810 showed that chloride of silver assumes different colors in different parts of the spectrum, and Becquerel in 1847 found that a plate of silver, immersed in metallic chlorides and exposed under colored glasses, receives an impression which it retains while kept in the dark. *Heliocromy*, or the production of colors by sunlight, is therefore possible, but no way of fixing these colors is known.

The first step in the ordinary photographic process is to obtain a negative. The cameras used consist of a dark box, capable of being drawn out, so that a prepared plate at the rear can be brought into the focus of a lens in the front. This lens for portraits must be able to concentrate a strong light on the plate; it must also give as perfectly flat and sharp a picture as possible. The glass plate being thoroughly cleansed with acid, and then with ammonia or otherwise, is coated with collodion. The collodion plate is immersed in a bath of solution of nitrate of silver, previously saturated with iodide of silver, to prevent the solution of the iodide of silver formed during the immersion on the collodion plate. The wet plate is now inclosed in a dark case and placed in the camera, where it is exposed as long as necessary to the light. The plate is removed to the dark room and a developer poured over it, and left until the details of the picture are all visible, when it is washed off. Generally a negative is not intense enough, and then it is intensified by pouring over it some more of the sulphate of iron solution with a little acetic acid and very dilute solution of nitrate of silver. It is then washed, and fixed in a solution of cyanide of potassium, which dissolves the unchanged iodide and bromide of silver. The fixed negative is dried and varnished, and is then ready for furnishing the *positives*. To obtain the positive picture the negative is placed upon albumenized paper, previously impregnated with solution of chloride of sodium, then floated in solution of nitrate of silver, and dried. The two are exposed to the light, and the silver salts on the paper are darkened by the light which passes through the transparent parts of the negative. The result is a picture in which the lights and shades are in their proper places, and it is now necessary to fix this picture by dissolving the superfluous silver salt with hyposulphite of soda. By this operation the purplish-brown color of the positive is changed to a disagreeable yellowish-brown, which is remedied by *toning* in a gold bath before fixing. The picture thereby acquires a better color, and is more durable on account of the gold surface obtained. Chloride of gold, generally combined with chloride of potassium or sodium, is used for toning, and the color produced will vary according to the acidity or alkalinity of the bath. After being fixed, the positive is well washed, mounted, and calendered. By using developers with nitrate of potash, nitrate of silver, and nitric acid, with a suitable collodion and short exposure, positives can be taken at once in the camera, either on glass, afterward coated on the back with black varnish, or on plates of dark glass or of iron faced with black varnish. These are called *ambratypes* and *melanotypes*. Transparent positives on glass can be made by substituting for the paper a plate of glass properly prepared with sensitized collodion. Stereoscopic pictures are taken with cameras having 2 lenses, about  $\frac{1}{4}$  inches apart, or by moving the single-lens camera a little to one side after taking the first picture. Negatives of very minute objects in enlarged size are taken with the microscope by inserting the eye-piece of the instrument into the camera and throwing the image of the strongly illuminated object on the prepared plate without the intervention of the usual camera objective. Photographs of astronomical objects are taken by substituting for the eye-piece of the telescope a prepared plate, which receives at once the image thrown on it by the object-glass or this image enlarged by the intervention of a lens of short focus. Microscopic photographs are obtained by again photographing a negative with a lens of very short focal distance.

Some of the most important accessory processes of P. depend upon the following facts: If gelatine impregnated with bichromate of potash or ammonium is exposed to the light, it loses its properties of swelling in cold water and of dissolving in warm water. Talbot discovered this, and employed it to produce steel engravings, by coating the steel with chromatized gelatine, exposing it under a negative, dissolving out the unchanged gelatine, and etching the plate where it was thus exposed. Pretsch by copying under

a positive obtained a film in relief, which he reproduced with copper by the galvanic battery, and used for printing. Pigment prints are made by coating paper with chromatized gelatine, colored with any desired pigment, and exposing it under a negative. The gelatine film is then dampened, placed on a smooth zinc plate, and when dry immersed in warm water. This removes the paper, and the gelatine film is then transferred to glue-paper. As the gelatine is affected to a greater or less depth according to the intensity of the light, the half-tones are preserved. Monochromatic pictures are thus reproduced in their original colors, sketches of the old masters being especially so copied. By exposing a simple chromatized gelatine film, resting on collodion, under a negative, dissolving out the unchanged gelatine with hot water, allowing the relief thus obtained to become very hard by drying, and then placing it on a lead plate under a strong press, Woodbury obtains a printing plate. On this is poured warm colored gelatine solution, upon which is placed calendered paper, and the gelatine adhering to this in layers of different thickness produces a perfect representation of the half-tones. This process is called "relief printing." Asser and Osborne obtain photolithographs by exposing under a negative chromatized gelatine paper, which then only absorbs lithographic ink where the light has worked; the paper is then washed and applied to a lithographic stone, which absorbs the ink and can be used for printing. [From orig. art. in *J.'s Univ. Cyc.*, by Prof. H. B. CORNWALL.]

#### Photolithography. See PHOTOGRAPHY.

**Photometer** [Gr. *φως*, "light," and *μέτρον*, "measure"], an instrument for comparing the intensity of any light with that of another assumed as a standard. The principle upon which most of these P. are constructed depends upon the law that "the intensity of light emanating from a point varies inversely as the square of the distance of the light from the object illuminated." Among those deserving consideration are the following:

*Mason's Electro-Photometer*, especially adapted for comparing lights of different colors, consists of a circular disk divided into black and white sectors which is revolved by clock-work at the rate of 250 to 300 turns per second. When illuminated by a constant light it appears gray, but when illuminated by the electric spark the sectors are visible as if it were at rest. If the intensity of the light from the spark is diminished, or the illumination from the constant source of light is increased, a point is finally reached at which the light from the spark ceases to make the sectors of the disk visible. By a comparison of the distances at which 2 lights prevent the appearance of the sectors when the electric spark is passed, the relative intensities of the 2 lights may be calculated.

*Rumford's Photometer* consists of a wooden cylinder with a small white screen behind it, upon which its shadow is thrown. With 2 lights there are of course 2 shadows, each shadow being illuminated only by one of the lights. The lights are so arranged that the shadows are brought close together without overlapping, and the lights are moved independently nearer to or farther from the screen until the shadows are equally illuminated. The intensities of the lights are then inversely as the squares of their distances from the screen. *Ritchie's Photometer* is a modification of this, where the lights are cast upon a screen of oiled paper in a box inclosed in a dark chamber. *Foucault's modification* of Rumford's P., starched glass plates, has been extensively used in Fr.

*Bunsen's Photometer* consists of a bar 80 to 100 inches long, supporting a small disk of paper in a frame, the paper being oiled all over with the exception of a spot in the centre, or in some cases the centre being oiled while the remainder of the paper is left in its natural state. At one end of this bar is placed the standard light, at the other the light to be tested. The disk is moved along the bar until it is seen to be equally illuminated on both sides. *Letheby's modification* of Bunsen's P. has the disk inclosed in a box, with mirrors at each side so placed that the observer can see both sides of the disk at a glance. This form of P. is the one most generally used.

*Lowe's Jet Photometer* depends upon an entirely different principle. It is used exclusively for testing illuminating gas. Mr. Lowe discovered that "the height of a flame of gas burning under a well regulated and constant pressure from an aperture of unalterable dimensions depends upon the illuminating power of that gas." The apparatus therefore consists essentially of a jet with a single opening, made at first of porcelain, but at present usually constructed of steel, connected with suitable apparatus for regulating the flow and pressure of the gas. The jet of gas is made to burn in a box, the front of which is of glass on which is engraved a scale, while on the opposite side of the box is another scale corresponding, so that the point to which the top of the flame attains may be observed accurately.

In photometrical experiments the operations are usually conducted in a room the walls of which are blackened to prevent as far as possible any reflections which would tend to affect the observations. Some few P. are constructed with a view to dispensing with the so called "dark room," but the results are considered more reliable when the observations have been made in an apartment prepared for the purpose by having the walls colored a dead black. [From orig. art. in *J.'s Univ. Cyc.*, by E. WALLER.]

#### Photo-Relief Printing. See PHOTOGRAPHY.

**Phran'za**, or **Phran'zes**, the last of the Byzantine historians, b. in 1401, was ed. at the court of Constantinople; appointed chamberlain to Manuel II. Palaeologus in 1418, and employed in diplomatic missions. After the death of Manuel II. he attached himself to Constantine, the brother of the reigning emp., John VII., and distinguished himself as a soldier. At the siege of Patras he saved the life of Constantine, but was taken prisoner himself. On the accession of Constantine Palaeologus to the throne in 1448, he was



promoted to the highest positions, but after the capture of Constantinople in 1453 he was made a slave. He escaped to Sparta; from Sparta he fled to Corfu, was still active for some time in diplomatic negotiations, but retired finally to the monastery of Tarchaniotes, where he wrote his *Chronicon*, and d. after 1477.

**Phrenology** [Gr. φρήν, "mind," and λόγος, "discourse"]. This term, properly signifying the science of faculty, in distinction from psychology, the science of the soul, was first applied by Gall and Spurzheim to a group of psychological theories arising partly from the discovery that the animal brain is a very complex congeries of organs, and partly from empirical observations as to the existence of a certain correspondence, or series of correspondences, between the configuration of the cranium and the special aptitudes exhibited by its possessor.

Gall's view of the physiology of the brain may be described as follows: The convolutions are distinct nervous centres, each having its special activity. As concerns the lobes, the frontal are occupied by the perceptive group of centres; the superior by the moral and æsthetic groups; the inferior by a group mainly concerned in the nutrition and adaptation of the animal to external conditions; the posterior by the social instincts; and the cerebellum is supposed to have the function of presiding over the procreative activity, of endowing it with passion and psychic significance, and thus lifting it within the sphere of sentiment and feeling. As concerns all these propositions, with the exception of the last, recent experiments in vivisection have verified their general accuracy. As respects the function of the cerebellum, the truth may probably be formulated as follows: The cerebellum co-ordinates the movements concerned in locomotion in a primary and instinctive manner, as vivisection experiments and comparative anat. indicate; but as these movements are partly identical with those concerned in coition, it is also materially concerned in the sexual instinct, which, if the evidences of comparative anat. are permitted to have their proper weight, must be regarded as having its special centre in the abdominal section of the spinal column, since the relative complexity under which the sexual instinct is shown in the different orders of animals is always in direct ratio to the relative development of gray matter in the inferior section of the spinal marrow.

While, so far as respects the physiology of the brain, many of the leading positions of Gall and Spurzheim have been verified by later specialists, the empirical parts of their work have remained without the pale of science. P. superimposes upon certain established views of brain-physiology certain empirical doctrines, and groups them together under the general head of craniology, which, as a part of the system, rests upon the assumption that the relative development of the centres of the brain can be accurately determined by an external examination of the skull—by protuberances here as contrasted with depression in another quarter, and by other indications in their nature unverifiable in any special instance without *post-mortem* examination, but having a certain degree of foundation in the general truths of physiology. In Amer. P. as such has obtained general currency, and only here it assumes to delineate a man, mentally, morally, and physically, with unerring precision, by examining his head, making a few measurements, and observing his special temperament. That practised phrenologists are often quite correct in their descriptions of the inner life and the special aptitudes and biases of a person under examination is generally conceded. That they are frequently in error they themselves concede. The data being uncertain and general, such must be the conclusions. In no aspect of anat. is there a greater variation than exists between the dimensions of the skull and the development of the cerebral cortex. The thickness of the skull is also subject to considerable variation in different portions of its surface. These facts appear at first sight to militate against the assumption that the relative development of the cortex or the thickness of the skull can be determined by external examination; although, on the other hand, these variations themselves are subject to laws that enable expert anatomists to predict, in any given case, that the convolutions will be found deep or shallow, and the skull thick in certain quarters or the reverse, by superficial inspection of a subject submitted for dissection. [From orig. art. in *J.'s Univ. Cyc.*, by Prof. F. G. FAIRFIELD.]

**Phrygia**, frî'e-a [Gr. φρυγία, an anc., highly civilized, and flourishing kingdom, whose boundaries cannot be exactly determined, occupying the W. central part of Asia Minor. The people (of Indo-European descent) were closely related both in race and hist. to the Bryges ("freemen") of Macedonia. The whole national character was highly enthusiastic and sensuous. The country was noted for its wool, its cheeses, and the excellence of its agriculture generally. Its great wealth is indicated by the fable of Midas turning everything that he touched into gold. P. was conquered by Cressus of Lydia (568-544 B. C.), afterward by the Pers. and Grs., and with the rest of Pergamum, fell into the hands of the Roms. 133 A. C. The Rom. prov., however, was not identical with the anc. kingdom. Christianity was introduced by the apostle Paul. Papias the millenarian and Montanus the enthusiast were Phrygians.

**Phryne**, frî'ne, a Gr. courtesan of surpassing beauty, was employed by Praxiteles as a model for his Cnidian Venus, and by Apelles for his Venus Anadyomene. She was b. at Thespia in Boeotia. When accused of profaning the Eleusinian mysteries, and summoned before the tribunal of the Heliasts, her defender threw off her veil, whereupon the judges immediately acquitted her, and the people carried her in triumph to the temple of Aphrodite.

**Phrynichus**, frîn'î-kus, an Athenian poet and one of the founders of the Gr. tragedy; gained his first tragic victory in 511 B. C., and his last in 476 A. C. The improvements for which the Gr. tragedy was indebted to him were very

considerable. P. brought a tragedy on the stage representing the capture of Miletus, and the representation was so powerful that the whole audience burst into tears. But such a stirring up of their passions the Athenians would not allow to art, and they fined the poet 1000 drachmae.

**Phthalic Acid**, **Alizaric Acid**, **Naphthalic Acid**, **Monocarbo-benzole Acid**, or **Dicarbo-benzole Acid**, a bibasic acid derived from benzene by substitution of 2 carboxyl for 2 hydrogen. There are 3 modifications, (1) ortho-P. A., or simply P. A.; (2) meta-ortho-P. A. is formed by the oxidation of meta-xylene or iso-xylene; (3) para- or tere-P. A. is produced by the oxidation of turpentine oil, cumic acid or aldehyde, xylene, and other aromatic hydrocarbons.

**Phthisis**. See CONSUMPTION.

**Phycology** [from φύκος, a "sea-weed," and λόγος, a "discourse"] is the name applied to that dept. of bot. which treats of the Phycæ, or Algae, as they are more frequently called. Algae may be defined as thalloids, or flowerless plants having no proper distinction of stem and leaf, which always grow in water or very wet places, which have green coloring-matter, and which are never truly parasitic.

**Phylacteries** [Gr. φυλακτήριον, a "guard," a "charm"], properly, amulets worn to protect the person from evil influences. In the N. T. the name is given to the leathern cases containing on fine parchment certain passages of Script. They are fastened by leathern straps to the forehead and the arm, and also to doorposts and the like.

**Phylæ** [Gr. φυλή, a "tribe"] designated the tribes into which anc. Attica was divided. Their number was originally 4, but after the expulsion of the Pisistratidæ it was raised to 10 by Cleisthenes; 2 more were afterward added in honor of Antigonous and his son Demetrius. At the head of each tribe was a phylarch.

**Phylloxera**, fil-lox'e-ra [from φύλλος, a "leaf" and ἔνσός, "parched"]. This name was first proposed in 1884 for a genus of plant-lice, the type being *Ph. quercus*, a species found in Europe on the under side of oak leaves. Though first characterized in Europe, N. Amer. seems to be the home of the genus; for while there are but 2 well-defined species so far known as indigenous to Europe, 16 distinct species have already been described from the U. S.

For a long time the term *Phylloxera* was known only to the naturalist; but during the past 8 or 10 yrs. the grape Ph., or *Ph. vastatrix*, a species which affects the grape-vine, has attracted so much attention that it has come to be known as the *Phylloxera*. This insect, indigenous to that portion of N. Amer. lying E. of the Rocky Mts., is found from Canada to the Gulf wherever the grape-vine grows, and has doubtless existed on our wild vines from time immemorial, but the more normal root-inhabiting type was not suspected, however, till discovered by the writer in 1871. Meanwhile, about 1865 a peculiar grape-root disease began to attract attention in Fr. The disease, which was at first confined to a few localities, extended, and attracted more and more attention until the grape interest was so threatened that the minister of agriculture offered a premium of 60,000 francs for a remedy, and this sum was subsequently increased to 300,000 francs. Study and investigation soon brought to light the facts that the insect producing the disease is identical with that which is indigenous on Amer. vines, and that it was imported into Fr. from Amer., and on our vines sent to Fr. nurserymen. First noticed in the lower valley of the Rhone, it has continued to spread.

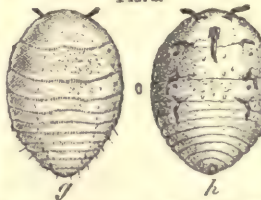
**Natural History of the Insect.**—The species presents itself in 2 types—the one (*gallicola*) gall-inhabiting, the other (*radicicola*) root-inhabiting. The former is easily distinguished from the latter by lacking the tubercles or warts on the back. On opening herself with pale-yellow eggs, scarcely the one-hundredth part of an inch long, and not quite half as thick. She is about .04 inch long, of a dull orange color. The eggs begin to hatch when 6 or 8 days old. Issuing from the mouth of the gall, the young lice scatter over the vine, most of them finding their way to the tender terminal leaves. Here they commence pumping up and appropriating the sap, forming galls and depositing eggs. This process continues during the summer until the fifth or sixth generation. Every egg brings forth a fertile female, which soon becomes wonderfully prolific. The young lice attach themselves to the roots, and thus hibernate. The gall-inhabiting insect occurs only as an ægmic and apterous female form. It is not but a transient summer state, tendril; dot and lines not at all essential to the perpetuation of the species, and does, compared to the other or root-inhabiting type, little damage.

FIG. 1.



e, egg; d, section of gall, showing mother-louse and eggs; e, swelling of gall-louse and its eggs. tendril; dot and lines not at all essential to the perpetuation of the species, and does, compared to the other or root-inhabiting type, little damage.

FIG. 2.



Mother gall-louse: g, dorsal; h, ventral view; natural size indicated between them.

soon commence laying unimpregnated eggs, for there are



at that time no males. These bring forth females, which in their turn develop and lay unimpregnated eggs; and this virginal reproduction continues for 5 or 6 generations, the development increasing in rapidity with the heat, but the number of eggs laid decreasing. In July some of the individuals show little wing-pads at the sides, and begin to issue from the ground and to acquire wings. These winged individuals are all females, and carry in the abdomen from 3 to 8 eggs of 2 sizes, the larger ones about  $\frac{2}{100}$  of an inch long, and half as wide; the smaller,  $\frac{1}{4}$  as long. These eggs increase

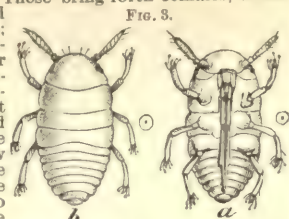


Fig. 3. Newly hatched larva: a, ventral; b, dorsal view; natural sizes in circles at sides.

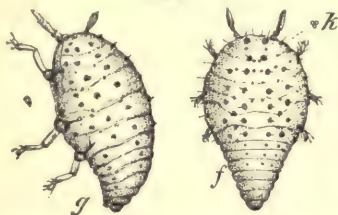


Fig. 4. Wingless mother root-lice: f, dorsal; g, lateral view; natural size indicated at side.

somewhat in size, and give birth in about 10 days to the true sexual individuals, the larger producing females, the

Fig. 5.

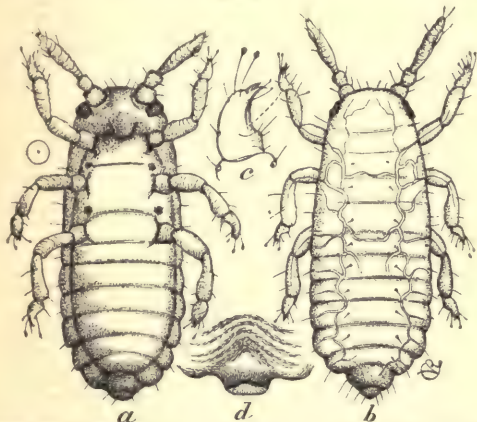


Fig. 5. True female Phylloxera: a, ventral view, showing obsolete mouth and solitary egg, occupying nearly the entire body; b, dorsal view; c, tarsus; d, contracted anal joints after the egg is laid; dot in circle showing natural size.

smaller males. These individuals are born perfect, though without mouth and with no other than the reproductive function. The sexes pair soon after hatching, and the female is delivered on the third or fourth day of a solitary egg, and then perishes. This impregnated egg is never laid on the leaf, but always on the wood, either under the bark or in sheltered situations above ground, or on the roots under ground. The young hatching from it is the normal agamous mother, which, with increased vigor and fertility, lays a large number of eggs, and recommences the virginal reproduction and the cycle of the species' curious life.

**Appearance of the Phylloxera Disease.**—A vine attacked by Ph. has the more fibrous roots covered with little swellings, which in course of time rot, and the lice settle on the larger roots. Vines that are more susceptible to the disease generally show external signs the second yr. of attack in a sickly, yellowish appearance of the foliage and in stunted growth, while the third yr. they frequently perish, when on examination the lice are no longer to be found, and all the finer roots have decayed and wasted away.

**Spread of the Disease.**—The wingless Ph. travels over the surface of the ground from vine to vine, or beneath the ground where roots interlock, while in the winged form it may fly or be carried as many as 15 or 20 m., and, under ex-

ceptional conditions even more. Through man's agency, by commerce in plants and cuttings, it may be carried to indefinite distances. Plants and animals suffer most from diseases which they have not been accustomed to. Amer. vines, though showing a varying power of resistance to the attacks of Ph., are less susceptible than the European vine, which has been so long under cultivation and which is more highly developed and more tender. The disease spreads more rapidly also in countries where the grapevine is grown to the exclusion of almost every other plant; for the winged females can scarcely fail to settle where their offspring may live and thrive.

**Practical Considerations.**—Of the many remedies that have been proposed, none are universally practicable or satisfactory. Such an underground enemy is measurably beyond man's reach. Submersion, where feasible, is a sufficient protection. Coal-tar and sulpho-carbonate of potassium have given some satisfaction. Having discovered that our cultivated Amer. vines possessed a varying degree of resistance to the disease, the writer recommended the least susceptible to be used in the Fr. vineyards as stocks on which to graft their own vines. In consequence, there has been an increasing demand for cuttings of such Amer. vines. All other remedies are being abandoned in Fr., and by means of the Amer. vines there is hope of restoring the blighted vineyards. Amer. unwittingly gave the disease to that country; she also gives the remedy. [From orig. art. in *J.'s Univ. Cyc.*, by C. V. RILEY, M. D.]

**Physalis** (Gr. *φυσίς*, a "bladder"), a genus of annual or perennial herb of the family Solanaceae or night-shades. The *P. Peruviana*, otherwise known as strawberry tomato, ground cherry, winter cherry, yellow alkekengi or Cape gooseberry, is cultivated in Eng., Fr., and the U. S., and bears an edible fruit inclosed in a balloon-shaped netted angular calyx. The *P. alkekengi*, probably a native of Sp. or N. Afr., bears a brilliant scarlet berry, and is an ornamental garden-plant. An Amer. species, *P. Philadelphia*, or purple alkekengi, has a dark-purple berry an inch in diameter, which is sometimes preserved.

**Physical Geography, or the Geography of Nature.** See GEOGRAPHY, by PROF. A. GUYOT, LL.D.

**Physician.** See MEDICINE.

**Phys'ick** (PHILIP SYNG), M. D., b. at Phila. July 7, 1768, grad. at the Univ. of Pa. 1785; studied med. in Phila., Lond., and Edinburgh, where he took his med. degree in 1792, having been previously the pupil and intimate friend of John Hunter; became one of the ablest surgeons and phys. of Phila., in whose hospitals and public charities he was for many yrs. a prominent official; became in 1805 prof. of surgery in the Univ. of Pa., and was (1819-31) prof. of anat. there; was chosen in 1825 a member of the Fr. Inst., and in 1836 honorary member of the Royal Med. and Chirurgical Society of Lond. D. Dec. 15, 1837.

**Physics.** See DYNAMICS and MECHANICS.

**Physics of the Earth** [Fr. *physique du globe*], or **Terrestrial Physics**, a term often employed to designate the study of the globe as a unit, irrespective of its surface, comprising its gen. form as given by geodesy, its density, its magnetism, its specific temperature, etc., forming a special portion of phys. geog.

**Physiognomy** (Gr. *φύσις*, "nature," and *γεννάσκειν*, to "know" or "discern"), the art of interpreting the character of man by facial conformation and expression. The P. of infants, while the intellect is latent, expresses only happiness and pain or sorrow. With the training of the tongue and lips in phonation, and the development of the lang., of expression by the control of the muscles of the eye, the nostrils, and mouth, combinations of facial lines and individuality of features become established. The man of finest intellect may by facial paralysis wear a mask which conceals all trace of his character. Reversely, by electrical excitation of muscles and groups of muscles of the face, the various expressions of mirth, sorrow, impotency, power, etc. may be produced irrespective of the mental condition. The size and prominence of the eye, state of the pupil, the action of the nostrils, the contraction and attenuation of the lips in moments of mental concentration, are the results of involuntary control by emotional states. Marked lineaments and activity of facial expression are indicative of force of will and intellect, rather than of quality. The various involuntary facial conditions are controlled by the sympathetic nervous system. Facial expressions, dependent upon habitual use or the education of certain muscles, are derived chiefly from the motor oculi and facial nerves and the independent or combined action of the analogous muscles of the 2 sides of the face.

**Physiology**, *φύσις*, "nature," and *λόγος*, "discourse"; that dept. of natural science which treats of the laws, processes, and phenomena of organized life. The prominent features of the P. of human phys. being are vital force and nutrition.

The blood is the circulating nutritive fluid of the body— $\frac{1}{2}$  of the entire weight, or about 18 lbs. It is alkaline, and has a sp. gr. of 1.052. It consists of the plasma, or water with albumen, fibrine, and salts in solution, and the solid elements, the red and white blood-cells. The heart is the centre of the circulation, propelling the blood into the arteries with a force of 51½ lbs.—a force steadily decreasing as the arteries subdivide and approach the capillaries. Capillary circulation is effected partially by a remaining element of cardiac force, chiefly by vital relations of the blood to their capillary channels and the chemico-vital processes they subserve. The veins return the blood to the heart. The veins are more numerous than the arteries—have double their capacity; hence, the venous blood circulates with but half the rapidity of the arterial. Venous return is aided by the compression of the integuments, exercise, and the presence of valves in the veins. Respiration is a double act of inspiration and expiration, expansion and contraction of the lung. Respiration is an involuntary act.

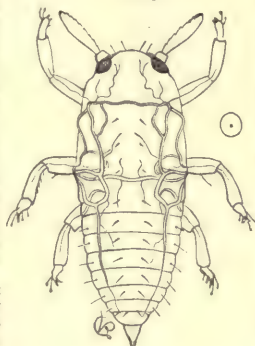


Fig. 6. Male Phylloxera: dot in circle showing natural size.



The materials of the blood are supplied by food after preparation by the processes of digestion. Food must be varied in character, and include both nitrogenous substances and hydrocarbons, as well as water and a proportion of salts. The preliminary steps of digestion are mastication, insalivation, and deglutition. Secretion is the action of special glands in the body, which elaborate elements of the blood for special purposes. Excretion is glandular separation from the blood of effete products—the urine, faeces, perspiration, and bile. Faecal matter is partly so far as it aids digestion. Bile is to be regarded secretory so far as it aids digestion. Nutritive waste and supply and glandular activity evolve heat, and determine the normal temperature of the body—in the healthy adult, 98.5° F., with little variation.

The nervous system is divided into the cerebro-spinal and the sympathetic. The first comprises the brain, spinal cord, motor and sensory nerves, and nerves of special sense. The second controls the functions of the large internal organs, the capillaries, and the equilibrium of the circulation. The brain and cord have gray and white substances; the gray is ganglionic, composed of cells which originate force or receive impressions; the white is tubular, nerve-tracts which transmit motor stimulus from the brain to the muscles or sensory impressions from the body to the brain. The brain comprises the cerebrum—the seat of the mind—the cerebellum, pons varolii, and medulla—controlling vital functions. The spinal cord is a column of nerves connecting the brain with their distributions throughout the body. Speech is produced by movements of the larynx, tongue, teeth, and lips, methodically trained to create sounds, which, by custom, are representative of ideas; it is an artificial method, the invention of man, and slowly developed and perfected. Sight is the impression received by the brain of light and the images of objects, transmitted through the optical media of the eye to the sensitive retina and optic nerve. Hearing is a transmission of sound-waves to the tympanum, and, by the system of ossicles and resonating canals and cavities, to the filaments of the auditory nerve.

**Physiology, Vegetable.** See VEGETABLE PHYSIOLOGY.

**Physiophas.** See VEGETABLE IVORY.

**Placen'za** [anc. *Placentia*], chief town of the It. prov. of the same name, situated on the right bank of the Po, a little below the mouth of the Trebbia. The position is of the greatest military importance. The streets are broad, and the prin. square, the Piazza de' Cavalli, in which are 2 famous equestrian statues in bronze, has a busy aspect. The city in gen., however, has a decayed and sombre look, owing partly to the mediæval character of so many of the public and private buildings. The cathedral, begun in 1122, is Lombardo-Gothic in style, and is especially remarkable in its interior. Among other noticeable chs. is that of Sant' Antonio, built in 324. The private palaces contain some rare pictures. The little trade of P. is chiefly in the products of the rich neighboring country—grain, wine, cheese, etc.; the manufactures are silks, linens, etc. Pop. 34,987.

**Plariats** [Lat. *pūs*, "pious"], called also the **Pauline Congregation**, and popularly known as **Scelopins**, a congregation of regular clerks of the R. Cath. Ch., founded in 1509 by St. Joseph Calasancius (1556-1648) for the purpose of spreading education. They were confirmed by Paul V. (1617) and by Gregory XV. (1621).

**Plas'sava Fibre**, a coarse substance used for making brushes and brooms for street-sweeping. It is brought from Brazil, and is produced chiefly from palm trees.

**Plas'tre** [akin to the words "plaster," "flat," and "plate," applicable as well to any coin], the Sp. and Sp. Amer. dollar. In the Levant there are P. whose value is about 5 cents.

**Platt** (DONX), b. in Cin., O., in 1829, grad. at St. Xavier Coll.; studied law, and was made judge of the court of common pleas for Hamilton co., O.; was appointed sec. of legation at Paris by Pres. Pierce, and for 9 months acted as *chargé d'affaires*. When the c. war broke out he enlisted as a private; was elected capt.; served through the war as assistant adjutant-gen. on the staff of Gen. Schenck. After the war he served one term in the O. legislature, and founded the Wash. *Capital*.

**Platt** (JOHN JAMES), b. at Milton, Ind., Mar. 1, 1835, was ed. at the Columbus (O.) High School and Kenyon Coll.; joint author, with W. D. Howells, of *Poems by Two Friends*; with his wife, wrote *Nests at Washington*; sole author of *Poems in Sunshine and Firelight*, etc.

**Plazzi**, pe-ah'tse (GIUSEPPE), b. at Ponte, on the Valtelline, in 1746, was appointed in 1790 prof. of math. at Palermo, where he promoted the establishment of an observatory. This observatory was opened in 1791, and there P. compiled his famous *Catalogue of the Stars*. On Jan. 1, 1801, he discovered the planet or asteroid Ceres, which opened the way for the discovery of so many others. P. revised the plan of the new observatory at Naples, of which he was afterward for some time the director. D. in 1826.

**Picard**, pe-ka' (JEAN), a Fr. astron., b. at La Flèche, dept. of Sarthe, Fr., July 21, 1620; accomplished the first exact measurement of a degree of the meridian, between Amiens and Malvoisin; made a number of valuable improvements in the instruments of observation and methods of calculation; was the real founder and constructor of the Observatory of Paris; wrote *La Mesure de la Terre* and *Voyage d'Uranibourg, ou Observations astronomiques faites en Danemark*. D. at Paris Oct. 12, 1682.

**Piccini**, pêt-chee'ne, or **Piccinini** (NICOLÒ), b. at Bari, It., in 1728, received his musical education in the conservatory of Naples; made in 1754 his début as a composer with the opera *Le Donne dispettose*; achieved in 1760 an almost unprecedented success by his opera *Cecchina, ossia la buona figliuola*; went in 1770 to Paris, and engaged in musical contest with Gluck. He composed during this period *Roland*, *Phaon*, *Alys*, *Iphigénie en Tauride*, etc., in all 15 operas; but Gluck was victorious; P. left Paris for Naples in 1791. In It. he composed several successful operas,

*Griselda*, *La Serca Padrone*, etc., but the govt. suspected him of sympathizing with the Fr. Revolution. In 1798 he returned to Paris, where he was appointed inspector of music at the National Conservatory. D. May 7, 1800.

**Pichegru**, pèsh'groo (CHARLES), b. at Arbois, dept. of Jura, Fr., Feb. 16, 1761, was a teacher of math. at the military school of Brienne while Bonaparte was a pupil there; entered the artill. service of the Revolutionary army in 1790 and rose rapidly; was commander-in-chief of the army of the Rhine in 1793, of the army of the North in 1794; conquered Hol. and organized the Batavian republic in 1795; resumed the command of the army of the Rhine, but entered into negotiations with the Bourbons; became suspected, and was deprived of his command in 1796. In 1797 was elected a member of the Council of Five Hundred, and chosen its pres., but his plotings with the *émigrés* and the royalist party being discovered, he was arrested Sept. 4, 1797, and transported to Cayenne. In 1798 he escaped to Eng., where he formed a conspiracy against Nap.'s life. He repaired secretly to Paris, but was captured, imprisoned, and found strangled in his cell Apr. 5, 1804.

**Pich'urim Beans**, or **Sassafras Nuts**, the seed-lobes of *Nectandra Pichuri*, a S. Amer. lauraceous tree. They are used by chocolate-makers and others for flavoring. They have a strong taste, resembling nutmeg as well as sassafras.

**Pick'ard** (HUMPHREY), D. D., b. at Fredericton, N. B., June 10, 1813, grad. at Wesleyan Univ., Middletown, Conn., in 1839; entered upon the Wesleyan ministry in N. B.; was pres. of the conference of E. Brit. Amer. 1862, and again 1870; pres. of the coll. at Sackville, N. B., 1866-69, when he became ed. of the *Provincial Wesleyan* and book-steward for the conference at Halifax, N. S.

**Pick'ens** (ANDREW), b. at Paxton, Pa., Sept. 13, 1739; went with his parents to the Waxhaw Settlement, N. C., in 1752; was a volunteer in Grant's expedition against the Cherokees 1761; capt. of militia at the beginning of the Revolution; soon rose to the rank of brig.-gen., and shared with Marion and Sumter the honor of the resistance made in S. C. to the Brit. and Tory forces. After the war he was for many yrs. a member of the legislature; M. C. 1793-95; was frequently commissioned to make treaties with the Indians; settled at Hopewell in the Pendleton dist., which he had purchased from the Indians. D. Aug. 17, 1817.—His son, ANDREW PICKENS, JR., was gov. of S. C. 1816-18. D. July 1, 1838.

**Pickens** (FRANCIS W.), son of Andrew, was b. at Togadoc, S. C., Apr. 7, 1807, was ed. at S. C. Coll., and in 1829 became a lawyer of Edgefield dist.; was prominent in 1832 as a nullifier in the State legislature; M. C. 1835-45; opposed the Bluffton secession movement of 1844; U. S. minister to Rus. 1857-60, gov. of S. C. 1860-62, and as such had important connection with the early secession movements of his State. D. Jan. 25, 1869.

**Pickens** (ISRAEL), b. in Cabarrus co., N. C.; M. C. 1811-17; register of land-office, Miss. Terr., 1817; gov. of Ala. 1821-25, U. S. Senator 1826. D. Apr. 23, 1827.

**Pick'ere**l [dim. of *pike*], a name given in Eng. to the young of the pike of that country (*Esox lucius*), but in the U. S. variously applied. In many parts of the country it is given to the small Esocidae, and in some places (e. g. the interior lakes of the N. W. States) to the *Esox lucius* (= *E. estor*, Les.). The species so called of most of the great N. lakes, and especially in the markets, are, however, Percids or Luciopercae—i. e. *Stizostedion americanum*, etc.

**Pick'ering** (EDWARD CHARLES), b. at Boston July 19, 1846, grad. at the Lawrence Scientific School 1865; taught math. at Cambridge 1865-67; was shortly afterward elected Thayer prof. of physics at the Mass. Inst. of Technology; was a member of the *Nautical Almanac* party which observed the total eclipse of Aug. 7, 1869, in Ia., and of the Coast Survey party sent to Sp. with a similar object in 1870; has conducted extended observations in optics, and has carried out the laboratory method of teaching physics upon a system exhibited in his work entitled *Physical Manipulation*. In 1873 he was elected a fellow of the National Acad. of Sciences; afterward became director of the observatory at Cambridge, Mass.

**Pickering** (JOHN), LL.D., son of Timothy, b. at Salem, Mass., Feb. 17, 1777; accompanied his father in his visits to the Six Nations of Central N. Y., from which he derived his fondness for Amer. philology; grad. at Harvard 1796; studied law in Phila.; was attached to the U. S. legations in Lisbon and Lond. 1797-1801; a lawyer of Salem, Mass., 1801-27; city solicitor of Boston 1829-46; was much in the State legislature, and assisted in revising the statutes; declined the Gr. and Heb. professorships at Harvard; was a laborious philological student and familiar with many langs.; pres. of the Amer. Acad. of Arts and Sciences; founder and first pres. of the Amer. Oriental Society; author of legal, archaeological, and philological papers, including an *Essay on a Uniform Orthography for the Indian Langs. of N. Amer.*, a *Vocabulary of Americanisms*, and a *Gr. and Eng. Lexicon*. D. May 5, 1846.

**Pickering** (OCTAVIUS), LL.D., son of the succeeding, b. in Wyoming Valley, Pa., Sept. 2, 1792, grad. at Harvard 1810; became a lawyer of Boston 1816; was State reporter 1822-40; lived in Europe 1841-48. Author of an unfinished *Life of Timothy Pickering*, of 24 vols. of law-reports, and other legal writings. D. Oct. 29, 1868.

**Pickering** (TIMOTHY), LL.D., b. at Salem, Mass., July 17, 1745, grad. at Harvard 1763; became a lawyer of Salem 1768; was prominent in resistance to Brit. aggressions; in 1775 became judge of the maritime and common pleas courts; prepared an *Easy Plan of Discipline for a Militia*; commanded the Essex regiment raised in 1776; served through the Revolution as col.; became in 1777 Washington's adjutant-gen., serving as such at Brandywine and Germantown, and member of the board of war in the same yr.; quartermaster-gen. 1780; became a commission mer-



chant at Phila. at the close of the war; was sent in 1786 by govt. to quiet the difficulties arising from a conflict of jurisdiction in the valley of Wyoming, Pa.; acquired a large tract of land in that region and settled at Wilkesbarre, and strove to harmonize the conflicting elements, but was imprisoned for 30 days; was a delegate from Luzerne co. to the Pa. constitutional conventions of 1787 and 1790; negotiated treaties with the Six Nations of N. Y. in 1790, 1791, and 1794, and with the O. Indians in 1793; P. M.-gen. 1791-94; sec. of war 1794-95; sec. of state 1795-1800; returned to the forests of Wyoming and built a log house for his family; went back to Salem; made a judge of common pleas 1802; was U. S. Senator 1803-11, one of the war-board of Mass. 1812-15, M. C. 1815-17; author of able political pamphlets; devoted much attention to agriculture, being pres. of the Essex Agricultural Society. (See his *Life*, commenced by his son and completed by C. W. UPHAM.) D. Jan. 29, 1829.

**Pick'ett** (GEORGE E.), b. in Richmond, Va., Jan. 25, 1825, grad. at W. P. 1846; in the war with Mex. from Vera Cruz to the capture of the City of Mexico; brevet first lieu. and capt. for gallantry at Contreras, Churubusco, and Chapultepec; on frontier duty 1848-61, when (June 25) he resigned, and in Sept. was appointed col. in the Confed. army, and brig. and major-gen. in 1862. In the Va. Peninsular campaign of 1862 he led a brigade, and was wounded at Cold Harbor. Continuing with the army of N. Va., he participated in the battles of that army. At Gettysburg his division led the assaulting column, which suffered so severely July 3, 1863; also commanded in N. C. at the capture of Plymouth. In the campaign of 1864-65 he made the final stand at Five Forks, where his division was surrounded and broken up. D. July 30, 1875.

**Pic'oline** [Lat. *pic*, "pitch"], or **Odorine**, an oily base found in the tar obtained by exposing bones and other animal substances, bituminous coal, shale, peat, beans, cinchonine, etc. It is produced by the decomposition of the acrolein-ammonia formed during these distillations.

**Pic'rates**. Picric acid was discovered in 1788 by Haussman while treating indigo with concentrated nitric acid. Within a few years chemists have derived it from other substances, especially from carbolic acid. It has been called *amer d'indigo*, *amer de Welter*, carbo-nitric acid, nitro-picric acid, carbazotic acid, and trinitro-carbolic acid. It is a crystalline body of a brilliant golden yellow, very bitter to the taste, and is largely used as a dye. When heated to 600° Fahrenheit it detonates with violence. The salts obtained by treating many of the bases with picric acid possess its characteristic properties; that best known is the potassium-picrate. This forms golden crystals having a metallic reflection. Insoluble in alcohol, and but slightly soluble in water, it detonates violently at 600° Fahrenheit.

**Picric Acid**. See CARBAZOTIC ACID AND TRINITRO-CARBOIC ACID.

**Picrotox'ine** [Gr. *πικρός*, "bitter," and *τοξικόν* (sc. *φάρμακον*), "arrow-poison"], a poisonous bitter principle found in the *Cocculus indicus* of commerce, the berries of the *Anamirta cocculus*. Its chem. constituents are carbon, hydrogen, and oxygen.

**Pictor** (FABIUS). See FABIUS PICTOR.

**Picts**, a Celtic tribe, inhabiting the lowlands and the E. part of Scot. They were divided into the S. and N. P. by the Grampian Mts. The S. P. were converted to Christianity in the 5th century by St. Ninian—the N. in the 6th by St. Columba. In the 9th century they were subdued by the Scots, a kindred tribe which invaded the country from Ire. Subsequently attacked on both sides—from the N. by the Scandinavian invaders, and from the S. by the Teutonic inha. of Eng.—the Picts gradually disappeared.

**Pied'mont**, terr. of N. It., comprising an area of 11,200 sq. m., and bounded S. by the Maritime Alps, W. by the Graian and Cottian, N. by the Pennine Alps, and E. by the river Ticino. In the 12th century it became a possession of the house of Savoy, and now it forms a large division of the kingdom of It. The greater part of this country is mountainous, covered with spurs of the Alps, between which the numerous affluents of the Po form beautiful and fertile valleys. But toward the E. the country gradually opens into the plain of the Po, which belongs to the most fertile and best cultivated land of It. Rice, wheat, maize, wine, olive oil, and many varieties of the most delicious fruits are produced, and a very extensive dairy-farming and manufacturing industry is carried on. The method of the Piedmontese silk-culture is celebrated. Pop. 3,070,379.

**Piedmont**, R. R. junc., Mineral co., W. Va., 173 m. E. of Wheeling, in the great coal-region of Va. Pop. 1870, 1366; 1880, 1853.

**Pierce**, purre or peerse (BENJAMIN), b. at Chelmsford, Mass., Dec. 25, 1757; served throughout the Revolution with valor; settled in N. H., where he held various important positions, and was gov. in 1827-29; father of Pres. Franklin Pierce. D. Apr. 1, 1839.

**Pierce** (FRANKLIN), 14th Pres. of the U. S., b. at Hillsborough, N. H., Nov. 23, 1804, grad. at Bowdoin Coll. 1824, was the law-pupil of Levi Woodbury; came to the bar in 1827, and practised in Hillsborough and Concord, N. H.; M. C. 1833-37, U. S. Senator 1837-42; favored the union of Tex. with the U. S.; twice declined positions in the cabinet of Mr. Polk; became col. 16th U. S. Inf. 1846, brig.-gen. 1847; served in the Mex. war; was pres. of the N. H. constitutional convention 1850-51; was chosen Pres. of the U. S. in 1852 by 254 electoral votes to 42 for Gen. Scott, the Whig candidate. His administration was a period of great political excitement. Prominent among its events were the Gadsden Purchase, the repeal of the Mo. Compromise, the beginning of the troubles in Kan. (during which the Pres. opposed the organization of a free State govt.), and the publication of the Ostend Manifesto. He was an ardent advocate of the State Rights doctrine, and during the c. war sympathized with the S. States. (See his *Life*, by HAWTHORNE.) D. Oct. 8, 1869.

**Pierce** (GEORGE EDMOND), D. D., b. at Southbury, Conn., Sept. 9, 1794, grad. at Yale 1816 and at Andover Theological Sem. 1821; was ordained pastor of a Congl. ch. at Harwinton, Conn., 1822, pres. of Western Reserve Coll. 1834-55. D. May 27, 1871.

**Pierce** (GEORGE FOSTER), D. D., b. in Greene co., Ga., Feb. 3, 1811, studied law; in 1831 joined the Ga. conference of the M. E. Ch.; performed pastoral work in prominent places in Ga. and S. C., and presided over literary insts. (Emory Coll. for 6 yrs.) till 1854, when he was made bp.; was a prominent member of the Gen. Conference of 1844 in N. Y., when measures were adopted for the division of the Ch.; was also a member of Gen. Conferences of 1846, 1850, and 1854; author of *Incidents of Western Travel*, etc.

**Pierce** (JOHN), D. D., b. at Dorchester, Mass., July 14, 1773, grad. at Harvard 1793; was tutor there 1796; ordained pastor of the First Congl. ch. at Brookline 1797; remained sole pastor for above half a century; was a member of the Acad. of Arts and Sciences and of the Mass. Historical Society; pres. of the Mass. Bible Society, and had great knowledge of genealogy and antiquities, on which he filled 18 vols. of MS. with his memoranda. Author of a *Half-Century Discourse* and a *Sketch of Brookline*. D. Aug. 24, 1849.

**Pierce City**, R. R. junc., Lawrence co., Mo., 290 m. S. W. of St. Louis. Pop. 1870, 432; 1880, 1350.

**Pierpont** (JOHN), b. at Litchfield, Conn., Apr. 6, 1785, graduated at Yale 1804; was an instructor in Conn. and S. C.; studied law, and in 1812 became a lawyer of Newburyport, Mass.; was afterward engaged in an unsuccessful mercantile business in Boston and in Baltimore; was pastor of the Hollis st. Unit. ch., Boston, 1819-45; held pastorates in Troy, N. Y., 1845-49, and in Medford, Mass., 1849-56; was chaplain in the 22d Mass. regiment 1861; employed in the U. S. treas. dept. 1861-64. Author of *Airs of Palestine*, *Poems*, the *Little Learner*, a series of reading-books for schools, and other works. He was a leading anti-slavery and temperance orator and writer, and late in life became a Spiritualist. D. Aug. 27, 1866.

**Pierre**, Dak. See APPENDIX.

**Pierrepont** (EDWARDS), LL.D., b. in North Haven, Conn., Mar. 4, 1817, grad. at Yale 1837, and a yr. later was admitted to the bar; practised law at Columbus, O., till 1846, when he removed to New York; in 1857 was elected a judge of the superior court of N. Y., resigning that position 3 yrs. later; was engaged by the govt. in 1867 to conduct its case against John H. Surratt, indicted for complicity in the murder of Pres. Lincoln; in 1869 became U. S. dist. atty. for S. dist. of N. Y., but resigned in May 1870; atty.-gen. of U. S. 1875, minister to Eng. 1876, resigned 1877.

**Pierrepont** (JOHN), b. at Litchfield, Conn., Sept. 10, 1806, received a common-school education; grad. at the Litchfield Law School at 21; began practice of law at Pittsford, Vt.; removed to Vergennes, Vt., in 1832; continued the practice of law until 1857; was member of State senate from Addison co., and during the session of 1857 was elected fourth assistant judge of the supreme court of Vt.; became chief-justice in 1865, which position he held by continuous elections till his decease; represented Vergennes in the general assembly of Vt. in 1841. For over 20 yrs. he held the office of register of probate, and was a justice of the peace nearly the same period. He was 6 yrs. mayor of Vergennes. D. Jan. 8, 1882.

**Pier'son** (ABRAHAM), b. at Lynn, Mass., 1641, grad. at Harvard 1668; was ordained in 1672 at Newark, N. J., as colleague to his father, Rev. Abraham Pierson (1608-78); was Congl. pastor at Killingworth, Conn., 1694-1707, and was the first pres. of Yale Coll. 1701-07. D. Mar. 5, 1707.

**Pietists**, in Ger., Chrs. who never formed a sect nor professed distinctive doctrines, but were noted for their preference of practical religion. The term was first applied in derision to a number of teachers at Leipzig in 1689, chief among whom were A. H. Francke and Philipp Jakob Spener. The combined influence of Spener and Francke led to the foundation of the Univ. of Halle, which became a centre of the pietistic movement. The rationalism of the close of the 18th and beginning of the 19th century was adverse to pietism, but since the overthrow of rationalism by the Straussian school, pietism has largely revived in Ger., its centres being Berlin, Silesia, and Württemberg.

**Pigeon**, plj'un [Fr.], a name applied primarily to the *Columba livia* in its wild as well as domesticated races, and secondarily extended to all the species of the family Columbidae. The *Columba livia*, in its wild state, is an inhab. of almost the entire extent of Europe. It belongs to a section of the genus in which the tarsi are as long as the middle toe. The wings are black at their outer margin, and have a black spot at the extremity of the secondaries, and a second on the great coverts; the rump is ashy; the tail is of a bluish ash at its basal two thirds, black at its posterior third, with the lateral feathers at their basal half white externally. The length from tip of bill to end of tail is about 15 inches, and the spread of wings nearly 27; the weight is about 14 or 15 ounces; the beak is about 3/4 of an inch long, the feet at middle toe about 3/4 inches long. Such are the characters of the wild P., which is the stock from which have originated the numerous varieties of domesticated breeds.

**Pigeon Berry**. See GARGET-BROOT.

**Pigeon English** [from the Chi. mode of pronouncing the word *business*], an extraordinary and grotesque artificial dialect employed in the commercial cities of Chi. as the medium of communication between foreign merchants and the Chi. Its base is Eng., with a mixture of Port. and Hindo-stance.

**Pigeon (Gyro)**, an instrument consisting of an apparatus for imitating the movements of pigeons when released from a trap, and recommended on humanitarian grounds as a substitute for pigeons in shooting-matches.

**Pigeon Pea**, a name applied to the pea-like pulse grown upon the leguminous shrubs *Cajanus flavus* and *dit-color*, which are extensively cultivated in many tropical



countries. The better sorts are very palatable substitutes for the pea.

**Pigments.** See PAINT.

**Pike**, a name applied in the Eng.-speaking countries to different species of fishes. All the species agree in the form familiar to most persons from personal acquaintance with some one or other of the species, or from the illustrations in angling books, and differ chiefly in the comparative length of the snout, the extension of scales on the cheeks and opercle, the number of rays in the dorsal and anal fins, and color.

**Pike** (ALBERT), b. at Boston Dec. 29, 1809; became a teacher, and studied at Harvard, where he afterward received the degree of M. A.; went in 1831 to Santa Fé, N. M., by way of St. Louis, going much of the way on foot; reached Ft. Smith, Ark., in 1832; was a journalist at Little Rock 1834-36; afterward a successful lawyer and a prominent State Rights politician; served as a capt. of Ark. cav. in Mex.; was brig.-gen. in the Confed. service during the c. war; ed. of *Memphis Appeal* 1867-68; author of *Prose Sketches and Poems*, *Law Reports*, *The Ark. Form-Book*, *Nugé* (poems), *Morals and Dogma of Freemasonry*, etc.; was for yrs. the head of the Ancient Accepted rite in the S.

**Pike** (ZEBULON MONTGOMERY), b. at Lamberton, N. J., Jan. 5, 1779, son of a capt. in the U. S. A.; became a cadet in his father's regiment; was soon promoted to lieut.; was appointed to conduct surveys of various parts of the newly acquired terr. of La.; penetrated to the head-waters of the Miss. in the autumn of 1805, and in the following yr. was charged with an exploration of the interior of La., in the course of which he discovered Pike's Peak in the Rocky Mts. and reached the Rio Grande; was detained by Sp. authorities and his papers seized. Being ultimately released, he arrived at Natchitoches July 1, 1807, received the thanks of the govt., and was rapidly promoted; wrote in 1810 an account of his two expeditions; became brig.-gen. 1813, and commanded an expedition sent against York (now Toronto), Canada, in the assault of which he was killed, Apr. 27, 1813. (See his *Life* in SPARKS'S *Amer. Biography*.)

**Pike's Peak**, a summit of the Rocky Mts., in El Paso co., Col., 10 m. S. W. of Manitou, is 14,147 ft. above the sea.

**Pilate** (PONTIUS), the 5th Rom. procurator of Judea and Samaria; entered his office in 26 A. D., residing partly in Cæsarea and partly in Jerusalem, where he inhabited the magnificent palace built by Herod the Great. In 36 he was arraigned by the Samaritans before the Syrian proconsul, Vitellius, on account of his unjust and cruel govt., and Vitellius sent him to Rome to answer the accusations before the emperor. According to Eusebius, he was banished to Vienne in Gaul, and committed suicide soon after. His singular behavior during the trial of Christ, as we read it in the Gospels, excited from the earliest time a most vivid interest, and occasioned very different explanations.

**Pilchard.** See CLUPEIDÆ.

**Pilcomayo**, a river of S. Amer., is formed in lat. 21° 35' S. by the junction of 2 streams, which both rise in the Bolivian Andes. It flows S. E. through the terrs. of the Argentine Republic, and joins the Paraguay a few miles below Asunción, after a course of about 1200 m. It has not yet been thoroughly explored.

**Pile** (WILLIAM A.), b. near Indianapolis, Ind., Feb. 11, 1829; became a Meth. preacher of Mo.; chaplain of a volunteer regiment 1861, capt. of artill. 1862, col. of inf. volunteers 1862, brig.-gen. of volunteers 1863, serving to the end of the war; was M. C. in 1866 from Mo., gov. of N. M. 1869-71, and afterward U. S. minister to Venezuela.

**Piles, or Hemorrhoids** [Gr. *αἵμα*, "blood," and *πῆξις*, to "flow"], vascular and fibro-vascular tumors of the lower bowel or rectum—termed *external* P. when below the sphincter muscle and upon the verge of the anus; *internal* P. when above the sphincter. In structure they are due to congestion of the hemorrhoidal veins, which are a part of the portal venous circulation, returning blood from the intestines through the portal vein and liver to the vena cava and the heart. P. when chronic are varicose veins of the anus and rectum, with fibrous thickening of the tissues and mucous membrane investing them. P. seldom afflict persons who are robust, abstemious, frugal, and engaged in active exercise. They result from excessive eating and drinking, congestion of the liver, alcoholic excesses, and constipation and costiveness. Sedentary occupation favors their development. P. are a frequent disease in tropical countries and very hot seasons. Patients with hemorrhoids usually discharge mucus from the anus, and sometimes shreds and patches of organized lymph. They are to be prevented, and also treated in their milder forms and stages, by regulated, laxative diet, active exercise, and mild saline cathartics. When pedunculated they may be removed by the knife, ligature, or galvano-cautery. Ulcerated and infamed P. are treated by cold applications, astringent and anodyne ointments, and free evacuation of watery stools by use of saline cathartics. E. DARWIN HUDSON.

**Pilgrims, The, or Pilgrim Fathers.** When, during the reign of James I., the Puritans were persecuted in Eng., they sought refuge in Hol. Among these refugees members of a dissenting ch. at Norwich made their way to Amsterdam in 1608, and at Leyden they formed a congregation with John Robinson as pastor. At length they matured a plan for emigrating to Amer. They received permission of the Plymouth Co. to settle within their domain. On Aug. 6, 1620, they sailed for Amer. in 2 small ships, the *Speedwell* and the *Mayflower*, but the *Speedwell* was reported unseaworthy, while the *Mayflower* proceeded on her voyage with 41 men and their families (101 souls). After a voyage of 63 days they anchored in Cape Cod Bay, in what is now Provincetown harbor, and here was signed, on board the *Mayflower*, the first constitution of government to which the signatures of a whole people were attached. At length all of the people of the *Mayflower* landed upon a rock in a snug harbor (now Plymouth, Mass.), Dec. 22, 1620. In the

midst of snow they built log-cabins, and John Carver was chosen gov.

**Pillars of Hercules**, the name applied by the anc. to the rock of Gibraltar in Europe, together with that of Abyla, now Ceuta, on the Afr. coast, which were considered the W. boundary of the earth.

**Pillory** [Fr. *pilori*, from *pilier*, a "pillar"], an instrument of punishment, consisting of a wooden frame in which the offender's head and arms were inserted, he being then left exposed to public ridicule. From the reign of Henry III., and especially during the 16th, 17th, and 18th centuries, the P. was a statute punishment for perjurers, forgers, users of false weights, etc., and was not altogether abolished until 1837. The P. existed on the statute-books of U. S. until 1839, but it seems to have been rarely if ever used.

**Pilot** (GIDEON JOHNSON), b. in Williamson co., Tenn., June 8, 1806, grad. at the Univ. of Nashville 1827; studied law, and practised at Columbia; appointed brig.-gen. of Tenn. volunteers July 13, 1846; was at first with Taylor on the Mex. frontier, afterward joined Scott at Vera Cruz; commanded the right wing at the battle of Cerro Gordo, where he was wounded; was made maj.-gen. Apr. 13, 1847; took part in the battles of Churubusco, Molino del Rey, and Chapultepec, being severely wounded in the last; came into collision with Gen. Scott, and at his own request was tried by a military court upon charges of insubordination, but was honorably acquitted; resumed the practice of law in Tenn.; was a member of the Nashville convention of 1850, where he opposed extreme measures; raised a force of Tenn. volunteers for the Confed. service in 1861; appointed maj.-gen.; commanded at the battle of Belmont, Nov. 7, 1861; second in command at Ft. Donelson in Feb.; refused to take chief command; escaped before the surrender, and afterward served in the S. W. D. Oct. 8, 1878.

**Pilot-Fish, or Pilot**, a name given because the fish in question was formerly supposed to act as a pilot to the mariner, and is still supposed to act as such to sharks; it is applied to certain carangoid fishes of the genus *Naucrates*. These are found in almost all tropical and temperate seas, and often follow in the wake of vessels associating with sharks and taking the refuse thrown from the ships. They are elongated, symmetrical, fusiform fishes of graceful form and with 7 cross-bands of black, which, however, in part disappear in after life. They are remarkable for the changes which they undergo, and which have given rise to numerous nominal species.

**Pilot Knob**, Iron co., Mo., on R. R., at the base of the celebrated Pilot Knob Mt., much of which consists of iron ore. Pop. 1870, 581; 1880, 1359.

**Pim** (BEDFORD CLAPPERTON TREVILLIAN), b. at Bideford, Devonshire, Eng., June 12, 1826, was ed. at the Royal Naval School; made a voyage round the world 1845-51; was engaged in the search for Sir John Franklin; saved from a ship on the E. to a ship on the W. side of the N. W. passage; visited the Isthmus of Suez and studied the question of an interoceanic canal 1859; retired on half-pay 1861; devoted himself for several yrs. to the project of an interoceanic communication across Nicaragua, and to the promotion of gold-mining in the same republic; wrote *The Gate of the Pacific and Doldrums on the Roadside in Panama, Nicaragua, and Mosquito*; was made capt. Apr. 16, 1868; placed on the retired list Apr. 27, 1870; was admitted to the bar at the Inner Temple Jan. 27, 1873, and was chosen to Parl. as a Conservative for the borough of Gravesend at the gen. election of Feb. 1874.

**Pimenta, or Pimento** [Sp. *pimiento*], the unripe berries of *Eugenia pimenta*, an evergreen tree of the natural order Myrtaceæ, growing throughout the W. I. and in Mex. and S. Amer. The name is a corruption of *pimiento*, the Sp. for "pepper." The fruit is two-celled, each cell containing a single black kidney-shaped seed. The active principles are a volatile oil and a green fixed oil. P. has a pungent, aromatic taste, and may be used in med. for the gen. purposes of the aromatic spices—viz. as stomachics to allay nausea, and correct the nauseating and griping effects of other meds. But its most common use is as a spice in cookery, under the name of "allspice" or "Jamaica pepper."

**Pimpernel, or Poor Man's Weather-Glass**, the *Anagallis arvensis*, a common herb of Europe naturalized in N. Amer., having rather handsome flowers, most commonly scarlet, but often white or blue. It is remarkable that it always closes upon the approach of bad weather. The water-P. is *Samolus valerandi*, found in the U. S. and most other countries. *S. floribundus* and *dracænalis* are found in the Gulf States. The above plants all belong to the Primulaceæ. The first-mentioned one was thought to have active medicinal powers, and the second was once looked upon as having magical qualities.

**Pina Muslin**, a costly fabric made in Manila from the fibre of pineapple leaves. It is beautiful, delicate, and durable, and is chiefly used in making ladies' handkerchiefs and dresses. It has a pale yellow tint and is transparent.

**Pinaster**, the *Pinus pinaster* or *maritima*, or cluster-pine of Europe and Asia, and planted extensively in the Landes of Fr., where, with the *Laricio*, it covers what were once great wastes of sand. It yields immense amounts of tar, pitch, turpentine, and lampblack.

**Pinckney** (CHARLES), LL.D., b. at Charleston, S. C., 1758, was bred a lawyer, and during a part of the Revolution was held a prisoner by the Brit.; was in Cong. 1784-87, and in the convention of 1787 which framed the U. S. const.; pres. of the convention of 1788 in which S. C. ratified the U. S. const., and of the State convention of 1790; gov. of the State 1789-92, 1796-98, 1806-08; U. S. Senator 1793-1801; minister to Sp. 1802-05; M. C. 1819-21. D. Oct. 29, 1824.

**Pinckney** (CHARLES COTESWORTH), LL.D., b. at Charleston, S. C., Feb. 25, 1746, was ed. at Westminster, at Christ Ch., Ox., and the Middle Temple, Lond.; studied military science at Caen, Fr.; became a barrister at Charleston 1769;



served as capt. and afterward as col. of S. C. troops in the Revolution; was aide to Washington in 1777; displayed valor and skill in the S. campaigns 1778-80; was a prisoner of war 1780-82; became a brig.-gen. 1783, and later a maj.-gen. of the State, and still later of U. S. troops (1797); declined many important offices; assisted in framing the U. S. const.; was one of the special ministers to Fr. 1796-97, when he was ordered to leave that country; author of the sentiment, "Millions for defence, but not one cent for tribute;" Federalist candidate for V.-P. 1800. D. Aug. 16, 1825.

**Pinckney** (HENRY LAURENS), b. at Charleston, S. C., Sept. 24, 1794, son of Gov. Charles Pinckney, grad. at S. C. Coll. 1812; became a prominent lawyer, legislator, and State Rights leader; mayor of Charleston 1832, 1839-40; M. C. 1833-37; edited for a time the Charleston *Mercury*; was collector of the port; author of memoirs of J. Moxey, of Jackson, and of R. Y. Hayne. D. Feb. 3, 1863.

**Pinckney** (THOMAS), brother of C. C. Pinckney, b. at Charleston Oct. 23, 1750, grad. at Ox., and was called to the bar at the Temple, Lond., 1770; entered the Revolutionary army, in which he served with distinction, receiving a wound at Camden; gov. of S. C. 1787-89; U. S. minister to Eng. 1793-94, and to Sp. 1794-96, when he negotiated the treaty of San Ildefonso; M. C. 1799-1801; maj.-gen. 1812, and served against the Creeks and Seminoles. D. Nov. 2, 1828.

**Pin'dar**, the greatest lyric poet of Greece, b. at Cynoscephale, a village near Thebes, Boeotia, in either 518 or 522 B. C., and studied his art at Athens. The lyrical art in those times comprised not only the rhythmical arrangement of the words, but also the composition of corresponding vocal and instrumental music and of accompanying choral dances; and P. is said to have been equally great in all these branches of his art. On his return to his native city he entered into the lyrical contest with the celebrated poetess Corinna, and was beaten 5 times. Nevertheless, his merits were soon recognized. His fame grew great, and, invited by kings and free cities, highly honored and richly paid, he wandered from place to place where the Gr. nation lived and the Gr. tongue was spoken, celebrating the great games and religious festivals with his songs. He resided for a period of 4 yrs. at the court of Hiero, tyrant of Syracuse, but left it on account of his disagreement with Simonides; lived for several yrs. at Athens; entertained friendships with Alexander, son of Amyntas, king of Macedon, and Theron, tyrant of Agrigentum. D. at Argos about 442 B. C.

**Pine** [Lat. *pinus*], the collective name of a tribe of plants of the greatest importance to man and of the greatest interest to science. They belong to the family of Coniferae, ligneous plants with sterile and fertile flowers separate, of the most simple and primitive structure, without any envelopes, such as calyx or corolla, and in the fertile ones the germs or ovules borne on open scales; not inclosed in carpels, as in all other flowering plants, nor the seeds in regular fruits. They thus belong to the class Gymnosperms, or plants with naked seeds. But together with their imperfect flowers, we find a high organization of the trunk, which is regularly exogenous, growing by external accretion of annual rings.

The pines, in the wider sense, are distinguished from other conifers by bearing 2 inverted ovules on each carpellary scale, many of which are crowded together in a cluster (inflorescence), and eventually form the well-known pinecone, in which each well-developed scale covers 2 winged seeds. All the pines have linear, almost always stiff and evergreen leaves, often called needles. They are confined to the N. hemisphere, and are the only forest trees of high lats. and altitudes. The wood of the pines is the most important of all trees on account of its abundance, size, lightness, and durability, and equally indispensable to us are the resinous products of these trees—tar, pitch, rosin, and turpentine—which no other plants can furnish.

The most numerous and most important are the trees which are more strictly called pines—*Pinus* of most modern botanists. We distinguish 2 sections of true pines. The white pines have 5 mostly slender leaves in a bunch; scales of the cones rather thin; wood whiter, lighter, softer, and less resinous, and therefore highly prized for carpenterwork. Of these our E. and N. white pine (*P. strobus*) is the fairest representative, a tree of magnificent proportions and universal application, and highly prized as an ornamental tree. The second section comprises those with knobby scales, leaves from 1 to 5 in a bundle. Next to these range the large-fruited nut pines, with thick or hook-knotted scales, and large short-winged seeds, of which *P. pinea* is the Mediterranean, and *P. Sabina*, *Canariensis*, and *Torreyana* the W. Amer. representatives. Of the large number of pines remaining, some bear their cones just below the terminal bud of the same yr.'s shoot; their scales are usually thinner, with less prominent prickles, and their wood whiter and less resinous. Those that bear lateral cones have usually very knobby and prickly scales, and heavy, resinous, yellowish wood—the real yellow or pitch pines.

All the other trees allied to the true pines are distinguished by single, not sheathed leaves, by bearing their flowers on branchlets of the previous yr., and by maturing their seeds in one season (except the cedar). Here belong the firs (*Abies*), stately trees with usually flat, 2-ranked leaves, bearing on their uppermost branches large erect cones, which at maturity fall to pieces. The hemlock-spruces (*Thuja*) have the flat leaves of the firs and the pendulous cones with persistent scales of the spruces; their spray is light and graceful, and their cones of the smallest, the wood rather inferior, but the bark greatly valued for tanning purposes. Of greater importance to us are the spruces (*Picea*), elegant, regularly shaped trees, with square leaves, and persistent scales to their pendulous cones. Here belongs the most important timber tree of Europe, the Nor. spruce. The last of the pine tribe are the larches and the cedars. Both have two different kind of branchlets: vigorous elongated shoots with distinct single leaves, and short,

knobby, lateral branchlets with crowded (fasciculated) leaves; such stunted branchlets also bear the flowers and fruit. The larches (*Larix*) peculiar to the mountains of Europe, Asia, and N. W. Amer., and the tamarack, to the swampy regions of N. E. Amer., are the only trees belonging here that bear deciduous leaves. The cedars (*Cedrus*) are distinguished from the larches by their persistent foliage, autumnal flowers, and their large compact cones, which mature one yr. after flowering, and after some time drop to pieces. [From orig. art. in *J. s. Univ. Cyc.*, by GEORGE ENGELMANN, M. D.]

**Pineapple**, the compound conical fruit of *Ananassa sativa*, a plant of the order Bromellaceae, a native of tropical Amer., now naturalized in many hot countries, and cultivated also in hot-houses. When properly cultivated it is one of the best of fruits, but too often it is tough, coarse, and indigestible. The leaves of this and allies afford the fibres whence the beautiful pina muslin is made.

**Pine Bluff**, R. R. June, cap. of Jefferson co., Ark., in the cotton-producing section of the State. Pop. 1870, 2081; 1880, 3203.

**Pine-chaf'er**, a name given to *Pissodes strobi*, *Tomicus pin*, *T. xylographus*, and several species of *Hylurgus*, coleopterous insects, whose larvæ commit great ravages in pine forests, eating away the new material between the bark and the wood.

**Pine Finch**, or **Goldfinch**, a bird of the family Fringillidae, the *Chrysomitris pinus* of recent authors. It is congeneric with the common yellow-bird of the U. S. It attains a length of about 4½ inches, is brownish-olive above, and beneath whitish, streaked with dusky.

**Pine Grosbeak**, a bird of the family Fringillidae and genus *Pinicola*, the *Pinicola enucleator* (Linn.), Cad. Its average length is about 8½ inches; the bill and legs are black; the male is rose-colored above, tinged, except on the head, with brownish, ashy below; the female brownish above, ashy, tinged with greenish-yellow below. As indicated by the name, the species affects pine and other evergreen forests; it feeds on spruce-seeds, etc.

**Pinel**, pe-nel (PHILIPPE), b. at St. André, Fr., Apr. 20, 1745, studied med. at Toulouse and Montpellier; removed in 1778 to Paris; obtained a prize in 1791 for his *Traité médical philosophique sur l'Altération mentale*, and was appointed first phys. of the Bicêtre in 1793, and in 1795 of the Salpêtrière. By his writings and by his successful management of the 2 asylums he accomplished a thorough reform of the treatment of mental diseases. Wrote *La Nosographie philosophique et la Médecine clinique*. D. Oct. 25, 1836.

**Pines, Isle of**, (1) An island in the Caribbean Sea, belonging to Sp., and situated 33 m. off the S. W. extremity of Cuba, comprises an area of 1200 sq. m., with about 2000 inhab. The prin. settlements of the colony are Nueva Gerona, Santa Fé, and Jorobado. (2) An island in the S. Pacific, belonging to Fr., and situated in lat. 22° 38' S., lon. 167° 25' E., off the S. E. extremity of New Caledonia, was discovered in 1774 by Capt. Cook, and was selected in 1872 by the Fr. Assembly for a penal station.

**Pine Snake** (*Pituophis melanoleucus*), a large serpent, 6 ft. long, 2 inches thick, of a shining white color with dark-brown spots, and emitting a strong, disagreeable odor; received its name from having its home in the pineries of E. Amer. It is perfectly harmless to man.

**Pink**, the name of various plants of the genus *Dianthus*, all natives of Asia and Europe, for the wild P. of the U. S. are of the genus *Silene*, and are properly called campions or catchflies; but *D. Armeria* and *prolifer* are sparingly naturalized here. The most common P. are often delightfully fragrant. There are thousands of fine varieties. They are somewhat doubtfully referred to some 4 or 5 original species (*D. plumarius*, *caryophyllus*, *Chinensis*, *Carthusianorum*, *superbus*, *deltoides*, etc.). All need much care to produce perfect flowers.

**Pinckney** (WILLIAM), LL.D., b. at Annapolis, Md., Mar. 17, 1764, studied med. and law; was admitted to the bar 1786; member of the constitutional convention of 1788; was chosen M. C. 1790, but did not take his seat; was a U. S. com. in Eng. 1796-1804, atty.-gen. of Md. 1805, minister extraordinary with Monroe, to G. Brit. 1806, minister resident there 1806-11, U. S. atty.-gen. 1811-14; served as a volunteer officer at Bladensburg, and was wounded; M. C. 1815-16, minister resident at Naples 1816, minister to Rus. 1816-18, U. S. Senator 1820-22. D. Feb. 23, 1822.

**Pink-root**, the root of *Spigelia Marilandica*, a showy herb of the U. S., not often found N. of the Potomac. The infusion of this root is used as an anthelmintic; it has also narcotic qualities. The P. should be combined with a cathartic, such as senna. *S. anthelmia* is a similar plant of S. Amer. They belong to the Loganiaceae. *S. loganioides* and *gentianoides* grow in Fla.

**Pin-Money** (law), an annual sum of money, sometimes provided for in a marriage settlement, to be paid by the husband to the wife for the purpose of defraying her own personal expenses for dress and the like. The term dates from the 14th century.

**Pintard** (JOHN), LL.D., b. in New York 1759, grad. at Princeton 1776; studied law, but never practised; was a volunteer in the Revolution; acted for 3 yrs. as clerk to his uncle, commissary for Amer. prisoners in New York; ed. for a short time the *Daily Advertiser*; engaged subsequently in commerce; was for many yrs. city inspector and sec. to the Mutual Insurance Co.; was the founder of the New York Historical Society, v.-p. of the Amer. Bible Society, and distinguished as the most accomplished local antiquary in New York. Author of many fugitive articles in periodicals, chiefly on antiquarian topics. D. June 21, 1844.

**Pin-worm**. See ASCARIS and VERMIFUGES.

**Pinzon**, pën-thôn', the name of a family of enterprising navigators at Palos, Sp. The head of the family, MARTIN ALONZO, rendered great service to Columbus in fitting out his little fleet and in obtaining sailors. He commanded the



**Pinta**; was separated from Columbus in the W. I., and subsequently by a storm on the return voyage, but reached Bayonne in safety before Columbus had arrived in Sp., and wrote to the court asking permission to give an account of the voyage. The opportune arrival of Columbus defeated what was believed to be a scheme for appropriating the honors of the discovery. P. was forbidden to present himself at court, and soon afterward d.—His brother, VICENTE YASZ, commanded the Nifia in the first voyage of Columbus; discovered Brazil at Cape St. Augustine Jan. 28, 1500; explored the N. coast as far as the Orinoco, entering the mouth of the Amazon; reached Hispaniola June 1500; lost 2 of his caravels, and returned to Palos in Sept., having lost his fortune by the voyage. In 1506 and 1508 he was associated with Juan Diaz de Solis in the voyages in which they discovered Yucatan and the river La Plata.—FRANCISCO MARTIN, the third brother, was pilot to the Pinta in the first voyage of Columbus.

**Pioche**, on R. R., cap. of Lincoln co., Nev., in a cañon of the Cordilleras, about 7000 ft. above the sea-level, possesses rich silver-mines. Pop. 1880, 745.

**Pipe-Fish**, a name given to species of fishes with a tubular or pipe-like snout, chiefly belonging to the order Lophobranchiata and family Synbranchidae.

**Piperaceae** [from *Piper*, the prin. genus], a natural order of exogenous and often climbing herbs and shrubs, altogether tropical, but rare in Afr. There are some 600 species, nearly all acrid, some of them astringent, and some narcotic. Pepper, cubebes, matico, and betel are the chief commercial products.

**Pipette** [Fr.], a chemical laboratory instrument of glass which is used for sucking up quantities of liquids by the application of mouth-suction. The P. has therefore a long stem with a contracted orifice for introduction into deep or narrow-mouthed vessels, with a bulbous or elongated expanded portion above to contain the liquid.

**Pipe Stone**, Minn. See APPENDIX.

**Piqua**, city and R. R. centre, Miami co., O., on Miami River and Grand and Erie Canal. Pop. 1870, 5067; 1880, 6031.

**Piræus** (Gr. Περαιεύς), a rocky peninsula, supposed to have been once an island on the coast of Attica, nearly 5 m. S. W. of Athens, forming 3 natural harbors, all commanded by the hill Munychia, 297 ft. high. Connecting the city and these 3 harbors were 2 parallel walls, about 60 ft. high and 1550 ft. apart, built between 457-431 B. C., and swept away by Sulla. (57-86 B. C.), though their foundations may still be traced. The prin. harbor is safe and deep. The modern town of Piræus has sprung up since 1834. A R. R., opened in 1869, connects it with Athens. Pop. 21,618.

**Pirate and Piracy**. A pirate is a sea-robber, and piracy robbing on the sea, or from the sea on the land, by persons having no commission from a state, or violating their commission to secure plunder. They are enemies of mankind with whom war only exists, and their crimes are justiciable everywhere.

**Pisa**, pee'zah, city of It., cap. of the prov. of the same name, situated on the Arno, which flows through it in a semicircular sweep from E. to W. The plain in which P. lies is extremely fertile, and the salubrity of the climate draws hither invalids from all parts of the world. It is still a walled town, and is entered by 6 gates. The bridges over the Arno are very fine. An aqueduct 4 m. in length supplies the town with water. The public buildings are of great interest, and the Duomo, the Baptistery, the Leaning Tower, and the Campo Santo of P. will always be among the first objects in It. to call forth the enthusiasm of the traveller. Another choice architectural gem is the Sta. Maria della Spina, a small Gothic ch. or chapel of exquisite beauty on the left bank of the Arno. Many of the other numerous chs. deserve attention, as do also several palaces remarkable for their historic associations and for their artistic wealth. The Univ. of P. (12th century) is very celebrated, and it counts Galileo among its former pupils and profs. An acad. of fine arts and a botanical garden are among the many other provisions for public instruction. Pop. 53,957.

**Pisa, Council of**, considered œcumenical by Gallican theols., but not so regarded by the R. Cath. Ch. Its object was to heal the papal schism which had scandalized Christendom since 1378. It was summoned neither by pope nor emp., but by 14 cardinals (7 in each obedience) of the 2 rival popes. It met in the cathedral of P. Mar. 25, 1409, and held its 23d and last session Aug. 7, 1409. The rival popes were deposed, and a new pope was chosen. Another C. of P., held May 30, 1185 (not 1184), excommunicated the antipope Anacletus II.—Still another, called by 5 rebellious cardinals of Pope Julius II., met in P. Nov. 1, 1511, adjourned to Milan Nov. 11, 1511, left Milan for Asti Apr. 21, 1512, and Asti for Lyons, having ridiculously failed in its attempt to depose the pope.

**Pisano**, pe-sah'no (NICCOLO), b. at Pisa in 1290; built several fine chs. in Pisa, Florence, Venice, etc.; became celebrated as a sculptor, which art he actually revived. D. 1278.—His son, GIOVANNI PISANO, b. at Pisa about 1240, d. there in 1320, became celebrated as an arch. He designed the Campo Santo at Pisa, and constructed the Castel Nuovo at Naples.

**Piscataqua River**, for some miles the boundary between Me. and N. H., is formed by the junction of Salmon Falls and Cocheco rivers, both of which furnish extensive water-power. Its lower course is tidal, and constitutes the harbor of Portsmouth, N. H.

**Pisgah**, whose present Arabic name is *Siāgah*, a mt. of Pal., mentioned several times in the Pentateuch, and identified as the summit from which Moses obtained his view of the Promised Land (Deut. xxxiv. 1).

**Pisidia**, an anc. terr. of Asia Minor, situated between Phrygia, Cilicia, Pamphylia, Lycia, and Caria. It was inhabited by wild and predatory tribes ruled by petty chiefs. The Romans held possession of the chief towns.

**Pisistratus**, b. at Athens about 612 B. C. (d. there 527 B. C.), belonged to one of the most aristocratic families, but made himself leader of the lower classes as against Solon, and seized the govt. of Athens. He retained the form of the Solonian const., but he took care that the highest offices were always held by members of his own family. He exacted obedience to the laws, and many of his social measures were sound and beneficial. The poorest class of the inhabs., which generally lay idle, he compelled to leave the city and engage in agriculture, and he provided them with seed and cattle. The artisans he kept busy with great building undertakings. Many of the most beautiful and most characteristic insts. of Athenian life are ascribed to P.

**Pistachio-Nut, or Green Almond**, the fruit of the pistachio tree, *Pistacia vera* (order Anacardiaceæ), is common in the S. of Europe, in Asia, and Afr. The kernel is somewhat like that of the almond, but is green. It yields a good table oil. To the same genus belong the mastich, the terebinth, and other valuable trees.

**Pistil** [Lat. *pistillum*], the female or central seed-bearing organ of fructification in phænogamous plants. A flower may possess one or more P., which collectively receive the name of *gynæcium*. A perfect P. has 3 parts—the *stigma*, the *style*, and the *ovary*. The stigma and the ovary are the only essential portions, and the style is often omitted. The ovary is the young pod, containing the ovules to be fertilized and become seeds. The style is usually cylindrical or columnar, often long and thread-form, sometimes flat, and it is crowned by the stigma, which may be a knob or a double or single line extending down the inner face of the style. It assumes very many different forms, but whatever may be its appearance, it always serves the same end. It consists of naked cellular tissue, or is rough with papillæ, or hairy or viscid. On its surface falls the pollen from the anthers, which then imbibes moisture, swells, and protrudes tubes, which penetrate the style, and finally reach the ovary and fertilize its contained ovules. These now develop the embryo or germ, increase in size, and become seeds. In theory, each carpel may be considered as a small leaf folded upon itself. It may be sessile or borne upon a stalk, representative of the petiole of the leaf. P. may be in flowers by themselves on the same or different plants. In hermaphrodite flowers both stamens and P. are present, although they may be so situated with reference to each other as not to be self-fertilizing. In such cases the desired cross-fertilization is usually accomplished through the agency of insects.

**Pistoia**, pis-to'yah [Lat. *Pistoria* or *Pistorium*], town of It., prov. of Florence, 21 m. N. W. of the city of Florence. It lies in a most fertile valley between 2 spurs of the Apennines. A fine view of P. is obtained from the remarkable railway which crosses the Apennines between Bologna and Florence. A wall surrounds the town, which is entered by 4 gates. The streets are sufficiently wide and well paved, the squares large, and the public buildings very respectable. The cathedral contains some interesting works of art. The baptistry, opposite the cathedral, is octagonal in form, though popularly called the Rotondo. San Bartolomeo, Sant' Andrea, and San Giovanni are all chs. of very anc. date. The bp.'s palace is an imposing edifice. The façade of the hospital is decorated with terra-cottas by the Della Robbia family. The manufactures of P. consist chiefly of hides, woollens, silk, iron-work generally, and especially firearms. A very fine rock-crystal is also wrought here. Pop. 51,552.

**Pistole** [from the It. *piastrola*, a "little piastre"]. The Sp. P. is a gold coin, lately worth about \$4, but formerly much more valuable. The new It. gold P. of 20 lire is worth \$3.823, but the old ones are variable. There are also Ger. and Swiss P.

**Pitcairn** (JOHN), b. in Fifeshire, Scot., about 1740; became capt. of marines Jan. 10, 1765, major Apr. 1771; was stationed several yrs. at Boston, Mass.; led the advance in the expedition to Lexington and Concord, Apr. 19, 1775; commenced the first battle of the Revolution, and was killed at Bunker Hill June 17, 1775.

**Pitch**. See BITUMEN and TAR.

**Pitcher-Plants**. These have their leaves in the form of a pitcher, urn, trumpet-shaped tube, or other hollow vessel capable of holding water. The prin. kinds belong to 5 different genera of plants, in 3 orders, which have no near relationship or resemblance except in the pitchers. One, of a single species, peculiar to S. W. Australia, is thought to belong to the Saxifrage family, where it stands alone.

**Cephalotus follicularis**. It is named *Cephalotus*. The leaves are all in a cluster next the ground; some are flat and of ordinary conformation; others are oval pitchers, hanging from a short stalk near the top on one side, where the handle of a pitcher should be, and fitted with a lid, which covers the mouth, resting at first upon a thickened and crested ring which surrounds the orifice, but opening on its hinge when the pitcher is full grown. (Fig. 1.) This pitcher secretes a watery fluid and entraps many insects. The other P.-P. belong to 2 natural orders, which so far as known contain only pitcher-bearing plants. One of them, *Nepenthes*, consists of many species of one genus, inhabiting the Indian Archipelago; the other, *Sarracenia*, is wholly Amer., mainly N. Amer., and consists of 3 genera—one, of a single species, in the mts. of Cal.; another, of one species, in the mts. of Brit. Guiana; the third, of several species, is confined to Atlantic N. Amer. This is *Sarracenia*. The pitchers are all at the root, and appear to rise from the ground in a cluster. *Sarracenia purpurea*, native of bogs from New-





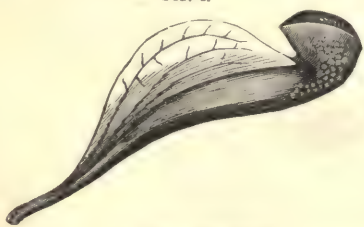
foundland to Florida, was the earliest known, and is the only N. species. Its pitcher (Fig. 2) is sometimes called 'huntsman's cup.' Instead of a

FIG. 2.

proper hood, it has a large projecting lip, nearly erect, which half surrounds the open orifice. Most of the water with which the cup is usually half full may therefore come from rain, but at first some is doubtless secreted. This water in summer is charged with the decomposing matter of insects and the like, of various kinds, which are in some way attracted to it and drowned in it. In low grounds of S. U. S., near the coast, is found a second species (*S. flava*), with very long and narrow pitchers. Here the hood closes the orifice in the growing state, overarches it for some time afterward, but at maturity stands erect or nearly so. The interior secretes a watery fluid, ordinarily in small quantity. Many insects are entrapped in these pitchers, and few if any of those that enter ever escape, owing partly to the narrowness of the tube, which prevents flight except directly upward, of which they are mostly incapable, partly to the extreme smoothness of the gorge and upper portion, and still more to the lining of the portion below with a fine *chevaux-de-frise* of close and sharp downwardly directed bristles. The captured insects therefore perish, decompose, or are macerated in the liquid when this is abundant, or their remains are fed upon by the larvæ of other insects hatched in the decomposing mass from eggs which are deposited therein. There are 2 red-flowered species in the S. States (*S. rubra* and *S. Drummondii*), with tubular or trumpet-shaped pitchers. But the most curious is a yellow-flowered species named *S. variolarius*, which is common in the low S. country. Its tubular pitchers are carried into dwellings to serve as fly-catchers, for which they are more efficient than any other. One of them is shown in Fig. 3, much reduced. They vary from 8 or 10 to 20 inches in length. The orifice is permanently protected by a strongly over-arching hood, which must naturally exclude the rain. The liquid which they contain, often in some abundance, collected at the bottom of the tube, is doubtless a secretion. Flies, ants, and most other insects which have entered far or fallen into the deep cavity are unable to escape.

In all these tubular pitchers, when freshly grown and vigorous, and in the warm temperature of early summer, a different secretion, sweet and somewhat viscid or honey-like, is exuded within the orifice and base of the hood, which is the attraction to insects, and allures them to the brink or within the gorge of the pit, into which they eventually fall. The existence of this sweet secretion and its attraction of insects in the *S.* species appear to have been more or less known at an early period, but nearly to have passed out of knowledge until recently. There are some allusions to it in William Bartram's *Travels in Ga. and Fla.*, pub. in 1791, but they are vague, and do not discriminate between the sweet secretion at the orifice and the watery liquid below. The first good observations we know of were made by Dr. James Macbride of S. C. in 1810 and the following yrs., and pub. in the *Transactions of the Linnean Society* in 1815. In *S. variolarius*, at the period of the greatest activity of its pitchers in secretion and insect-capture, a narrow line or trail of the sweet exudation appears upon the edge of the wing, and extends from the orifice down to near the base, a distance of from 8 to 18 or 20 inches, according to the size of the leaf. This trail of treacle, continuous from the copious similar deposit within the orifice down to near the ground, seems especially adapted

FIG. 4.

*Sarracenia peltata*.

for the allurements of ants and other wingless insects fond of sweets.

A remaining species, *S. peltata*, or the parrot-headed *Sarracenia* (Fig. 4) of the S. U. S., bears small pitchers, of less width than the leafy wing; it is mainly remarkable for the inflated hood completely inflated over the orifice, which is thus reached only from underneath. It is chiefly interesting as showing a transition toward the pitchers of the Californian representative of the family of a peculiar genus—viz. *Darlingtonia Californica*. This is found only in the N. portion of the Sierra Nevada. The flower is less like that of *Sarracenia* than are the leaves or pitchers. These may be compared with those of the last mentioned *Sarracenia*; only they are far larger, varying from a span to 2 ft. in length, stand erect or nearly so, have a twist of at least half a turn, the summit is equally hooded and inflated, so that the orifice looks downward, and the extremity of the hood bears a curious, two-forked, pendulous appendage, in the form of a fish's tail. The pitchers capture insects in abundance. Some watery secretion is found in young pitchers which have not yet opened; it increases somewhat afterward, especially after insects have been caught, and in proportion to their number. Bits of meat thrown in also increase the secretion. This at times fills 6 or 7 inches of the lower part of the tube, and sometimes almost the whole of it. From the situation of the orifice it is evident that no rain is likely to enter. The liquid, when first secreted, is slightly bitter and astringent. Later, it is shown to be slightly acid by litmus-paper. Insects immersed in it ordinarily die in a few minutes. After warm weather comes on, a sweet secretion begins to appear in the form of minute drops, like honey-dew, on the inside of the hood and

FIG. 5.

*Darlingtonia Californica*.

of the fish-tail appendage. As summer advances this is increased, extends all over the appendage or its lobes, outside as well as inside, occasionally gathering into a drop at the tip of each lobe. It has some odor and the taste of honey. Insects, flies especially, are fond of it. In large leaves at midsummer a line of this sweet secretion extends from the orifice downward along the edge of the wing almost to the ground; in most leaves, whether large or small, it occurs, in the form of minute globules resembling honey-dew, along the angle on either side formed by the junction of the wing with the tube.

FIG. 6.

*Nepenthes*.

It is difficult to believe that such adaptations, and the consequent captures, are purposeless or of no benefit to the plant, the more so now that several plants of the sundew family are found to be carnivorous. (See *SUNDEW* and *DIONEA*.) It has not been shown, however, and it is not very probable, that there is any proper digestion or absorption of unaltered animal matter in the *Sarracenia* family. But the products of decomposition, in a liquid or gaseous form, are probably absorbed and made subservient to the plant's nourishment.

Nothing is known as to the action of the only remaining P.-P. of the *Sarracenia* family, *Heliamphora* of Guiana. There is reason to believe that something like a true digestion takes place in the remaining order of P.-P., represented only by the rather large genus *Nepenthes*. (See art. *NEPENTHES* and Fig. 6.) These plants belong to the S. hemisphere and to the great islands, from Madagascar to Borneo. It is now known that a sweet secretion which allures insects forms on the rim of the pitcher, and sometimes on its lid; that the watery liquid which is secreted by and contained in the interior of the pitcher increases in quantity when insects are caught or drowned in it, and equally so when bits of meat or little cubes of cartilage or boiled white-of-egg are thrown in; also, that the secretion then becomes acid, and acquires the power of dissolving such solid matters, in a manner apparently analogous to that of the gastric juice of animals.

ASA GRAY.

**Pitchstone**, a variety of feldspar of somewhat resinous appearance; is a popular name for many sorts of opal which have a resinous lustre, and other glassy minerals.

**Pitkin**, Col. See APPENDIX.

**Pitkin** (TIMOTHY), LL.D., b. at Farmington, Conn., Jan. 21, 1786, grad. at Yale 1785; became a lawyer, and was 5 times speaker in the State legislature; M. C. 1806-20; author of *Statistical View of the Commerce of the U. S.* and *Political and Civil Hist. of the U. S.* D. Dec. 18, 1847.



**Pitman** (ISAAC), b. at Trowbridge, Wiltshire, Eng., Jan. 4, 1813, was ed. in the normal col. of the Brit. and Foreign School Society at Lond.; pub. *Stenographic Short-Hand and Phonography, or Writing of Sound*, giving the principles of his invention of a superior method of short-hand called phonography; devoted himself to the perfection and propagation of phonography and its complement phonetics; founded in 1843 the Phonetic Society, and established the Phonetic Institute, a printing-office from which he has brought out for many yrs. *The Phonetic Journal*. His most complete professional work is the *Phonographic Reporter's Companion* (1855).—A brother of the inventor, BENN PITMAN, removed to the U. S., settling at Cin., where he devoted himself to the propagation of phonography; pub. a *Manual of Phonography*.

**Pitman** (ROBERT CARTER), LL.D., b. at Newport, R. I., Mar. 16, 1823, grad. at Wesleyan Univ. 1845; was admitted to the bar in 1848, and became a lawyer of New Bedford, Mass.; was often in the State senate, of which he was pres. in 1869; became a police judge in 1858, and in 1869 one of the judges of Mass. superior court.

**Pitri** [cf. Lat. *pater*, a "father"], in Hindoo mythology, originally meant a deceased ancestor, but was ultimately transformed to signify one of an order of divine beings into which the spirits of mortals may be received on condition of the due performance of the *Sradha* or funeral rites.

**Pitt** (WILLIAM). See CHATHAM, EARL OF.

**Pitt** (WILLIAM), generally called the **Younger Pitt**, the second son of the earl of Chatham, b. May 23, 1759. In 1780 he entered into public life, and took his seat in the House of Commons as member for Appleby. The opposition against the party in power, the cabinet of Lord North, consisted of 2 factions—one led by Rockingham and Fox, and the other by Lord Shelburne. Pitt joined the latter, which mostly consisted of old friends of his father, and his speeches made such an impression that Lord Shelburne, when he became first lord of the treas. in July 1782, offered him a place in the cabinet as chancellor of the exchequer. Lord North, although at one time driven from power by Rockingham and Fox, now formed a coalition with them against the cabinet of Lord Shelburne, and in 1783 Lord Shelburne had to give in his resignation, and Pitt with him. But in the very next session, when Fox brought in his bill for transferring the govt. of India from the E. I. Co. to Parl.—that is to say, to the ministry—the coalition was defeated and the cabinet compelled to retire. Pitt was called upon to form the new cabinet, and after dissolving Parl. and gaining a majority at the gen. election of 1784, he established himself firmly in the most powerful position which a subject can occupy in Eng., and he maintained himself in this position without interruption for 14 yrs. The prin. feature of his administration is his war with Fr., but no Eng. historian has as yet been able to give a sufficient reason for this war which Eng. began in 1793 and continued to 1815. It seems to have been a whim, a chimera of the minister; he would imitate his great father in this point too. But his war administration was weak and confused, and when losses and disasters followed, the chimera grew into a mania. In 1801 he retired from office. In Feb. he resigned, and in May the Peace of Amiens was concluded. In 1804, however, he was recalled, and the war was renewed. But the surrender of the Aus. army at Ulm, the battle of Ansterlitz, the Peace of Presburg filled the haughty but impotent minister with such chagrin that he d. from disappointment, Jan. 23, 1806.

**Pitacus**, one of the Seven Wise Men of Gr. b. at Mytilene in Lesbos 652 B. C.; as a leader of the democratic party participated very actively in all the feuds and embroilments of his native city, and was chosen *asymnetes* in 589 B. C., which office he held to 579 B. C. D. 569 B. C.

**Pittsburg, Kan.** See APPENDIX.

**Pittsburg**, city and important R. R. and commercial centre, cap. of Allegheny co., Pa., at junction of Allegheny and Monongahela rivers, which here unite to form the Ohio. P. is 354 m. W. of Phila. by rail, and 40 m. E. of the O. State line; lat. 40° 20' 34" N., lon. 80° 2' 38" W.

**Railroads, Etc.**—The R. Rs. centring here are the Pa. and Baltimore and Ohio from the E.; the Allegheny Valley, P. and Erie, P. and Lake Erie, and Cleveland and P. from the N.; the P., Ft. Wayne and Chicago, and P., Cin. and St. Louis from the W.; the P., Va. and Charleston and P. Southern from the S. The P. and Western is just opening a W. connection; the Chartiers road connects Washington, Pa., and the W. Pa. connects Butler, Indiana, and Blairsville with the city; the oil-regions are reached from P. by any of the routes running N. The Allegheny River is navigable, in flood, to Warren, and the Monongahela to the W. Va. line; the Ohio is navigable from the city throughout its length about 8 months in the yr., and the coal and coke of W. Pa. find an outlet to the S. W. by it.

**Coal and Coke.**—There are 67 companies, firms, and individuals engaged in the business of mining and transporting coal. They have a capital invested of \$15,552,000, employ 17,992 men, and in 1881 produced 203,471,755 bushels or 7,726,776 tons, valued at \$12,308,906. In the manufacture and shipment of coke there are 60 companies and firms employed, with 10,854,500 capital, employing 5659 men, and producing 138,001,480 bushels or 2,760,037 tons, valued at \$4,423,559. Total value of coal and coke in 1881, \$16,681,865.

**Iron and Steel.**—There are 10 blast furnaces, with 16 stacks, having a capital of \$4,890,000, employing 2285 men, and producing 353,791 tons of pig iron annually, worth, in 1881, \$8,766,493; the pig metal and ore brought into P. by rail and river, for use here, averages 500,000 tons annually. The number of rolling-mills is 36; a capital invested, \$19,020,000; men employed 18,905; product, 475,148 tons; value, \$30,242,257; spikes produced, 31,600 tons; nails, 555,351 kegs; small nails and tacks, 11,500 packages. In the manufacture of steel there are now employed 17 establishments, with a capital of \$10,170,000; men employed, 7060; product—steel rails, 139,073 tons; steel in other forms, 73,344 tons; total, 211,417 tons; value,

\$18,378,836. There are also 5 file-makers, producing annually 8000 dozen files; 6 establishments making railway supplies, product valued at \$3,177,817; 3 iron-bridge building corporations—product, \$1,462,000; 35 establishments devoted to machine making, foundries, and engine building, which have a capital of \$2,740,000, employ 2083 men, and produce 42,344 tons, valued at \$4,000,000; 13 establishments for the manufacture of boilers, tanks, etc., producing a total of 24,300 tons, valued at \$1,500,000; 6 saw and tool makers, producing 270 tons vises, sledges, and hammers, 150,332 dozen picks, mattocks, etc., and 50,000 saws, valued at \$1,345,850; 5 agricultural implement makers, whose products are valued at \$675,000 annually; 7 stove factories, using over 6000 tons metal annually, and producing stoves to the value of \$700,000; 4 safe-makers; 3 factories of iron roofs, cornices, and buildings; 6 for the manufacture of iron railings, fences, etc., and 5 for making domestic hardware—all of which produce goods annually worth \$1,200,000. The total value of iron and steel in all shapes is \$67,448,253, which is based on the product of 1881.

**Glass and other Manufactures.**—There are 3 copper works, which produced goods in 1881 valued at \$1,000,000; 16 brass foundries, products valued at \$1,300,000; 59 glass factories and 4 of stained glass employing 4825 men, with a capital of \$6,000,000 and a product valued at \$6,922,683; and many other miscellaneous manufactures.

**Steamboat Tonnage.**—An immense amount of tonnage is employed on the rivers in the coal and coke business, nearly all the cities on the Ohio and Miss. rivers getting their supplies of coal from P. by river. Twenty-one steamboats were built at P. in 1881.

**Oil.**—The receipts of crude oil at P. in 1881 were 866,467 barrels, the export of refined 416,109 barrels, and delivery for home use 432,450 barrels; value of crude, \$801,491; of refined, \$4,030,655. Total sales at oil exchange in 1881 were 59,494,000 barrels.

**Miscellaneous.**—The receipts of direct importations in 1881 amounted to \$998,101, and the duties collected thereon were \$435,006. There are in the city 1824 business establishments, 1380 of which are factories, with a capital of \$116,107,481, employing 87,789 men, and doing a business annually of \$145,721,619 in manufactures and \$74,303,152 in jobbing goods—a total of \$220,024,771.

**History.**—Originally the city was laid out on the delta at the mouths of the 2 rivers, but has since reached 7 m. up both rivers, on both sides of them, and across. Allegheny City still maintains a separate municipal existence, but is always regarded as a part of P. In early times its situation at the head of the Ohio made it a place of great strategic importance, and the Fr. built Ft. Duquesne here, which the Brit. captured in 1758, and built a new ft. in 1759, calling it Ft. Pitt, in honor of William Pitt, then at the head of the Brit. ministry. When the place had grown to a town it was called Pittsburg. The post was abandoned by the Brit. in 1772. The town was always of importance as a shipping point to the W., but grew slowly for a long time. It was formed into a borough in 1804, and into a city in 1816, but its boundaries then included only the delta between the rivers. The city line was first extended about 1850, again in 1867, and finally in 1872 to its present boundaries.

**Population.**—The pop. by the census of 1880 was 156,389, its boundaries having been enlarged since 1870. Allegheny City, which adjoins it across the Allegheny River, has 78,685, and the suburbs of the 2 cities contain about 10,000 more, making a total of 245,071. The pop. of P. in 1793 was 1139. RUSSELL EBBETT.

**Pittsburg Landing.** See SHILOH.

**Pittsfield**, on R. R. cap. Pike co., Ill. has flour mills and tobacco factories. Pop. 1870, 1621; 1880, 2104.

**Pittsfield**, R. R. centre, cap. of Berkshire co., Mass., upon a plain 1300 ft. above the sea, and surrounded by fine sheets of water. There are 6 lakes and lakelets, the outlets of which form Housatonic River, one branch girding the village on the W. and the other on the E., both finally meeting S. of the village. The lakes in the vicinity afford excellent water-power. It contains a park, a free library, a fine c.-h., jail, high school, and a benevolent inst. for those disabled by accident or disease. The site of P. was granted to Boston in 1735, and was known as Boston Plantation until its incorporation in 1761, when it received its present name. Pop. tp. 1870, 11,112; 1880, 13,364.

**Pittsfield**, N. H. See APPENDIX.

**Pittsford**, N. R. centre, Luzerne co., Pa., in centre of Wyoming coal-region, 9 m. from Wilkesbarre, ships about 1,000,000 tons of coal annually. Pop. 1870, 6760; 1880, 7472.

**Pius**, the name of 9 popes, of whom only the last has any great historical interest.—PIUS IX. (*Giovanni Maria Mastai-Ferretti*), b. at Sinigaglia May 13, 1792, studied theol. at the Coll. of Volterra, and took holy orders in 1818; in 1825-25 visited Chili; in 1827 was created abp. of Spoleto, whence he was transferred in 1832 to the see of Imola; in 1840 was made cardinal; was several times employed in diplomatic missions; on the death of Gregory XVI. the conclave chose him pope (June 16, 1846), but 2 yrs. later (Nov. 23, 1848) he had to flee from Rome in disguise and take refuge in the Neapolitan fortress of Gaeta. He appealed to Fr., Aus., Sp., and Naples for help, and in Apr. 1849 an Aus. army moved toward Rome from the N., and a Fr. from Civita Vecchia. On Aug. 22 Rome surrendered to the Fr., and the papal authority was re-established; the pope himself returned in Apr. 1850. As long as the Aus. army occupied the N. part of the state, and the Fr. army Rome and the S. part, the govt. of Pius IX. remained undisturbed; but it was evident enough that it was antagonistic to the feelings and ideas of his subjects. As soon as the Aus. army retired (in 1859), the N. provs. annexed themselves to the kingdom of It., and the same took place in Rome and the S. provs. on the withdrawal of the Fr. army in 1870. Without any further revolutions or disturbances, the temporal power of the pope glided out of existence. How far the views of Pius IX. were



from harmonizing with the spirit of the 19th century was best seen from the new doctrines with which he enriched the theology of the Roman Ch.—viz. the immaculate conception of the Virgin, established by a decree of Dec. 8, 1854, and the infallibility of the pope in all matters of faith and morals, established by the so called oecumenical council of Rome in 1870, and from the famous Syllabus. Here Pius IX. condemned as heretical the ideas of liberty of conscience, of the liberty of the press, of the independence of the secular govt. from the ecclesiastical, of the equality of laymen and clergymen before the law, of the right of a people to make their own laws and elect their own magistrates, etc.; that is to say, he condemned in the 84 theses all the prin. ideas of modern civilization as heretical. In Fr. the publication of the Syllabus was forbidden, the It. govt. protested against its contents in very strong expressions, and the Aus. govt. took a cautious reservation. The gen. effect was that the antagonism between the spirit of the 19th century and the head of the R. Cath. Ch. became very vividly felt. D. Feb. 7, 1878.

**Pizarro**, pe-zar'ro (FRANCISCO), the "great marquis," b. at Truxillo, Sp., about 1471, was the natural son of a Sp. col. of foot by a peasant-girl of Estremadura; was bred a swineherd; grew up a bold, ignorant, and brutish man, and from 1510 to 1525 was engaged in perilous adventures in Sp. Amer.; was one of Balboa's party which discovered the Pacific Ocean. Having heard of the existence of Peru, with its great wealth, he led a party which reached and partly explored that country in 1526. In 1528 he obtained leave of Charles V. to attempt the conquest of Peru, but without public aid; and in 1531 he invaded the Peruvian empire; treacherously seized the confiding Inca, Atahualpa, and in less than 2 yrs. had overthrown the anc. govt. of the realm. P. was made a marquis, founded Lima and other towns, and for some yrs. ruled Peru as capt.-gen. with almost absolute power; but a desperate and nearly successful revolt by the Indians was followed in 1538 by a contest with Almagro, his associate, who was defeated and slain; soon after which Almagro's followers attacked P. in his palace (June 26, 1541), and he was killed after a desperate struggle.

**Placerville**, plah-sair'vil, city, cap. of El Dorado co., Cal., about 40 m. E. of Sacramento, has an acad. Quartz lodes bearing gold are numerous, and water is obtained for mining and irrigation from lakes situated near the summit of the Sierra Nevada, through an aqueduct over 40 m. in length. Pop. 1870, 1563; 1880, 1951.

**Plague**, pläg (Gr. *πληγή*; Lat. *plaga*, a "blow"), a malignant and fatal contagious fever, now little known, but formerly endemic in Egypt and the Levant, and spreading in devastating epidemics throughout Europe. It was termed the "pest," the "black death," and the "great mortality." Its first appearance in Europe was at Constantinople A. D. 544. Since then epidemics have occurred at variable intervals; there were 45 in the 17th century. It is estimated that in Europe 25,000,000 have died of P. The P. is now regarded as a zymotic disease, derived from insalubrious and poisonous atmospheric or telluric conditions, a *matres morbi* gaining access to the blood, and rapidly multiplying in it and destroying its nutritive elements. In malignity and nature it resembles typhus fever. Its propagation was formerly supposed to be by contagion, but it is now regarded as due to importation by ships or on the person, and communicable by atmospheric infection. Overcrowding, bad ventilation, uncleanness, deficient food, and residence in damp, marshy soils have been considered the predisposing causes of local epidemics. The disease has 4 stages, yet all may occur in rapid succession and brief time: (1) invasion, (2) fever, (3) local phlegmons, and (4) collapse or convalescence. It is preceded by lassitude and enfeeblement of mind and body; its definite onset is announced by shivering, headache, vertigo, vomiting, high fever-heat, great prostration, stupor or unconsciousness, blood in the urine or from the bowels, the appearance of bubos or inflammatory enlargement of lymphatic glands, or of carbuncles, or again, in fatal cases, of petechie or purple spots and mottling of the skin. Its duration is 2 or 3 days, and, when survived, a slow subsequent convalescence. (See HECKER'S *Epidemics of the Middle Ages*.)

**Plainfield**, city, on R. R., Union co., N. J., was incorporated as a city in 1869; has an inst. and a sem. Pop. 1870, 5095; 1880, 8125.

**Plain'tiff** (law). At the common law this term was confined to the class of legal actions called personal, as distinguished from real, and described the party who is named on the record as bringing the action. This common-law rule formerly prevailed in most of the States of the country. The reformed procedure has reduced all forms of civil actions, legal and equitable, to one, in which the complaining party is denominated the plaintiff. A "plaintiff in error" is the party who obtains a "writ of error," and thereby removes a judgment into a higher court for the purpose of review.

**Plain View**, on R. R., Wabasha co., Minn. Pop. 1870, 637; 1880, 668.

**Plainville**, Conn. See APPENDIX.

**Plainwell**, R. R. junc., Allegan co., Mich. Pop. 1870, 1035; 1880, 1356.

**Plan'er Tree**, the *Planera aquatica*, a rather small ulmaceous tree of swampy lands in the S. States, has the gen. appearance of the elms. Another planer is *P. Richardi* of Per. and the Caucasus, partly naturalized in Europe, and sometimes called *zelkova*.

**Plan'et** (Gr. *ἀστήρ πλανήτης*, "wandering star"). This term was applied by the anc. Gns. to 5 conspicuous stars (Mercury, Venus, Mars, Jupiter, and Saturn), which, changing their places, seemed to *wander* among the constellations. Modern science has added to these no less than 226 other bodies, all having planetary characteristics, and all subject to the same common conditions, the earth itself being, for those reasons, undoubtedly to be classified among those bodies, and also Uranus and Neptune, as well as the minor planets between Mars and Jupiter, which by Sir William

Herschel were designated as *asteroids*; of which, up to the present time (Mar. 10, 1882), 221 have been recognized. But this systematic nomenclature and designation does not include satellites (see Moon) nor comets, nor yet meteorites of various dimensions, whose phys. const. or governing centres of force, or both, are different.

The conditions to which all the P. are subject in their revolutions around the sun are distinctly indicated in *Kepler's Laws*. These are:

**Law 1st.** That the P. describe ellipses, all having a common focus at the centre of the sun.

**Law 2d.** That every P. so moves around the sun that an inflexible line drawn from the P.'s centre to that of the sun describes areas proportional to the times.

**Law 3d.** That the squares of the *periodic times* (times of entire revolution around the sun) are as the cubes of the mean distances from the sun. The third law affords the means of determining the relative mean distances of the several P., and even those of the periodic comets, when the periodic times have been first ascertained; and these in the instances of the prin. P. have been very accurately determined by long-continued observations. The third law is itself slightly modified by the consideration due to the masses of the revolving bodies.

The relative mean distances, that of the earth being 1, are as follows:

Mercury .....	0.3870987 —	Jupiter .....	5.2028004 —
Venus .....	0.7233322 —	Saturn .....	9.5338544 —
Earth .....	1.0000000 —	Uranus .....	19.1838617 +
Mars .....	1.5236913 —	Neptune .....	30.0567298 —

The distances of all the P. can be found when we know that of the earth. If we take the earth's mean distance from the sun to be 92,940,000 miles, which is not far from the truth, the distances of the other P. can be obtained by multiplying it by the respective numbers set opposite their names. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. S. ALEXANDER, LL.D.]

**Plane Table**, an instrument used in surveying for mapping in the field. It is especially valuable in filling in outline sketches of trigonometrical surveys. It is not used where great accuracy is required, but where approximate results only are required it is particularly valuable on account of the rapidity with which they can be attained. The instrument consists essentially of a drawing-board mounted on a tripod in such manner that its upper surface may readily be made horizontal, and so that the entire table may be turned in azimuth through any angle whatever. The combination of parts by which these motions are effected is entirely similar to that employed in levelling and orienting the horizontal limb of a theodolite. The instrument is accompanied by a ruler, usually of brass, and provided with a telescope so mounted that its line of collimation and the bevelled edge of the ruler shall always be in the same plane. To the telescopic ruler is attached an arc of a vertical circle for measuring small vertical angles. The paper on which the map is to be made is smoothly stretched on the surface of the table, to which it is fastened by clamps. (For a fuller article see *J.'s Univ. Cyc.*) W. G. PECK.

**Plane Tree**, the preferable name for trees of the genus *Platanus* and order Platanaceæ, commonly known as buttonwood, sycamore, cottonwood, etc. The Oriental P. (*Platanus orientalis*) of the Old World grows rapidly, lives long, and in favorable situations attains a great size. It is a valuable timber tree. The Occidental P., the buttonwood of the U. S. (*P. occidentalis*), is one of the largest native trees; is often cultivated for shade. The timber of the buttonwood of the Pacific coast (*P. racemosa*) is valuable.

**Plankinton**, Pak. See APPENDIX.

**Pla'no**, on R. R., Kendall co., Ill., 55 m. W. of Chicago, has an acad. Pop. 1880, 1782.

**Plantag'enet**, the surname of the Angevine dynasty of Eng. monarchs. The P. monarchs reigned from 1154 to 1485, when the victory of Bosworth transferred the crown to the house of Tudor.

**Plantain**, plan'tin [Lat. *plantago*], the *Plantago major*, an herb common in nearly every part of the world. It belongs to the order Plantaginaceæ, and although nearly inert is employed in domestic med. Its seeds are fed to cage-birds, and its young leaves are boiled as potherbs. There are many species in this genus, which is well represented in the U. S. Of these, ribwort (*P. lanceolata*) is sown in Europe as a forage plant, and fleawort (*P. psyllium* and *arenaria*) is raised in Fr. for the seeds, which yield a valuable size.

**Plantain**, a name given to the fruit of coarser cultivated varieties of *Musa paradisica*, the finer and more delicate sorts being called bananas. The P. is a native of the E. I., but is now common in nearly all hot countries. It is of the order Musaceæ. *M. Carandishii* or *Chinenis* is a dwarf variety. The P. furnishes a very large part of the food of the human race in some hot countries. The leaves yield a fibre which closely resembles manila hemp.

**Plant-Louse**. See APHIDES.

**Plantsville**, Hartford co., Conn., on R. R. and Quinipiac River. Pop. not given in census.

**Plaquemine**, plak-meen' (on R. R., cap. of Iberville parish, La., on W. bank of Miss. River, at mouth of Plaquemine Bayou, 20 m. S. of Baton Rouge, has a large river-trade. Pop. 1870, 1460; 1880, 2061.

**Plas'ter** (*emplastrium*), in pharmacy, an adhesive mixture of lead-oxide and a fatty acid, or a resinous and fatty compound, often medicated, and designed to be spread upon leather, linen, or paper, and applied to some portion of the human body. They have a considerable use in med., and especially in surgery.

**Plaster of Paris**. See GYPSUM.

**Plata, La.** See ARGENTINE CONFEDERATION.

**Pla'ta, Rio de la**, the name of the estuary formed by the entrance of the 2 great S. American rivers, Parana and Uruguay, into the Atlantic, 180 m. long, and 180 m. broad at its mouth.



**Plate-powder**, a polishing-powder, a mixture of fine chalk with powdered talc, peroxide of tin, or other detergent materials. Some P.-P. contain mercurial salts, and are very destructive to silver.

**Plating**. See ELECTRO-PLATING, NICKEL, and SILVER.  
**Platinum**, or **Platina** [*Sp. plata*, "silver"], a whitish, steel-gray metal, malleable, very ductile, and as unalterable by ordinary agencies as gold. Like gold, it occurs in the native state, and in this form its specific gravity ranges from 16 to 19; it is harder than gold or silver, and a little softer than iron. When fused and refined it is as soft as copper, and the gravity is increased to 21.15. This metal was first discovered in Choco, S. Amer., was taken thence to Sp. in 1735, and in 1822 was discovered in Rus., whence the chief supply has since been obtained. It is found, like gold, chiefly in alluvial deposits, in rounded grains or nuggets, or in flattened scales worn smooth in the gravel of river-beds. It is there associated with gold and the other heavy metals, as iridium and iridosmine. Having nearly the same specific gravity as gold, it cannot be separated from it by washing in the ordinary way, and quicksilver, which will amalgamate with the gold and leave the P. untouched, is used to effect the separation.

Nearly all the native P. is more or less magnetic. Some masses have true polarity and hold iron filings like magnetic iron ore. The raw metal finds its chief market in Lond. and Paris, where it is refined before being made into ingots, plate, wire, and various objects. Its value, as compared with silver, is about as 5 to 1. The comparative infusibility of P. and its resistance to oxidation render it valuable for many purposes in the arts and to the chemist in analytical work, and in manufacturing. The experiment of using P. for money was tried in Rus. for several yrs., but was finally abandoned. The chief solvent of P. is aqua regia, and the chloride is the most important salt. It forms alloys with gold and silver and with many of the more fusible metals. These alloys are much more fusible than the pure P. When combined with iridium it forms an alloy of great hardness, especially well adapted for gun-vents and for standard weights and measures. The alloy known as platino-iridium is used for the manufacture of standard metres. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. WILLIAM P. BLAKE.]

**Platinum Black**, a finely divided form of platinum, resembling soot. It has the property of condensing gases upon its surface in a remarkable degree. It absorbs many times its bulk of oxygen, and gives it off in contact with alcohol or ether, forming new compounds. Platinum sponge is obtained by heating to redness the double chloride of platinum and ammonia. It condenses gases upon its surface, and to such a degree in a current of cool hydrogen that the metal glows with the heat evolved and inflames the gas.

**Plátō** [Πλάτων], a Gr. philos., b. 429 B.C. and d. at the age of 81 years. Platon and Codrus were both reckoned among his ancestors. He has made Socrates most familiar to us, and from Socrates, in turn, we become most familiar with the pupil: Plato and Socrates are inseparable names. They are one power in the world's movement. The Platonic *Dialogues* have remarkable dramatic merit. We feel that we are in the midst of the real; we are living at Athens; we know Socrates; we know his pupils, aside from their being, for the most part, historical characters. We observe Socrates in the scenes of the Symposium, the most exquisite picture which P. has given us of an Athenian literary soiree. The identity of the two minds appears especially in the *doctrine of ideas*. An idea is, in the first place, what the mind adds to a sensation so as to make it rational. Without it, the sense is *αλογος*, as P. supposed the animal to be, mere sense, and of itself incapable of becoming anything more.

Another Platonic doctrine, somewhat different from this, though often confounded with it, is that of *universals* as real existences. It is not generalization alone, but that within us, which makes us generalize, instead of being content with individual sense-objects. Without it we should be like the animal, who has no lang., not from defect of vocal organs, but because he has no inner or ideal world for which lang. is needed. We must have some notion of universals before we can even think of classifying. *Humanity* is as real as the individual man, who becomes *man*—that is, who becomes *real*—by partaking of this divine creation. The locus of universals is the eternal mind, whence they are mirrored in the finite intellect. Connected with *ideas* is P.'s doctrine of pre-existence—pre-existence of something belonging to all rational souls, and by partaking of which they become rational as they are born into this life. It was a divine reality, not a mere generalization.

P. held to the eternity of matter, it is said. In one sense it may be true; in another and clearer sense it is false. Matter, as body, as occupying space, as having even the lowest degree of resistance so as to become sensible to any possible sentience—such matter according to P. is one of the things of time, of the things that are born and perish. But there is another idea of P.'s which has doubtless given rise to the charge. He speaks of the *hyle* (ὕλη), "the mother of matter," "without form or qualities," and wholly supersensual. This has, indeed, a being before time, though nowhere represented as coeternal with God. It is something supposed to be between matter and spirit, matter and God. P. connects evil with matter, but it is with this gross matter whose resistance is in proportion to its grossness and consequent unmanageableness. This doctrine of P., that evil dwells in matter, might be regarded as a mere speculation. It may be called, however, the great defect of the Platonic philos.; not by making two eternals, but from the great practical mischief it works in its ethical teaching. It introduces a purgatorial idea into its otherwise most impressive system of future retribution. But worse than all is the view it gives of *sin*, as mainly, if not wholly, belonging to

the *flesh*. In consequence of this laying all evil upon the poor body, it ignores the sins of the spirit, the dire soul-sins, such as ambition, malice, revenge—that have little if anything to do with any corporeal constitution—or envy, that pure spiritual devilism, hatred of another's excellence. To compensate for this great defect there is the noble argument, presented in so many places, that *virtue*, the good, the *ἀγαθόν*, inseparable from the *καλόν*, the fair, is the end of the rational life, instead of happiness. *If happiness be the end, then virtue is a means, a subordinate thing; and that is a position which P. could not bear.*

What is called P.'s hedonic view is carried even into the state. As he says, in the beginning of the 4th book and in other parts of the *Republic*, the object of gov. is not so much to make men happier or richer, as to secure a healthy civic organism, "for in such a commonwealth may we best hope to find righteousness."

There is one feature in the Platonic *Dialogues* which has not received the attention it deserves. Allusion is made to what are called the Platonic myths. For the more extensive and gorgeous of them the reader is referred to the close of the *Republic*, the *Phædon*, and the *Gorgias*; the first two setting forth the retributions of the unseen world, and the third the appalling scenes of the spiritual judgment "for sins done in the body." There is the myth of *Prometheus* in the *Protagoras*, the fanciful myth of the *Phædrus*; the wholly original and splendid myth of the *Politicus*, setting forth the alternating cosmical periods, the one of the divine order, the other of Nature left to herself, when (in direct opposition to the latest scientific holdings) she inevitably begins to degenerate, as having in herself no principle of progression, or even of permanence, though even in her abandonment she may preserve some portions of the spermatoc reasons sown during her diviner circuit. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. TAYLER LEWIS, LL.D.]

**Platt** (JAMES H., JR.), b. in St. John's, Canada, July 13, 1837, grad. from the med. dept. of the Univ. of Vt. 1859; served during the c. war as capt. 4th Vt. Volunteers, and on the staff of Gen. Sedgwick as acting chief quartermaster 6th corps; prisoner of war May 30 to Dec. 1864; appointed lieutenant and chief quartermaster, which he declined. Settled in Va. at the close of the war; in 1869 elected to the 41st Cong., and re-elected to the 42d, 43d, and 44th.

**Platt** (THOMAS C.). See APPENDIX.

**Platte River**, formed in Lincoln co., Neb., by the union of the N. and S. forks. The former rises in the N. Park, Col., receiving the Sweetwater, the Laramie, and other streams. The S. Platte flows from the S. Park of Col., and in its upper course is utilized in irrigation and as water-power. The united stream flows E., and reaches the Mo. at Plattsmouth. It is the widest, but not the largest or longest affluent of the Mo. Its mouth is over 1000 yards wide, but it is so shallow that it can nowhere be navigated with success. The Loup Fork and Elkhorn are the chief tributary streams. Length of main stream, 900 m.

**Platteville**, city and R. R. junct., Grant co., Wis., has a State normal school. Pop. 1870, 2537; 1880, 2687.

**Plattsburg**, R. R. junct., cap. of Clinton co., Mo. Pop. 1870, 1067; 1880, 1344.

**Plattsburg**, R. R. centre, cap. of Clinton co., N. Y., on both banks of Saranac River at its entrance into Lake Champlain, has a fine harbor, good water-power, a c.-h., custom-house, and U. S. barracks. P. is noted as the scene of the capture of a Brit. fleet on Lake Champlain by Com. McDonough, Sept. 11, 1814. Pop. 1870, 5139; 1880, 5245.

**Platts mouth**, city and R. R. centre, cap. of Cass co., Neb., at the junction of Platte and Mo. rivers. Pop. 1870, 1944; 1880, 4175.

**Plautus** (TITUS MACCIVS), b. about 254 B.C. at Sarsina, in Umbria; came early to Rome, where he found employment with the actors; saved some money and started a business of his own, but failed; worked afterward at a hand-mill at Rome, and wrote about 234 A.C. 3 comedies, which he succeeded in selling to the managers of the public festivals. They were well received, and from this time he lived as a play-writer to his death, 184 B.C. The plots of his plays he took from the Gr. comedians, but both underwent a very free treatment and a thorough Latinization. His success was considerable. His fertility seems also to have been great. According to Varro, there existed 130 plays which bore his name, but the number of those unquestionably genuine the critics limit to 21—viz.: *Amphitruo*, *Asinaria*, *Autulularia*, *Bacchides*, *Capitini*, *Casina*, *Cistellaria*, *Curculio*, *Epidicus*, *Menechmi*, *Mercator*, *Miles*, *Mollitullia*, *Penulus*, *Persa*, *Pseudolus*, *Rudens*, *Stichus*, *Trinummus*, *Truculentus*, and *Vidularia*.

**Pleasant Hill**, R. R. junct., Cass co., Mo., 248 m. W. of St. Louis. Pop. 1870, 2554; 1880, 2372.

**Pleasanton**, Kan. See APPENDIX.

**Pleasantville**, on R. R., Venango co., Pa. Pop. 1870, 1568; 1880, 855.

**Pleasanton** (ALFRED), b. in D. C. Dec. 1823, grad. at W. Pt. 1844; assigned to the dragoons; took part in the Mex. war, gaining the brevet of first lieutenant for gallantry at Palo Alto and Resaca de la Palma; subsequently served on frontier duty. In the c. war he commanded his regiment on its march from Ut. to Wash., with which he continued to serve throughout the Va. Peninsular campaign of 1862; major of 2d Cav. Feb., and brig.-gen. of volunteers July 1862; commanded in Sept. the division of cav. (Army of the Potomac) following Lee's army invading Md.; engaged at Boonsboro'. South Mountain, Antietam, and subsequent pursuit; at Chancellorsville he stayed the advance of Jackson's corps. Promoted to be maj.-gen. in June, he was engaged in the actions preceding Gettysburg, where he commanded the cav.; transferred to Mo. in 1864, he drove Gen. Price from the State. Mustered out of volunteer service 1866; resigned in 1868 his commission in regular army, and became U. S. collector of internal revenue.

**Plebs** and **Plebeians**. See PATRICIANS.



**Pledge**, or **Pawn** (law), a species of bailment by which personal property is delivered by a debtor to his creditor, to be held as a security for the payment of the debt or the discharge of the obligation. To constitute a valid P. there must be an actual or constructive delivery of the article pledged into the possession of the creditor. The P. is ended and the title reverts to the pledgor upon performance of the obligation. Upon failure to perform, the pledgee may generally sell the property pledged and apply the proceeds to the payment of his claim. While the possession of the P. continues he is bound to use ordinary care and diligence in respect to the articles, and is responsible for any losses caused by ordinary negligence. JOHN NORTON POMEROY.

**Pleiades**, plé'ya-déz, or **Pleíades** [Gr. Πλειάδες or Πλειάδες], in astron., a group of stars in the shoulder of Taurus, called "the seven stars," though to most eyes only 6 are visible. According to the anc., the 7 stars were 7 daughters of Atlas and Pleione, one of whom (Sterope or Electra) became invisible from shame, because she had been embraced by a mortal.

**Pleth'ora** [Gr. πλεθώρα], a condition in which the supply of blood is excessive. It usually occurs in overfed persons of inactive habits; but med. writers speak of a *sthenic* P. occurring in robust and active young persons, who by it are rendered peculiarly liable to acute inflammatory attacks. Such persons should follow an out-door occupation and avoid excesses of all kinds. Far more common is the *asthenic* P. of overfed and inactive persons, whose muscles, and especially those of the heart, are weakened and atonic, often in consequence of excessive use of alcoholic drinks. Apoplexy and organic diseases of the viscera frequently occur in such subjects. A sparing diet and the judicious use of saline mineral waters, with correct hygienic conditions, may greatly relieve the evil tendencies.

**Pleurisy** [Gr. πλευρίς, "the side"], inflammation of the pleura. The causes of P. are exposure to damp and cold, congestion in the course of acute febrile diseases, and extension of inflammation from the lung when the seat of pneumonia or superficial tuberculosis. Acute P. is announced by an initial chill, by marked elevation of temperature, frequent pulse, rapid, shallow, and checked breathing, each inspiratory act producing a lancinating or stabbing pain in the side of the chest. There is a dry, irritative, hacking cough, without expectoration, the effort of coughing producing the local pain or "stitch" in the side in its greatest intensity. An "effusion" of pure serum may fill the entire cavity and compress the lung. In other cases it is sero-plastic. Still other cases have only plastic exudation, agglutinating the 2 pleural surfaces, and liable to organize and form permanent adhesions, which bind down and cripple the lung and render it liable to certain forms of phthisis. In healthy persons the fluid is soon removed by absorption, but in the feeble and sickly it remains and becomes purulent. Acute P. is treated by anodynes, counter-irritants, tonics, and iodide of potassium during the convalescence to insure the absorption of the effusion. P. in a majority of cases is harmless and recovered from; in the feeble, scrofulous, and consumptive, and in cases of unusual severity, it is fatal by exhaustion or the subsequent development of consumption. E. DARWIN HUDSON, JR.

**Pleur'o-Pneumo'nia** (see PLEURISY and PNEUMONIA). In seasons of unusual severity, of great cold and high winds, when influenza prevails in epidemics and fevers tend to the malignant and asthenic forms, acute pneumonia with co-existing pleurisy, attacking one or both lungs, seems to arise from gen. atmospheric causes, which depress the individual vitality, and to share in the low type and unusual fatality of other prevailing diseases. The aged, feeble, and consumptive are most in danger. The symptoms and phys. signs of pleurisy and pneumonia may be clearly present, but often are vague, and marked by the extreme prostration and other features resembling typhoid or typhus. P.-P. of widespread prevalence and fatality occasionally occurs among domestic animals. E. DARWIN HUDSON.

**Plin'y** (CAIUS PLINIUS SECUNDUS), generally called **Pliny the Elder**, b. at Verona or at *Novum Comum*, 23 A. D., of a noble and wealthy family; served in the army under L. Pomponius Secundus in Ger., where he composed a work, *De Jactatione Equestri*, and commenced another on the hist. of the Germanic war; returned to Rome in 52; studied jurisprudence and commenced to practise, but without success; retired to Verona, where he composed his *Studiosus*, in 3 books, and *Dubius Sermo*, in 8 books; was appointed *procurator provincie* of Sp. in 71; returned in 73 to Rome, where he lived in great intimacy with the emp. Vespasian, and was suffocated by the eruption of Vesuvius in 79. Of his works only the *Historia Naturalis*, in 37 books, is still extant.—His nephew, CAIUS PLINIUS CECILIUS SECUNDUS, generally called **PLINY THE YOUNGER**, was adopted and ed. by his uncle; served in the army in Syria; held several high offices, but devoted most of his time to literary studies. He was an intimate friend of Tacitus and Trajan. Nothing is known of him after 107. Wrote *Panegyricus* and *Epistole*.

**Plotin'us**, b. at Lycopolis, Egypt, about 203 A. D.; went to Alexandria in 232, and spent there 10 yrs. under the tutelage and instruction of Ammonius Saccas. In 242 he accompanied the emp. Gordianus on his expedition against the Pers., in order to make himself acquainted with the philos. of Per. and India; but the emp. was murdered in Mesopotamia in 243, and P. repaired by Antiochia to Rome. Here he applied himself to the teaching of philos., attracted immense audiences, gained numerous disciples, and enjoyed great respect and confidence. In 269 he retired into solitude. D. at Puteoli, in Campania, the following yr. The most famous of his disciples, Porphyry, collected his works and wrote a biography of him. Parts have been translated into Gr. and Eng., the whole into Fr.

**Plough**, an implement for breaking up the soil, was used, though in a primitive form, as far back in anc. time as hist. reaches. The O. T. speaks of P. with shares shod with

socks of iron or bronze. The Grs. knew the wheel-P. The modern P., with its mould-board to turn over the broken-up soil, was invented in the Netherlands in the 17th century, but has since been much improved. The first steam-P. was worked in Eng. in 1832.

**Plovers**, or **Charadriide**, a family of wading birds which includes several genera of plovers, lapwings, turnstones, etc., mostly found in the temperate climates of both continents. Many of its species are prized as game-birds.

**Plum**, the tree and fruit of those species of *Prunus* (order Rosaceae) which differ from the cherries in having a richer fruit, ripening later in the season. P. are extensively cultivated in Europe, but less so in the U. S. than in former times, chiefly on account of the ravages of the curculio and of the disease called black wart. The prin. varieties are referred to *Prunus domestica*, a small tree of Old-World origin. Prunes are made by drying certain kinds of P. The wood is very hard and handsome.

**Plumb** (JOSEPH), b. in 1791, was an early settler of Western N. Y.; resided many yrs. at Lodi (now Gowanda), Erie co., on the border of the Cattaraugus reservation of Seneca Indians, in whose welfare he took a deep interest; was one of the organizers of the Liberty party of 1840; was the owner of the land upon which the village of Cattaraugus was built, and sold all the lots with a clause of forfeiture in case any intoxicating liquors should ever be sold thereon. D. May 25, 1870.—His son, EDWARD LEE PLUMB, b. about 1826, has been sec. of legation and *chargé d'affaires* in Mex. and consul-gen. at Havana.

**Plumbago**. See GRAPHITE.

**Plumbing** [Lat. *plumbum*, "lead"]. Lead has been used from the earliest ages, and lead pipes have been more or less common in all the celebrated nations of old. They were employed to convey water wherever the pressure was too great to be sustained by those of earthenware or pottery. Lead pipes were extensively used in the old city of Rome, the water being conveyed to it by aqueducts built of strong masonry, and collected for household purposes in large tanks, and frequently in an anc. sarcophagus of stone or marble, but the water was rarely carried to the upper stories. The water-works of Rome were constructed on a substantial and extensive scale.

Pumps have been extensively improved since their introduction, and their designs have been various. From the atmospheric pump there is the hydraulic ram. It has a self-acting or reactionary movement, impelled by the water from a pond or reservoir gradually rising at the distance of 8 or 9 yards to a height of 10 ft. from the level of the ram, giving power enough to drive water 100 ft. high into the tank in a house. Siphons are very useful applications when water cannot be got readily, principally where hills intervene. Quarries can be emptied and houses supplied by them, but in all cases the end of the pipe out of the water must be several ft. lower than that in the water. Hydraulic presses are powerful machines for compressing goods. Where no steam is applied the force-and-lift-pump is used, forcing the water through a very small pipe. In the same manner is the hydraulic elevator constructed. It is formed like a telescope, and the water is admitted and emptied by the bottom. Hydraulic pressure in connection with steam operates the machine which makes lead pipes. The first improvement in leaden pipes was made in Eng. in 1539. The first machine for making lead pipes by hydraulic pressure was patented in Eng. by Mr. T. Burr in 1830. Several improved machines are now in use in this country.

The city of New York is supplied with water by aqueduct from Croton River, about 40 m. distant, collected into reservoirs, and distributed, and conveyed through cast-iron pipes from 1 to 4 ft. in diameter. The lower part of the city is very scantily supplied, the water being consumed as fast as it comes into the pipes. The water rarely reaches above the first floor, thus necessitating the use of pumps to drive it to the top of the houses and collecting it in cisterns. The upper part of the city, having been connected to the higher reservoir, has now the benefit of about 50 lbs. pressure, the lower part not having more than 10 lbs. Chicago is supplied with water from Lake Mich. driven into a large cylindrical pipe or water-tower by steam-pumps the height of the tower, giving about 50 lbs. pressure throughout the city, which lies only a few ft. above the level of the lake, in consequence of which it has always been a difficult problem to get perfect drainage for Chicago; and the houses were raised about 10 ft. and the streets filled in to accommodate the sewerage of the city. The Palace Hotel, San Francisco, one of the largest in the U. S., is supplied from an artesian well bored in the centre of the building. The water is distributed from reservoirs or tanks on the upper stories, furnished with steam-pumps; they supply hot and cold water to 1000 wash-hand basins, 400 water-closets, 400 bath-rooms, the wash-rooms, culinary dept., and steam apparatus.

Water-closets are of Asiatic origin. Those constructed in the palace of the Cæsars were adorned with marble, arabesques, and mosaics. The pipe and basin of one were discovered near the theatre in Pompeii, where they still remain. In the city of Fez "round about the mosques are 150 common houses of ease, each furnished with a cock and a marble cistern which scoureth and keepeth all clean and neat, as if these places were intended for some sweeter employment." Sir John Harrington is said to have introduced water-closets into Eng. in the reign of Elizabeth. Within the last 30 yrs. water-closets have been multiplied into such a vast number of designs, and improved upon to such an extent, that there is hardly any room left for improvement.

Bath-rooms may consist of a bath-tub, a wash-basin, a bidet, and foot-tub, all fitted up with hot and cold water, having a trap to each, with a 2-inch waste-pipe, to be carried down separately to the sewer in the cellar. All wash-basins should be connected to the sewer in the cellar by a good-sized pipe, and each separately trapped. Where hot



water is used, it should never be connected with water-closet waste-pipes.

**Plum Creek**, Neb. See APPENDIX.

**Plume-Bird** (*Epinachus*), a bird inhabiting Papua, belonging to the family *Paradisæide*. The grand P.-B. (*Epinachus speciosus*) is a foot long, its tail three feet. Its color is black-brown, the side-feathers curled and raised upward, glittering with changeable blue and green tints.

**Plum'er** (WILLIAM), b. at Newbury, Mass., June 25, 1759; removed to Epping, N. H., in 1768; became a lawyer 1787; was much in the State legislature, and took a prominent part in framing the const. of 1792; was U. S. Senator 1802-07; gov. of N. H. 1812-13, 1816-19, and afterward engaged in literary occupations. D. Dec. 22, 1850.—His son WILLIAM (1789-1854) was M. C. 1819-25; wrote 2 vols. of poems and a *Life* of his father.

**Plumer** (WILLIAM SWAN), D. D., LL.D., b. at Darlington, Pa., July 25, 1802, grad. at Washington Coll., Va., 1825; studied at Princeton Theological Sem.; was ordained 1827; organized in that yr. a Jacobite ch. at Danville, Va.; afterward preached at several places in N. C. and Va.; became pastor of chs. at Richmond and Baltimore; conducted (1837-45) the *Watchman of the South*; was a prof. in the W. Theological Sem. at Allegheny City, Pa., from 1854 to 1862, when he removed to Phila.; was pastor of a ch. at Pottsville, Pa., 1865-66, and afterward prof. in the Theological Sem. of Columbia, S. C. Author of several works of theol. and biblical criticism. D. Oct. 22, 1880.

**Pluralism**, a term used in canon law, denoted the possession of more than one ecclesiastical benefice by the same person at the same time. In the earlier times of the Chr. Ch. P. was considered unlawful, and it was forbidden by many councils. Later it became one of the most common and most vicious practices in the R. Cath. Ch., and in order to screen its unlawfulness very subtle distinctions were made by the canonists.

**Plush** [*Fr. peluche*; Ger. *Plüsch*], a fabric which differs from velvet in not being shorn, and in having a long pile or shag. It is sometimes all worsted, sometimes worsted with a mohair pile, and most frequently of cotton with a silk pile. The loops of the pile are cut with a long needle-knife.

**Plutarch**, plu'tark, b. at Chæronea, in Boeotia, Gr.; travelled much in It. and lived for some time in Rome, where he lectured on philos. in the reign of Domitian, but returned subsequently to his native city, where he held an office as a magistrate, and d. at an advanced age in the reign of Hadrian. He was a very prolific writer: 60 works bearing his name and treating various subjects, mostly of a practical character, are still extant, and were collected under the common title of *Moralia*. But the work which made his name so widely known in antiquity, and in all ages up to our day, is his *Parallel Lives*.

**Pluto**, in anc. mythology, a son of Saturn and Rhea, a brother of Jupiter and Neptune, and married to Persephone or Proserpina, received the lower world when the universe was divided among Saturn's 3 sons, and was fierce and inexorable in character.

**Plutus**, in anc. mythology, the personification of riches, often represented by art, but never worshipped.

**Plymouth**, a seaport-town and parliamentary borough of Devon co., Eng., on the sound of the same name, between the estuaries of the Plym and Tamar. The S. Devon R. terminates here. Taken in its largest sense, it comprehends what are called the "three towns"—Devonport on the W., Stonehouse in the centre, and Plymouth (proper) on the E. The citadel forms one of the most noticeable features of P. proper. P. has important manufactures of soap, sail-cloth, cement, etc.; also ship-building yards, foundries, etc. Its fisheries are productive, its trade, both coasting and foreign, important. But the chief importance of P. is as a naval station, the naval arsenal of Devonport occupying about 360 acres, and comprising 2 of the finest dockyards in the world. As a great naval station, P. owes its prominence in great measure to the spaciousness and accessibility of Plymouth Sound. To protect the interior of this wide estuary the S. Breakwater was constructed. Pop. of P. including Devonport, 75,096. J. G. BARNARD.

**Plymouth**, city and R. R. centre, cap. of Marshall co., Ind., on Yellow River. Pop. 1870, 2484; 1880, 2570.

**Plymouth**, port of entry, on R. R. and Mass. Bay, cap. of Plymouth co., Mass., 37 m. S. E. of Boston, is celebrated as the landing-place of the Pilgrim Fathers in 1620, who here founded the first settlement in N. Eng. It has various manufactures, and is engaged in Newfoundland fisheries. The town contains many points of interest associated with the Pilgrim Fathers. Pop. tp. 1870, 6238; 1880, 7093.

**Plymouth**, on R. R., one of the caps. of Grafton co., N. H., is the point of departure by stage for White Mts. Pop. tp. 1870, 1409; 1880, 1719.

**Plymouth**, Luzerne co., Pa., on R. R. and E. branch of Susquehanna River, 4 m. from Wilkesbarre, has an active business in coal-mining. Pop. 1870, 2684; 1880, 6065.

**Plymouth Brethren** (so called). In 1827, 4 persons, led by the apprehension of the unity of the Church as the body of Christ, and the ruin of the professing body around them, to which may be added the expectation of the coming of the Lord, and the deep conviction that ministry flowed from gift from Christ on high, and not from ordination by man, met in Dublin, Ire., breaking bread every Lord's day; demanding only soundness in the faith and godliness of life, and then only seeking for themselves what met the demand of their consciences, according to what they saw in the Word of God; preaching and teaching belonging to those who had the gift of one or the other. This spread from like wants in others, or the conversion of sinners. As regards their doctrines, they hold the great fundamental doctrines of Christianity. What may perhaps be said to distinguish them is a definite faith in the personal presence of the Holy Ghost as come down on the day of

Pentecost, giving, on the one hand, the consciousness of being children or sons of God to all those who are sealed by his being given to them, and that they are in Christ; and, on the other, so uniting them to Christ that they are members of his body, hence, that the true Ch. began only on the day of Pentecost (though the ground of salvation be the same for all), and will continue till the Lord comes and takes it up to be with himself, and all things in heaven and earth will be gathered under Christ as head, the Jews being restored, and the earth blessed and in peace, Satan being bound. Afterward will be the final separation on earth, Satan being let loose, and then the wicked dead judged before the great white throne.

**Plymouth Sound**, an inlet of the Eng. Channel, on the S. coast of Eng., is 3 m. long, 4 m. broad, and forms, with the estuaries of the Plym and the Tamar, the harbors of Plymouth and Devonport, one of the prin. naval stations of G. Brit. In order to protect the shipping against the heavy surge which sets in from the Atlantic, a breakwater, 1700 yards long, has been constructed.

**Pneumatics**, nu-mat'iks [*Gr. πνεῦμα*, "air"], deals with the mechanical properties of elastic fluids, of which air is taken as the representative. A perfectly elastic fluid, or what is called a perfect gas, is characterized by this property: A fixed quantity of it by weight—as, for instance, a pound—may occupy any space, however great or small. Inclosed in a vessel of 1000 cubic ft. capacity, it fills every part of it, while it may be compressed so as to occupy a volume of but 1 cubic ft. or less. In either case, if it is kept at the same temperature, its volume multiplied by its pressure per square inch or per square ft. is the same. The density of a gas is its weight per cubic ft. A cubic ft. of air at the temperature of 32°, and under the average atmospheric pressure, weighs 0.08073 lbs. The densities of several other gases at the same pressure and temperature are as follows:

Oxygen.....	0.0698 lbs. per cubic ft., or 11.304 cubic ft. to the lb.
Hydrogen.....	0.00559 " " " 179 " "
Carbonic acid.....	0.1234 " " " 8.101 " "
Nitrogen.....	0.0784 " " " 12.753 " "

**Temperature**.—When air is maintained at a uniform pressure, its volume is increased 0.365 times, or 36½ per cent., in passing from the temperature of melting ice to that of boiling water; and when air is maintained at a uniform volume its pressure is increased by the same fraction in undergoing the same change of temperature.

**Pressure of the Atmosphere**.—As in the case of liquids, the pressure of the atmosphere per square inch, at any point, is equal to the weight of a vertical column of air 1 inch square reaching from that point to the upper limit of the atmosphere. The difference of pressure between 2 points at different heights is the weight of a vertical column of air reaching from the level of the lower point to that of the higher. Instruments for measuring the pressure of the atmosphere are described in the article *BAROMETER*. Instruments for measuring higher gaseous pressures are constructed upon the same principles, and are called pressure-gauges, manometers, piezometers, etc. The well-known suction-pump is a striking illustration of the atmospheric pressure. This machine consists of a tube dipping into water, and rising above the same to any height not exceeding that of the least pressure of the atmosphere. The upper part is provided with an apparatus for exhausting the air consisting of 2 valves, one contained in a movable piston, the other in a fixed diaphragm. Each valve permits passage of fluid in an upward direction, but not downward.

**Determination of Heights by the Barometer**.—The pressure of the air, as indicated by the barometer, furnishes the means of finding the heights of points upon the earth's surface. The accurate performance of this operation requires attention to several facts—viz. (1) The pressure of the mercurial column depends, in some degree, upon its temperature as well as its height. This temperature is usually somewhat different from that of the surrounding air. (2) It requires a knowledge of the temperature as well as the pressure of the air to give a correct indication of the height. (3) The scale, usually of brass, changes its length with the height of the mercurial column, changes its length with the temperature, though not in the same degree as the mercury itself. (4) The force of gravity acts with greater intensity at the lower station than at the higher. This variation affects the column of mercury differently from the column of air. (5) The force of gravity changes somewhat with the lat. of the place, also affecting the mercury differently from the air. (6) The height indicated by a given pressure and temperature of the air depends, in some degree, upon the quantity of aqueous vapor contained in the air. [*From orig. art. in J.'s Enc. Cyc.*, by J. P. FRIZZELL.]

**Pneumatic Trough or Cistern**, an apparatus for collecting and preserving samples of different gases in the laboratory and chemical lecture-room. It consists of a vessel of water, with a shelf situated an inch or two beneath the surface of the water. This shelf often slides in grooves. It is sometimes perforated with holes. To collect a sample of a gas, a jar or bell is inverted under the water in the cistern, thus becoming filled with water. It is then turned mouth downward while beneath the water. If then raised vertically with proper care and placed on the shelf, it of course remains full of water, kept there by the atmospheric pressure. The tube conducting the gas is then brought up through one of the holes under the jar, or the jar may stand projecting a little over the edge of the shelf and the tube brought under it, so that the gas may bubble up and displace the water.

**Pneumonia**, nu-mō-ne-a [*Gr. πνεῦμα*; pl. *πνεύμονες*, "the lungs"], as commonly termed in Eng. and this country, is an inflammation of the air-sacs, which are the functional elements of the lung for the oxygenation of the blood and the liberation of carbonic acid gas. P. is usually confined to one lung, rarely is double. Primary P. in healthy persons occurs more often in the right lung, beginning, as



a rule, at the base of the lung, and progressing upward toward the apex. In old and feeble persons it may begin at the apex, but P. when local or commencing at the apex is usually secondary to tubercle in the lung, deposits by broncho-P., or former plastic pleurisy. P. is a disease chiefly of adults, and more often of males. It results from catching cold, fatigue, impoverished condition of the blood, the congestions and perverted blood-states of acute and malignant febrile diseases. It is announced by a heavy chill, high fever, rapid respiration, frequent pulse, flushed cheek—on the side of the affected lung; in severe cases by delirium and symptoms of a typhoid nature. There is acute pain in the side, due to congestion of the pleura, and a duller, heavier pain or soreness of the side, with sense of weight, due to excess of blood, and the solid products of inflammation in the lung. There is cough, with expectoration of mucus tinged with blood or rust-colored; and in grave cases brownish or dark sputa, resembling tobacco-juice or prune-juice. Acute P. of adults, although grave in its symptoms, is usually recovered from, and, contrary to popular apprehension, seldom leads to subsequent consumption. P. is treated with tartar emetic and calomel, cold water and ice-bags. Warm poultices, warm anodyne fomentations, cotton batting, and oil silk afford the greatest comfort. Carbonate and muriate of ammonia, callosa bark or quinine, mild alcoholic stimulation, and rich liquid diet to sustain strength, digitalis to control the heart and lessen pulmonary congestion, are the most approved and successful agents.

E. DARWIN HUDSON, JR.

**Po** [Lat. *Padus*], the largest and most important river of It. A rivulet rising on the E. flank of Monte Viso, in lat. 44° 30', is popularly regarded as the true Po, and takes that name at its very source. It flows N. E., receiving many affluents in its course, till its junction with the Dora Baltea near Chivasso. From this point its gen. direction is a little S. of E. to the Adriatic, into which it discharges by several mouths. The total length of the Po, in a right line, is 260 m., or, measured by its own channel, 360 m. The width of the Po is about 525 ft. at Turin; 870 ft. at the great bridge of Mezzana Corti, not far from Pavia; and 750 at Ponte Lagoscuro, near Ferrara, where it is crossed by its last bridge. About 50 m. from its mouth it begins to form its delta. It is navigable for small barges 60 m. from its source, and it drains an area of about 27,000 sq. m., of which It. geogs. class 16,000 as mt., 11,000 as plain lands.

**Pocahontas**, daughter of Powhatan, an Indian chief of Va., b. about 1595. According to John Smith, she in 1607 rescued him from death by throwing herself beneath the uplifted war-club and successfully entreating her father to spare the prisoner's life. The truth of this narrative is doubted. In 1609 she visited Smith with news of an intended Indian attack, and she several times supplied the hungry colonists with corn. In 1612 a chief sold her to Argall for a copper pot; in 1613 she married Thomas Rolfe, afterward sec. and recorder-gen. of Va. She was baptized as Rebecca, went to Lond., and was presented at court. King James, it is said, blamed Rolfe severely for marrying an emp.'s daughter without his consent. D. at Gravesend, Eng., Mar. 1617, leaving a son, Thomas Rolfe, from whom descended the Randolphs and other leading families of Va.

**Po'cock** (EDWARD), D. D., the foremost of Eng. Orientalists, b. Nov. 8, 1604, at Ox., where he grad. in 1622; was fellow in 1628; Laud prof. of Arabic from 1636; regius prof. of Heb. and canon of Christ Ch. from 1648; received the degree of D. D. in 1660. D. Sept. 10, 1691. His life was one of many vicissitudes. He pub. beside other works, *Version from the Syriac and Notes on the Epistles of 2 Peter, 2 and 3 John, and Jude*, omitted in the Peshito; *Specimen Historiarum Arabum*, *Porta Moysi*, *Annals of Eutychius*, *Arabic Version of Grotius de Veritate*, *Abulfaragius Historia Dynastiarum*, and Eng. *Commentaries* on Micah, Malachi, Hosea, and Joel. He also rendered important assistance in the editing of *Walton's Polyglott*.—Of his 9 children, two sons, EDWARD and THOMAS, were authors in the same line.

R. D. HITCHCOCK.

**Po'cocke** (RICHARD), LL.D., the Oriental traveller, distantly related to the preceding, b. at Southampton, Eng., in 1704, grad. at Ox. in 1731. D. Sept. 1765. His fame rests upon his work on Pal., which Robinson pronounces "one of the most important," although he knew but little Arabic, and his scholarship was more classical than biblical.

**Podlie'brad** (GEORGE), b. April 23, 1420, of a noble Bohemian family belonging to the moderate section of the Hussite party; joined the Utraquists after the election of Albert of Aus. to the Bohemian throne in 1438, and compelled Albert to raise the siege of Tabor. As leader of the whole Hussite party he became gov. of Bohemia in 1444, during the minority of Albert's son, Ladislaus the Posthumous, and on the death of Ladislaus he was elected king himself, and crowned at Prague Mar. 2, 1458. It was his aim to reconcile the Hussites and the R. Caths. among his subjects. But the pope excommunicated him as a heretic, preached a crusade against him in Ger., incited his son-in-law, Mathias Corvinus, king of Hungary, to attack him, and even instigated his own R. Cath. subjects to revolt against him. But P. suppressed the insurrection, routed the Ger. crusaders, defeated the Hungarians several times, and, in order to strengthen the anti-papal and anti-Hungarian party in Bohemia, he induced his countrymen to elect Ladislaus, heir of the Polish crown, as his successor, while his 2 sons retired into the ranks of the nobility. D. Mar. 22, 1471.

**Podu'ra** [Gr. *πους*, *ποδος*, "foot," and *ουρα*, "tail"], a genus of degraded wingless neuropterous insects, found on the surface of stagnant water, on dung-heaps, in hot-beds, and often seen on the snow in winter. They are called "spring-tails" and "snow-fleas," for they can leap a prodigious distance, considering their small size. The short anal bristles are bent under the body, and assist the creature in its leaps.

**Poe** (EDGAR ALLAN), b. at Boston, Mass., Feb. 19, 1809. His parents, who were actors, died in his early childhood,

and he was adopted by Mr. John Allan of Richmond, Va., by whom he was placed at school in Eng., whence he returned in 1822. In 1826 he entered the Univ. of Va., but was soon expelled. In 1829 put forth a small vol. containing *Al Aaraaf* and other poems. Was admitted to the Military Acad., W. Pt., 1830; was expelled Mar. 1831; resided a while with his foster-father, quarrelled with him, and enlisted as a private in the army, having in the mean while put forth another small vol. of poems. In 1833, after many adventures, he gained 2 prizes of \$100 each for a poem and a tale, and became assistant ed. of the *Southern Literary Messenger* at Richmond, Va., and married his cousin, Virginia Clemm. In 1837 he went to New York; wrote for periodicals, putting forth in 1838 the *Narrative of Arthur Gordon Pym*; went to Phila. 1839, and was successively ed. of the *Gentleman's Magazine* and of *Graham's Magazine*, putting forth in 1840 *Tales of the Arabesque and the Grotesque*. In 1844 went again to New York, where his poem *The Raven* (1845) made him widely known; became assistant ed. of the *Home Journal*, writing also for other periodicals, and setting up the *Broadway Journal*. He had contracted habits of inebriety, and fell into great pecuniary straits. In 1848 delivered a lecture (afterward printed), *Eureka, a Prose Poem*. D. Oct. 7, 1849. Mr. Rufus W. Griswold, who became his literary executor, prepared an edition of the *Works of Poe* (1850), prefixing to them a *Memoir*, in which the character of Poe was very unfavorably represented. Subsequent writers have represented his character in a much more favorable aspect. (See Mrs. WHITMAN, *Edgar A. Poe and his Critics*, and *Memoirs by INGRAM, STODDARD, GILES, WOODBERRY*, and others.)

**Po'e't-laure'ate**, a title once bestowed at univs. and by sovereigns at various courts, and so named from the tradition that Horace and Virgil were crowned with laurel in the Rom. Capitol. In 1341 Petrarch was crowned P.-L., and this has been called the first instance of the title. Court-poets had long been employed in Eng., but it is believed that John Kay or Caius, appointed by Edward IV., was the first to receive the title. In 1512 Robert Whittington was made P.-L. by Ox. This is the last instance of the degree at an Eng. univ. The present court P.-L. is Tennyson (since 1850). The yearly fee of the P.-L. was formerly £100 and a tierce of canary wine, but since 1813 the wine has been commuted for money.

**Po'etry** [from the Gr. *poëiv*, to "make," to "create"] is used in a double sense—the one, especially Eng., nearly synonymous with "verse," and forming the opposite to "prose;" the other, descending from the Gr. *lit.*, denoting all creations of the imagination irrespective of their form, verse or prose, lit. or art, and forming a correlative to "science."

**Poin'dexter** (GEORGE), b. in Louisa co., Va., 1779; became a lawyer; removed in 1802 to Miss.; atty.-gen. of Miss. Terr. 1803, delegate in Cong. 1807-13, a U. S. Judge 1813-17. M. C. 1817-19, where his brilliant defence of Jackson attracted much attention, but Jackson and he afterward became enemies. P.'s duel with Abijah Hunt, who was killed, led to sharp controversies. He was gov. of Miss. 1819-21, U. S. Senator 1831-35, after which he practised law at Louisville, Miss.; prepared the *Revised Code of Miss. laws* 1824. D. Sept. 5, 1853.

**Poin'sett** (JOEL ROBERTS), LL.D., b. at Charleston, S. C., Mar. 2, 1779, spent his childhood in Eng.; ed. at Greenfield, Conn., under Pres. Dwight 1798-94; went again to Eng. 1796; studied med. at Edinburgh, and entered the military acad. at Woolwich; returned to Charleston and studied law 1800; went again to Europe 1801; travelled in Asia Minor and in Rus.; returned home in 1809; was sent to Chili by Madison to report on the revolution in that country; M. C. from S. C. 1821-25; U. S. minister to Mex. 1822 and 1825-29; sec. of war 1837-41; founded the Acad. of Fine Arts, Charleston; author of *Notes on Mex.*; was a strong opponent of the extreme State Rights view. D. Dec. 12, 1851.

**Point'er** (*Canis avicularis*), a species or dog of the hound type, employed for hunting game. The best-known breed is the Sp. P. probably of E. origin. The faculty of pointing at game, though much developed by training, seems to be chiefly due to inheritance, so that dogs of the purest stock acquire the habit almost without instruction.

**Point Pleasant**, W. Va. See APPENDIX.

**Poison**. See TOXICOLOGY, JURISPRUDENCE, MEDICAL, and LEAD-POISONING.

**Poison Ivy**. See RHUS.

**Poison of Serpents**. (See VENOM.) There is no antidote yet known. The proper treatment is to tie a ligature around the part bitten, and at once to lay open the wound in the line of the fang-mark. It is useless to apply any local dressing, save to put the part in hot water to provoke copious bleeding. If within reach of full help, an elastic bandage should be put around the whole limb, after Esmarch's plan for bloodless operations, until time is given to deal with the part bitten. This would be better than a mere ligature alone, which causes swelling beyond it. After ligation every effort should be made to squeeze out the venom from the wound. Next, alcohol should be given until the heart is excited, when the ligatures may be loosened a little, so as to admit to the gen. circulation some of the poison, which soon or late must reach it. When the heart begins to fail the ligature should be tightened again and more stimulus given, and so the poison which remains may be fought in detail. The alcohol is not an antidote. Men bitten when dead drunk die; it is a stimulus to carry the suddenly enfeebled system over this time of weakness. For the second stage there is little to do but to ease pain and wait. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. WEIR MITCHELL, M. D.]

**Poitiers**, poi-teerz', town of Fr., on the Clain, has a noted lyceum, a theological sem., a good public library, etc. Here Edward the Black Prince defeated King John of Fr. and brought him prisoner to Eng. in 1356. Pop. 36,210.

**Poke**, a name given in parts of the U. S. to *Phytolacca*



*decandra*, and in other parts to *Veratrum viride*. These plants are both poisonous, and both useful in med., but differ widely in properties and appearance. The young shoots of the former are eaten like asparagus.

**Poland** [from *poliska*, "a plain"] comprised at the time of its first division an area of 282,000 sq. m., with about 12,300,000 inhabs., and extended from the Baltic Sea to the Carpathian Mts.; bounded E. by the Rus. provs. of Smolensk, Tchernigov, Poltava, and Kherson, and W. by the Prus. provs. of Silesia, Brandenburg, and Pomerania. This country is inhabited by one of the brightest branches of the Slavic race, and during the Middle Ages it was the seat of a splendid empire. But when in 1572 the Jagellon dynasty became extinct and the empire became an elective monarchy, the governing power was split up by the various parties among the nobility to such a degree that decay immediately set in, and with the death of Augustus III. in 1763 the end began. There was one party, called monarchists or reformers, and headed by the family of Czartoryski, which saw where the root of the evil lay, and tried to hit it. The abolition of *liberum veto* and the establishment of an hereditary constitutional monarchy were their ideas, and in order to realize them they sought and found the support of Catharine II. of Rus. At the death of Augustus they succeeded, by the aid of Rus. bayonets, in placing Stanislas Poniatowski, a member of the Czartoryski family and a great favorite of the empress, on the Polish throne, and the work of reform began immediately. Catharine saw very soon, however, that P., reformed in this direction, would very rapidly fall out of her grasp, and accordingly she changed position. There was another party, headed by the family of Potocki, and called republicans because they defended the old oligarchical insts. They had adopted the old Polish maxim of religious toleration, while the Czartoryskis were fanatical R. Caths., and tried to exclude all dissenters from office. The empress chose to defend religious toleration and "republican" insts., and having entirely forgotten her former favorite, the present king, she had a number of his adherents kidnapped in the night and sent to Siberia. This occasioned the Confederation of Bar, headed by the family of Pulaski, and formed in 1768 against foreign aggression (which meant Rus.), regal usurpation (which meant the king and the Czartoryski party), and the influence of the dissenters (which meant the republican or Potocki party). The confusion could not be greater. The confederates entered into an alliance with the Turks, and the war began. Catharine had a large army in the country, and in 1772 a Prus. and an Aus. army also entered P. A diet was convoked in 1773, but only to sanction the dismemberment of the country—its first division. Rus. took the palatinates of Polotzk, Vitebsk, and Mstislavl, comprising an area of 42,000 sq. m., with 1,800,000 inhabs.; Prus. took the prov. of Posen, area 13,000 sq. m., pop. 416,000; and Aus. took Galicia and Lodomeria, area 27,000 sq. m., pop. 2,700,000. The second and third divisions followed in rapid succession. The people had now become thoroughly roused to the appreciation of the dangers which their old const. involved, and reform became the work of the day. *Libertum veto* was abolished, the crown was made hereditary, the cities received political rights, etc. But, unfortunately, there were found a few persons who, at the instigation of Catharine II., formed the Confederation of Torgovitsa in 1792, in defence of the old "republican" insts., and under the pretext of aiding them and their cause the Rus. army invaded P. once more. Frederick William II. of Prus. who had encouraged the reformers, found it more profitable now to side with the czarina, and when, at last, the poor king himself went over to the confederates, Joseph Poniatowski and Kosciusko's victories were in vain; the second division took place. Rus. seized a terr. of 96,000 sq. m., with 3,000,000 inhabs., and Prus. one of 22,000 sq. m. with 1,100,000 inhabs. A general and violent rising in all the Polish provs. was the consequence, and the Rus. and Prus. had to retreat; but in the right moment Aus. entered the stage and turned the balance. Kosciusko was taken prisoner at Maciejowice, Praga was stormed by Suwarow, Warsaw capitulated, the king resigned his crown, and the third division (in 1795) annihilated the existence of P. Rus. took all the provs. E. of the Niemen and Bug (area 48,000 sq. m., pop. 1,200,000); Aus. those between the Bug and the Vistula (area 18,000 sq. m., pop. 1,000,000), and Prus. the remainder, together with the cap. (area 21,000 sq. m., pop. 1,000,000). Thus the end had come. CLEMENS PETERSEN.

**Poland** (LUKE P.), LL.D., b. at Westford, Vt., Nov. 1, 1815, admitted to the bar 1836; register of probate 1839-40, prosecuting atty. 1843-44, judge of the supreme court, annually re-elected, 1848-65, becoming chief justice 1860; served as U. S. Senator, filling the vacancy caused by the death of Jacob Collamer, 1865-67; M. C. 1867-75 and 1883-95; was a regent of the Smithsonian Inst.

**Polar Clock.** See OPTICS (conclusion).

**Polariscope** [Gr. *πολεῖν*, to "turn," and *σκοπεῖν*, to "view"], properly, an instrument for testing the condition of radiant light as to polarization. The term is, however, very commonly employed to denote any of the various forms of apparatus designed for the examination of transparent media with a view to ascertain how far they may possess the polarizing power. Among the forms of P. may be mentioned that of Soleil, employed in his ingenious saccharimeter. It is a disk of quartz formed of 2 semicircular plates, severally cut from right-handed and left-handed crystals across the axis, and joined along their common diameter. Light transmitted through this disk and received through an analyzer is colorless if unpolarized, but if originally polarized will exhibit complementary colors in the 2 semicircles, except in a single position of the analyzer, in which the tint is the same on both sides. This tint, called the "tint of passage," changes with a very slight movement in rotation of the analyzer or of the plane of original polarization, and the tints become again contrasted. Sen-

armont's P. is a compound plate, or flat rectangular prism made up of 4 triangular prisms, two of them cut from right-handed, and the other 2 from left-handed quartz crystals. In polarized light it presents colored stripes parallel to the edges of the plate, the middle stripe being well defined and dark. These stripes, in a certain position of the analyzer and of the plane of polarization, are continuous from end to end, but on the slightest rotatory displacement of either they become dislocated, the halves being displaced laterally in opposite directions. Any instrument capable of being used as a polarizer, or as an analyzer of polarized light, may serve to a certain extent as a P., since, when common light is observed through such an instrument, the intensity is independent of the azimuth; while polarized light exhibits a variable intensity when the azimuth of the instrument is varied by rotation. F. A. P. BARNARD.

**Polar Research**, a term indicating explorations and researches in the Arctic and Antarctic circles. The Arctic or its vicinity was visited as early as the 9th century. Iceland was discovered by Naddodr, a Nor. viking, A. D. 860, and settled in 874 by a colony of Norsemen. In 890 Oether, a Nor., sailed into the Arctic, along the N. E. coast of Nor. In 982 or 983 Erik the Red, a Northman, discovered the E. coast of Greenland. In 1477 Columbus, from his own account, "sailed 100 leagues beyond the island of Thule," from which it is inferred that he visited Iceland, and probably Greenland. Toward the close of the 15th and throughout the 16th century the N. nations of Europe, and particularly the Eng. and the Dut., became deeply interested in promoting explorations and discovery in this quarter of the globe. To the statesmen and geogs. of that day it appeared highly probable, as a passage by water had been found around the continent of Afr., that one would be found also around the continent of Europe or through some portion of the N. part of America. It was with this object that the voyages of the Cabots were made in 1495, 1497, and 1502. The design of Sebastian Cabot was the discovery of a N. W. passage to India, but having sailed as far as 67° N. lat. without finding it, an expedition under Sir Hugh Willoughby and Richard Chancellor sailed in 1583, and entering the Arctic, reached as far as the S. part of Nova Zembla, in about 72° N. lat., but were compelled to return. The search for a N. E. passage was renewed by the Eng. in 1556, and Stephen Burroughs discovered the straits that bear his name and the entrance to the Sea of Kara. The efforts and failure of the Eng. to discover a passage to the N. E. stimulated the Dut., and in 1594 the merchants of Amsterdam, uniting with those of Middelburg and the syndic of W. Friesland, fitted out 3 vessels, 2 of which sailed through the Turgosky Schar and along the coast of Nova Zembla, thence through the Sea of Kara to about the vicinity of the Gulf of Obi, and then returned; while Barentz, in the other vessel, sailed along the W. coast to the N. extremity of Nova Zembla. A Dut. expedition in 1597, commanded by Barentz and John Cornelius Ryp, discovered Bear Island and Spitzbergen, both vessels reaching as far N. as 80° N. lat., when they entered the Strait of Hinlopen from the E., and passing around New Friesland and W. Spitzbergen, returned to Bear Island, from whence Barentz, in one of the vessels, sailed around the N. E. point of Nova Zembla. All further attempts to pass around Nova Zembla to the N. E. were unsuccessful until 1871, when Capt. Karlsen rounded it in a small Swe. sloop. In 1879 Adolf Erik Nordenskjöld discovered a N. E. passage to Siberia through the Arctic Ocean.

The ill-success to find a N. E. passage drew the attention of the Eng. to the possibility of crossing in the direction of the pole. Henry Hudson was sent out in 1607, and got as far as about 81° N. lat., E. of Spitzbergen, when he was obliged to put back to Nova Zembla. The failure to discover a passage either to the N. E. or in the direction of the pole revived the interest for the discovery of a N. W. passage. In 1585 some merchants of Lond. sent out John Davis, who discovered Davis Strait and a part of Cumberland Island, and reached as far as 72° N. lat. In 1608 Hudson, in the employment of the Dut., explored the coast of N. Amer., and discovered the Hudson River and the Bay of New York. In 1610 he was sent out again by the Eng., and discovered Hudson Strait and Hudson Bay. The Eng., continuing their efforts, despatched expeditions which resulted in discoveries, such as Baffin's Bay, the strait between Cumberland Island and the continent, and Horn, Lancaster, and Smith sounds. These investigations were renewed by Den. in the expedition of Jens Munk in 1619; and in 1631 the Eng. sent out Fox, James, and Middleton; in 1641 Moor and Smith, and in 1646 Capt. Wood; by which expeditions the Island of Southampton, Fox Channel, James Bay, Wager River, and Repulse Bay became known. The whole of the N. coast of Asia, with the Liakhov Islands or New Siberia and Wrangel's Land, was discovered by the Rus. The Arctic was traversed in the middle of the 16th century by Rus. navigators in small vessels from the White Sea and the Petchora to the entrances of the rivers Obi and Yenisei.

The search for a N. W. passage was resumed by the Eng. in 1818 under Sir John Ross, and continued until the discovery of the passage by Sir Robert McClure in 1850. The explorations and expeditions despatched for this purpose, and those sent out for the relief of Sir John Franklin or other absent explorers resulted in the discovery of the region from Davis Strait to Cape Bathurst, embracing Banks, Prince Albert, and Prince Patrick's Lands, Melville Island, and Sound, McClintock's Channel, Bathurst Island, Victoria, Prince of Wales, and King William Lands, Boothia and Gulf of Boothia, N. Somerset, N. Devon, Melville Peninsula, Lancaster, Grinnell, Ellesmere, and Washington Channel, Kellett, Barrow, Franklin, Peel, Sir James Ross, and the Fury and Herla straits, Regent's Inlet, and the discovery in 1833 by Sir James Ross of the N. magnetic pole. Parry determined in 1827 to renew the attempt to reach the pole. His vessel being impeded by ice at the N. end of Spitzbergen, he made the at-



tempt to reach the pole in boats, getting as far as 82° 50', the highest position attained by any previous explorer. The N. W. passage found by McClure is between Banks and Prince Albert Lands, through Prince of Wales Strait, Melville Sound, Barrow Strait, and Lancaster Sound, to Baffin's Bay, and may be entered from other points.

The explorations of Dr. Kane and Dr. Hayes in 1853 and 1860 through Smith Sound and Kennedy Channel revived the belief in the existence of an open polar sea. Dr. Kane's expedition to Smith Sound in 1853 was for the purpose of discovering it, during which Morton and a companion discovered Kennedy Channel, and reached as far as Cape Constitution in 82° 27' N. lat. Dr. Hayes followed up this exploration in Smith Sound by an expedition in a single vessel in 1860, and by a sledge-journey reached as far as 81° 35'.

The Aus. expedition under Lieuts. Weyprecht and Payer penetrated the sea between Spitzbergen and Nova Zembla, discovering a large region (Franz Joseph Land) extending from below the 80th to beyond the 83d parallel of N. lat.; and from the farthest point reached, 81° 57' N. lat., they saw land extending beyond the 83d parallel, the farthest N. point upon the globe yet seen by man. Lieut. Payer's opinion was that ships could not penetrate N. of Franz Joseph Land, and he has no belief in an open polar sea. The Nors. were also very successful. They penetrated through Pet's Strait and the Karian Sea to the Gulf of Obi, and Capt. Karlsen sailed around Nova Zembla in 1871—a feat achieved for the first time. In 1872 Capt. Hall sailed through Smith Sound and Kennedy Channel, and through what he named Robeson Channel, unobstructed, to 82° 16' N. lat., being farther than any sailing vessel had reached before.

Under orders from the Brit. Admiralty, May 25, 1875, Sir George Nares, in command of the Alert, sailed from Portsmouth in search of the N. Pole. The expedition returned, October, 1876, having planted the Brit. flag in lat. 83° 20' 26" N., and gathered much valuable scientific material.

In 1878 the steam-yacht Pandora, then returned from a brief but successful Arctic voyage, was purchased by Mr. Bennett and sent to San Francisco to be fitted out for an expedition in search of the N. pole. The yacht was called Jeannette, and Lieut. G. W. De Long, who had already seen service in the Arctic, became her commander. On July 8, 1879, she sailed out of the Golden Gate. De Long selected the way *via* Bering Strait. But the expedition became an unsuccessful one. On June 11, 1880, the Jeannette was crushed by ice in 77° 15' N. lat., 157° E. lon. Boats and sledges made a good retreat to 50 m. N. W. of the Lena River. But De Long and his crew all perished, except 13. The most recent expedition was that fitted out under the auspices of the Weather Bureau and the War Dept. of the U. S., and commanded by Lieut. Greely. It reached 83° 24', but only six out of the crew were rescued by the U. S. relief expedition, June, 1884.

Explorations within the limits S. of 66° 30' S. lat. of the Antarctic circle have been few as compared with those of the Arctic. Cook, in his voyage of 1772-75, made a circuit of the S. seas in high lats., and entered the Antarctic circle in 3 separate quarters. The most southerly point attained by Cook within the Antarctic circle was 71° 10' S. lat., on the 107th meridian, and he settled the form of New Zealand, New Caledonia, and other Australian lands and islands. Bellinghausen in 1821 sailed several degrees within the circle, and discovered Petra and Alexander islands. In 1821 Palmer, an Amer., discovered the land bearing his name. Weddell, in 1823, reached 74° 15' S. lat. Biscoe, in 1831-33, discovered Graham and Enderby Lands and Kemp Island; Balleny, in 1833, Sabrina Land. Expeditions for discovery were sent in 1840 by the Fr. govt. under D'Urville, and by the Amer. govt. under Wilkes. D'Urville discovered Adelle and Clarie Lands, and Wilkes, in about the same parallel, coasted along an impenetrable barrier of ice and saw land at different points. The most important exploration in the Antarctic was made by Sir James Ross in the Erebus and Terror, from 1839 to 1843, who penetrated to 78° 11' S. lat., the highest S. lat. ever attained, and made extensive discoveries within the Antarctic circle, among which was Victoria Land. In the N. extremity of this land he discovered Mt. Erebus, a volcanic mt., 12,360 ft. high, and Mt. Terror, 10,880 ft., and Mts. Ross, Crozier, Sabine, and Murchison, the whole coast being steep, rocky, and entirely bare. He found the position of S. magnetic pole to be 75° 5' S. lat., 154° 8' E. lon.

The researches made show that the 2 polar regions differ greatly. The seas of the Arctic term with animal life. Land animals, such as the bear, wolf, reindeer, musk-ox, and Arctic fox, are scattered over the frozen surface of the land, where they find the means of subsistence. The air is filled with innumerable flocks of birds; a hardy vegetation extends close up to the Arctic circle, and beyond it, in mosses, lichens, scurvy-grass, sorrel, small stunted shrubs, dwarfed trees, and in summer beautiful flowers. In the Antarctic, on the contrary, vegetation ceases at a certain limit, trees terminating at about 58° S. lat. Animal life abounds in the seas, but no quadrupeds are found upon the land, though birds exist in great numbers and in varieties unknown in the Arctic. The researches show that in both regions a luxuriant tropical or semi-tropical vegetation formerly existed. The fossil remains of trees 3 ft. in circumference have been found in the Antarctic underlying basalt, and beds of coal in Kerguelen Island and throughout the Arctic, particularly in the E. portion of the N. W. passage; and at Disco, New Siberia, and in Smith Sound fossil remains have been found of trees of enormous size, of plants, and of numerous animals that exist now only in tropical or semi-tropical regions. [From orig. art. in *J.'s Univ. Cyc.*, by CHARLES P. DALY, LL.D.]

**Polar Seas.** See ANTARCTIC OCEAN and ARCTIC OCEAN.  
**Polder** [Dut., probably allied\* to Eng. "pool;" Ger. *pfuhl*, a "pool" or "marsh"], a term in Hol. for a once-submerged area of land surrounded by dikes and reclaimed by artificial drainage. The P. vary in area from 100 acres

and less to 12,000 or 15,000 acres; their surface is usually depressed from 1 to 15 or 20 ft. below the surrounding country, and the lowest are below the sea-level. The most important are those which have been created of what were submerged areas, such as that of the Haarlemmermeer. In connection with the formation of the N. Sea Canal, all the areas once covered by the waters of the Y and Wijkmeer are converted into P.

**Pole** (REGINALD), b. at Stourton Castle, Staffordshire, Eng., in Mar. 1500, son of Sir Richard Pole and of Margaret Plantagenet, daughter of the duke of Clarence, the brother of Edward IV.; studied at the Carthusian monastery of Shene, near Richmond; grad. at Magdalen Coll., Ox., 1515; was made prebendary of Salisbury 1517 and dean of Wimborne and Exeter 1519; completed his education at the Univ. of Padua, It., 1520-23; returned to Eng. 1525; was favorably received by Henry VIII., by whom he was sent in 1529 to negotiate for the approval by the Univ. of Paris of the projected divorce of Queen Catharine of Aragon, but soon came himself to an opinion adverse to that measure, and was dismissed from the royal presence 1530; refused also to approve Henry's project of renouncing the allegiance of the Eng. Ch. to the pope; resided successively at Avignon, Padua, and Venice; sent to Henry his book *Pro Ecclesiastica Unitatis Defensione* (1536), for writing which he was deprived of his ecclesiastical preferments and attained by Parl., but in compensation was in the same yr. created cardinal Dec. 3; was commissioned as papal legate to Fr. and Flanders 1537, but refused entrance into their terrs. both by Francis I. and Charles V., but was received by the latter as ambassador in Sp. Jan. 1539; was legate at Viterbo 1539-42; presided as papal legate at the opening of the Council of Trent Dec. 13, 1545; was appointed legate to Eng. on the accession of Queen Mary, and received by her with great pomp Nov. 24, 1554; successfully invited Parl. to a reconciliation with the papacy, and freed the realm from spiritual censures; was appointed by the pope abp. of Canterbury Dec. 11, 1555; was consecrated Mar. 22, 1556; elected chancellor of the univs. of Ox. and Cambridge 1556; made a visitation of the univs. Feb. 1557. D. Nov. 18, 1558.

PORTER C. BLISS.

**Polecat.** See WEASEL.

**Polemics** [Gr. *πόλεμος*, "war"]. **Theological**, a branch of the science of theol. which has now lost its position in the theological system as an independent discipline, but which at certain periods of the hist. of the Chr. Ch. has vindicated itself as of the greatest importance. Thus, in the earliest times of the Chr. Ch., when Christianity had to defend itself against the attacks of the Jews and the pagan philos., theological polemics often occupied the time and the genius of the first minds, and a science was developed of the method and principles on which Christianity was to be defended. Again, at the time of the Ref. a similar situation was formed. By Schleiermacher this discipline was reduced to an introduction to practical theol.

**Polemoniacæ** [from *Polemonium*, one of the genera], a natural order of exogenous gamopetalous plants, mostly herbs, mostly Amer., of no economical importance, but rich in plants for ornamental cultivation, such as *Phlox*, *Gilia*, and *Cobaea*.

**Pollanthis.** See TUBEROSE.

**Polignac**, po-lên-yahk', the name of a Fr. family which has played a conspicuous part in the later hist. of the Bourbons.—JULES, COUNT DE POLIGNAC, and his wife, YOLANDE MARTINE GABRIELLE DE POLASTRON, were the most intimate friends of Marie Antoinette and the most prominent members of that faction of the court which, under the leadership of the count of Artois, gathered around her and intrigued against the reforms of Louis XVI. and his ministers. The count was made a duke in 1780, and the family received immense donations of land and money. She and her husband left the country, together with the count of Artois, July 16, 1789, as the first *émigrés*. The duchess d. at Vienna Dec. 3, 1793. The duke went afterward to Rus., where he was well received by Catharine II.; she gave him an estate in Ukraine, where he d. Sept. 21, 1817. His 3 sons were very active for the return of the Bourbons. The second of them, JULES AUGUSTUS ARMAND MARIE, b. May 14, 1780, was made a Rom. prince by the pope in 1830, and became pres. of the cabinet Aug. 8, 1839. As such he signed the famous ordinances of July 25, 1830, which caused the downfall of the Bourbon dynasty. He fled, but was caught at Granville Aug. 15, 1830, and sentenced to imprisonment for life and forfeiture of his titles and rights as a citizen. Restored to liberty by the amnesty of Nov. 29, 1836, he went to Eng. D. Mar. 5, 1847, at Paris.

**Polishing Slate**, a very light scaly material brought from Fr. and Ger., and used for finishing glassware, marble, etc. It is composed of the fossil frustules of diatoms, and is essentially the same as tripoli.

**Polish Language and Literature.** The great Slavic family, with its numerous idiomatic variations, offers 4 distinct literary langs.—the Polish, the Bohemian (Czech), the Serbo-Illyrian, and the Rus. The P. is superior to all her sisters. The Poles, who were masters of all the countries between the Elbe and the Dnieper, have spoken it ever since their settlement in these regions. It became a written lang. simultaneously with the introduction of Christianity into Poland. Its oldest relic is the war-song *Bogorodica* ("St. Mary's Hymn"), ascribed to Bp. Adalbert (d. 997), a Bohemian, Poland's first apostle and martyr. But the Lat. lang. introduced and fostered by the Ch., gained a powerful ascendancy even among the people; Polish writers used it exclusively for several centuries. The golden era of Poland's classical lit. embraces the interval between 1506 and 1622. The popular idiom had at that time asserted its right as a written lang., without entirely superseding the Lat., as the poems of the renowned lyrists Sarbiewski (d. 1640) and Szymanowicz (d. 1629) attest.

Nicolas Réj (d. 1560) heralded the classical period of P.



lit. in his didactic-historical memoirs entitled *The Books of the Life of an Honest Man*. Jan Kochanowski (d. 1584), the most brilliant representative of this literary period, is considered as the corypheus of the P. lang. Highly valued was his translation of the Psalms. A charming production is his lyrical poem, *Treny* (tear-drops shed over the grave of his little daughter). His rivals and imitators were numerous, but all the writers of this period were distinguished not only for simplicity and elegance of style, but for entire absence of levity. The sacred lit. of this period is represented by Andrew Trzyczewski (d. 1584), who contributed extensively to the Prot. P. hymnal compiled by Jan Seklucyan (d. 1578). Jacob Wujek (d. 1697) translated the Bible into P. for R. Caths. The third decade of the 17th century found Poland's lit. in complete lethargy, which continued for over a century and a half. The precious germs so successfully nurtured during the golden era became blighted under the baneful influence of the order of Jesuits, whose importation into Poland was effected by Cardinal Hosius in 1562. Toward the close of the 18th century began among the priestly order of the Piarists a national reaction against the Jesuits. A member of the former order, Konarski (d. 1773), undertook to revive the national lit., wherein he was supported by O. Kopczynski, Piramowicz, and Naruszewicz. Lit. revived, but the Fr. classicism of the period of Louis XIV. became its absolute model. The leaders of this movement were the abb. Krasicki (d. 1801), whose fables and satirical epics, *Myseis* ("War of Mice") and *Monomachia* ("War of Monks"), are famous; the satirist Trembecki (d. 1812), the erotic Kiazmin, and the satirist Wegierski (d. 1787).

Poland's deplorable downfall caused also the death of this artificial lit. The national chord was touched by Karpiński (d. 1825), and the epic poem of Woronicz (d. 1829) *Sibylla*, delineates the prin. epochs of Poland's hist. Still more decisively is this the case in the works of Julian Niemcewicz (d. 1841). His *Songs of the Poles*, his drama, *Kasimir the Great*, his novel, *Jan of Tenczyn*, and his hist. of the reign of Sigismund III. are replete with national pathos. Upon these harbingers follows the reformer of P. lit., Adam Mickiewicz (d. 1855), undoubtedly the greatest poet that not only Poland, but the entire Slavic race has as yet produced. He belongs to the romantic school of poets. The dominant thought which resistlessly agitates him is the moral and political restitution of his country. A fierce strife ensued after 1815 between the classical and romantic leaders in Poland, which resulted in the gen. acknowledgment of Mickiewicz as leader of the modern lit., seconded by the excellent popular lyric poet and influential critic, Brodzinski (d. 1835). A. C. Odyniec and I. Korsak have both been meritorious in furthering the new movement by the translations of congenial foreign authors. The most perfect expression of Mickiewicz's genius is given in his ballads and romances, including the rhapsody *Paris* and the sonnets *From the Krim* (Crimea). Among his creations in dramatic form is *Diady* ("Obsequies"), wherein the author portrays the woes of his people and humanity at large. More artistic in form than *Diady* is *Konrad Wallenrod*, which the Poles consider their national epic. The pearl of Slavic lit. is Mickiewicz's *Pan Tadeusz* ("Thaddeus"). In it the author treats the social and political events of his country of a recent date. A contrast to Mickiewicz was J. Slowacki (d. 1849). As a dramatist (in *Maria Stuart*, *Balladyna*, *Mozepa*, etc.) and as a writer of epics (in *Zmija*, *Jan Bielecki*, *Mnich*, *Lambro*, *Waclaw*, *Benioski*, etc.) he has evinced high power, and as a lyrist, in his last poem, *Krol Duch* ("king-genius"), he delineates the Slavic genius.

With the Lithuanian school of poets—called so in honor of Mickiewicz's home—was associated that of the Ukraine. Among the first of the Ukraine's poets is Bogdan Zaleski, whose *Dumy* ("Musings") have become the common property of the people. His next great poem, *Duch od Stepu* ("The Genius of the Steppe"), is a reflection of the historical destiny of the Slavs. Malczewski (d. 1826) and Goszczynski portray Ukraine's life, the former in his poetical narrative *Maria*, the latter in his *Zamek Kanowski* ("Castle of Kanow"). Michal Czajkowski gives graphic pictures of the life and habits of the Cossacks and Don Slavs in his *Cossack Legends*, *Wernyhora*, the *Prophet of the Ukraine*, *Kirdzali*, the *Helman of the Cossacks*, *Czarniecki*. As lyrists and novelists, Bielawski, Siemieniowski, Skarbek, Massalski, and Kraszewski—the latter a highly gifted author, and unquestionably the greatest, most fertile, and national among P. novelists—deserve mention. In the historical novel Rzewuski is noticeable. In his poetical narratives, *Stepy*, *Kirgiz*, Zielinski is the successful rival of Mickiewicz and Malczewski. Prominent among the most recent writers are the poet of *Larenka*, T. Lenartowicz, the national songster, Vincent Pol (d. 1873), Romanowski (d. 1863), Roman Zmorski, Ch. Brzozowski, F. Morawski, Maria Ilnicka, Gabriela Zmichowska, the improvisatrice Deotima (Hedwig Luszczyńska), and the epic as well as dramatic poet, Wladimir Wolski. In religious legends and popular traditions, Abb. Holowinski excelled (d. 1855). Adam Asnyk pub. in 1869 his excellent poems. Wladyslaw Belza may be counted among the most gifted modern poets. Stephen Garczynski, since his participation in the revolutionary war against Rus. (1830), has uttered many a wrath-flaming war-song in exile. His philosophical epic, *Waclaw's Deeds*, is his prin. work. Sigismund Krasinski (d. 1859) was the author of *Nieboska Komedia* ("Undivine Comedy"). His second work, *Iridion*, delineates the exasperated strife between an anc. and modern society—the strife from an enlarged Ch. view of the world with that of an arrogant Rom. state-idea.

In the dept. of metaphysics J. Goluchowski is noteworthy (d. 1859). *Philos. in its Relation to the Life of Nations and Single Individuals*. August Cieszkowski accepts in his *Prolegomena Historiophisica*, as a philosophical basis, a personal self-conscious God and the immortality of the soul. F. B. Trentowski (d. 1869) wrote, beside numerous works in P., in Ger. *Vorstudien zur Wissenschaft der Natur; Grundlage der universellen*

*Philosophie, und Die Freimaurerei*. J. Supinski belongs to the greatest of national economists. Carl Libelt wrote a new system of philos., holding that the discovery of truth is only feasible through intuition. Among Poland's modern historians, Joachim Lelewel occupies the first place. Bestowing his activity not only on the hist. of his own country, he embraced in his investigations all nations. Lelewel wrote in P. as well as in Fr. This meritorious man, minister of public instruction in Poland during the revolution of 1830, lived during the last 29 yrs. of his life at Brussels in indigent circumstances, yet honored by high and low. He rejected with indignation every offer of open or secret aid. D. at Brussels in 1861. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. JOSEPH KARGÉ.]

**Political Economy** [Gr. *oikonomia*, "the law of the house"] is that branch of social science which treats of the development and application of material wealth for the well-being of men in society. Its main subject is *wealth*, which is the collective name for all useful things which can be owned and exchanged. The original source of all wealth is the bounty of God in nature. The secondary source of wealth is man's labor exerted to bring forth the bounty of nature in form and time and place adapted to meet the wants of men. In the unfolding of this science 4 distinct lines of inquiry are to be followed. The first question is, How things intended to satisfy men's wants may be most economically produced? The second is, What rules can be laid down for their economical consumption? The third is, How the proceeds of industry in production may be equitably distributed to the different parties concerned in the process? And the fourth is, What are the processes involved in the exchange of these objects of wealth, one for another, all over the world? So the leading divisions of the science are Production, Consumption, Distribution, and Exchange.

**Production.**—Wealth is produced by the application of human labor to things existing in nature. But the laborer must have fit instruments, and must be supported by provisions already laid up. These are the fruits of previous labor embraced under the comprehensive term *capital*. Under production must be considered, therefore, (a) *labor*, (b) *capital*, (c) *the co-operative union of labor and capital*. Under labor are included both phys. and mental labor. The effectiveness of labor is increased by the employment of nature's forces and by a systematic division of labor. (See the article on DIVISION OF LABOR.) To secure these helps capital is all-essential. Capital is the result of saving—i. e. simply laying up a surplus of wealth produced above wealth consumed. It represents former labor, and in the process of production it is embodied in 3 forms—viz. the materials to which labor is applied, the instruments of labor, and the means for the support of the laborers. (See CAPITAL.) The union of labor and capital is natural and necessary. In it, past labor, the fruit of saving, simply joins hands with present labor, vital and active. They meet to best advantage in the same person—i. e. when the laborer is owner of capital enough to employ his labor. Sound P. E. favors the making of every laborer to some extent a capitalist, and every capitalist in some way a laborer.

**Consumption** may be regarded as either private or public, the former embracing all destruction of wealth for personal necessities and gratifications, the latter that which is directed by public authority for the general good. There are 2 simple rules of economy for both private and public consumption: (1) let the destruction of value in any case be as small as possible to secure a given result; (2) from a given expenditure get the largest result possible.

**Distribution.**—In any branch of industry, and in the general productive industry of a nation, 3 parties are to be recognized—viz. the govt., which gives security to property, the owners of the capital employed, and the laborers. The gross annual production must accordingly be distributed for 4 distinct purposes: (1) for the support of govt. through taxes paid (see TAXATION); (2) for replacing the capital actually destroyed, in materials used up, in provisions consumed, and in machinery worn and decayed; (3) to give capital its due reward in the form of rent, interest, or dividends (see INTEREST and RENT); (4) to give labor its due reward in wages, salaries, commissions, or fees (see WAGES). These 4 items are to be reckoned in the aggregate of expenses of production. But the result of productive industry should show a surplus beyond these in the form of profits. (See PROFITS.) The most difficult question of distribution respects the disposal of these. Strict justice would divide the profits in some fair proportion between the capitalists and the laborers, including the managers, with due regard to the difference of capacity, responsibility, and risk pertaining to the respective parties. The interposition of govt. is needed only to guard the rights of all.

**Exchange.**—The diversity of nature's gifts, the wide reach of men's desires, and the principle of division of labor necessitate exchange. This part of the machinery of society gives rise to the most difficult problems of our common life. The simplest form of exchange is barter—i. e. the giving of service for service, commodity for commodity, or service for commodity, and commodity for service. Value is the central term in this branch of the subject. (See VALUE.) The inconveniences of barter necessitate the introduction of some instrument which shall serve as a universal measure of values and as a medium of exchange. This instrument, whatever form it takes, is money. (See CURRENCY and MONEY.) Credit also, in the machinery of exchange, renders a service no less important than that of money. As an intermediate agency it actually effects far the greater part of the exchanges of the world with great saving of money, time, labor, and risk, virtually resolving trade to a great extent into barter.

**History.**—Under the anc. civilizations of Egypt, India, Gr., and Rome we find evidence of careful observation of the facts of economic science and the occasional defining of sound principles. But no systematic arrangement of either



facts or principles was attempted. Aristotle in one of his works first employs the term "political economy," though in a vague way, and propounds some good doctrines which have stood the test of time. Feudalism gave birth to the protective system and to manifold grievous monopolies. In the 16th century the industrial and commercial activity of the It. cities prompted a broader and more philosophical investigation of the sources of public prosperity, and with the It. writers of that and the following centuries systematic P. E. had its origin. Its development was aided by Sp. and Fr. writers and by the financial reforms instituted by Sully and Colbert, the ministers of Henry IV. and Louis XIV. In 1776 Adam Smith pub. his *Wealth of Nations*, which may be said to be the beginning and source of modern P. E. Since his day, amid much conflict of opinions, fundamental principles have been settled, and the tendency has been to recognize more and more the golden rule of Christ as applicable alike to states, communities, and individuals, in their economic as in all other social relations. A. L. CHAPIN.

**Polk** (JAMES KNOX), 11th Pres. of the U. S., b. in Mecklenburg co., N. C., Nov. 2, 1795; of Scotch-Irish stock originally named Pollock; removed to Tenn. with his father 1806; grad. at the Univ. of Nashville 1818; studied law with Felix Grundy; was admitted to the bar at Columbia 1820; was a member of the State legislature 1823-25; acquired prominence as a lawyer; M. C. 1834-39; conspicuous as an opponent of the administration of Adams, of all Federal appropriations for internal improvements, of protective tariffs, and of the national bank; was an early supporter of Jackson, whose conduct in the removal of the deposits he vindicated in the session of 1833-34, being then chairman of the committee of ways and means; was defeated as Dem. candidate for speaker 1834, but elected 1835, and re-elected 1837; gov. of Tenn. 1839-40; was proposed by the legislatures of Tenn. and of other States 1840 as a candidate for V.-P. of the U. S.; was defeated in 1841 for re-election as gov.; was nominated by the Dem. national convention at Baltimore (May 27, 1844) for the Presidency in opposition to Henry Clay, and elected by 170 electoral votes against 105, the chief issue being the annexation of Texas, which was accomplished by the administration of Tyler the day before P.'s inauguration, Mar. 4, 1845. He formed a cabinet consisting of James Buchanan, Robert J. Walker, William L. Marcy, George Bancroft, Cave Johnson, and John Y. Mason; settled the Or. boundary question; created the dept. of the interior; succeeded in carrying the low tariff of 1846; reorganized the financial system of the gov., and conducted the Mex. war, which resulted in the acquisition of Cal. and N. M. Declining to seek a renomination, he retired to Nashville. D. June 19, 1849.

**Polk** (LEONIDAS), b. at Raleigh, N. C., in 1806, grad. at W. Pt. 1827; entered the artill.; resigned Dec. 1, 1827; in 1831 was ordained in the P. E. Ch.; was missionary bp. of Ark. and Ind. Terr. S. of 36° 30', with provisional charge of the diocese of Ala., Miss., and La., and missions in the republic of Tex. 1838-41; bp. of La. 1841-61. In 1861 he accepted the appointment of maj.-gen. in the Confed. army, and commanded at Columbus; subsequently commanded a division in the W.; at Murfreesboro', Chattanooga, Chickamauga, and in Ga. campaign of 1864 commanded a corps, ranking as lieutenant-gen.; was killed at Pine Mt., Ga., June 14, 1864.

**Polk** (TRUSTEN), b. in Sussex co., Del., May 29, 1811, grad. at Yale 1831; studied in the law school at New Haven, Conn., and in 1835 became a lawyer of St. Louis; was chosen to the constitutional convention of 1845; Presidential elector 1848, gov. of Mo. 1857, U. S. Senator 1857-62, when he was expelled on account of hostility to the U. S. govt. D. Apr. 16, 1876.

**Polk** (WILLIAM) b. near Charlotte, N. C., in 1759, was present at the Mecklenburg Dec. of Ind., May 1775; joined the Revolutionary army 1777; was engaged in the battles of Brandywine and Germantown; accompanied Gates and Greene in their S. campaigns; was wounded at Eutaw Springs; represented Mecklenburg co. in the N. C. legislature 1787; subsequently removed to Raleigh; took an active part in State politics; declined a nomination as brig.-gen. 1812, being opposed to the war with Eng. D. Jan. 14, 1835, being last surviving field-officer of the N. C. line.

**Polk** (WILLIAM H.), brother of Pres. Polk, b. in Maury co., Tenn., May 24, 1815, ed. at Chapel Hill, N. C., and at the Univ. of Tenn.; was admitted to the bar 1839; elected to the legislature 1841 and 1843; appointed by Pres. Tyler *chargé d'affaires* to Naples 1845; served as a major of dragoons in the Mex. war; was a delegate to the Nashville convention 1850, M. C. 1851-53, and a firm opponent of secession. D. Dec. 16, 1862.

**Polkard** (EDWARD A.), b. in Nelson co., Va., 1838, ed. at the Univ. of Va. and at William and Mary Coll.; was a govt. clerk at Wash. under Buchanan's administration; ed. the *Richmond Examiner* 1861-65, *Southern Opinion* 1867-69; author of *Southern Hist. of the War*, *The Lost Cause*, *Lee and his Lieuts.*, *Life of Jefferson Davis*, etc.

**Polle** [Lat. "fine flour"], the fine dust-like substance produced within the anthers of phanerogamous plants, and discharged by the bursting of the anther. It serves to fertilize the ovules contained within the female organs of the plant. The forms of P.-grains when seen under the microscope are exceedingly various, but are constant for the same species, and sometimes for genera or orders. Each P.-grain possesses 2 envelopes, the inner one exceedingly delicate. Functionally, the P.-grain represents the phytozoon (antherozoid) of the cryptogamous plant, but in structure it more nearly resembles the spore. A. GRAY.

**Pollock**, a name of the *Pollachius* (or *Gadus*) *carbonarius*. (See COAL-FISH.)

**Pollock** (JAMES), LL.D., b. in Milton, Pa., Sept. 11, 1810, grad. at Princeton 1831; admitted to the bar in 1833; dist. atty. 1835-38; M. C. 1843-49; became in 1850 pres. judge of a State dist. court; gov. of Pa. 1855-58; director of the U. S. mint, Phila., 1861-66, and again in 1869.

**Pollock** (ROBERT), b. at Muirhouse, Renfrewshire, Scot.,

in 1799, grad. at the Univ. of Glasgow; studied theol., and was licensed as a preacher of the United Secession Ch. 1827. D. at Southampton Sept. 15, 1837. Wrote *Tales of the Covenanters* and *The Course of Time*.

**Pollux**. See CASTOR AND POLLUX.

**Polo**, city, on R. R., Ogle co., Ill. 23 m. S. of Freeport. Pop. 1870, 1895; 1880, 1819.

**Polo**, *Marco*. The Polos were a noble family of Venetian merchants represented about 1260 by 3 brothers, Marco, Nicolo, and Maffeo. In the year named Nicolo and Maffeo went on a mercantile venture to Sarai on the Volga, thence to Bokhara, where a party of Mongol envoys invited them to the Great Khan in the far East. Kublai was then reigning. Never before having seen European gentlemen, he took the Polos into great favor, and sent them back, in the character of envoys to the papal court, to ask for a great body of priests to instruct his people. The 2 brothers reached Acre in Apr. 1269, and, hearing that the papal see was vacant, went home. After waiting 2 yrs. vainly for a new pope, the brothers started again for the East, taking young Marco. They were yet on the Gulf of Scanderoon when they heard of a pope's election in the person of Gregory X. He recalled them to Acre to receive his letters. The long journey to Cathay occupied 3½ yrs. It lay through S. Armenia, Per., the valley of the Oxus, and Badakhshan, thence over the high plateau of Pamir. From Pamir the Venetians descended upon Kashgar, and thence by Khotan and across the Gobi desert to *Tangut*. Here they were met as the Great Khan's guests, and conducted to his summer-seat at Shangtu on the plateau of Mongolia, 200 m. nearly due N. of Peking (*Cambaluc*—i. e. *Khan-baligh*, "imperial city"). Kublai received the party cordially, and showed especial favor to Marco. The young man soon got employment in the khan's service. His first important commission carried him through W. Chi. and the wild Tibetan frontier to Yun-nan, and thence to the borders of Burmah (*Mien*). Favor followed him. A mission to India was one of his charges, and the govt. of the great city of Yangchow, with its dist., was another. Meanwhile Kublai's kinsman, Arghun, khan of Persia in 1286, lost his favorite wife, Bulughan. Dying, she begged him to fill her place with a Mongol lady of her own family in Cathay. Envoys were sent to Cambaluc, and Kükachin, a beautiful maiden, was selected to return with them. The envoys desired to return by sea, and sought the company of the experienced Venetians. Kublai fitted the party out nobly for the voyage. Their fleet of 14 vessels sailed from Fokien in the beginning of 1292, and the Polos, after 2 yrs., landed in Per. Arghun had long been dead, but Ghazan, his son, succeeded to the bride's hand. After a time the Polos proceeded to Europe, and reached Venice late in 1295. Venice and Genoa were then in rivalry. In 1298 the Genoese sent forth a powerful armament under Lamba Doria to strike the foe in her own waters. Venice augmented her Adriatic fleet under Andrea Dandolo, and under him went M. P. as gentleman-commander of a galley. On Sunday, Sept. 7, 1298, the fleets came to action off Curzola, with disaster to the Venetians; 7000 prisoners were carried to Genoa, P. among them. In the summer of 1299 peace was made and the prisoners were liberated. M. P. survived to June 1325.

The *Book of Marco Polo* consists of 2 unequal sections. The first, called *Prologue*, is a personal narrative of great interest, but too great brevity. The second consists of a long series (232 in the oldest form) of chapters, extremely various in length and interest, descriptive of the regions of Asia visited by the Polos in their different journeys, but especially of the emp. Kublai, his court and dominions. M. P. was the first traveller to trace a route across the whole lon. of Asia, naming and describing kingdom after kingdom from the shores of Cilicia to the Yellow Sea; the first traveller to reveal Chi. in all its wealth and vastness, with its mighty rivers, its huge cities, its swarming pop., and rich manufactures; to tell us of the nations on its borders, with their eccentricities of manners and worship; of Thibet, of Burmah, of Laos, of Siam, of Cochin-China, of Japan; the first to speak of that museum of beauty and wonder, the Indian Archipelago; of Java, the pearl of islands; of Sumatra (*Java Minor*); of Ceylon with its Mountain of Adam; of India, not as a mythical region, but as a country seen and partially explored; of the secluded Chr. kingdom of Abyssinia; of Zanzibar, Madagascar, and Socotra; and in remotely opposite quarters of the high plateaus of Pamir, with their wild sheep; of Siberia and the Arctic Ocean; of white bears, sledge-dogs, and reindeer-riding Tunguses. [From orig. art. in *J. de l'Univ. Cyc.*, by MAJ.-GEN. H. YULE.]

**Poltava**, town of Rus., cap. of the govt. of Poltava, on the Vorskla, has 4 annual fairs, at which large commercial transactions take place. On June 27, 1709, Peter the Great won here a victory over Charles XII. of Swe. Pop. 33,979.

**Polyan**, *dry* [Gr. πολυς, "many," and ἄνθρωπος, "man," husband"], the custom which prevails in various parts of the earth of marrying a woman to several husbands at once. The Todas of India, the people of Thibet, and other tribes of Asia follow this practice.

**Polyanthus** ("many-flowered"), a popular name for a large class of primroses, probably belonging to *Primula grandiflora*, and quite closely allied to the auriculas, cowslips, oxlips, etc. The P. is a hardy perennial, and the flowers are often beautiful and profuse.

**Polybius**, b. about 204 b. c. at Megalopolis in Arcadia of a wealthy and influential family; entered early into the military and political service of the Achaean league, and was one of the 1000 Achaean who were summoned to Rome after the battle at Pydna (167 b. c.) to answer before the senate why the league had not sent auxiliaries to the Rom. army in Macedonia. The hostages were detained 16 yrs. in It. P. stayed in the house of *Emilius Paulus*. Here he formed friendship with Scipio *Emilianus*, whom he accompanied on his Afr. campaign, where he witnessed the destruction of Carthage. On the outbreak of the war between



Rome and the Achaean league he hastened home, and arrived in Gr. just after the fall of Corinth, in 146. He exerted himself to mitigate the fate of his countrymen. He is said to have d. in the 92d yr. of his age. His prin. work is his hist. of Rome, in 40 books, from 220 to 146 A. C., with an introduction giving a sketch of the rise of the city from its conquest by the Gauls to the second Punic war.

**Poly carp**, one of the apostolic Fathers, b. in 69 or 70, apparently of Chr. parentage, a disciple of St. John and bp. of Smyrna, where he suffered martyrdom, probably 155 or 156 A. D. When entreated to save his life by reviling Christ, the answer of the martyr was, "Eighty and six years have I served him, and he has done me no ill, and how can I blaspheme my King who has saved me?" P.'s Epistle to the Philippians appears to have been written shortly after the martyrdom of Ignatius, 115 A. D. Its genuineness is now generally conceded.

**Polyce'tus**, b. at Sicyon, Achæa, subsequently made a citizen of Argos; received instruction, together with Phidias and Myron, from Ageladas, made the chryselephantine statue of Hera in the Heraeum of Argos, the statue of the *Spear-bearer*, and built the theatre of Epidaurus.

**Polyce'tes**, tyrant of Samos, one of the many seakings who in anc. times swarmed over the Aegean Sea; was warned by his friend, King Amasis of Egypt, that he should sacrifice something which he valued very highly in order to ward off the envy of the gods. He threw his ring, a jewel of immense value, into the sea, but the next day the ring was found in the stomach of a fish served up on his table. Orestes, satrap of Sardis, lured him into Magnesia, and seized and crucified him, about 522 A. C.

**Polygala'ceæ**, a natural order of polypetalous exogenous herbs and shrubs, of which the large genus *Polygala* is the typical one. The order is remarkable for the seemingly papilionaceous character of its flowers, although the structure is really quite different. Several species of *Polygala* (called milkwort, but not milky) are prized for their ornamental flowers. The Atlantic U. S. have numerous species, among them *P. Senega*, the Seneca snake-root, the acrid root of which is used as a stimulating expectorant and diuretic. It has an old reputation as an antidote to the bite of the rattlesnake.

ASA GRAY.

**Polygamy** [from the Gr. πολύς, "many," and γαμειν, to "marry"], the state of a man having 2 or more wives at the same time. In anc. times P. was practised by all the E. nations, and tolerated by their religions. In the Homeric age it seems to have existed to some extent among the Grs., but during the later development of Gr. civilization it entirely disappeared. To the Romans and the Gotho-Germanic races it was unknown. With the Jews it was common among the patriarchs and tolerated by the law of Moses, but toward the beginning of our era the custom appears to have died out. The Koran sanctions it, but among the Arabs it does not prevail as a general rule. Among Chrs. it was never tolerated until, in 1843, Joseph Smith introduced it among the Mormons in accordance with a special "revelation" he had received. In our times P. is common only among the savage Afr. and Malayo-Polynesian races, and among the degraded Asiatic nations.

**Polyglot** [from the Gr. πολύς, "many," and γλῶττα, "tongue"], a book with versions of its text in several langs., but generally used only of such editions of the Bible.

**Polygno'tus**, b. in the beginning of the 5th century A. C., in the island of Thasos; was an intimate friend of Cimon, and lived mostly in Athens, where he decorated the temple of Theseus, the Anaceum, and the Pœcile; afterward also the inner halls of the Propylæa.

**Polygon** [Gr. πολύς, "many," and γωνία, "angle"], a limited plane figure bounded on all sides by straight lines. The bounding lines are called *sides* of the P., and the points at which they meet are called *vertices* of the P.; the entire bounding line is called the *perimeter*. P. are divided into classes according to the number of their sides or angles. P. of 3 sides are called *triangles*; those of 4 sides are called *quadrilaterals*; those of 5 sides, *pentagons*; those of 6 sides, *hexagons*; those of 7 sides, *heptagons*; those of 8 sides, *octagons*; those of 10 sides, *decagons*, and so on. If the sides of a P. are equal, the P. is said to be *equilateral*; if its angles are equal, it is called *equiangular*. A *regular P.* is both equilateral and equiangular. If the circumference of a circle is divided into any number of equal arcs, the chords of these arcs form a regular P. having a corresponding number of sides; if the number of sides of such a P. is greater than any assignable number, or *infinite*, the value of each side is less than any assignable line, or *infinitesimal*, and the P. is then said to become a circle. The circle is therefore the limit of an inscribed regular P. having a varying number of sides. A closed broken line, all of whose sides are not in a single plane, is often called a *twisted P.* W. G. PECK.

**Polygona'ceæ**, a natural order of apetalous exogenous herbs, shrubs, or rarely trees, found in most parts of the world and containing about 700 species. The essential marks of the order are the swollen joints, usually entire leaves, and ochreate stipules—i. e. the stipules form sheaths around the stem; the stamens seldom accord in number with the divisions of the usually colored calyx; and the ovary contains a solitary orthotropous ovule rising from the base of the cell. The order produces rhubarb, sorrel, etc., and the farinaceous grain of buckwheat takes the place and well fulfils the office of a cereal grain.

ASA GRAY.

**Polygonal Numbers**, series of numbers each term of which is formed from the preceding by adding to it the corresponding term of an arithmetical progression. They are so called because the number of points in each series can be arranged in the form of a polygon, which gives the name to the series.

**Polyhe'dral Angle**, an angular space bounded by 3 or more planes passing through a common point. The intersections of the bounding planes are called *edges* of the P. A., and their common point is called the *vertex*.

**Polyhe'dron** [Gr. πολύς, "many," and ὄδρα, "side"], a volume bounded on all sides by polygons. The polygons are called *faces*, and the lines in which they meet are called *edges* of the P. The points in which 2 or more edges meet are called *vertices* of the P. The simplest P. is bounded by 4 triangles, and is known as pyramid or tetrahedron.

**Polyhym'nia**, one of the nine muses, the inventor of the lyre and the genius of lyric poetry.

**Polymeric Isomorph'ism** is a term applied to a class of facts first observed by Scheerer, to the effect that in minerals containing both magnesia and combined water the crystalline form is not altered by the substitution of 3 equivalents of water for 1 equivalent of magnesia.

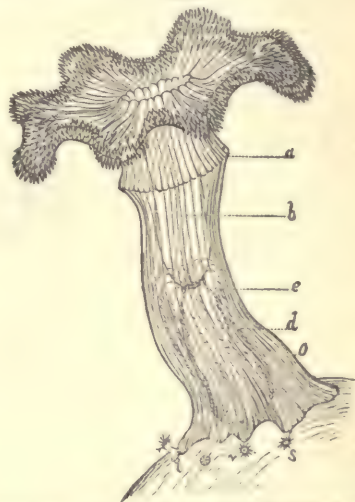
**Polyne'sia** [from the Gr. πολύς, "many," and νῆσος, "island"], employed as the common name for all the islands and groups of islands situated between lon. 100° W. and the Philippines—Papua, New Britain, New Hebrides, New Zealand, etc., including the Hawaiian, Marquesas, Society, Friendly, Fiji, Caroline, Ladrone Islands, etc.

**Polyph'e'mus**, a Cyclops, son of Poseidon, a gigantic monster with one eye in the centre of the forehead; lived in the island of Thrinacia, near Sic., where he captured Odysseus on his return from Troy; but Odysseus escaped by making him drunk and burning out his eye.

**Polypod**, or **Polyp'ody** [Gr. πολυπόδιον, "many-footed," alluding to the branching root-stock], popular names given to many ferns, but the name properly belongs to those of the genus *Polypodium*, of which the U. S. have several species, growing on rocks, tree-trunks, etc.

**Polyps**, or **Polyp'i** [Lat. *polypus*, from Gr. πολύς, "many," and πούς, "foot"], a name applied to one of the classes of Radiata. The true P., or Anthozoa, constitute an important group, including most of the true coral-producing animals, as well as many that secrete no coral. Most species of P. form compound colonies or clusters composed of numerous more or less closely united individual zooids, each of which usually has at least a mouth and stomach of its own. The zooids of such a colony all originate from one primary P., either as successive generations of buds that do not separate completely, or by repeated incomplete spontaneous divisions of the first one and its suc-

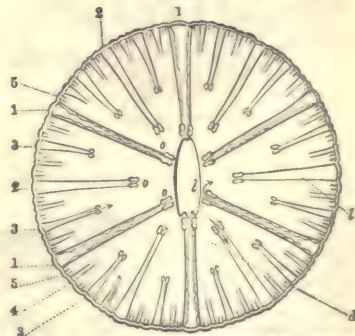
FIG. 1.



*Metridium marginatum*, Edw.: a young translucent specimen, reduced one half.

cessors. Nearly all P., when first hatched from the egg, have the form of oblong or oval ciliated larvae or *planula*, and swim free in the ocean, but most of the species very soon attach themselves to some solid substance and remain

FIG. 2.



Transverse section of an Actinia: b, stomach; d, body-cavity; f, a radial chamber; c, ovaries; 1, 1, 2, 2, 3, 3, 4, 4, 5, 5, radial partitions of the five successive series.

fixed for life, whether they are to remain simple or become compound by budding.

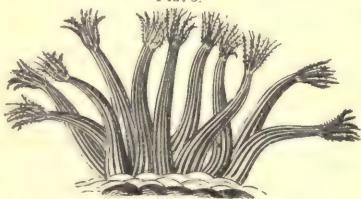
P. have a tubular body, which may be long and cylindri-



cal, or short and broad, or even almost disk-like; the base or lower end sometimes tapers to a point, but is oftener broad for adhesion, and is perforated in only a few species; the upper end of the body terminates in a circular or elliptical disk, in the centre of which there is an oblong or elliptical mouth, with the lips usually bordered by more or less prominent lobes (Fig. 1); the disk is surrounded by one or several circles of hollow tentacles. The tentacles are usually very contractile, and are covered with great numbers of minute netting-cells, with which they capture their prey. In the interior the stomach (Figs. 1 and 2, *b*) occupies the centre, in the upper portion of the body. It is a capacious flattened sac, with a corrugated internal surface, communicating directly with the mouth at its upper end, and having an orifice (Fig. 1, *c*) at the lower end, opening directly into the general cavity of the body (*d*). The body-cavity is longitudinally divided by a number of symmetrically arranged fleshy radial partitions (Fig. 2). The radiating partitions are filled with muscular fibres, which, by contracting at the same time with the outer wall, serve to withdraw the disk and tentacles and contract the upper end of the body into a small compass when disturbed. In *P.* the sexes are generally separate, but the ovaries and spermaries (Figs. 1 and 2, *e*) are alike attached to the inner margins of the radial partitions in the body-cavity, below the stomach. The eggs are discharged into the body-cavity, where they often remain until developed into ciliated planulae, and even into well-formed young *P.*; they are usually discharged by passing into the stomach and thence out of the mouth. The nutritive fluid contained within the general cavity of the body and in the hollow tentacles is kept in constant circulation by the vibrating cilia that cover the internal membranes, and no special blood-vessels have been detected. After feeding, the undigested parts of the food are discharged from the mouth, and the nutritive parts pass directly into the general body-cavity, mingling with the fluid contained therein, which is also mixed with a large proportion of sea-water when the *P.* expands.

*P.* are naturally divided into 3 orders—Alicynaria, Actinaria, and Madreporaria.

I. **ALICYNARIA.**—In these the body-cavity is divided into 8 chambers by 8 simple radial partitions; there are 8 broad tentacles, which are pinnately branched or lobed along the sides. In these the radiating chambers never secrete coral, but in a few cases the external wall of the body becomes calcified and rigid in its lower part, thus forming tubular corals (*Tubipora*, *Heliopora*), and all the species secrete, more or less abundantly, small nodules, grains, or plates of carbonate of lime in the outer wall, and usually also in the tentacles and various other parts. (Fig. 4, *b*.) These are most commonly known as spicula. The Alicynaria are divided into 3 sub-orders—Pennatulacea (Fig. 3), *Gorgonacea* (Fig. 4), *Alicynacea* (Fig. 5).



*Anthelia lineata*, Stimp, natural size.

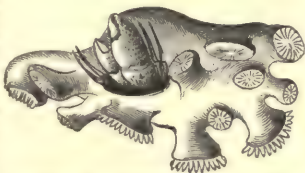
II. **ACTINARIA.**—In this order the zooids have the outer walls of the body flexible and muscular to the base, with a large central body-cavity extending, like the radial chambers, quite to the base, no coral being secreted either in the walls or radial chambers. The radial chambers have each a lateral radial lamella of its own on each side, so that adjacent chambers are separated by two radial partitions. These chambers and the corresponding tentacles vary in number from 10 to many hundreds in the dif-



*Rophobeleum clavatum*, Verrill.



*Astrogoria sinensis*, V.: a, natural size; b, a retracted zooid, enlarged.



*Epizoanthus americanus*, V., incrusting a shell occupied by a hermit crab.

ferent species, but are commonly in multiples of 6. As the *P.* grow, new chambers and tentacles are introduced, in successive sets, in the spaces between the older ones. (Fig. 2.) There are 3 sub-orders—Actinacea (Fig. 1), *Zoanthacea* (Fig. 6), and *Antipathacea*.

III. **MADREPORARIA.**—This order includes nearly all true reef-building corals, as well as many smaller and more delicate kinds, found in all seas, and even at great depths in the ocean. Most of the species form large compound colonies, firmly attached to the bottom or to one another, but many remain always simple (Fig. 7). Among the compound species the forms are very diverse, according to the mode of increase. Some form large tree-like or shrubby clusters of branches (*Madrepora*, etc.); others grow in low incrusting forms (Fig. 8) or in flat fronds, and many of the reef corals form large, solid, hemispherical or irregular masses,

sometimes several feet in diameter. Some of these increase in size by the budding of new zooids, others by the repeated subdivisions of the old ones. (Fig. 8.) In this order the tentacles are simple and usually elongated, varying in number from 12 to several hundred. The disk and upper parts of the wall are flexible and retractile, but the lower part of the wall secretes coral and becomes rigid; coral is also secreted in the lower part of the radiating chambers, and often in the central cavity among the ovaries, and by the coenecy-ma. The radial and central chambers are therefore smaller and less developed than in the previous groups. There are several sub-orders—(1) *Madreporacea* (Fig. 8); (2) *Oculinacea* (Fig. 7); (3) *Astracea*; (4) *Fungacea*; (5) *Stauracea*, or *cyathophylloid* corals.

Modern reef-forming corals are restricted to the warmer parts of the ocean, where the average temperature of the coldest month is not below 68° F. For the same reason they do not flourish beyond about 100 ft. in depth, below which the water is too cold, even in the tropics. But in Palaeozoic times reef-forming corals of many kinds were abundant, even on the shores of the Arctic Ocean. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. A. E. VERRILL.]

**Polypus**, a tumor of any mucous cavity, as the external auditory canal, nostrils, throat, urethra, or uterus. A *P.* by growth in size and weight drags on its neck or attachment, which is termed its pedicle. It may reach great size and protrude from its cavity or passage. Excision is the common treatment.

**Polytechnic Schools** [from the Gr. *πολύς*, "many," and *τέχνη*, "art"], a kind of higher educational inst. in which the sciences of math., physics, and chem. are taught, either exclusively or principally, and with a more or less strongly marked practical bearing. The first and most celebrated of these insts., the École Polytechnique in Paris, was founded in 1794 by decree of National Convention.

**Polythelms** signifies the distribution of the perfections and functions of the infinite God among many limited gods, as do the ancient heathen mythologies.

**Pombal** (SEBASTIÃO JOSÉ DE CARVALHO e Mello), MARQUIS of b. at Lisbon, Port., May 13, 1699, studied law at the Univ. of Coimbra; spent some yrs. in the army; afterward entered the civil service and obtained the favor of the court; was sent in 1739 as minister to Lond., and in 1745 to Vienna, where he succeeded as mediator in averting the rupture between the court of Aus. and Pope Benedict XIV.; became minister of foreign affairs of Port. 1750; acquired a great influence over his sovereign, King Joseph; became first minister 1756, and caused the banishment from Port. of all the members of the Society of Jesus by royal decree of Sept. 3, 1759; created count of Oeiras in 1759, he was made marquis of Pombal in 1770. On the accession of Pedro III. he retired to his estates. D. at Pombal May 5, 1782.

**Pomegranate**, pum-gran'at [Lat. *pomum granatum*, "fruit abounding in seeds"], the *Punica granatum*, a shrub of the Old World, and of the order Granataceae, now naturalized in most warm countries. It grows finely in the Gulf States. Some of the varieties are sub-acid and others sweet. Most of the sorts abound in small seeds, but some are seedless. The fruit is very grateful in hot climates. The plant is sometimes used for hedges. The flowers are very fine, and sometimes are double. The bark is used in tanning. The rind is a good astringent for medicinal use. The bark of the root is a good anthelmintic.

**Pomerania.** See APPENDIX.

**Pomeroxy**, city, on R. R. and Ohio River, cap. of Meigs co., O., equidistant from Pittsburg and Cin. Veins of bituminous and canal coal underlie this section, and deposits of salt are extensive. Pop. 1870, 5324; 1880, 5560.

**Pomeroxy** (JOHN NORTON), LL.D., b. at Rochester, N. Y., Apr. 12, 1828, grad. at Hamilton Coll. 1847; studied law, and was admitted to the bar 1851; prof. of law and dean of the law faculty in the Univ. of New York 1864-69, during a portion of which period he also occupied the chair of political science; returned to Rochester and resumed the practice of his profession; removed to San Francisco in 1878, where he now occupies the chair of municipal law in the Hastings Coll. of the Law, the law dept. of the Univ. of Cal. In 1865 pub. *An Introduction to Municipal Law*, and in the following yr. received the degree of LL.D. from Hamilton Coll.; in 1868 pub. *An Introduction to the Constitutional Law of the U. S.* (3d ed. 1875), adopted as a text-book in the U. S. Military Acad. at W. Pt. and in many of the leading colls.; in 1874 prepared a second edition of Mr. Sedgwick's *Statutory and Constitutional Law*, with notes; in 1876 pub. a treatise on *Remedies and Remedial Rights, according to the Reformed*



*Amer. Procedure*, adapted to use in all the States and Terrs. where that system prevails, and also in Eng.; has been a regular writer for the *Nation*, and contributed numerous articles to *Amer. Law Review* and *N. Amer. Review* upon topics connected with constitutional and international law, gen. jurisprudence, and science of politics. He was one of the assistant eds. of *J.'s Univ. Cyc.* D. Feb. 16, 1885.

**Pomeroiy** (SAMUEL C.), b. at Southampton, Mass., Jan. 3, 1816, ed. at Amherst Coll.; was elected to the Mass. legislature 1852; took part in organizing the N. Eng. Emigrant Aid Society 1864, of which he became financial agent; went to Kan. the same yr.; was engaged in the anti-slavery struggle in that terr. as a member of the defence committee; a delegate to the Pittsburg and Phila. conventions 1856, and to that of Chicago 1860; was chairman of the relief committee during the famine in Kan., and U. S. Senator from that State 1861-73.

**Pomeroiy** (SETH), b. at Northampton, Mass., about 1715, was major in the Mass. forces at the capture of Louisburg 1745; lieut.-col. of the regiment commanded by Col. Ephraim Williams, at whose death, in the battle of Lake George, Sept. 8, 1755, he took command and gained a victory over Dieskau. Was a mechanic, and skilled in the manufacture of arms; a delegate to the Mass. provincial cong. 1774-75, by which he was elected a gen. officer Oct. 1774, and a brig.-gen. Feb. 1775; fought at Bunker Hill as a private soldier, and was soon afterward appointed senior brigadier by the Continental Cong., but declined in consequence of disputes about military rank and retired to his farm. In 1776 he raised a force for the relief of the army under Washington, and marched to the Hudson River. D. Feb. 1777.

**Pomeroiy** (THEODORE M.), b. at Cayuga, N. Y., Dec. 31, 1824, grad. at Hamilton Coll. 1845; studied law; was dist. atty. for Cayuga co. 1850-56, member of State legislature 1857, M. C. 1861-69; chosen speaker Mar. 3, 1869.

**Pomology.** See FRUIT CULTURE.

**Pomona**, the Roman goddess of fruits. The *flamen Pomonalis*, her chief priest, was one of the minor flamines, chosen from the plebs.

**Pomona**, Cal. See APPENDIX.

**Pompador**, pón-pah-door, de (JEANNE ANTOINETTE POISSON), MARCHIONESS, b. at Paris Dec. 29, 1721, the natural daughter of a butcher; was married in 1741 to a farmer of the taxes; became the mistress of Louis XV. in 1744, and exercised a most decided influence on the govt. of Fr. for nearly 20 yrs. in all its branches, bringing loss and disgrace over the country at every point. D. Apr. 15, 1784.

**Pompeii**, pom-pä'ye, an anc. city of Campania, situated at the foot of the S. S. E. slope of Vesuvius, near the Sarnus, about 14 m. S. E. of Naples. P. first appears in hist. as a flourishing commercial town in the 4th century B. C. In 79 A. D., in the midst of a public festival, Vesuvius suddenly shot forth clouds of smoke, and soon buried, under volcanic ashes, sand, pebbles, and scoræ. P., Herculaneum, and several smaller towns. In 1592 Fontana began to construct the aqueduct that now passes through these ruins, but no important discoveries were made, and it was not till 1748 that some objects found by a peasant attracted the notice of Charles III. of Naples, and led him to make experimental excavations. The results were such as to induce his successors to continue the work; but only little was done in the true spirit of antiquarian research until the govt. of Victor Emmanuel appointed in 1861 the accomplished Florelli to superintend the excavations. Since that time the work has been conducted with system and with care; the ruins previously exposed are protected; the police is admirable, as are also the facilities afforded the visitor. The city was entered by 8 gates, named from the towns toward which they led. The streets (the widest 30 ft., others much narrower, and some mere lanes) run nearly at right angles, are solidly paved with polygonal lava-blocks, and are provided with sidewalks and raised crossing-stones. The wheel tracks are deeply worn, and the width between the parallel ruts is only 4½ ft. Of the public structures already uncovered, the first found (1748) was the amphitheatre; then followed the theatres, the temple of Isis, the Forum Civile, the temples of Mercury and of Jupiter, the Pantheon or Temple of Augustus, the Forum Triangulare, the Basilica or Temple of Venus, the Chalcidicum, probably used as an exchange; the thermæ or baths, the so called courts of justice, the prisons, etc. Near a large barrack-like building were found 64 skeletons, supposed to be of soldiers on guard. In most of the above-named edifices as well as in the private houses, statues, statuettes, frescoes, mosaics, etc. of various ages and degrees of merit have been found in profusion. Among the private dwellings richest in art are the House of the Quæstor or of the Dioscuri, beautifully adorned with frescoes and overflowing with sculptures, vases, candelabra, etc.; the House of the Faun, so named from an exquisite dancing faun found here among endless artistic treasures, of which the most celebrated is a mosaic supposed to represent the battle of Issus; the House of Sallust, one of the largest and finest; the House of M. Lucrinius, very rich and curious; the House of the Tragic Poet, where, among other valuable mosaics, was found the dog with the motto "*Cave Canem*"; the House of Proculus, more recently excavated, and containing paintings of great freshness and beauty. The graceful statuettes known as the *Narcissus*, the *Ganymede* or *Paris*, *Aphrodite gathering up her hair*, and an invaluable painting representing *Laocon*, are among late discoveries.

The great interest of the buried city lies in the revelation it has made to us of the daily life and habits of its citizens. We see them in their streets, in their temples, in their theatres, in their dwellings, their factories, their bakeries, their shops—in short, everywhere—and surrounded by the objects of their worship, their pleasure, their convenience, and their business. (See MAZOIS and GAU, *Les Ruines de Pompéi*.) [From orig. art. in *J.'s Univ. Cyc.*, by CAROLINE C. MARSH.]

**Pompey the Great**, b. Sept. 30, 106 B. C., was ed. in the camp, and distinguished himself in the battle at the Colline Gate. After the death of Sulla (79 B. C.), and after a short but successful contest with Lepidus, P. became the acknowledged head of the aristocratic party and the most powerful man in the republic. In Sp., however, the popular party still held the ascendancy; Sertorius, one of Marius's gens., could not be reduced. P. was sent against him (76 B. C.) with a brilliant army, but the war lasted 4 yrs., and was not brought to a conclusion until after the assassination of Sertorius by Perperna. A much more brilliant feat was his war against the pirates. In 67 B. C. he was invested with almost absolute power in order to stop their ravages, and in less than 3 months he swept the sea clear, chasing the pirates from the Straits of Gibraltar to the coast of Cilicia, where he finally broke their power in the battle of Coracesium. The term of his power was extended, and he now formed a new army, with which he marched through Asia Minor against Mithridates and his allies. Mithridates was defeated in several battles, and driven back into the inaccessible parts of his dominions in Cimmerian Bosphorus, Armenia, Pontus, Syria, and Palestine were conquered. His dealings with Cæsar are told in that article. After the battle of Pharsalia (Aug. 9, 48 B. C.) he fled to Egypt. Sept. 29 he reached that country, descended from the trireme, and was rowed toward the shore, where the Egyptian king stood waiting for him. But when he rose to salute him, he was stabbed from behind by one of his own centurions, then in the service of the king of Egypt; his body was thrown naked on the shore, and his head was sent to Cæsar.

**Pompey's Pillar** (so called) was erected by one Publius, prefect of Egypt, in honor of Diocletian. It stands on an eminence just S. of Alexandria. The total height of the column is 98 ft. 9 inches. It was erected about 296 A. D.

**Ponce de Leon**, pón'tha da la-on' (JUAN), b. in Leon, Sp., about 1460, of an anc. family; became page to Don Fernan, afterward the renowned Ferdinand V.; served in the Moorish wars, and in 1493 sailed with Columbus to Hispaniola, where he was commandant of the E. prov.; in 1509 he conquered Porto Rico; sailed in 1512 in search of the island Bimini with its miraculous fountain of youth; landed (Apr. 8) upon the coast of Fla., whose coasts he explored; went to Sp. 1513, and was named gov. of Fla., which he was directed to conquer and colonize; led in 1514 an expedition against the Caribs, and in 1521 invaded Fla.; was repelled by the Indians, received a wound, and d. in Cuba, 1521.

**Pond** (ENOCH), D. D., b. at Wrentham, Mass., July 29, 1791, grad. at Brown Univ. 1813; studied theol.; was pastor of a Congl. ch. at Auburn, Mass., 1815-25, when he became ed. of the *Spirit of the Pilgrims*, Boston. In 1829 he became prof. of systematic theol. in the sem. at Bangor, Me.; was made pres., prof. of ch. hist., and lecturer on pastoral duties in 1836, and in 1870 pres. and prof. emeritus. Wrote *Pastoral Theol.*, *Chr. Theol.*, *Hist. of God's Ch.*, etc. D. Jan. 21, 1882.

**Pondicherry**, a Fr. settlement in India, on the Coromandel coast, 83 m. S. W. of Madras, in lat. 11° 55' N., comprises an area of 107 sq. m., with 171,217 inhabs. The town of P. is the cap. of all the Fr. possessions in India. Its manufactures of fine cotton cloth and thread are important; but it has no harbor, vessels are compelled to anchor in an open roadstead, and landing is difficult on account of the surf. Pop. 30,000, of whom 4000 are Europeans.

**Poniatowski**, the name of a celebrated princely family of Poland directly descending from the It. family of the Torelli, which settled in Poland in the middle of the 17th century, and closely allied to the Leszczyńskis and Czartoryskis. The most prominent members of the family are (1) STANISLAS AUGUSTUS, the last king of Poland, b. in Lithuania Jan. 17, 1732; ascended the throne in 1764 by the influence of Catharine II.; resigned in 1795, and d. at St. Petersburg Feb. 12, 1798.—(2) JOSEPH ANTONY, b. at Warsaw May 7, 1762, a nephew of the king; entered the Polish army in 1789 as a maj.-gen.; commanded against the Rus. in 1792; fought again in 1794 against Rus. under Kosciuszko; repaired to Vienna in 1795, but returned to Warsaw in 1798. In 1807 he commanded the Polish army against Rus., and when the duchy of Warsaw was established by the Peace of Tilsit he was appointed minister of war. In 1812 he commanded the Polish contingent of the grand army during the Rus. campaign. Shortly before the battle of Leipzig he was made a marshal of Fr., and after the battle he was charged with covering the retreat of the army, but was drowned (Oct. 19, 1813) in crossing the river Elster.

**Pontchartrain, Lake**, of La., about 40 m. in its longest dimension E. and W. and 25 m. N. and S., the S. shore of which is about 5 m. from and nearly parallel to the Miss. River. It is separated by a peninsula of cypress swamp from Lake Maurepas on its W., with which it communicates by the Pass Manchac. One of the numerous outlets of the lake is the Iberville bayou, formerly discharged through Amite River into the latter lake. This was closed as a measure of defence by Jackson in 1815, and there is now no connection between the lakes and the river. New Orleans communicates with the lake by Pontchartrain R. R., almost the earliest in the U. S., and by 2 canals navigable by schooners and smaller craft. These canals have their heads in "basins" in the rear of the city, and do not communicate with the Miss. The lake communicates with Lake Borgne and Mississippi Sound by the passes of the Rigolets and Chef Menteur, through which there is a tidal flow of the salt water. Fts. Pike and Macomb defend these passes. The N. shore of the lakes, a continuation of the "pine-woods" region, is elevated and beautiful. The S. and W. shores are the cypress swamps of the Miss. margins. The Great Northern R. R. from New Orleans, skirting Lake P., threads, through the cypress swamps, the peninsula between the lake and Maurepas—the Mobile R. R., taking the reverse direction, crosses the Chef Menteur and Rigolets, and finally escapes from the swamps and prairies *tremblantes* to the pine woods of the Gulf shore. J. G. BARNARD.



**Pont du Gard**, the remains of one of the most magnificent Rom. structures in Fr. is a bridge 156 ft. high and consisting of 3 tiers of arches, on which the aqueduct which brought the water of the Aure to Nîmes crossed the river Gard 10 m. N. E. of that city.

**Pontiac**, city and R. R. junc., cap. of Livingston co., Ill., 90 m. S. of Chicago, has a State reform school and a coal-mine. Pop. 1870, 1657; 1880, 2242.

**Pontiac**, city and R. R. centre, cap. of Oakland co., Mich., on Clinton River, 20 m. N. W. of Detroit, has a large trade in wool, etc. Pop. 1870, 4867; 1880, 4509; 1884, 5348.

**Pontiac**, a chief of the Ottawa Indians, b. near the river Ottawa in 1720, became an ally of the Fr. in N. Mich., and in 1746 defended Detroit against Indian attacks. In May 1763, 9 garrisons (ranging from W. Pa. to Mackinaw) were destroyed or dispersed on the same day, and the whole frontier was ravaged. The attack on Detroit, led by P. himself, was anticipated by the Eng., but the chief-tain besieged the town May 12-Oct. 12, 1763. In 1766 he was obliged to submit to the Brit. rule. He was murdered at Cahokia, Ill., in 1769.

**Pontifex** [Lat. probably from *pons*, "a bridge," and *facto* "to make," because the pontiffs built and sustained the Sublician bridge at Rome; but perhaps referring to the making of sacrifices upon that bridge], a member of the great coll. of priests in anc. Rome, of whom there were at first 4, beside the P. maximus, their chief, but the number varied, and finally became 15. The name is usually rendered *pontif* in Eng. The duties of the pontifical college were the supervision of religious rites and the execution of certain civil duties, which thereby attained a religious solemnity. The office of pontif was one of great dignity.

**Pontine Marshes** [Lat. *Pontina Paludes*], a tract of marshy ground in the prov. of Rome in It., much resembling in its gen. features the Maremma of Tuscany, but less elevated above the sea. These marshes are generally described as extending from the vicinity of Cisterna S. W. to the sea at Terracina, a distance of about 28 m., with a mean width of little more than 5 m. The slope of the marshes toward their gen. outlet at Terracina is too gentle for the discharge of their waters, and though about  $\frac{1}{2}$  of the surface has been drained and converted into arable land and permanent pastures, it is subject to occasional overflow, and most of it is either a swampy waste or at best capable only of serving as a range for half-wild horses, ordinary domestic quadrupeds, and buffaloes. Both the marshes and the boggy and tangled forest on the low sands which bound them on the S. W. are very unhealthy during the warm season, and the miasmata they exhale are borne by the S. winds even to the city of Rome. They can hardly be said to be inhabited, though there are a few agricultural, pastoral, and police stations upon them, and numbers of hardy mountaineers come down to them to labor at seed-time and harvest. The Romans made many partially successful attempts to drain this terr., but nothing very effectual was accomplished until the last quarter of the 18th century, when Pope Pius VI. brought them nearly to their present state. They now yield to the govt. an annual revenue of about \$18,000.

GEORGE P. MARSH.

**Pontoppidan** (ERIK), b. at Aarhus, Jutland, Den., Aug. 24, 1698, studied theol. at the Univ. of Copenhagen; became prof. in 1738, bp. of Bergen, Nor., in 1747, chancellor of the Univ. of Copenhagen in 1755; wrote *Menoza, Annales Ecclesie Danie*, *Danske Atlas*, etc. D. Dec. 20, 1764.

**Pontus**, the name of a terr. of Asia Minor, extending along the S. coast of Pontus Euxinus or the Black Sea between Cappadocia and Paphlagonia. It belonged alternately to one or the other of these 2 countries. In 66 B. C. it was conquered by Pompey. In A. D. 63 it was made a Rom. prov. The most celebrated of its rulers was Mithridates the Great, under whom it culminated and fell.

**Pontus Euxinus**. See BLACK SEA.

**Pony** [Fr. *poni*], a name applied to the small varieties of the horse. The most famous European ponies are the Shetland, Iceland, Welsh, Dartmoor, Corsican, and Gr. In N. Amer. there are the Canadian, Sable Island, Gay Head, Sea Island, and Mustang.

**Poole** (MATTHEW), b. at York, Eng., 1624, ed. at Emmanuel Coll., Cambridge; took orders in the Ch. of Eng., and became rector of St. Michael-le-Querne, Lond., but was ejected for nonconformity in 1662. Author of numerous works, among which are a compendium of the critical views of 150 biblical commentators, entitled *Synopsis Criticorum*, and of *Annotations upon the Holy Bible*, left unfinished, but completed by eminent nonconformists. D. Oct. 1679.

**Poonah**, town of Brit. India, cap. of a dist. of the same name, in the presidency of Bombay, on the Moota, near its influx in the Moolia, on a dry and treeless plain, 2000 ft. above the sea. The place is considered healthy, and has been made the station of the army of Bombay. The city is well built, and contains many fine barracks, a coll., a prosperous female school, and several other educational insts. Its trade in the raw products of the interior and in manufactured goods from Bombay is considerable. Pop. 129,751.

**Poon Tree**, the *Calophyllum angustifolium* and *C. inophyllum*, a tree of Farther India, used in ship-building. P. spars are famous in the East. The tree is of the order Clusiaceae, and abounds in a resin called tacamahac.

**Poor** (DANIEL), D. D., b. at Danvers, Mass. June 27, 1789, grad. at Dartmouth 1811, at Andover 1814; went to Ceylon as a missionary 1815. D. at Jaffna, Ceylon, Feb. 3, 1855.—His son, DANIEL WARREN POOR, D. D., b. at Jaffna, Ceylon, Aug. 21, 1818, grad. at Amherst in 1837; spent 2 yrs. at Andover; was pastor of the Central (Congl.) ch. at Fairhaven, Mass., 1843-49, of the High st. (Presb.) ch. in Newark, N. J., 1849-69, and of the First Presb. ch. at Oakland, Cal., 1869-72, when he was appointed prof. of ecclesiastical hist. in the San Francisco Theological Sem. In 1876 he was appointed cor. sec. of the Presb. board of education. He received the degree of D. D. from the Coll. of N. J. in 1857.

He has pub. *Select Discourses from the Fr. and Ger.* (with Dr. Fish) and *First Corinthians*, in the Amer. ed. of Lange's *Commentary*, etc. R. D. HIRCOCCK.

**Poore** (BENJAMIN PERLEY), b. at Newbury, Mass., Nov. 2, 1820; learned the printing business; edited the *Southern Whig* at Atlanta, Ga., 1838-40; became an attaché of the U. S. legation in Belg. 1841; made a collection of historical MSS. from the Fr. archives for the State of Mass. 1844-48; travelled in Egypt, Pal., and other E. countries as correspondent of the Boston *Atlas* 1843-48; wrote *The Rise and Fall of Louis Philippe*, *The Life of Gen. Taylor*, *The Early Life of Nap.*, and several novels; became ed. and proprietor of the *Amer. Sentinel*; has lived since 1854 chiefly at Wash. as correspondent of the Boston *Journal*, sec. of the U. S. Agricultural Society, and clerk of Senate committees; edited the vols. of the *Conspiracy Trials* of 1865 and the *Congressional Directory* since 1867.

**Poor Handmaids of Jesus Christ**, a R. Cath. sisterhood founded in 1849 at Dernbach, Ger., by Catharine Caspar, under the auspices of the bp. of Limburg; received papal approbation in 1860 and 1870. Their mother-house in the U. S. is at Ft. Wayne, Ind.

**Pope** [Gr. *papas*; Lat. *papa*], a term applied in the Gr. Ch. to all priests, and originally used in the same manner also in the W. Ch., but in the latter part of the 5th century it began to be applied exclusively to the bp. of Rome, and since the time of Gregory VII. (1073-85) it has become his official title. The supremacy of the pope over the R. Cath. Ch. is nothing but a simple historical development. Not the circumstance of St. Peter being bp. of Rome, which is at least very uncertain, but that of Rome being the capital of the world, gave prominence to its bp. Nevertheless, no supremacy was either claimed or recognized during the 1st, 2d, and 3d centuries, and when, in 343, at the Council of Sardica, the supremacy of the Rom. see over the Chr. Ch. was spoken of for the first time in undisguised terms, the Oriental bps. protested and left the council. Thus from the very beginning the primacy of the Rom. bps. was confined to the Occidental Ch., and the Council of Chalcedon (451) determined that the see of Constantinople should occupy the same rank in the E. Ch. as that of Rome in the W. But originally no power, either secular or spiritual, was connected with this supremacy of rank. Charlemagne treated the pope simply as the first metropolitan, and considered himself the head of the Ch., its patron, and its legislator; and up to the middle of the 11th century the pope remained subordinate to the emp. and the councils. But with Gregory VII. a change took place, and in the course of the 2 following centuries the hierarchical position of the pope became fully developed and firmly established, especially by the exertions of Alexander III. (1159-81), Innocent III. (1198-1216), Gregory IX. (1227-41), Innocent IV. (1243-54), and Boniface VIII. (1294-1303). He was now acknowledged as the vicergerent of Christ on earth and as the highest authority in all matters of faith and discipline. CLEMENS PETERSEN.

**Pope** (ALEXANDER), b. at Lond. May 21, 1688; began writing epics and tragedies when he was 12 yrs. old, and was for some time (about 1704) very busy correcting Wycherley's verses. He followed the famous dramatist "as a dog." But one day Wycherley became a little haughty, and in the same moment P. became "malicious," and the friendship was at an end. In 1709 he pub. his *Pastorals*, written several yrs. before, and almost immediately he was acknowledged as one of the first poets of his age. Then followed the *Essay on Criticism* in 1711, *Rope of the Lock* 1712, *Windsor Forest* 1713, *Temple of Fame* 1715. From 1715 to 1726 he translated the *Iliad* and *Odyssey*, and in 1725 he pub. a new ed. of Shakespeare. The best of all his productions are perhaps the *Dunciad* and the *Essay on Man*. D. May 30, 1744.

**Pope** (JOHN), b. in Prince William co., Va., about 1770; studied law, and practised first in Shelby co., Ky.; afterward settled at Lexington; was many yrs. a member of the State legislature; U. S. Senator 1807-13, pres. *pro tem.* of the Senate 1811, gov. of Ark. Terr. 1829-35, M. C. 1837-43. D. July 12, 1845.

**Pope** (JOHN), b. in Louisville, Ky., Mar. 16, 1823, grad. at W. Pt. 1842, and assigned to the topographical engineers. Prior to 1846 he was engaged in Fla. and in the survey of the N. E. boundary-line between the U. S. and G. Brit.; in the war with Mex. he participated in the battles of Monterey and Buena Vista, gaining the brevets of first lieutenant, and capt.; returning to duty with his corps, for 6 yrs. (1853-59) he conducted the survey of a route for the Pacific R. R.; on light-house duty until the outbreak of c. war. Appointed brig.-gen. of volunteers May 17, 1861, he held important commands in Mo., and in Dec. 1861 surprised a Confed. camp at Milford, which he captured with large supplies, thus forcing the Confed. Gen. Price to S. E. Mo.; in command of the Army of the Miss., in co-operation with Admiral Foote, New Madrid was taken (Mar. 14, 1862). Promoted to be maj.-gen. Mar. 21, 1862, and (Apr. 8) captured Indian No. 10 in Miss. River. Uniting with the armies under Halleck, he participated in the advance upon Corinth, and upon the evacuation of that place (May 30) pursued the Confed. army as far as Baldwin. Called to the E. in June, he was made a brig.-gen. in the regular army (July 14, 1862) and placed in command of the Army of Va., comprising the forces of Fremont, McDowell, and Banks, to which were added those of the Army of the Potomac arriving from the Peninsula of Va. The unsuccessful battle of (the second) Bull Run was fought Aug. 29-30, and (Sept. 1) that of Chantilly; a few days later P. resigned his command, and resumed that of the dept. of the N. W. He has commanded various military divisions and depts. Became maj.-gen. Dec. 11, 1882.

**Popham** (GEORGE), b. in Somersetshire, Eng., about 1550, brother of Sir John Popham, lord chief-justice of the king's bench (b. 1531, d. June 10, 1607), who was one of the patentees, with Sir Ferdinando Gorges, of an extensive terr. in the present State of Me.; sailed from Plymouth, Eng., May 31, 1607, and landed Aug. 15, 1607, at the mouth of Kennebec



or Sagadahoc River, where they built a rude fortification which they named Fort St. George. This was the first Eng. settlement in N. Eng., but Popham having d. Feb. 5, 1608, the colonists became discouraged at the inclemency of the region, and returned to Eng.—Sir FRANCIS POPHAM was a patentee of N. Eng. and M. P. 1620.

**Popish Plot.** See OATES (TITUS).

**Poplar** [*Lat. populus*], properly the name of the trees belonging to the genus *Populus* and order Salicaceae, but popularly and very incorrectly extended to the TULIP TREE (which see) of the U. S. They have a light, white wood, which is now largely used for paper-pulp. The common balsam P., tamarac, or balm of Gilead tree (*P. balsamifera*), produces a copious fragrant resin on its buds. The W. P. are called cottonwood. (See COTTONWOOD TREE.) The abele, or silver-leaf P. of Europe (*P. alba*), is sometimes planted in the U. S., but it has the fault of spreading rapidly by the roots. The Lombardy P. (*P. fastigiata*) is remarkable for the singular upward tendency of its branches.

**Popocatepetl**, po-po-kah-tā-petl' (Aztec, *popoca*, "smoking," and *petl*, "mountain"), a volcano, still smoking, 45 m. S. E. of the city of Mex. It rises 17,784 ft. above the sea, is of conical form, and covered with forests to a height of about 13,000 ft. to the snow line.

**Poppy** [A.-S. *popig*], the common name of the *Papaver* genus of plants of the natural order Papaveraceae. The flower is large and showy, the corolla being generally 4-petaled and the calyx 2-leaved. The P. is an annual or perennial herbaceous plant, and abounds in a milky juice. There are about 30 species, natives of Europe and Asia, most of which are found only in the warm temperate regions. By far the most important species is *P. somniferum*, from which the drug opium is obtained. In Oriental countries it is cultivated for opium, but in Fr. and Ger. principally for a bland fixed oil, *poppy oil*, found in the seeds. This oil exists in the seeds in about the proportion of 40 per cent., is entirely devoid of narcotic properties, and is used extensively for the same purposes as olive oil, which it much resembles. In Eng. there occurs in abundance a species of P. called the red P. or corn-rose (*P. Rhæas*), characterized by a fiery red flower. The scarlet petals of this are used in pharmacy, to impart their brilliant color to mixtures. In Amer. *P. somniferum* has been naturalized, but is cultivated principally as a garden-flower.

**Population** [Lat. *populatio*]. The matter of chief interest on this topic respects the ratio between the increase of P. and the increase of food for its subsistence. The law of reproduction in mankind no doubt tends to increase P. in a geometrical ratio. But there is also in the vegetables and animals on which man feeds a structural provision for increase in a higher geometrical ratio. The industries of civilized society open new treasures of earth, control new forces of nature, and tend always to a production of means of satisfaction even beyond the ever-multiplying desires of an ever-growing people. With free interchange of friendly and commercial intercourse between the nations, we may regard the time to be far off in the indefinite future when the P. of this earth shall be brought up to the full measure of the earth's resources to support human life. These views are confirmed by the following statistics: The number of inhabs. to the sq. m. is, in Belg., the most densely peopled state of Europe, 436; in Eng., which stands next in order of density, it is 389; for the whole of Europe the average is but 71. In Chl. it is estimated at 430 to the sq. m.; the average is 46 for all Asia, and 16 for all of Afr.; the average for the whole U. S. is 11, and for the Amer. continent as a whole, 6 to the sq. m. In Australia there are nearly 2 sq. m. for every inhab.

A. L. CHAPIN.

**Porcelain**, a name applied to the finer varieties of earthenware, composed essentially of silicates of alumina. In the making of true P., however, beside fine pure, white clay—mineralogically, *kaolinite*—a certain proportion of white feldspar is always incorporated before burning.

**Porcelain Clay.** The finer varieties of white clay, after being purified by washing, are so called. Technically, we may define P. C. as those fine white and plastic clays which are free, or almost so, from iron and manganese.

**Porcupine** [It. *porco-spino*—i. e. *porco*, "a pig," and *spino*, "spiny"], a name given to certain rodents of the families Hystrioidæ and Spalacopodidæ, distinguished by the development of spines among the hairs. The forms thus characterized are found in Amer., as well as Asia and Afr., but belong to 2 quite different groups, and their relations in other respects are with forms having hair little more harsh than ordinary mammals. The Old-World species have much stouter spines, and form the family Hystrioidæ, the nearest relatives of which are S. Amer. animals without spines. The S. Amer. P. belong to the family Spalacopodidæ and sub-family Cerculabineæ. The quills of all the P. are nothing but modified and greatly developed spine-like hairs, and almost every grade of hair is exemplified either in the same animal or in representatives of related types. Belonging to the same family with the Amer. P. are numerous genera, some of which have hairs little less robust than the P. The name porcupine has been also extended to the Australian, *Trachyglottis*, a representative of the order of Monotremes.

**Porgy** [*Stenotomus argyrops*, or the *Pagrus argyrops* of Cuvier and old Amer. authors], a species of the family Sparridæ peculiar to the coasts of the Atlantic States. This name is the one given at New York and its vicinity, but it is also known as the scup about Vineyard Sound, etc., scuppaug, bream in R. I. (formerly), and fairmaid on the E. coast of Va. It ranges from the S. side of Cape Cod southward to Cape Florida, at least; on the S. coast it occurs throughout the yr., but is most abundant in June and July, and on the N. coasts is only found in considerable quantities in the summer. It attains not unfrequently a length of 18 inches and a weight of about 4 lbs. or more; this size is reached probably in about 5 or 6 yrs.; the female, however

even in the second yr., has mature eggs. It is highly regarded as food, and is one of the most prominent fishes of the markets of New York, Phila., and the S. coast cities.

**Po'riism** [Gr. *πορισμος*], a name given by anc. geometers to a class of propositions having for their object to show what conditions will render certain problems indeterminate. In order that the solution of a problem may be determinate, there must be as many independent conditions as there are parts to be determined. If, therefore, any supposition can be made on the data of the problem that will cause one of the given conditions to depend upon one or more of the others, the solution will become indeterminate—i. e. the problem will have an infinite number of solutions. The object of the P. is, then, to discover an hypothesis that will make one of the given conditions of a determinate problem dependent upon one or more of the others. [From orig. art. in *J. s' Univ. Cyc.*, by Prof. W. G. PECK, LL.D.]

**Pork** [Fr. *porc*; Lat. *porcus*, a "swine"], the flesh of the domesticated swine, extensively used as an article of food. It is cured either by salting or smoking, and in the latter case is called bacon. The prin. source of the commercial supply of P. is the U. S. The valley of the Miss. produces most of the swine. They are mostly transported alive to large commercial centres like St. Louis, Chicago, Cin., Boston, and Buffalo, and are there killed. The P. is shipped principally to Gr. Brit., Fr., Ger., and the W. I.

**Porphyrius**, b. at Batanea, Syria, about 233 A. D.; received the instruction of Origen at Cæsarea; studied afterward at Athens under Longinus, and finally in Rome under Plotinus, of whom he became a passionate disciple; travelled in Sic. and other countries, but returned subsequently to Rome, where he d. about 305. The most important of his lost productions was his work against Christianity, which was publicly burned by order of Theodosius II. in 448.

**Porphyry** [Gr. *πορφύρεος*, from *πορφυρα*, "purple"], a name applied to various rocks, but correctly to red antique P., a metamorphic mass of uncleavable feldspar, containing crystals of orthoclase or oligoclase, which when polished causes the purplish-gray surface to be spotted with paler patches. Much of the so-called P. is P.-conglomerate, containing pebbles. Diabase P. is hornblende. The name porphyry is often extended to other volcanic and basaltic rocks containing feldspar crystals.

**Porpoise** [It. *porco*, "hog," and *peace*, "fish"], a name given to the small and slender species of the family Delphinidæ and sub-family Delphininæ. The name probably owes its origin to the snuffing noise which the animals make, simulating the grunt of the hog, and which has obtained upon our own coasts the name of "snuffer" and "puffing pig" for the *Phocæna americana*. They are represented by numerous species and several genera.

**Porsenna**, a king of the Etruscan city of Clusium, with whom the Tarquins, when expelled from Rome, sought refuge and aid; is believed to have conquered Rome and occupied it for some time.

**Portia, del'la** (GIAMBATTISTA), b. in Naples about 1540; studied natural science, especially optics; founded in his native city an acad., I Segretti, to which none was admitted unless he had made some discovery in natural philos.; became very famous on account of certain predictions which turned true; was accused of magic, and compelled by the pope to dissolve his acad.; wrote many vols. on natural magic, geom., optics, the human physiognomy, etc.; invented the camera obscura. D. Feb. 4, 1615.

**Portage**, city and R. R. centre, cap. of Columbia co., Wis., on the govt. canal between Fox and Wis. rivers. Pop. 1870, 3945; 1880, 4346.

**Port-au-Prince**, the cap. of Hayti, situated on its W. coast, on the Bay of Gonaives, is an ill-built, filthy, and unhealthy place. A large part of the children of the city grow up without any school education. Coffee, cocoa, mahogany, and Campeachy-wood are exported. Pop. 35,000.

**Port Byron**, N. Y. See APPENDIX.

**Port Chester**, on R. R., Westchester co., N. Y., 25 m. from New York. Pop. 1870, 3797; 1880, 3254.

**Port Clinton**, O. See APPENDIX.

**Port Deposit**, Md. See APPENDIX.

**Porte**, **Ottoman Porte**, or **Sublime Porte** [the "lofty gate," or high gate of the Imperial palace, among the Byzantines, was a seat of justice; also the gates of cities are places for deliberative meetings], names given to the central govt. of Tur. and sultan's court at Constantinople.

**Port Elizabeth**, in a commercial point of view, the most important town of the E. prov. of the Eng. colony of the Cape of Good Hope. It was founded in 1820, is situated on Algoa Bay, in lat. 34° S., and its growth has been steady and rapid. The wool-trade of all the E. dists. of the colony is here concentrated. Pop. 17,968.

**Porter**. See BEER.

**Porter** (ALBERT G.). See APPENDIX.

**Porter** (ALEXANDER J.), b. near Armagh, Ire., in 1786, came to the U. S. in 1801; engaged in mercantile pursuits at Nashville, Tenn.; was admitted to the bar 1807; settled at St. Martinsville, La., 1810; was a member of the convention which formed a State const. 1811; gained prominence as a jurist and politician; became a judge of the supreme court of La. 1821, U. S. Senator 1834-37, again elected in 1843, but declined to accept on account of ill-health. D. Jan. 13, 1844.

**Porter** (ANDREW), b. at Worcester, Pa., Sept. 24, 1745; taught a school at Phila. from 1776 till June 1776, when he accepted from Cong. a commission as capt. of marines; was soon transferred to the artil., and was promoted to a colonelcy at the close of the war; was a com. to survey the boundary-lines of the State 1784-88; became brig.-gen. of State militia 1800, soon afterward maj.-gen.; was appointed surveyor-gen. of Pa. 1809; declined the post of sec. of war tendered him by Madison in 1812. D. Nov. 16, 1813.

**Porter** (AUGUSTUS S.), b. at Canandaigua, N. Y., in 1798, grad. at Union Coll. 1818; studied law, and settled first at Black Rock, N. Y., and afterward removed to Detroit, Mich.,



of which city he was for some yrs. mayor; was afterward elected to the U. S. Senate. D. 1872.

**Porter** (BENJAMIN F.), b. at Charleston, S. C., Sept. 1808; was admitted to the bar at an early age; afterward studied med., which he practised in Ala. until 1830, when he returned to the legal profession; was elected to the Ala. legislature 1832; became reporter of the State 1835; was elected to the bench 1840, but declined, doubting the constitutionality of his election; edited *Ala. Reports*; translated Heineccius's *Elements of the Institutes*; wrote a vol. of *Poems*, and was an orator and a contributor to periodicals.

**Porter** (DAVID), b. at Boston Feb. 1, 1780, served on board a merchant vessel under his father; entered the U. S. N. as mdpn. Apr. 1798; was on board the *Constellation* during her engagement with a Fr. frigate 1799; became a lieut. Oct. 1799; was wounded in an action with pirates on the coast of Santo Domingo Jan. 1800; took part in the naval war upon Tripoli 1801-06; was captured in the Philadelphia Oct. 1803, and held for 18 months a prisoner; was given command of the frigate *Essex* (32 guns) in 1812; captured the *Alert*, the first man-of-war taken from the Brit.; made several other prizes; sailed to the Pacific Jan. 1813; captured several whalers and trading vessels, but was himself captured in the harbor of Valparaiso Mar. 28, 1814, by 2 Brit. vessels; wrote a *Journal of the Cruise of the Essex*; was a navy com. 1815-23; commanded an expedition against W. I. pirates 1824; was court-martialed and suspended for 6 months in 1825 for disobedience of orders in a difficulty with the Sp. authorities of Puerto Rico; resigned his commission Aug. 18, 1826, and accepted the command of the Mex. navy; consul to Algiers 1829, *chargé d'affaires* to Tur. 1830; afterward minister resident, and negotiated several treaties with the Porte. D. at Pera, near Constantinople, Mar. 28, 1843.

**Porter** (DAVID DIXON), son of the preceding, b. in Pa. June 8, 1814. His father, having accepted the position of commander-in-chief of the naval forces of Mex. during her war with Sp., obtained an appointment for his son as mdpn. in the Mex. navy, and sent him to sea in the *Guerrero*, a 22-gun brig, commanded by his nephew, David H. Porter. The *Guerrero* sailed from Vera Cruz Apr. 17, 1827, and a few weeks thereafter fell in with the Sp. frigate *La Lealtad*, 64 guns. Finding it impossible to get away from the frigate, Capt. Porter gave battle, and maintained the unequal fight for nearly 4 hours, not striking his colors until the brig was filled with the dead and dying and her spars and sails so torn to pieces as to make her unmanageable. As soon as the Spaniards saw the Mex. flag come down they ran down to the *Guerrero*, delivering 2 heavy broadsides when within 100 yards. Capt. Porter was cut in two by a round shot, and his remains, instead of being interred with military honors, were thrown overboard in plain view of the land. Two yrs. after this David D. Porter entered our navy as mdpn., and as a lieut. 18 yrs. later was actively engaged in all the operations of our navy on the E. coast of Mex. When the c. war broke out, P. than a commander, was despatched in the *Powhatan* to the relief of Ft. Pickens, Fla. This accomplished, he went to work fitting out a mortar flotilla for the reduction of the forts guarding the approaches to New Orleans by the lower Miss. After the fall of New Orleans the mortar flotilla was actively engaged at Vicksburg, and in the fall of 1862 P. was placed in command of all the naval forces on the W. rivers above New Orleans, with the rank of rear-admiral. His ability was now exhibited not only in the battles which he fought, but also in the creation of a formidable fleet out of river-steamboats. In 1864 he was transferred to the Atlantic coast to command the naval forces destined to operate against the defenses of Wilmington, N. C., which resulted in the capture of Ft. Fisher Jan. 15, 1865. In 1866 he was made vice-admiral, and appointed supt. of the Naval Acad. On the origin of Farragut (in 1870) he became admiral. [From orig. art. in *J.'s Univ. Cyc.*, by Com. FOXHALL A. PARKER.]

**Porter** (DAVID R.), son of Andrew, b. in Pa. in 1788, became a lawyer; was frequently a member of both houses of the legislature; became an iron manufacturer, and was gov. of Pa. 1839-45. D. Aug. 6, 1867.

**Porter** (EBENEZER), D. D., son of Thomas, b. at Cornwall, Conn., Oct. 5, 1773; removed in 1779, with his father, to Thimouth, Vt.; grad. at Dartmouth 1792; became in 1796 pastor of the Congl. ch., Washington, Conn.; in 1812 prof. of sacred rhetoric, and in 1827 pres. of Andover Theological Sem. Author of *Young Preacher's Manual* and a series of works on sacred rhetoric, etc., and compiler of the *Rhetorical Reader*. D. Apr. 8, 1894.

**Porter** (ELIPHALET), D. D., b. at N. Bridgewater, Mass., June 11, 1758, grad. at Harvard 1777; studied theol. with his father, Rev. John Porter, who was minister at N. Bridgewater from 1740 to 1802; was ordained pastor of the Congl. ch. at Roxbury Oct. 2, 1782, and filled that post until his death. Author of a *Eulogy on Washington*, etc.; was a member of the Amer. Acad. of Arts and Sciences. D. Dec. 7, 1833.

**Porter** (FRITZ JOHN), b. at Portsmouth, N. H., Aug. 30, 1822, grad. at W. Pt. 1845; served through the war with Mex., being wounded at the assault of the capital Sept. 13, 1847; brevet capt. and major for gallantry at Molino del Rey and Chapultepec. From 1849 to 1855 he was stationed at W. Pt. as instructor of artill. and cav., and was for a yr. adjutant of the post. Transferred to the adjutant-gen.'s dept., with the rank of brevet capt. June 1856, he served at various points, being (1857-60) assistant adjutant-gen. of the U. S. expedition. He was appointed col. of the 15th Inf. May 14, 1861, and 3 days later brig.-gen. of volunteers, and served as chief of staff with Gen. Patterson and Gen. Banks until Aug. 1861, when he was assigned to the command of a division in the defenses of Wash. In the Va. Peninsular campaign he was director of the siege of Yorktown, and upon the evacuation of that place was placed in command of the 5th corps, and fought the battles of Hanover C.-H., Mechanicsville, and Cold Harbor; at Malvern Hill he was in command, and his corps mainly resisted the assaults of that day. In the

second battle of Bull Run his corps suffered severely on Aug. 30, but was not engaged on the 29th, other than by holding the enemy in check and preventing them turning Pope's left. He received no orders to attack till too late to be executed. Continuing in command of his corps, he was present at Antietam, but in Nov. was arraigned before a court-martial on the charge of disobedience of orders, and on Jan. 21, 1863, was cashiered. A new trial was granted to him in 1878, and the court recommended that the former conviction should be reversed, and he be restored to his position in the U. S. A. A portion of the sentence which prohibited holding office was remitted by Pres. Arthur in 1882.

**Porter** (GEORGE B.), son of Andrew, b. at Lancaster, Pa., in 1790; became a lawyer; was appointed gov. of Mich. Terr. 1831, and while holding that office d. July 6, 1834.

**Porter** (JAMES DAVIS), b. at Paris, Tenn., Dec. 7, 1828, grad. at the Univ. of Nashville 1846; was a member of the legislature of Tenn. 1859-60; adjutant-gen. of Cheatham's Confed. division; elected judge of a circuit of Tenn. 1871; resigned 1874, and was inaugurated gov. 1875. Became U. S. assistant sec. of state 1885.

**Porter** (JAMES MADISON), son of Andrew, b. at Selma, Pa., Jan. 6, 1798, was ed. for the bar; served as a volunteer in the war of 1812; was a member of the Pa. constitutional convention of 1838; appointed sec. of war by Pres. Tyler 1843, but was rejected by the Senate; one of the founders of Lafayette Coll. at Easton, pres. of its board of trustees 25 yrs., and served at different times as pres. judge of 2 judicial dists. D. Nov. 11, 1862.

**Porter** (JANE), b. at Durham, Eng., in 1776, daughter of an army surgeon, who died during her childhood. Wrote *Thaddeus of Warsaw, Scottish Chiefs, Duke Christian of Lunenburg, or Traditions from the Harz*, etc. D. May 24, 1850.

**Porter** (JOHN ADDISON), M. D., b. at Catskill, N. Y., Mar. 15, 1822, grad. at Yale in 1842; became prof. of rhetoric and modern langs. in Delaware Coll.; went in 1847 to Glissen and studied chem. with Liebig; prof. of chem. applied to the arts in Brown Univ. 1850-52; held chemical professorships in Yale 1852-64. Author of 2 chemical text-books and of several scientific papers; edited the *Conn. War Record*; translated parts of the *Kalevala*. D. Aug. 25, 1866.

**Porter** (NOAH), D. D., LL.D., b. at Farmington, Conn., Dec. 14, 1811, son of Noah Porter, D. D., minister of Farmington for nearly 60 yrs. (b. 1781, d. 1866); grad. at Yale 1831; master of Hopkins grammar school at New Haven 1831-33; tutor at Yale 1833-35, pursuing theological studies at same time; became pastor of Congl. ch. New Milford, Conn., 1836; settled at Springfield, Mass., 1843; chosen Clark prof. of metaphysics and moral philos. at Yale 1846; spent a yr. (1853-54) in Europe, chiefly in Ger., where he made a close study of modern Ger. philos., and was elected pres. of Yale on the resignation of Dr. Woolsey in 1871. Author of an *Historical Discourse*, delivered at Farmington Nov. 4, 1840, in commemoration of the 200th anniversary of the settlement of that town; a prize essay on *The Educational Systems of the Puritans and the Jesuits compared, The Human Intellect, with an Introduction upon Psychology and the Soul, Books and Reading, Amer. Colls. and the Amer. Public, Elements of Intellectual Philos., and The Science of Nature versus the Science of Man*. He was the prin. ed. of the revised edition of *Webster's Dict.*, and has contributed to religious and literary reviews and periodicals. Wrote *Elements of Moral Science*.

**Porter** (PETER BUEL), b. at Salisbury, Conn., Aug. 14, 1773, grad. at Yale 1791; studied law at the Litchfield Law School, and settled at Canandaigua, N. Y., but soon removed to Black Rock, where and at Niagara Falls he, in connection with his brother, had acquired large possessions. He was elected to Cong. in 1808, re-elected in 1810, and the yr. following prepared the report recommending war with G. Brit.; resigned his seat in Cong., refused a gen.'s commission in the regular army, was made quartermaster-gen. of N. Y., and not long afterward received the command of the Pa. and N. Y. volunteers and a body of Indians of the Six Nations. In June 1813, after Buffalo and Black Rock (where he lived) had fallen into the hands of the Brit., his own house was made their head-quarters; he rallied a force and drove them back to Canada. Holding a command in Smythe's "army of invasion," he was twice permitted to embark to lead the van of the army into Canada, and each time recalled before reaching its shore. Some remarks on this course ended in a duel with Gen. Smythe. In the summer of 1814, with his brigade, he joined the army under Gen. Brown, which was again to undertake an advance into Canada. He exhibited great gallantry at Chippewa, and at Lundy's Lane his brigade fell upon the right flank of the Brit., securing victory in the most sanguinary battle of the war. Besieged with the army under Gen. Gaines at Ft. Erie, he planned and led the sortie of Sept. 17, the only instance in hist. where a besieging army was entirely broken up and routed by a single sortie. Passing with part of his staff from one column to another, he suddenly came upon a party of about 70 Brit. soldiers. Ordering them to surrender, he advanced boldly and disarmed them. In acknowledgment of his services in this war the city of New York presented P. with the freedom of the city in a gold box, the State of N. Y. voted him a sword, and the thanks of the Cong. of the U. S., with a gold medal struck to commemorate the campaign of 1814, were presented to the 5 gens. who had most distinguished themselves—Brown, Scott, Ripley, Gaines, and Porter. He was appointed in 1816 by Madison a com. under the treaty to settle the boundary-line between Canada and the U. S. An early projector of the Erie Canal, he with Morris and Clinton constituted the first board of coms. for selecting its route. In 1828 he was appointed sec. of war, holding the office to the end of Adams's administration. D. 1844. [From orig. art. in *J.'s Univ. Cyc.*, by G. W. HOLLEY.]

**Porter** (THOMAS), b. at Cornwall, Conn., May 1734, served in the Fr. war at Lake George 1755; became a member of the Conn. legislature; took an active part in the public



concerns of the Revolution: removed to Tinnmouth, Vt., 1779; was for 10 yrs. a judge of the supreme and co. courts of Vt., and served 35 yrs. in the legislatures of Conn. and Vt., D. Aug. 1833.

**Port Gibson**, cap. of Claiborne co., Miss., on R. R. and Bayou Pierre, 8 m. from Miss. River, has a collegiate acad. Pop. 1870, 1088; 1880, pop. not given.

**Port Henry**, Essex co., N. Y., on R. R. and Lake Champlain, has several iron-mines and iron-furnaces. Pop. not given in the census of 1880.

**Port Hudson**, on R. R., E. Feliciana parish, La., and on the left bank of the Miss. Pop. not given in the census of 1880. P. H. stands on a high bluff at a sharp bend of the river. Confed. batteries, heavily mounted, well protected, and strongly manned, had been erected along the bluffs for a distance of about 3 m., completely commanding the river. The Union fleet under Farragut made an unsuccessful attempt to pass these batteries on the night of Mar. 13-14, 1863. The place was invested by Gen. Banks May 24, 1863, and a gen. assault was made May 27, which was repulsed, the Union loss being 1843 killed and wounded; the Confed. loss was not more than 300. Another unsuccessful attempt was made June 11. An effort to carry the works by storm June 14 was repulsed, with a Union loss of about 700. On July 7 tidings were received that Vicksburg had fallen 3 days before, and negotiations for the surrender of P. H. were at once opened. The surrender was made July 9. There were 6408 prisoners of war; 51 guns, 5000 small arms, much ammunition, and 2 steamers were also captured. The siege had lasted 45 days. The entire Union loss was about 3000 men; the Confed. loss about 800, exclusive of prisoners. The capture of P. H. opened the entire course of the Miss.

**Port Huron**, city, R. R. centre, and port of entry, cap. of St. Clair co., Mich., at the foot of Lake Huron; engaged in lumber trade. Pop. 1880, 8883; 1884, 10,300.

**Port Jervis**, R. R. junc., Orange co., N. Y., on the Del. and Hudson Canal, at the confluence of the Neversink with the Del., and at the intersection of the boundary-lines of N. Y., N. J., and Pa. Pop. 1870, 6377; 1880, 8678.

**Portland**, Middlesex co., Conn., on R. R. and Conn. River, nearly opposite Middletown, noted for "Portland quarries" of brown sandstone. Pop. 1870, 4693; 1880, 4157.

**Portland**, R. R. centre, cap. of Jay co., Ind., on Salamonie River; has lumber trade. Pop. 1870, 402; 1880, 1694.

**Portland**, an important R. R. and commercial centre, cap. of Cumberland co., is the largest city in Me., and compactly built upon a small peninsula jutting into Casco Bay, in lat. 43° 40' N., lon. 70° 13' W.; area, 1668 acres. The entrance to the harbor is defended by Fts. Preble, Scammel, and Gorges.

**Schools and Libraries.**—The public schools fit students for coll., for teaching, or for commercial business. The expenditure for these schools in 1881-82 was \$76,207. The Portland Med. School offers the advantage of clinical instruction at the Me. Gen. Hospital. The public library contains 28,000 vols., and the library of the Me. Historical Society 9000 vols. The Greenleaf Law Library is a valuable collection of reports and early text-books. The Society of Nat. Hist. and the Maine Charitable Mechanic Association have valuable libraries.

**Commerce and Finances.**—The harbor is accessible without a pilot in all weathers, and the place was chiefly concerned at first in the fisheries and in the W. I. trade. The refining of sugars was a natural outgrowth of the W. I. trade. As R. Rs. began to affect the conditions of land traffic, P. became the gateway for the business of Me., securing connection by rail with Boston in 1842, and with Montreal in 1853. The railway system, as now perfected and supplemented by steamboat lines, makes P. the centre of a large trade with all parts of Me., N. H., Vt., and the maritime Brit. provs. P. is also the winter port of the ocean steamers connecting with the Grand Trunk Railway at Montreal in summer. Value of imports in 1882, \$11,009,637; exports, \$11,330,184. The city debt was \$3,382,178 in Mar. 1882; taxable valuation at the same time, \$32,642,755.

**History.**—The Indian name of the place was *Machigonne*; settled by whites in 1632; settlement destroyed by Indians in 1676, and again by Fr. and Indians in 1690. In 1718 included in the town of Falmouth, and known as Falmouth Neck; in 1735 Falmouth became half shire-town of York co., then covering what is now the entire State; in 1760 Cumberland co. was set off, and Falmouth became its cap.; pop. in 1774, about 1900. In 1775 the v. was bombarded and burned by a Brit. fleet commanded by Capt. Mowatt. The Neck was incorporated as the town of Portland in 1786, and adopted a city charter in 1822. In 1866 a third part of the city was destroyed by fire, but has been rebuilt. Pop. 1870, 31,413; 1880, 39,810.

**Portland**, on R. R., Ionia co., Mich., 110 m. W. of Detroit, has fine water-power. Pop. 1870, 1060; 1880, 1670.

**Portland**, city and R. R. centre, cap. of Multnomah co., Or., on the W. bank of Willamette River, 12 m. above its confluence with the Columbia, at the head of ship-navigation; has an Epls. gram. and divinity school, and 2 R. Cath. acads. Laid out in 1845, P. was incorporated as a city 1851. It is connected by ferries with city of E. Portland; pop. in 1880, 2334. Pop. of P. 1870, 8293; 1880, 17,577.

**Portland Beds**, in the Brit. Upper Oolite, is the name (1) of a stratum resting on the Shotover sandstone, and (2) of a dirt-bed in the Lower Purbeck, lying over the former and associated with fresh-water marls. Fishes, mollusks, marsupials, and Insectivores have left their remains in these strata. The Portland stone is from these and the overlying strata. The best is from the lowest beds.

**Portland, Isle of**, also called, from its shape, the **Bill of Portland**, a peninsula projecting into the Eng. Channel from the coast of Dorsetshire, Eng.; rises 458 ft., is connected with the mainland by a ridge of loose shingle, the Chesil Bank, and is noted for its quarries of excellent building-stone, its fine breed of sheep, the old castle, erected

by Henry VIII.; the magnificent breakwater, its prisons, capable of accommodating 1500 convicts, etc.

**Portland (or Barberini) Vase**, a cinerary urn of blue glass covered with an enamel of white glass, and out in cameo, so as to show a finely artistic group of the wedding of Thetis and Peleus. It once held the ashes of a relative of the emp. Alexander Severus. It dates from the 3d century A. D. It was found in the 16th century in a rich sarcophagus on Monte del Grano, and was placed in Barberini Palace. In 1810 it was placed in the Brit. Museum.

**Port Louis**, cap. of the Eng. colony of Mauritius, on the N. W. coast of the island. It is well built and strongly fortified, has a good harbor, barracks, a public library, a theatre, and a botanic garden, and forms the centre of the commerce of the colony. Pop. 68,000.

**Porto Rico**, por'to ree'ko, an island in the W. I., one of the Greater Antilles, belongs to Sp., and comprises an area of 3550 sq. m. From W. to E. the island is traversed by a range of mts. whose average height is 1500 ft., but which in some peaks reach a height of above 3000 ft. In some places these mts. approach very near to the sea, but generally they leave a belt of low coast-land from 5 to 10 m. broad and consisting of rich alluvial soil. Numerous short rivers flow out from among the mts. and form lagoons along the coast, but most of them are navigable to the foot of the mts., and the island has many good harbors. The climate is hot, but not unhealthy. Water is abundant, and the vegetation is very rich. Forests of tropical density cover the mts., and rice, maize, sugar, cotton, and coffee are extensively cultivated. Many cattle are reared, and of a good breed. Copper, iron, lead, coal, and salt works are in operation; gold is found. Pop. 731,648. Cap. Porto Rico.

**Portrait-Painting**, or (that we may include sculpture as well as painting) **Portraiture**. Until Mariette's discovery in Lower Egypt of portrait-statues belonging to the third dynasty (b. c. 4449) we had a right to believe the art of portraiture to be of recent origin. Coming down to historic times, perhaps the earliest portraits of which we have any mention are those Apelles made of Alexander and Antigonus. We have but little record of the subsequent hist. of portraiture in Gr. The Romans had a great liking for portraits, and of all the marbles left us from Rom. times, a goodly share are busts or statues. The revival of painting in It. in the 13th century was exclusively in the interests of the Ch., but even Giotto introduced portraits of his contemporaries into his religious pictures, and his example was followed by almost every succeeding It. artist. It was late before portraits were painted as separate pictures. Raphael and his contemporaries, with their immediate successors, brought the art to its full perfection. In Sp. Velasquez is the greatest name. N. of the Alps, Van Eyck, Cranach, Dürer, Holbein, Rubens, Franz Hals, and Rembrandt distinguished themselves in portraiture. In Fr. no native-born portrait-painter of any distinction appeared until the 18th century.

In Eng. Holbein may be said to have created P.-P.: he had many imitators, some of them most skillful, yet she welcomed good painters from other lands. In Mary's time Antonio Moro came from Utrecht, and in Elizabeth's reign Federigo Zuechero, an It., was in vogue. A Dut. painter, Lucas de Heere, also found employment. Later were the 2 Oliveris, of Fr. extraction; they were miniature-painters, and contemporary with them was Nicholas Hilliard, one of the first Englishmen by birth who gained distinction in the art. The brief visit of Rubens gave, after Holbein, the second great impetus to the art of P.-P. in Eng. He was followed by his great pupil, Van Dyck, who became for Eng. a standard of excellence in portraiture. Contemporary with him was George Jameson, who had studied with Rubens, and who enjoyed in his own day a reputation second only to that of Van Dyck. The next name of repute is that of Samuel Cooper, a miniature-painter, b. in Eng. Peter Lely, a Westphalian, came to Eng. and established himself as a portrait-painter. Cornelis Jansen of Leyden, a good painter, came over in 1618. While Lely was flourishing, Gottfried Kneller, a native of Lubeck, arrived; he had already gained some distinction in Europe, and met with great success in Eng. With the appearance of Sir Joshua Reynolds (1723-92) began a new and more fruitful period, the third important influence affecting the growth of painting, and particularly of P.-P., in Eng.; and from his time to the present the hist. of Eng. portraiture has never wanted for splendid names.

The modern Fr. school began with David (1748-1825). Fr. has, however, never had a great artist whose name is identified exclusively with P.-P. Yet Gérard (1770-1837) made many interesting portraits, and those of Ingres (1781-1867) must surely outlive all but 2 or 3 of the imaginative compositions on which he thought to build his fame. Within a few yrs. P.-P. in Fr., as in Eng., has been taken up by some of the foremost men, and in the Royal Acad. exhibitions the portraits by Holman Hunt, Watts, and Millais are looked for with the same interest that attends their other works.

In Amer. the art of portraiture properly begins with Copley, b. in Boston in 1773, but who went to Eng. in 1774, when he was 37, and remained there the rest of his life, dying in 1815. He was followed by John Trumbull, who deserves to be remembered for his miniatures. Another excellent miniature-painter was Malbone. The next most distinguished name to Copley is, however, that of Gilbert Stuart (1756-1828). Other notable names, bringing us down to our own time, are Leslie, Sully, Inman, Harding, Healy, Elliot, Baker, Huntington, Page, and Furness.

CLARENCE COOK.

**Port Richmond**, Richmond co., N. Y., on N. side of Staten Island and on Kill von Kull River, 8 m. S. W. of New York, with which it has hourly connection by steamer; was incorporated as a v. 1866. Pop. 1870, 3028; 1880, 3561.

**Port Royal** (or, more properly, **Port Royal des Champs**), founded in 1204 by Matthieu de Montmorency at Chevreuse, near Versailles, as a monastery for Bernar-



dine or Cistercian nuns. In the course of time it became noted as an educational inst., but at the same time it lost to some degree its religious character. In the beginning of the 17th century the abbess, Mère Marie Angélique, revived the old religious discipline. She was a sister of Antoine Arnauld, the ardent disciple of Jansen, and thus the monastery became Jansenistic. It flourished, and the number of nuns increased rapidly. In 1625 Hôtel de Clugny, in Faubourg de St. Jacques, Paris, was bought, and a branch inst. was founded here under the title of Port Royal de Paris, and in 1626 a new and extended abbey was erected at P. R. des Champs. Meanwhile a number of pious and learned men had established themselves at a farm-house near P. R. des Champs, called Les Granges; and when the nuns moved to the new abbey they were allowed to occupy the old place under the immediate jurisdiction of the abp. of Paris. They were all Jansenists, and soon P. R. became famous as the centre of the whole Jansenistic movement and the focus of the opposition to the Jesuits. But in 1664 the community was scattered by force; in 1669 the 2 monasteries, P. R. des Champs and P. R. de Paris, were separated, and the latter re-organized under the influence of the Jesuits; and when the nuns of P. R. des Champs still refused to subscribe to the papal condemnation of Jansen, they were dispersed in 1709, and imprisoned in various other monasteries of Fr., and the buildings of their abbey levelled to the ground. (See *SAINT-BEVIS, Port Royal*.)

**Port Royal**, on R. R., Beaufort co., S. C., noted for one of the earliest settlements made by the Spaniards within the present limits of the U. S. and for important events during the c. war. The harbor is one of the finest in the world. Pop. 1880, 387.

**Port Said**, sah-ee'd', town of Egypt, at the junction of the Suez Canal with the Mediterranean, was in 1862 an insignificant village, but had, in 1881, 13,294 inhabs., and its harbor, formed by 2 immense moles, is annually visited by over 1000 vessels.

**Portsmouth**, town of Eng., county of Hants, on the small island of Portsea, which is separated on the N. from the mainland by a narrow strait crossed by a bridge, is situated at the entrance of an inlet of the Eng. Channel, 4 m. long, 5 m. broad, but only 220 yards across its entrance, and affording convenient and perfectly secure anchorage. P., like Plymouth, is a triple town, consisting of P. proper, Portsea, adjoining on the N., and Gosport, the latter on the opposite side of the harbor, communicating by a flying bridge. The dockyard is the most important establishment of that description in the United Kingdom. The Royal Clarence victualling yard is now removed to Gosport. Plymouth and Portsea are encircled by a fortified *enceinte* of the last century. The modern exigencies of defence have removed the perimeter of defence to a chain of works built on modern types from 3 to 5 m. distant, and including in its length the crest of the commanding Portsdown Hill. Closely associated with P. as a naval depot, and with its defense from maritime attack, is the important anchorage of Spithead. Pop. 127,953.

**Portsmouth**, city, port of entry, and R. R. centre, cap. of Rockingham co., N. H., on the right bank of Piscataqua River, 8½ m. from the sea; was incorporated as a city 1849, and is the only seaport in the State. Its harbor is one of the best in the U. S., 40 ft. deep at the entrance at low tide, with a mean rise and fall of 8½ ft., and never freezing. Principal business, commerce and ship-building. It has 2 libraries of about 14,000 vols., a mineralogical cabinet, and a fine custom-house. The U. S. navy-yard, about ½ m. distant, is built upon 2 islands lying on the Kittery side of the river, and comprises 170 acres. Though in Me., it is intimately connected with P., and is commonly known as Portsmouth navy-yard. Pop. 1870, 9211; 1880, 9690.

**Portsmouth**, city and R. R. centre, cap. of Scioto co., O., at the confluence of Scioto River with the Ohio, and at the S. terminus of Ohio and Erie Canal, is the shipping-point for the mineral regions of S. O. and N. E. Ky., and for the fertile valley of the Scioto. Pop. 1870, 10,592; 1880, 11,321.

**Portsmouth**, city and port of entry, cap. of Norfolk co., Va., on R. R. and E. bank of Elizabeth River, opposite Norfolk, with which it is connected by ferry, has one of the best harbors in the U. S., is the seat of Gosport navy-yard, of a dry dock, and naval hospital, and has steamers to the prin. Atlantic seaports. Pop. 1870, 10,492; 1880, 11,390.

**Port Townsend**, W. T. See APPENDIX.

**Portugal** [from *Portus Cale*, the anc. name of the city of Oporto], an independent kingdom of Europe, occupying the W. part of the Iberian peninsula, and bounded N. and E. by Sp., S. and W. by the Atlantic, comprises an area of 96,510 sq. m., with a pop. of 4,160,315. The Azores and the islands of Madeira and Porto Santo are directly connected with the kingdom with respect to their administration. The colonial possessions in Afr. and Asia comprise an area of 709,495 sq. m., with 3,333,700 inhabs., and consist—in Afr., of Cape Verd Islands, São Thomé and Príncipe Islands, several points in Senegambia, Angola, and Benguela (312,509 sq. m.; pop. 2,000,000), Mozambique, and Sofala (382,683 sq. m.; pop. 300,000); and in Asia, of Goa, Salsette, Damann, Macao, and Timor (7160 sq. m.; pop. 849,553). The surface is in all its prin. features simply a continuation of Sp., and will be described there. The climate is milder than that of Sp., the severe cold with snow being unknown except in the N. mt. dists. Extensive forests of oak, elm, ash, pine, and chest-plantations of cork trees and date-palms; in the central, fig, peach, walnut, and almond are raised throughout the whole country, and are of excellent quality. The prin. cereals are wheat, rye, maize, and rice, but agriculture is in a very backward state, and the produce is barely enough to satisfy home demands. The cultivation of the olive tree and the vine is carried on with more care, and yields a consider-

able quantity for exportation. The most important vineyards of P. are situated in the valley of the Douro. The finest breed of cattle is reared in the N. provinces, of sheep in Beira, of horses in Alentejo. Mules and asses are generally used as beasts of burden. Goats and pigs are very numerous, especially in the mt. dists.; bees and silk-worms are also extensively reared. The commerce and manufacturing industry, although steadily progressing, are still only little developed. Some cotton, wool, silk, paper, glass, and soap factories are in operation, and manufactures of earthenware, chemicals, hats, lace, copper, tin, and wicker ware are carried on. The foreign trade is principally with G. Brit., though also to some extent with Brazil and Fr.

P. was originally inhabited by Celtic and Iberian tribes. In the 2d century before our era it was conquered by the Romans, and made a prov. under the name of *Lusitania*. But at the close of the 11th century Alfonso V., king of Leon and Castile, conquered the region between the Minho and the Douro from the Moors, and gave it to his son-in-law, Henry, about 1095; and from this point begins the national hist. of the Port. Henry called himself count of Port., transferring the name from his cap., Porto Cale, to his whole dominion and his son Alfonso assumed the title of king on the battle-field of Ourique in 1139, having defeated the Moors and extended his possessions to the Tagus. In 1253 the kingdom comprised nearly the same area as to-day. The most brilliant period of its hist. was in the 15th and 16th centuries, when the Port. occupied a prominent place among the European nations on account of their scientific knowledge, their practical enterprise, and their wealth. Prince Henry the Navigator (1394-1480) awakened that enthusiasm for the study of geog., astron., navigation, etc. and started the series of maritime explorations, which finally led to the discovery of Amer. In 1480 Porto Santo, and in 1421 Madeira, were discovered by Tristram Vaz, and soon after colonized. In 1445 Dinis Diaz passed Cape Verde, in 1486 Bartolomeu Diaz doubled the Cape of Good Hope, in 1497 Vasco da Gama found the way S. of Afr. to India; Goa, Ceylon, the Moluccas, etc. were conquered, and at the riches of India began to flow into the harbors of P. In 1500 Cabral discovered Brazil and took possession of it, and for more than half a century P. occupied the position of a grand power in the political system of Europe; Lisbon was at this time the centre of the commerce of the world. But under John III. (1521-57) the Jesuits came into the country with the Inquisition, and they soon succeeded in burying the energy of the people under dull superstition. The country was once more rapidly advancing toward prosperity under the energetic govt. of Pombal, but under the long reign of Maria I. (1777-1816) the Jesuits again succeeded in plunging it into misery. Its close alliance with Eng. implicated it in the wars with Nap., and Nov. 24, 1807, the royal family fled to Brazil. The Eng. succeeded in re-establishing the dynasty by the Treaty of Cintra, Aug. 30, 1808, but the country had to pay very dear; its finances were loaded down with debt, and its commerce and industry were much impeded by monopolies held by Lond. merchants. John VI. (1816-26) returned in 1821 from Brazil, but before he landed in P. he was compelled to sign a liberal const. July 3. In 1822 Brazil was separated from P. and acknowledged as an independent state under his son Dom Pedro. He was succeeded by Maria II. (1826-53; see MIGUEL, DOM), Pedro V. (1853-61), and Louis I., the present king.

CLEMENS PETERSEN.

**Portuguese Language and Literature.** The P. lang. is a branch of the *lingua Romana rustica*, with a strong infusion of Arabic terms, derived from the time of Moorish domination, and a considerable admixture of Teutonic, brought by the early Sævic and Burgundian conquerors, and is closely connected with the Gallician dialect of Sp., with which it was originally identical. The national lit. of Port. has suffered from the constant tendency of native writers to employ the Sp. and more recently the Fr.) lang.; and had the subjection of Port. to Sp. by Philip II. (1580-1640) been permanent, P. would doubtless have ceased to exist. The inveterate political enmity of the P. to the Spaniard has, however, preserved the national lang. The P. lang. assumed a distinct form in the 11th century, but the earliest existing specimens date from the beginning of the 13th century. The P. kings of the Burgundian dynasty fostered the beginnings of the national poetry, several of them being themselves poets, especially Dionysius or Diniz (1279-1325), by whom a *cancioneiro* or song-book was compiled. The celebrated romance *Amadís de Gaul*, by Vasco de Lobeira, was among the first prose compositions. In the 15th century hist. in the form of chronicle began to flourish, the most eminent author being Fernão Lopes. In the 16th century Damião de Goes wrote a learned *Chronicle of King Emanuel*, João de Barros produced his classic *Ásia Portuguesa*, Alfonso d'Albuquerque his *Commentaries*, Lopes de Castanheda wrote his valuable hist. of the discovery of the Indies, and the traveller Fernão Mendes-Pinto produced the celebrated *Peregrinação*. During the same century, which is the golden age of P. lit., Bernardino Ribeiro wrote his famous romance, *Menina e Moça*, and founded the pastoral and romantic school of poetry, which was soon adorned by the writings of Christovão Falcão Sa de Miranda, Pedro de Caminha, Diego Bernardes, Rodrigues Lobo, and Jeronimo Cortereal. About the middle of the century Antonio Ferreira, in his *Ines de Castro*, produced a tragedy before any theatre existed in Sp. He was quickly followed by Gil Vicente. The greatest name in P. lit. is Luiz de Camoens (1524-79), author of the immortal epic *Os Lusíadas*, which has forever determined the literary form of the lang. The close of the 16th and beginning of the 17th century was a period of literary as well as political eclipse, illustrated only by the names of Pereira de Castro, Sa y Menezes, Faria e Sousa, Barbosa Bacellar, and Jacinto Freire de Andrada, author of the admired *Vida de João de Castro*. Toward the close of the 17th century Father Antonio Vieira



produced his remarkable sermons. The *Bibliotheca Lusitana* of Diego Barbosa Machado gave the literary hist., bibliography, and biography, down to 1750. The greatest names of the latter half of the 18th century were the lyric poets Francisco Manoel do Nascimento and Manoel Barbosa de Boccage, and the distinctively modern school of P. lit. dates from the epic and romantic poet Agostinho de Macedo. The leading recent writers of Port. are the historian and novelist Alexandro Herculano and the viscount Almeida Garrett, the dramatist Mendes Leal, and the novelist Rebello de Silva.

P. lit. in Brazil produced toward the close of the 18th century the epic poems *Uruguay*, by José Basilio da Gama, and *Caramuri*, by Fray Durão; and lyric poetry was creditably cultivated by some writers who constituted the so called Minas school. In the present century the most noted Brazilian writers have been the moralist Fonseca, marquis of Maricá, the lexicographer Moraes e Silva, the dramatist and poet D. J. G. de Magalhães, the historian F. A. de Varnhagen, and the novelists and poets, Gonçalves Dias, Joaquim Manoel de Macedo, and Norberto de Souza e Silva.

PORTER C. BLISS.

**Portulacacæe** [from *Portulaca*, one of the genera], a natural order of succulent exogenous herbs and shrubs, all harmless and many of them with gay flowers. The purslanes (*Portulaca*), the calandrinias, and the claytonias include a few ornamental species.

**Porus**, a king of India, ruling E. of the Hydaspes; attacked Alexander when he tried to cross this river, but was defeated, wounded, and captured. He was restored, however, by Alexander to his kingdom, which was much enlarged. As an ally of the Macedonians he supported them on their further expedition into India, but after the departure of Alexander he was put to death by Eudemus, who was left in command of the Gr. army of occupation.

**Posen**, town of Prus., cap. of the prov. of Posen, on the Warta, is an old but handsome city. It contains many elegant buildings, both public and private, many fine promenades and public squares, many good educational and benevolent insts., and extensive manufactures of tobacco, sealing-wax, wax candles, leather, furs, etc. Pop. 65,760.

**Possey** (THOMAS), b. in Va. July 9, 1750; was quartermaster to Lewis's division of Lord Dunmore's expedition against the O. Indians, and took part in the battle of Point Pleasant, Oct. 10, 1774; was in the following yr. a member of the Va. committee of correspondence, and capt. of a company in the 7th Va. regiment; participated in the defeat of Dunmore, July 8, 1776; joined the Continental army at Middlebrook, N. J., early in 1777; was transferred to Morgan's rifle regiment; distinguished himself in the battles of Bemis Heights and Stillwater; commanded the regiment with the rank of major in an expedition against the Indians Oct. 1778; commanded the 11th Va. regiment 1779 at Stony Point; served under Wayne in Ga.; defeated the Indians June 28, 1782; was appointed brig.-gen. 1793; removed soon afterward to Ky., where he became lieut.-gov. and maj.-gen. 1809; U. S. Senator from La. 1812-13; succeeded Harrison as gov. of Ind. Terr. 1813, and became agent for Indian affairs 1816. (See SPARKS'S *Amer. Biography*.) D. Mar. 19, 1818.

**Posidonius**, b. at Apamea in Syria about 135 B. C.; studied at Athens under Panætius; settled in Rhodes; became the head of the Stoic school of philos., whose doctrines he softened and toned down in harmony with those of the Peripatetics; lived in 86 a. c. to Rome as ambassador; taught Cicero and Pompey. D. at Rome about 51 B. C.

**Positivism** [Lat. *positivus*]. In the opinion of its adherents P. or the positive philos. is a universal system, which is destined to be accepted by the whole human race, and in comparison with which all other systems must appear as insignificant and local.

Isidore Auguste Marie François Xavier Comte was b. at Montpellier, in the S. of Fr., Jan. 19, 1798. His ideal of society was one in which the beliefs and actions of the great mass of mankind should be prescribed by a small governing class; and the most extreme result of his radicalism was to alter the superficial appearance of this small governing class by substituting a "high priest of humanity" and a board of positive philos. for the pope and the imperial council of the Middle Ages. It was Comte's peculiarity that he saw that any such attempt, to be legitimate, must be based upon a thorough study of the conditions of social existence and of the tendencies of human nature as concretely exemplified in hist. Before artistic practice must come scientific theory; before the polity must come a sociology. It was in connection with these views that Comte maintained in 1824 that the phenomena of society conform to fixed and ascertainable laws, no less than the phenomena of chemical combination or planetary rotation.

In the attempt to inaugurate a scientific theory of social phenomena Comte worked up the elements of a grander theory of scientific method than any which had yet been laid before the world. Having made a division between abstract and concrete sciences, he arranged his so called abstract sciences in a linear series, determined by the decreasing generality and simplicity of the phenomena with which the respective sciences are concerned. Upon this principle the inorganic sciences, as a group, were manifestly to come before those which deal with organic phenomena. The "hierarchy of the positive sciences" thus came out in the following order: (1) mathematics, (2) astronomy, (3) physics, (4) chemistry, (5) biology, (6) sociology. According to Comte, the resources at our disposal for the inductive investigation of phenomena may be classified as Observation, Experiment, and Comparison. In simple observation we merely collate the phenomena as they are presented to us; in experiment, we artificially vary the circumstances; in comparison, we watch the circumstances as they are varied for us on a great scale by nature. The conditions of successful observation are best studied in astron.; physics and chem. are the sciences of experiment, and in biology

we best learn the use of the comparative method, since here we have a vast hierarchy of organisms, in which various organs and their corresponding functions appear in all stages of development. Comte endeavored to sum up the most prominent aspects of social progress, both intellectual and material, and his first achievement was his celebrated theory of the "three stages" through which men's conceptions must pass. The theory may be thus stated: "There are 3 modes of philosophizing—the theological, the metaphysical, and the positive. The first two modes are characterized by the attempt to formulate the unknowable Cause or causes of phenomena; but P. ignores the unknowable Cause or causes of phenomena. P. limits itself to ascertaining uniformities of coexistence and sequence among phenomena. Metaphysics and theol. superadd investigations concerning the nature of the hidden efficient cause of the phenomena, but metaphysics regards this cause as a mere abstract entity, while theol. regards it as endowed with volition and intelligence. There are 3 successive stages of theol.—fetichism, polytheism, and monotheism. According to Comte, philos. began in fetichism; as science progressively arranged phenomena in groups of wider and wider generality, philos. passed through polytheism into monotheism; and as with its increasing generality the primitive anthropomorphic conception of cause faded away, becoming replaced by the conception of an unknowable Cause manifested in phenomena, philos. became metaphysical; finally, when the unknowable Cause is ignored, and no account is taken of anything beyond the immediate content of observed facts, philos. becomes positive."

In 1825 Comte was married to Caroline Massin, bookseller, and in 1836 he had sufficiently matured the scheme of his positive philos. to begin the systematic exposition of it in a course of 72 lectures. But after some 3 or 4 had been delivered, the course was brought to an end by an attack of acute mania, from which he soon recovered as to be able in 1838 to proceed with his work. In 1839 the first vol. was pub., and in 1842 the concluding vol. appeared. In this same yr. he was separated from his wife, and about this time he lost an office in the Ecole Polytechnique which he had held since 1833. To mitigate the blow 3 Englishmen offered to replace the official salary for 1 yr., understanding that at the end of the yr. Comte would be either reinstated or would have resolved on some other career. The position was not regained, and the subsidy was not renewed, and Comte's indignation was great at the refusal to keep up a contribution to his support, to which he considered himself as legitimately entitled in virtue of his services to philos. In 1845 he conceived an intense affection for Madame Clotilde de Vaux, a lady who had been separated from her husband by a crime which had condemned him to the galleys for life. Comte's relations with this lady gave a color to all his after life and speculation, and certain arrogant pontifical moods of feeling took entire possession of him. His old project, of inaugurating a new philos. which should renovate human society, now assumed the form of an attempt to institute a new religion. The true explanation of these aberrations is the theory that during the later yrs. of his life Comte was really insane. He died Sept. 5, 1857.

At his death Comte left behind him one great disciple, M. Emile Littré, one of the wisest thinkers and most consummate scholars that Fr. has produced. Among eminent Eng. thinkers Comte exercised considerable influence over Mr. Mill, and made a partial conquest of Mr. Lewes. (See LITTRÉ, *Auguste Comte et la Philosophie positive*; MILL, *Auguste Comte and Positivism*; LEWES, *Comte's Philos. of the Sciences, Hist. of Philos.*) [From orig. art. in *J's Univ. Cyc.*, by JOHN FISKE, LL.B.]

**Posse Comitatus** (law), literally, "the power of the county." The phrase is used to designate the body of men summoned by the sheriff to assist him in the execution of process or other official acts. The sheriff in the U. S. has the right to summon such assistance, although its exercise is generally governed by statute. JOHN NORTON POMEROY.

**Post** (GEORGE EDWARD). See APPENDIX.

**Post** (TRUMAN MARCELLUS), D. D., b. at Middlebury, Vt., June 3, 1810, grad. at Middlebury Coll. 1829; was prin. of an acad. at Castleton, Vt., 1829-30; tutor at Middlebury 1830-32, during which time he studied law; settled at Jacksonville, Ill., and was admitted to the bar, but in the same yr. (1833) accepted the professorship of langs. in Ill. Coll. at that place; subsequently became prof. of hist.; was ordained and installed pastor of the Congl. ch. at Jacksonville 1840; became in 1847 pastor of the Third Presb. ch. at St. Louis, and in 1851 of the First Congl. ch., then formed in the same city. During his pastorate in St. Louis he also officiated as prof. of hist. in the theological sem. at Chicago, and of ecclesiastical hist. in the sem. at Andover. He lectured on Congregationalism in the sem. at Andover. He has contributed to periodicals, and is author of *The Skeptical Era in Modern Hist.*

**Postliminy** [Lat. *postliminium*], a Rom. law-term, literally denoting "return behind one's own threshold" or "into one's own house;" then, especially, return from a state of capture and its consequences, or restoration to former political and other rights. Capture in war, as well of a Rom. as of any one else, was held to make him a slave; and as a slave could make no will nor have any civil rights, the captured Rom.'s rights of property, citizenship, even of family, would be by this calamity not merely suspended, but brought to an end. The right of testament was saved from the effect of capture by the fiction of the Cornelian law, according to which the soldier was conceived of as having been killed in battle while yet a free Rom. The rights of citizenship, family, and property were saved by the *ius postliminii*, by which, if he had freed himself during war or had been restored by treaty, it was assumed that he had never been away. This right of postliminy has been applied in international law to recapture; but as capture in Chr. nations does not involve slavery, it is unnecessary as far as



persons are concerned; and as far as the rights of an original owner of recaptured property are concerned, there is no need of applying to them the principles of Rom. P., nor can it well be done.

T. D. WOOLSEY.

**Post-Office, The.** Couriers for the conveyance of letters and despatches for kings and princes are as old as empires and kingdoms, but the first system of posts seems to have been established by the Romans. It was the policy of the Romans to maintain constant communication with all the countries that became subject to them, and for this purpose they constructed royal ways from Rome through all the countries of Europe. Along these ways the couriers bore public and private letters, while passengers and merchandise were carried by slower conveyances. The Dark Ages removed these vestiges of civilization. The Renaissance led to a renewal of intercourse, and by slow degrees the highways were renewed and posts were again seen travelling through the land. On the Continent the postal service was established for the convenience of the sovereigns and nobles, but subsequently the carriage of passengers, freight, and the letters of private individuals was permitted. The carriage of the mails in Eng. was generally left to private parties. The introduction of stage-coaches at the close of the last century gave despatch and regularity to the postal service of G. Brit., and about 1800 the mails were carried with as great rapidity as the posts of the Romans.

The P. O. abroad was established for the use of the rulers, and the cost was defrayed by regular taxes; but when the people were permitted to use it they were charged for the privilege a postage high enough to pay all expenses and yield a large revenue to the state. In Amer. it was established for the benefit of the people, and as public intelligence contained in newspapers was for the public benefit, they have been carried free or for a very small postage, and private intelligence or letters have been carried at a higher rate, the revenue derived from these two classes of mail-matter being high enough nearly to cover the expense of the service. The P. O. existed in Amer. from its earliest settlement. Originally, it was merely a receptacle in the coffee-house, where letters arriving from abroad were deposited, and taken by those to whom they were addressed or carried to them by their neighbors. Gradually a postal service was established between the several colonies, and in 1672 there was "a post to goe monthly from New York to Boston." In 1710 the postal service of the Brit. empire was consolidated into one establishment, the chief offices at Edinburgh, Dublin, and New York. One of the earliest acts of the Continental Cong. was the establishment of a P. O. and post routes from Falmouth, Me., to Savannah, Ga. Benjamin Franklin was the first P. M.-gen., and under his practical management it was soon extended through all the colonies. Newspapers were generally published by the P. Ms. of the several cities, and their papers were not only sent free through the mails, but all others were excluded. Franklin was the first to give equal privilege to all publishers. The rates of postage fixed in 1792 were continued, with a few unimportant changes, for more than 50 yrs. But the high and various rates amounted almost to a prohibition of correspondence. Few letters were sent, and from 1800 to 1830 the increase scarcely kept pace with the growth of the pop. The P. O. for the use of the people and as the agency of the govt., in which they are more immediately interested than in any other dept., is the product of the present generation. In 1845 the number of letters and transient matter mailed throughout the U. S. was about 29,000,000; in 1875 the number of letters and transient matter mailed in the city of Boston alone was about 39,000,000, or  $\frac{1}{4}$  more than was mailed in the whole country by the preceding generation. Prior to 1851 the dept. was self-sustaining, although in some yrs. the receipts were less than the expenditures; since then the expenses have generally exceeded the income. In the yr. 1851 the postage on newspapers and magazines was greatly reduced, and bound books were first carried by mail at less than letter-postage; subsequently seeds, clothing for soldiers, ores, minerals, and merchandise generally were made mailable matter.

The rapid growth of the postal service has not been confined to Amer., but has extended to all civilized countries. It commenced in G. Brit. in 1840, 5 yrs. earlier than in this country, when penny postage was introduced after a contest of many yrs., and in 3 yrs. the correspondence was quadrupled. In all the countries of the Continent a similar result has taken place. This increase is due to 4 causes: first, the reduction of letter-postage from an average of 12 $\frac{1}{2}$  to 2 cents in this country, and from 15 to 2 cents in G. Brit.; second, the introduction and extension of R. Rs., by which intercourse with different places is facilitated, more frequent mails are sent, and much greater despatch made than by the old methods of travel; third, by the extension of the mail-routes to the dwellings of the inhabs. of large cities through the letter-carrier system; and fourth, by increased efficiency in the management of the dept., and by the greater activity and stimulus in the habits of men and in the business of the country.

Many of the R. Rs. of the U. S. have placed upon them postal cars, attended by several clerks, which receive and deliver mails at the stations, the mails received being assorted while the cars are in motion. This system has been further extended by the improved facility of receiving the mails from hanging-posts by a crane or scowp, by the necessary adaptation of the car, without stopping at the stations, the mails being also delivered by being thrown from the car at the stations. In 1875 2 fast-mail trains were put in operation between New York and Chicago and between New York and St. Louis, by which the time of delivery of mails is much lessened between the E. and W. portions of the U. S.

A system of registration for letters has been adopted. The fee is uniform at 10 cents for all parts of the world. Its use is increasing slowly, but the registration of letters will not be made generally available until some further improve-

ments have been made and a prompt delivery of the package guaranteed by the dept., as is now done in some countries of Europe. The money-order system was introduced a few yrs. ago, and is coming into gen. use. The rates vary with the value of the order—from 8 cents for \$10 to 45 cents for orders over \$80 and under \$100. These orders are issued payable in G. Brit., Switz., Ger., It., Canada, Newfoundland, Fr., Jamaica, N. S. Wales, Victoria, New Zealand, Belgium, Port., Tasmania, and the Sandwich Islands.

Postal-cards, a recent extension of the service, were first adopted by Ger. Their use has increased much more rapidly here than abroad. The number of letters mailed in G. Brit. is 50 per cent. greater than with us, but the number of postal-cards mailed is  $\frac{1}{4}$  less. The postage on letters is the same here as in G. Brit. G. Brit. has the largest correspondence in proportion to pop., but the ratio of increase is much less rapid than that of the U. S. Switzerland has the greatest number of P. O. in proportion to pop., U. S. next, Sp.  $\frac{1}{10}$  as many as G. Brit., while Japan leads Gr. and It.

Amer. has always had an interest in the interchange and development of its correspondence with Europe; the high postage formerly limited this correspondence. In 1865 the postage to Eng. was 24 cents, to the Continent higher; only 6,000,000 letters were then exchanged with Europe. Our P. O. was the first to propose a reduction of ocean-postage.

At the invitation of Ger., in the yr. 1874 a postal cong. of all the states of Europe, the U. S., and Egypt was held at Berne, and a postal convention was agreed upon, which was signed by the delegates from the countries of Europe and the U. S., and has been ratified by the several govts. A postal-union was organized, with a central office at Berne, under the supervision of the P. O. dept. of Switz., for the purpose of considering and working out all questions in the interests of the union. It is expected that hereafter these conventions will be held every 3 yrs. Instead of the varying rates theretofore prevalent, a uniform postage was adopted of 5 cents on prepaid and 10 cents on unpaid letters, weighing not over  $\frac{1}{2}$  ounce, between all members of the union; newspapers, not over 4 ounces in weight, 2 cents; books and other printed matter and patterns of merchandise, not exceeding 8 $\frac{1}{2}$  ounces, 2 cents for each 2 ounces; postal-cards, 2 cents; prepayment invariably required except on letters.

Eng. has taken the lead in almost every reform of the postal service. It was the first to adopt a penny postage; it has the best free-delivery system extending over both town and country, and issues postal money-orders payable in almost every part of the world. It receives and pays out deposits as a savings bank, allowing interest on deposits of small amounts, and has absorbed almost all the old savings banks; 1,670,000 individuals have on deposit \$115,000,000. It issues licenses for dogs, horses, carriages, servants, guns, and game, from which it derives an income of over \$2,600,000. It grants annuities and effects insurance on lives, and has in existence about 10,000 of these contracts. The P. O. pays annually to the treas. nearly \$14,000,000 net profits, and it operates the postal telegraph. The letter-delivery in the city of Lond. is unequalled.

In all the countries of Europe the telegraph has been adopted as one of the postal agencies for the transmission of correspondence. The rates are generally low and uniform, the business large, and a source of profit in almost every country. In G. Brit. the postage on letters not exceeding 1 ounce is 2 cents; on registered newspapers, 1 cent; on books and printed matter, 1 cent for each 2 ounces; prepayment invariable. The size is limited to 18 in.  $\times$  9 in.  $\times$  6 in., and the weight to 5 lbs. No other kinds of parcels are mailable, unless at letter-postage, excepting samples for foreign countries. In Fr. the postage is 3 cents for drop-letters, 5 cents for others; double rates if not prepaid. Journals and periodicals treating of politics and social economy, 4 centimes, or 8 mills; other journals, 8 centimes — 16 mills; other printed matter, 4 mills a gram, increasing 2 mills for each added gram; samples of merchandise, 3 cents for 50 grams, adding 1 cent for each additional 50 grams to 800, the extreme limit; other parcels are not mailable except at letter-rates. In almost all the other countries of Europe merchandise is mailable, but in these countries it is not received, transmitted, or delivered with letters, but through separate bureaux and by other conveyances; the rates vary with the weight, distance, and speed of transmission. [From *orig. art. in J.'s Univ. Cyc.*, by GARDNER G. HUBBARD.]

**Potash** [Fr. *potasse*; Ger. *Kaliumoxyd*, *Phosphorsalz*; *laugensalz*], **Vegetable Alkali**, or **Pearlash**; chemically, hydrate of the oxide of the metal *potassium*. P. and pearlash of commerce are obtained by the lixiviation of wood-ashes mixed with lime, and boiling down the lye. Pearlash is merely a somewhat purer form, produced by calcination. During the burning of wood to form ashes, organic salts of P., which exist in it, are converted into carbonate of P.; and in the lixiviation the lime converts the carbonate into hydrate of P. Ashes vary greatly in their content of P. according to their source. The U. S., being one of the countries in which wood is abundant, is one of the largest P.-producing countries, and the State of N. Y. is said to furnish 75 per cent. of the whole of the large Amer. export of P. As the forests disappear, however, mineral sources of P. must come into application. The greatest natural treasures of P. are the common mineral *feldspars*. In Amer. we have another mineral, even cheaper and more readily obtainable than feldspars, the *glauconite* of the Cretaceous or *green sand* formation, chiefly developed in N. J.

**Potassium** [Ger. *Kalium*], a metallic element which forms the basis of the bodies known as potash-compounds. Anhydrous *potash* is one oxide of this metal, and common *caustic potash* is engendered by its contact with water in proper proportions.

**History.**—It was reserved for H. Davy in 1807, while experimenting with a voltaic battery of great power upon potash, to isolate and obtain the wonderful new metal P.—



a discovery which at that time created an interest and excitement throughout the chemical world such as has seldom been equalled. His experiment was repeated by all chemists who possessed the means, and other modes were discovered of decomposing potash.

**Occurrence and Functions in Nature.**—P. is widely diffused throughout the earth. In the older rocks of the continents almost its sole matrices are *orthoclase* or potash-feldspar, and the potash-micas *muscovite*, *biotite*, and *phlogopite*. Like all the other soluble constituents of the rocks, potash is continually being leached out from these as well as from soils composed of their debris, and being carried down into the ocean. Potash was called, in the early days of the science, the "vegetable alkali," from the fact that it peculiarly abounds in the plant kingdom, the ashes of which are indeed as yet the most abundant source of this alkali. A highly productive source of P. compounds of late yrs. has been found in certain layers of the great saline deposits at Stassfurt, as the chlorides *carналите* and *syvite*, and the double sulphate with *magnesia*, *picromerite*.

**Preparation of the Metal.**—The method now in gen. use for making P. is known as "Brunner's method." It consists in distilling in an iron retort, at a very elevated temperature, an intimate mixture of dipotassium-carbonate and charcoal, the whole mass being (theoretically) convertible into P. and gaseous dioxide of carbon. In the manufacture of P. by the method of Brunner there is a great tendency to the formation of an *explosive body*, not well understood, but supposed to be a compound of P. and carbonic oxide, which often gives rise to dangerous accidents. The P. produced must always be redistilled once or twice to rid it of all admixture with secondary products, which either contain or in time engender the explosive body referred to.

**Nature and Properties.**—P. is a very soft metal, cutting like wax, having a rather dark lead-blue color, with brilliant lustre, becoming brittle and crystalline at zero Centigrade. It burns when heated with a large flame of very intense temperature and a peculiar violet color. When thrown on water, the reaction which occurs between the metal and the water is so violent, and so much heat is developed, that the P. and the hydrogen produced by the decomposition of the water both take fire spontaneously, and burn together with a rich rose-red colored flame, constituting one of the most beautiful, interesting, and instructive experiments of the chemical class-room. The melted globule of P. runs about over the surface of the water eccentrically, propelled by the torrent of hydrogen gas evolved around it, the motion becoming more and more rapid until there remains at last only a fused globule of caustic potash; which is also supported out of contact with the water by the atmosphere of steam around it, until finally, on cooling sufficiently, this globule suddenly unites with the water below with a slight sharp explosion. P. unites with mercury with great and explosive violence to form P.-amalgam. [From orig. art. in *J.'s Univ. Cyc.*, by Prof. H. Wurtz, Ph. D.]

**Potassium Compounds, Medicinal Uses of.** *Potassa* is powerfully caustic to living tissues. Taken internally, potassa or a strong solution thereof is a violent corrosive poison. The antidote is some organic acid, such as acetic (vinegar), citric, or tartaric. Potassa is used in surgery as a caustic, being fused and run into cylindrical moulds about the size of a goosequill. A solution of potassa of specific gravity 1.065 may be used for the gen. purposes of alkaline medication, but alkaline salts of the same base are preferable. *P. carbonate* and *bicarbonate* are strongly alkaline, and have essentially the physiological properties of solution of potassa. Like other alkaline lotions, they often allay the itching of skin disease. They are not much given internally, sodium salts and other alkalies being preferable for alkalinizing the contents of the alimentary canal, and salts of P. with organic acids for producing the effects of potassa on the system at large. They are sufficiently alkaline to be poisonous in large dose. *P. acetate* and *citrate* become converted into carbonates in the blood through decomposition of the organic acids. They thus tend to increase the alkalinity of the blood, and especially to diminish the quantity of uric acid present in the system. They may also prove diuretic, increasing the quantity of the solid elements as well as the water of the urine, but this effect is very uncertain. These salts are used medicinally in rheumatism, gout, and uric-acid gravel, and in dropsy and deficient secretion of urine to produce diuresis. Solution of the citrate, made by saturating lemon-juice by P. carbonate and drunk during effervescence, is a favorite mode of giving the salt for the above purposes, and for reducing over-action of the heart in acute febrile states. *P. and sodium tartrate* (Rochelle or Seignette salt) in large dose is purgative simply. In smaller quantities, as a drachm, given considerably diluted, it is absorbed, its acid decomposed, and then under the form of carbonate it may be used for the purposes just enumerated. It is also employed as a purgative, and is most commonly given in the form of the *Seidlitz powder*, which consists of a blue paper containing 2 drachms of the Rochelle salt and 40 grains of sodium bicarbonate, and a smaller white paper containing 35 grains of tartaric acid. *Acid P. tartrate* (bitartrate = cream of tartar) is purgative like Rochelle salt, and is considerably used as a saline cathartic. *Neutral P. tartrate* is also purgative, but from its disagreeable taste the acid tartrate is medicinally preferable. *P. sulphate* is purgative, but is harsh and may be poisonous. *P. nitrate* (nitre = saltpetre) is irritant and in large dose poisonous. Nitre is used in med. as an ingredient of cooling saline draughts in fever, and was at one time largely employed in acute rheumatism. *P. chlorate*, though of high diffusion power like nitre, is less freely soluble, and is hence not so strongly irritant and poisonous; yet an inordinate dose can inflame the stomach. Medicinally its use is almost confined to inflammatory and ulcerative diseases of the mouth and throat. A saturated solution may be gargled,

and a little swallowed from time to time, or a few of the crystals may be held in the mouth and allowed slowly to dissolve.

The other P. salts used in med. derive peculiar powers from their several acidifying principles. *P. cyanide* is intensely poisonous, and has essentially the properties of hydrocyanic acid. *P. ferrocyanide* has but feeble physiological action, and is practically used only in pharmacy and the arts. *P. bromide* has peculiar powers over the nervous system, in addition to possessing the properties of P. salts in general of enfeebling the heart and tending to cause diuresis. This salt is largely used in med. to allay morbid nervous irritability, and is of special curative power in epilepsy. *P. sulphide* is used in med. for the sulphur it contains. *P. bichromate* is irritant and caustic, and internally a corrosive poison. *P. permanganate* in concentrated solution is slowly caustic, but the medicinal use of the salt is as a disinfectant, and in weak solution is an excellent application to wounds, foul sores, and ulcers. [From orig. art. in *J.'s Univ. Cyc.*, by Prof. EDWARD CURTIS, M. D.]

**Potato**, the most widely cultivated and valuable of esculent tubers, is a native of the elevated tropical valleys of Mex., Peru, and Chili, and was probably carried to Sp. from Peru early in the 16th century. It was probably introduced into Va. from Fla. by the Sp. explorers, and into G. Brit. from Va. by Sir John Hawkins in 1565. The common P. was described in 1597 under the name of *Batata Virginiana* by Gerard in his *Herbal*, and in the following century it was cultivated on a small scale in the Netherlands, Burgundy, and in It., and on account of its great yield was recommended by the Brit. Royal Society in 1663 for introduction into Ire. as a safeguard against famines. It was little regarded in Va., and seems to have been unknown in N. Eng. until the 18th century, when it was carried thither from Ire.

The P. may be described as a perennial plant, with smooth herbaceous stems, from 1 to 3 ft. in height, pinnate leaves, flowers varying in breadth from an inch to 2 inches, and in color from bluish-white to purple, and consisting of a wheel-shaped corolla, more or less veined, bearing a globular purplish fruit or seed-ball of the size of a gooseberry, and an herbage characterized by a narcotic smell, and practically useless, though it may be eaten like spinach, both by man and by cattle. One of the leading qualities of the P. is an extraordinary productiveness, far exceeding that of any esculent with which it can be placed in competition. P. consist almost wholly of starch, and are accordingly deficient in nitrogen, and ill-adapted for an exclusive article of diet. They are hardy, and grow well in poor land throughout a vast extent of the earth's surface.

**Potato-Bug.** This term is applied indiscriminately by farmers to a great many different insects that attack the potato. Of the prin. insect enemies of the potato, the following may be enumerated: *Boring in the stalk*—the stalk-borer (*Gortyna nitela*); the potato-stalk weevil (*Baridius trinitatus*). *Feeding upon the leaves*—the potato-worm (*Sphinx 5-maculata*); the 3-lined leaf-beetle (*Lema trilineata*); the cucumber flea-beetle (*Haltica cucumeris*); over half a dozen species of blister-beetles, belonging to the genera *Lytta* and *Epicaula*; and finally the Colorado potato-beetle



Colorado Potato-beetle: a, eggs; b b b, larvae; c, pupa; d, beetle from side and back. Colors, a, orange; b, venetian red; c, pale orange; d, black and yellow.

(*Doryphora 10-lineata*), a hemispherical yellow beetle about  $\frac{1}{4}$  of an inch long, with 10 black stripes on the elytra. This last, on account of its singular hist. and great destructive power, has come to be known as "the potato-bug," and it is to it that we shall confine our attention under that title.

Few insects have attracted greater attention than has this species since 1860. Feeding originally on the sand-burr (*Solanum rostratum*), a wild plant belonging to the same genus as the potato, the insect was at first doubtless confined to the more fertile country just E. of the Rocky Mts., ranging from the Black Hills down into Mexico. In 1861 it invaded Ia., in 1862 S. W. Wis.; in 1864 and 1865 it crossed the Miss. to the W. part of Ill.; along the Ia. line and from N. E. Mo. in 1866, it occupied most of the country W. of a line drawn between Chicago and St. Louis; in 1867 it reached S. W. Mich. and W. Ind.; in 1868 many parts of O., and from that time on kept spreading from year to year, until in 1874 it touched the Atlantic seaboard at numerous places.

**Natural History.**—The insect hibernates in the perfect or



beetle state under old rubbish or in sheltered situations of whatever kind, but normally in the ground. As vegetation

FIG. 2.



*Tachina-fly*: Colors, black and silvery-gray.

starts in spring the insect issues from the ground, and long before potatoes are up, or even planted, it may be seen flying on genial days in search of food and company, the rose-red under-wings contrasting prettily with the yellow and black of the elytra. It will frequently work into a sprouting hill of potatoes as these are raising the soil, and feed upon the tender sprouts and tubers; and as soon as the plant shows itself the female begins to lay her oval orange eggs in clusters of from 10 to 40. With favorable weather there hatch-



FIG. 3.



*Fiery ground-beetle*: a, larva; b, beetle. Colors, a, black; b, black and golden.

red, hunch-backed larva, which becomes paler and acquires a double row of lateral black spots as it advances toward full growth. This period arrives in about 3 weeks from hatching, and the larva finally burrows into the ground, where, within a simple earthen cavity, it becomes a pupa, and finally a beetle in from 7 to 10 days, the whole cycle of its transformations from the egg to the beetle requiring rarely more than a month. The beetle feeds less than the larva, but is nevertheless very tenacious of life. The period of oviposition covers about a month for each female, and the number of eggs produced by each averages about 500. While the species feeds by preference on plants belonging

FIG. 4.



*Convergent Ladybird*: larva, pupa, and beetle. Colors, black and orange.

FIG. 5.



*15-spotted Ladybird*: a, larva; b, pupa; d, beetle. Colors, a, black and yellow; b, black and orange; d, black, cream-yellow, and chocolate.

to the genus *Solanum*, yet in its march across the country it has adapted itself, in an emergency, to other kinds, among which may be mentioned the cabbage.

*Means of averting its injuries.*—These may be considered under 3 heads: (1) natural enemies; (2) preventive measures; (3) direct remedies.

FIG. 6.



*Spined Soldier-bug*: c, egg; b, larva; a, pupa; d, mature bug, with wings on one side extended; e, its beak magnified. Colors, c, bronze; a, b, black, yellow, and red; d, yellowish-gray.

*Natural Enemies.*—Among birds, the rose-breasted grosbeak often effectually clears a potato-patch of the pest. The

quail also devours it, and the domestic chicken has in some sections been used to good advantage. The crow also attacks it. Among quadrupeds, there is good evidence that the skunk feeds upon it. Among reptiles, the toad finds the insect to its taste. Among spiders, some species of the long-legged harvestmen or "grandfather gray-beards" feed upon it. The only true parasite known to infest it is a tachina-fly belonging to the Diptera, and having the gen. appearance of a common house-fly. From minute, tough, ovoid, whitish eggs, laid on the back of the thoracic joints of the *Doryphora* larva, the larvæ (white, footless maggots) of this fly enter the body of their victim, and are carried into the ground when it descends to transform.

FIG. 7.



*Many-banded Robber*: with beak enlarged at side, b. Colors, pale yellow and black.

FIG. 8.



*Ring-banded Soldier-bug*: a, mature bug; b, enlarged antenna; c, enlarged beak. Colors, polished brown and yellow.

several species are also very efficient in piercing the beetle, and more particularly the larva, with their strong beaks, and sucking out the vitals, the most common and efficient being the spined soldier-bug, the many-banded robber, and the ring-banded soldier-bug.

*Preventive Measures.*—The insect shows a preference for the more tender-leaved varieties, and such as the white Neshanock are destroyed much quicker than the early rose and peach-blow, for instance. By isolating a potato-patch in the midst of a corn-field or in timber, or by surrounding a field of the less-liked varieties with a few rows of the kinds preferred, much will be gained in the battle with the pest. Sliced potatoes dusted with Paris green, and laid upon the ground where other animals cannot reach them, will allure and kill many beetles early in the season, before planted potatoes sprout; and when the tubers are planted a dressing of ashes and hen-manure will have the effect to prevent the earth cracking, and to deter the beetle from entering the ground, and from attacking the young plants as they appear above the surface.

*Direct Remedies.*—Destruction by hand of the first beetles and eggs appearing on the young plants is to be strongly recommended. Numerous mechanical means—machines used by hand, and even by horse-power—have been devised to knock the insects off the vines and collect them. The only cheap and effective way of protecting the plants when once the insect has been allowed to unduly multiply is by the use of Paris green. This poison is now very generally employed, either as a powder with about 25 parts of some diluent, such as ashes, lime, bran, or flour—the last the best; or in suspension at the rate of a tablespoonful of the pure green to 3 gals. of water, and with a certain portion of molasses or other cheap sticky substance to facilitate adhesion.

This article would be incomplete without a brief reference to the bogus Colorado potato-beetle (*Doryphora juncta*), which closely resembles the species under consideration. The illustrations introduced will show the prin. differences; and it only remains to add that in *juncta*, as compared with *10-lineata*, the eggs are paler; the larva is paler, with but 1 row of lateral black dots, instead of 2; the beetle has the

FIG. 9.



*Bogus Colorado Potato-beetle*: a, a, eggs; b, b, larva; c, beetle; d, enlarged elytron; e, enlarged leg. Colors, a, whitish-yellow; b, cream-yellow, brown, and black; c, black, yellow, and brown.

second and third black stripes on the elytra (counting from the lower edge) joined at the ends, instead of the third and fourth; the punctures of said elytra more regularly in rows, and the legs with pale instead of dark tarsi, and with a black spot on the thighs. It feeds on the nettle, and never touches the cultivated potato. [From orig. art. in *J.'s Univ. Cyc.*, by C. V. RILEY, M. D.]



**Pottery**, a term applied to all objects made of baked clay. It was one of the oldest arts of mankind, and sundried bricks appear in Egypt almost coeval with the nation itself. Vases of small size made of red kiln-baked clay abound in the vicinity of the Pyramids, and the so called *porcelain* of this people, a kind of faience of white sand, very slightly fused, and covered externally with a thin silicious glaze of a blue or green color, is of equal antiquity. At a later period, yellow, red, and other colors formed by metallic oxides appear. This porcelain continued in Egypt till the 2d century A. D. The bright blue is remarkably fine, but was superseded about the 6th century A. C. by a pale and dull green. The art of P. was extensively used by the Babylonians and Assyrians, and terra-cotta or slightly baked red clay employed in the shape of barrel-cylinders or prisms for historical records deposited in the foundations of edifices, or rectangular tablets, sometimes convex on the sides, for various records and compositions. On these the scribe im-



pressed with a stylus the cuneiform or arrow-headed characters. Bricks of the same material were also used and inscribed in the same manner, and some of these are as old as a. c. 2000. The vessels of these people resembled those of the Egyptians, except that the forms were more elegant and the sides thinner. They also at an early period had a faience of glazed ware of various colors with a lead glaze, employed for bricks, architectural ornaments, and vessels. Blue was a favorite color, as in Egypt, and the bricks had sometimes pictures in outline on them. This was continued in the valley of the Euphrates after the fall of the Babylonian empire, and large coffins with oval covers of the Sassanian epoch, as late as the 1st century A. D., have been found extensively used in the cemeteries of Warka and Mugeyer.

Among the Grs. the invention of the potter's art was as old as Homer. Kiln-dried bricks were used in the palace of Croesus. Several architectural members of buildings were also made of terra-cotta stamped by moulds, and statues of life-size were occasionally made of the same material about the 4th century B. C. Objects to affix to other emblemata, and a great number of small terra-cotta figurines, hollow internally, were made throughout Gr. and Asia Minor from a very early period to the 2d century A. D. These were colored white with a coating of lime (*leukoma*) and gaudily painted. Lamps, *lychni*, with subjects in relief on the upper surface and with the maker's name beneath; dolls with movable limbs (*neurospasta*); cones or weights; whorls or conical bracts, and some few smaller objects, were made of terra-cotta. But the prin. product of the Gr. potter was vases, made on the horizontal table or wheel. They are *amphoreis*, or amphora, and used as casks, and came extensively into use about the 2d century B. C. Some of these vases are of the oldest date of the pre-historic period of Gr. Other vases of the same material, made for purposes purely sepulchral, were covered with a similar coating, painted and in part gilded. The most remarkable are the so called *painted* (or rather glazed) vases found in the sepulchres of all Gr. sites and in Etruria. The glazed bands and geometric ornaments were at first accompanied by small figures of animals; human figures were subsequently introduced. These figures were traced on the moist clay by an incised or dotted line, and the colors laid on with a brush; a second color was applied in the accessories over the black color of the figures, and incisions were made through the dark color of the face and limbs to indicate the details. The dark color of these early vases was manganese—the flat, superposed pipe-clay, oxides of iron and copper, and ochres. The clay of Corinth was straw-color, that of Athens fawn, but a warm red came into use as the art advanced. The whole vase, except the flat tints, was covered with a siliceous glaze. These vases with black figures seem to have prevailed from the 6th to about the 4th century B. C., after which by degrees the figures were left the color of the clay, and instead of incisions lines drawn by the pencil filled up the details; the background was colored black; and the art which had reached its apogee about the middle of the 4th, gradually changed in style from the chaste and pure to the florid and voluptuous about the 3d century B. C., becoming at last extinct as the states of Gr. declined and metallic vases superseded those of clay. The Etruscans worked in terra-cotta like the Grs., their best products being statues; they produced a peculiar ware of brown color with rude ornaments, and a soft black ware moulded with ornaments and figures in coarse style.

The Romans made great use of flat bricks (*lateres*) and tiles (*tegulae*), like bricks, but with flanges for roofs, covered by a semi-cylindrical tile (*imbrex*) at the joint. These were employed for buildings, walls, and graves. The tiles, as well as other architectural members and ornaments, were made of a fine compact clay of red color. Statues, figurines, lamps with bas-reliefs of different subjects and names of makers, vases, or casks of huge size (*dolia*), and other vessels for domestic use, especially amphora and phials, were also produced by the potteries. But the best ware of the first 2 centuries A. D. was the so called Samian, made of a red sealing-wax color and appearance throughout, with subjects stamped in relief.

Outside the limits of the civilized world, the inhabs. of Europe made at the early or pre-historic period hand-made vases of a rude, friable, imperfectly baked brown-ware. The use of unglazed P. and terra-cotta declined in the Middle Ages in Europe, and did not revive till the 14th century. Great jars, water-bottles, and some other vessels have been made from that period to the present day in the W. and E., the earthenware being of a harder texture; and about the 14th century a glazed earthenware, consisting principally of jugs covered with a green glaze, came also into use. The conquest of Majorca (1155) is thought to have introduced metallic glazes, and a new departure took place about 1415, when Lucca della Robbia employed them for architectural ornaments. A century later the majolica-ware was used for plates, jars, and other objects of luxury, painted with gay colors from designs by Raphael, Marc Antonio, and others. Pesaro, Gubbio, Faenza, Forlì, and Rimini were the chief sites of this P., which flourished in It. till the 18th century. In Fr. it was surpassed by the potter Palissy about 1550, who produced dishes and objects with animals in relief of a hard gray paste covered with a fine enamel, and by the so called Henry II. ware made of pipe-clay, with various colors finely glazed. Ger. also made majolica and glazed wares at the same time, and Hol. the delftware imitated from the Chi., and stoneware bottles for wine and tankards glazed by salt and ornamented with reliefs produced by a mould.

In Eng., except the rudely glazed pitchers, the prin. produce of the potteries was the so called Norman tiles, used for the floors and other parts of religious edifices. They were made of red clay, with white or yellow devices of a floral or architectural character, and glazed. Improvements

in the Eng. potteries were caused by the introduction of Dut. potters in the 17th century, and the discovery of the use of flint and more suitable materials; but the great improver was Wedgwood, who invented several improved wares, as well as terra-cottas, and whose small objects in relief, with designs by the sculptor Flaxman, elevated the beauty of the production, especially by his works in biscuit, used for objects of virtu. Great improvements were made by Spode about 1800 in the production of soft porcelain by the introduction of feldspar, borax, and bone. The introduction of Chi. porcelain gradually effected a revolution in the European potteries. The invention of P. is attributed by the Chi. to Hwang-te, who lived about a. c. 2700. Porcelain was not made in Chi. till the time of the Han dynasty, about B. C. 185, when it was invented at Singing, and about A. D. 538 the celebrated potteries at Kingtechin, consisting of 3000 furnaces and 56 establishments, were established. The date of the introduction of porcelain manufacture into Japan is not exactly known. But A. D. 662 a Buddhist monk introduced translucent porcelain into Japan, and it came to Europe in the 16th century. The Japanese porcelain is whiter, of finer quality, and more beautifully colored than the Chi.

In 1709 Böttcher, a chemist of Berlin who had fled to Sax., produced a perfect white porcelain at Meissen, near Dresden, from the kaolin found at Aue in the Erzgebirge. At Vienna in A. D. 1730 an establishment was founded, and has been followed by others at Carlsbad and Prague. Others appeared in 1755 at Frankenthal, and a private porcelain manufactory at Berlin in 1751. In Fr., although soft porcelain was attained in 1695, and the manufactory of Sèvres established in 1756, the requisite kaolin and phtintz were not discovered till 1768, and soft porcelain continued till 1804. Other places in Fr. also manufactured this ware, but that of Sèvres was always pre-eminent for elegance of shape, beauty of color, and the painting. In Eng. soft porcelain was first produced at Bow in the 18th century, and at Chelsea at the close of the 17th, but it was not till Fr. and Ger. artists had been procured that the Chelsea ware attained that beauty of form and painting for which it is distinguished.

In the U. S. attempts were made early in the present century to establish works for the production of porcelain and P.—one in N. J. in 1816, others at Phila., abandoned in 1836. Trenton, N. J., has extensive fire-brick and terra-cotta works; Jersey City manufactures glazed red and white granite ware and a good porcelain; Greenpoint, L. I., N. Y., has large porcelain works; and E. Liverpool, O., produces fine stoneware.

E. and porcelain are divided into soft P., fine earthenware, stone or granite ware, and porcelain. The soft porcelain is distinguished by fusing at a lower temperature. At all times the pride of the potters has recorded their names upon their productions. Thousands of these names and devices occur, and require a special knowledge to refer the pieces to their exact place and period. [From orig. art. in *J.'s Univ. Cyc.*, by S. Birch, LL.D.]

**Pottery and Porcelain Manufacture** [Earthenware, Stoneware, Ceramics; Ger. *Porzellan Steingut, Töpferer; Fr. potterie*]. The peculiar properties of clay and its gen. distribution have made it the most available material for the manufacture of useful and ornamental vessels from the most remote antiquity. Clay is the product of the disintegration or weathering of siliceous rocks. Feldspar, mica, hornblende, etc., are silicates of alumina, potash, soda, lime, magnesia, oxide of iron, etc., which occur in the crystalline rocks associated with grains of quartz. By the long-continued action of water, carbonic acid, etc., they are decomposed; the alumina retains a certain proportion of the silica, combines water, and becomes clay, while the other bases are removed more or less completely either as soluble silicates (potash and soda) or as soluble bicarbonates, etc. (lime, magnesia, etc.). The immediate effect of this decomposition is the conversion of the firm rock into a soft mass of clay (more or less firm) and of quartz-sand. By the action of water this mass is finally separated into sand, which, owing to its size, is deposited while the water is still in motion, and clay, which is held in suspension until the water becomes quiet, when it is deposited in beds. Owing to the difference in the mineral constituents of the original rocks, and in the extent to which the decomposition and separation has proceeded, there is the greatest variety in the composition, and consequently in the quality, of the resulting clays. The chief and characteristic constituent of all clays is the hydrous silicate of alumina, called *kaolinite*. Associated with this there is always a considerable quantity of fine quartz-sand, a little silicic hydrate or alkaline silicate, variable proportions of undecomposed feldspar, mica, hornblende, etc., oxide of iron, carbonate of lime, organic matter, etc. Clay occurs in soft masses. It is plastic when wet. It concretes into a hard mass on drying, and after baking is often so hard as to strike fire with steel. If it contains little beside pure clay (kaolinite) and silica (sand), it is infusible at a white heat, but the presence of undecomposed silicates, feldspar, etc., or of alkalis, lime, magnesia, oxide of iron, etc., renders it more fusible. Oxide of iron, if present to any extent, causes it to become red on baking. The pure, highly plastic clays are liable to crack in drying and

FIG. 1.



Proto-Samian cup, with an Amazonomachia in relief, from Athens.



to lose their shape. This is counteracted by adding sand. To prevent distortion in firing, hard-burned stoneware is ground to powder and incorporated with the clay. A fusible and a refractory clay when baked together form a mass which is no longer porous (stoneware). The clays employed in ceramic manufacture are—(1) Refractory clays, as kaolin or porcelain clay, fire-clay, pipe-clay, etc.; (2) fusible clays, as potter's clay, loam, or brick-clay, etc.; (3) calcareous clays or marls; (4) ferruginous clays, as ochre, redde, etc.

*Kaolin, or Porcelain Earth*, is white, with often a yellowish tint. It is meagre to the touch, burns white, and is infusible in the porcelain furnace. It is found in connection with the crystalline rocks—granites, porphyries, etc. Its chief localities are (1) Bavaria: Aschaffenburg, Stolberg, Diendorf, Oberedersdorf; (2) Prus.: Morl and Trotha, near Halle (material for Berlin porcelain manufacture); (3) Sax.: Schneeberg, Mionia; (4) Hungary: Brenditz, Carlsbad, Prinzdorf; (5) Fr.: St. Yrieux, near Limoges; (6) Eng.: St. Ansel, in Cornwall; (7) Chi.; (8) Japan; (9) U. S.: Brandon, Vt.; New Castle and Wilmington, Del.; Jacksonville, Ala.; Edgefield, S. C.; Augusta, Ga., etc.

*Fire-clay* is one of the most refractory varieties. It is used for crucibles, gas-retorts, stove-linings, and fire-bricks. It is found in the Carboniferous strata, immediately under the coal-beds, whence it is called the *under clay*.

*Pipe-clay, Potter's Clay, Plastic Clay*, compact, smooth, even unctuous to the touch; may be polished by the finger when dry. It has a great affinity for water, adheres strongly to the tongue, forms a tenacious paste with water; infusible in the porcelain furnace, but acquires great solidity in firing, which distinguishes it from common clays used for coarse earthenware. Some varieties burn white, some red. It is used for fine stoneware. Such clay is abundant at Hackensack and Perth Amboy, N. J., E. Liverpool, O., etc.

*Ordinary Potter's Clay* is very plastic, but contains such quantities of oxide of iron, lime, etc., as to cause it to fuse at high temperatures, and generally to burn dark-red. It abounds at Elizabethport, N. J., and many other places.

*Dorsetshire Blue Clay* is a fusible clay which burns white; it is abundant at Wareham. The Glasgow red or brown clay is a fusible clay much prized for common black ware, flower-pots, etc.

*Common Clay, or Loam*, is an impure mixture of clay and sand, generally containing sufficient iron to burn red. It is found at the surface, occurs almost everywhere, and is used for bricks, drain-tile, and coarse pottery. Beds occur in some of the W. States which are so free from iron that they burn to a cream color; the Milwaukee bricks are notably of this character.

*Marls* are clays containing considerable quantities of carbonate of lime. In water they fall to powder, and form a non-adhesive pasty mass. They fuse easily.

The following are the prin. varieties of ceramic ware:

I. **PORCELAIN**.—Mass uniformly fluxed, dense, not scratched by knife, texture fine and uniform, translucent, very sonorous, white. (1) *Hard or Real Porcelain*.—Mass difficult of fusion, consists of infusible kaolin with quartz, and a flux of feldspar or lime. The glaze is composed of the same flux; contains no lead or tin. (2) *Tender Porcelain*.—Mass easily fusible. (a) Fr. tender porcelain: a glass-like mass, a potash-alumina silicate, prepared without clay, and consequently not properly a clay ware; containing lead, and glazed with lead; (b) Eng. tender porcelain, *ironstone china*. The mass pipe-clay, with flux of gypsum and bone-ash. Glaze, clay, chalk, borax, and oxide of lead.

II. **STONEWARE**.—Mass dense, hard, not scratched by knife, sonorous, fine-grained, homogeneous, showing incipient fusion, scarcely translucent on the edges, white or colored. (3) *Fine Stoneware, Granite Ware, Firestone Ware*.—Mass white or colored, composed of plastic pipe-clay and kaolin, with flux of feldspar (Cornish stone). Glazed or not; glaze often contains lead. (4) *Common Stoneware*.—Mass reddish-gray or bluish, generally without glaze or with a salt glaze.

III. **EARTHENWARE**.—Mass earthy, porous, pretty hard, opaque, texture open, little sonorous. (5) *Fine Earthenware (Faience)*.—Mass white, hard, and sonorous. Glaze of crystal containing lead, borax, feldspar, etc., or opaque with tin; majolica, delftware, etc. (6) *Common Earthenware*.—Mass finely granular, uniform, more or less colored (yellow). Glaze, a soft white or colored enamel. (7) *Ordinary Pottery*.—Mass earthy, porous, opaque, soft, homogeneous, texture very open, very porous, always colored. Glazed or unglazed; glaze may contain lead or not; is always easy of fusion, and transparent. (8) *Bricks, Tiles, Terra-cotta Ornaments, Etc.*—Mass not uniform, always colored, very soft, porous, and open, little sonorous, opaque, fusible at a high temperature; sometimes glazed. (9) *Fire-brick, Crucibles, Etc.*—Mass difficultly fusible, or infusible; not glazed.

*Hard Porcelain* was made by the Chi. and Japanese long before the Chr. era. Chi. porcelain was first imitated in Fr. in a very imperfect manner in 1695. The manufacture of real china was invented in Ger. by Böttcher in 1709. The process was guarded as a great secret, but it finally became known, and was established in 1720 in Vienna, 1751 in Berlin, 1755 at Nymphenburg near Munich, 1758 at St. Petersburg, and in 1765, after the discovery of kaolin at St. Yrieux, it was substituted for the tender porcelain at Sevres. The hard porcelain is composed of kaolin, quartz to prevent excessive shrinkage on drying, and a flux (to fuse and bind the whole together) which consists of feldspar or gypsum.

**Forming**.—When the mass is ready, it is formed either on the potter's wheel or in moulds. "The potter's wheel consists of a vertical iron axis, on which is a horizontal disk, which is made to revolve by the feet of the operator on a lower disk or by steam. A lump of the plastic mass is placed upon the wheel, the thumb being placed in the centre of the lump and pressed downward; a hollow is thus formed, which is widened or the walls continued vertically according to the shape of the vessel to be made. The con-

stant revolution of the wheel easily allows of the moulder obtaining a perfectly cylindrical form. By thus humoring the clay, elongating the vessel, again depressing it, widening it, and by continued manipulation in this manner, the most exquisite shapes are produced. To form the ridges or sharp edges of the vessel a small piece of iron, a strip of horn or wood, termed a bridge, is used. The perfectly formed vessel is cut away from the wheel by a piece of brass wire." The mould is taken from the original article in parts, which are made to fit together accurately. The wet, plastic mass is made to fill all the indentations accurately, and when it has stood long enough to enable the porous mould to absorb enough moisture from it to make it firm, the mould is opened and the article released. For cups, plates, saucers, etc. the plaster form is placed on the wheel. The mass is rolled out into a sheet, pressed upon the mould, the wheel set in motion, and a brass knife, cut to the exterior form of the plate or saucer, or the interior form of the cup, is held against the mass as it revolves, and the surface scraped to the desired form. The handles for the cups are made in separate moulds and attached by moistening the surfaces. Many articles, such as pitchers, busts, etc., are cast in plaster moulds. The mass is thinned with water to a thick cream. The mould is filled with this, and allowed to stand till by the absorption of water it is lined with a firm layer of the mass of sufficient thickness. The still fluid mass within is then poured out, the whole allowed to stand till the mass is firm, when the mould is opened. When all the parts have been combined, and the article has been finished with tools, it is left to dry.

**Firing**.—The next step is the firing or baking of the ware. In order to protect it from ashes and smoke, it is carefully inclosed in fire-clay vessels called *seggars*. These seggars are piled one upon another in columns in the kiln or oven, which is a large circular reverberatory furnace with 3 chambers, one above the other, and 5 fires around the outside. Heat is applied gradually at first, but is finally carried to a strong red. This high temperature is maintained for 17 or 18 hours, when the kiln is opened and allowed to cool gradually for 3 or 4 days. The seggars are then removed and the ware taken out.

**Glazing**.—In some establishments the green ware is coated with the glaze before the first firing; in others the green ware is first baked to *biscuit*, the glaze applied, and fused by a second firing. Some articles, statues, vases, etc., are not glazed, but are sold as *biscuit*. The glaze for porcelain is made to resemble the mass of the ware as nearly as possible, except that it must be more fusible.

**Decorating the porcelain** is accomplished by applying metallic oxides mixed with a suitable flux, as a silicate or borate, or both together. The colors are therefore colored glasses, which are reduced to powder, mixed with oil of lavender, and applied with a brush. The burning-in of the colors is effected in a muffle furnace. For gilding, precipitated gold is applied, mixed with honey and a flux, as nitrate of bismuth. After it is burned in, it is brightened by burnishing. For silvering, the metal precipitated by copper or zinc, and for platinizing, platinum-black, are used.

**French Tender Porcelain, or Frit Porcelain**.—The manufacture of this peculiar ware began in Fr. in 1695 at Sevres, and was continued till 1751, when it was superseded by the hard porcelain. It is not properly porcelain, nor even a clay ware, but an imperfectly fused glass. The mass or body is composed of (1) frit, (2) chalk, (3) marl. This mass was almost entirely wanting in plasticity, owing to the nearly complete absence of clay. It possessed so little cohesion that it could not be worked at all till it received an addition of 12 per cent. of soap and glue or gum-tragacanth, and then only by pressing in plaster moulds, not on the potter's wheel. After moulding, the articles were dried, and finished on the lathe with iron tools. The firing lasted from 75 to 100 hours, and was a very delicate operation. Owing to the fusible nature of the mass, the articles had to be supported at all points to prevent their losing their form.

The glaze or enamel was a kind of crystal or flint glass. The fused mass was ground fine, and diffused in water, mixed with a little vinegar, to the consistence of cream. As the biscuit-ware was not porous enough to take the glaze by immersion, it was necessary to pour the slip over it. The articles were then baked again for 30 hours in separate seggars, but without supports, in the upper chamber of the kiln, which was not hot enough to soften the body of the ware. As the first glaze was not very equal, it was necessary to apply a second, and return the pieces to the kiln a third time. For decorating this ware the colors required careful and peculiar preparation and use.

**English Tender Porcelain, or Ironstone China**, is manufactured exclusively in Eng., where hard porcelain cannot be economically made for the want of clay sufficiently refractory for the seggars. The mass or body is composed of (1) plastic clay; (2) kaolin, "china clay" from Cornwall; (3) granite or "Cornish stone" (pegmatite), which consists of feldspar with some quartz; (4) chalk flints; (5) bone-ash, consisting of phosphate of lime, with some phosphate of magnesia, carbonate of lime, etc.; (6) stearite (soapstone) is sometimes used to diminish the contraction of the wares in the furnace.

**Parian, Carrara, Etc., Statue Porcelain**, is a fine unglazed, hard porcelain, made with a more fusible feldspar than ordinary porcelain. The peculiar creamy-yellow tint is due to a little oxide of iron contained in the materials; the surface is wax-like. Its composition is variable: some contains bone-ash, some silicate of barium, some only kaolin and feldspar. The statues etc. are cast in different pieces—in plaster moulds with liquid slip, and afterward united—some before, some after firing. Owing to the large amount of water in the slip, the mass contracts  $\frac{1}{4}$  its bulk in the firing. The best Parian is made in Eng.

**Stoneware** differs entirely from porcelain. It is dense, sonorous, fine-grained, semi-fused, does not cling to the



tongue. It is entirely opaque: is either white or colored. It may be made entirely of plastic clays, as in the case of the commoner kinds, or of a mixture of these, with fluxing materials, as kaolin, quartz, feldspar, etc., as in the case of finer varieties, such as granite ware, Wedgwood, etc. It may be unglazed, or glazed with a borax-and-lead glaze, or merely a salt glaze. Stoneware gradually passes into earthenware, so that it becomes difficult to draw a sharp line of division between the 2 classes of ware. Semi-fusion and an absence of porosity are the distinguishing characteristics of stoneware.

**Fine Stoneware, Granite Ware.**—The materials generally employed in Eng. are (1) plastic clay (blue); (2) kaolin, Cornish china clay; (3) flint; (4) Cornish stone, pegmatite, feldspar, with some quartz. For colored bodies metallic oxides are added to the mass: (1) for sage, oxide of chromium and cobalt; (2) for drab, 15 per cent. of common marl and a little oxide of nickel; (3) for dove-color, 1 per cent. of oxide of manganese and  $\frac{1}{4}$  per cent. of oxide of cobalt. For Amer. (New York) granite or ironstone the mixture consists of (1) plastic blue clay from Woodbridge, N. J.; (2) kaolin from Spring Garden or elsewhere; (3) quartz from Middletown, Conn.; (4) feldspar from the same locality. These are ground up with water to slips till one pint of each weighs as follows: plastic clay, 24 ounces; kaolin, 26 ounces; quartz, 32 ounces; feldspar, 32 ounces. These are mixed and evaporated to the proper consistence. The pieces are formed either on the wheel or in plaster moulds by moulding on the wheel, pressing, or casting. The ware is fired in seggars, either in a porcelain kiln or in simpler kilns, horizontal or vertical.

**Wedgwood Ware** includes a variety of fine stonewares, mostly unglazed, which were introduced by Wedgwood. They are known as Jasper, onyx, agate, porphyry, terracotta, basalt, etc. Owing to the peculiar composition of the mass, it is capable of receiving the most exquisite finish and delicacy of detail. Jasper or onyx ware consists of a porcelain-like mass, either white or colored throughout with metallic oxides. By a combination of white on a colored ground the most beautiful cameos, medallion portraits, etc., are produced.

**Encaustic Painting** was introduced by Wedgwood as a revival of the work of the anc. Etruscans, whose ware has not the glossy lustre of enamels or vitrified colors.

**Earthenware** includes those varieties of P. which present an open, porous body, which is opaque, little sonorous, and generally pretty hard. It is sometimes unglazed for water-coolers, crockets, bricks, tiles, etc., but its porosity makes it necessary to glaze it for holding liquids, and by glazing and decoration it can be made very beautiful. The peculiarities of the manufacture are (1) the use of clay and flint without any flux, or of clays alone; and (2) firing at a temperature so low as to preclude the fusion of any of the constituents. The glaze must necessarily be very fusible. This ware includes the fine Eng. ware, Dut. or delftware, the majolica or faience, ordinary P., terra-cotta, bricks, tiles, crucibles, etc.

**Fine Earthenware** is largely manufactured in Eng., the materials being the same as those for fine stoneware: (1) blue plastic clay; (2) kaolin, Cornish china clay; (3) flint; and (4) feldspar, Cornish stone. These 2 wares pass into each other by insensible gradations, the earthenware being distinguished by a smaller percentage of feldspar, Cornish stone, and by the lower temperature of the firing.

**Lacquered Ware**, called also *terracotta* and *siderolite*, are intermediate between fine and common stoneware, have no glaze, but a strong surface-color of varnish or lacquer. The color is mixed with varnish and applied to the baked ware, which is then heated in a slow oven to fix the surface. Another fine stoneware is known as lava, and extensively manufactured in Ger. The mass is plastic, and is often made into baskets in imitation of willow wicker-work.

**Common Stoneware** is made of certain plastic clays without the addition of any fluxing materials. The ware is semi-fused; the color is generally gray. The clay is merely kneaded in the pug-mill and worked by hand. Much of this ware is formed on the wheel; large vessels for chemical works, etc. are moulded. An agreeable color is often produced by a wash of ferruginous clay or ochre. For firing, horizontal kilns or furnaces are used, with no seggars. The mass being vitreous, glaze is unnecessary.

**Clay Pipes** are made from extremely plastic clay, free from oxide of iron and lime. The ends are sometimes glazed to prevent adhesion to the lips. The glaze is composed of the oxides of lead and tin, with sand, salt, and soda-ash.

**Delftware, Majolica, Faience**, are soft, porous, opaque earthenwares coated with an opaque enamel, the colors applied to the enamel by the brush, or by printing and transfer, and the ware subjected to a third firing in the muffle. The materials are plastic clay, calcareous clays, and quartz-sand. The mass is very plastic, easily formed on the wheel, and, if subjected to a high temperature, fuses.

**Common Earthenware, or Pottery**, is earthy, very porous, soft, colored, and easy of fusion. It is made of common plastic clays, with, when necessary, an addition of sand or refuse fire-brick or anthracite coal-ashes. The glaze is generally obtained by applying red lead or galena to the green ware and firing only once. The ware is formed on the wheel. To make the glaze, opaque oxide of tin is often added, and other metallic oxides for colors. As articles of food kept in such vessels are liable to become poisonous by dissolving the lead, a glaze free from lead may be prepared from 100 parts of borax, 50 of feldspar, and 50 of loam. **Terra-cotta** is a variety of earthenware. **Bricks and tiles** are prepared from common clays. **Fire-brick, stove-linings, and crucibles** are made from very refractory clays, free from iron, etc. Fragments of burned bricks are always added.

**Statuettes.**—P. is manufactured in all countries. Hard porcelain is made at the imperial factory at Berlin, the royal works at Meissen, Nymphenberg, Sèvres, and largely at

private establishments in Ger., and especially at Limoges in Fr. In the U. S. it is manufactured at Greenpoint, L. I. Tender porcelain is largely manufactured in Eng. Granite ware, Wedgwood, Parian, and other varieties of fine stoneware and of fine earthenware, faience, and majolica are most extensively made in Eng. Trenton, N. J., and E. Liverpool, O., are the seats of the largest industries in the U. S. These wares are also largely manufactured in Cambridge, Mass., New York, Jersey City, N. J., Phila., Baltimore, Cin., O., St. Louis, and other cities. C. F. CHANDLER.

**Potts** (SPACY GARDNER), b. at Harrisburg, Pa., 1800; edited the *Emporium* newspaper 1821, was admitted to the bar 1827, member of the legislature 1828-29, clerk of the N. J. court of chancery 1831-41, judge of the supreme court 1852-59, one of the coms. to revise the laws of N. J. 1845; wrote *Village Ties, Precedents and Notes of Practice in the N. J. Court of Chancery*. D. Apr. 9, 1865.

**Potts'town**, R. H. June, Montgomery co., Pa., 35 m. from Phila., has 2 smss. and extensive iron-works. Pop. 1870, 4125; 1880, 5305.

**Potts'ville**, city and R. R. centre, cap. of Schuylkill co., Pa., on the N. bank of the Schuylkill River, 93 m. by rail from Phila.; is the emporium of the Schuylkill coal-region. Iron ore also abundant. Pop. 1870, 12,384; 1880, 13,253.

**Poughkeepsie**, po-kip'se, city and R. R. centre, on the E. bank of Hudson River, 75 m. N. of New York and 69 m. S. of Albany, is the cap. of Dutchess co., N. Y. P. was settled by the Dut. at the close of the 17th century. The first substantial building was erected not far from 1705. The legislature of N. Y. met here in 1778 to give assent to the Articles of Confederation. Here also, on July 23, 1788, the U. S. const. was ratified in State convention. The city is partly upon a hillside sloping to the river, but chiefly upon table-land, back of which is College Hill, whose summit is 500 ft. above the town. It is distinguished for its sems. of learning, among which are Vassar Female Coll. (2 m. from the city) and a commercial coll.; has a public library, an orphan asylum, old ladies' home, hospital, and other charitable insts. Outside the city, to the N., is the Hudson River Hospital for the Insane. Pop. 1870, 20,080; 1880, 20,207.

**Poultney**, pölt'ne, on R. R. Rutland co., Vt., 18 m. S. W. of Rutland, has an acad. and extensive slate quarries. Pop. tp. 1870, 2896; 1880, 2717.

**Pounce**, the name for powdered cuttle-fish bone (so called). It is used in making moulds for delicate castings, for tooth-powder, for polishing, etc.; it is also powdered sandarach or rosin, used for blotting-sand, etc.

**Pound Sterling**, a denomination of Eng. money, equal in value to 30 shillings, or 240 pence, into which a lb. of silver was anciently divided, thus giving origin to the term "pound." The word "sterling" is probably derived from *Easterling*, the popular name of the Baltic and Ger. traders who visited London in the Middle Ages.

**Poussin**, poo-sahn' (NICOLAS), b. at Audely, in Normandy, 1594; studied art in Paris; went to Rome in 1624; attended the schools of Sacchi and Domenichino; was deeply interested in antique art; worked hard in obscurity; attracted the regard of Cardinal Barberini; was invited to Paris by Louis XIII.; received with distinction by Cardinal Richelieu; offered apartments at the Tuileries and the position of court-painter; went to Rome on the plea of bringing his wife to Paris; d. there 1665. P. loved to paint subjects from classical mythology, landscapes with figures, buildings of stately arch, with classical accessories. He was a skilful draughtsman, a sober colorist, learned, but poetic and imaginative. O. B. FROTHINGHAM.

**Powder**. See GUNPOWDER.

**Powell** (BADEN), F. R. S., b. at Stamford Hill, near Lond., Aug. 22, 1796, grad. at Oriol Coll., Ox., 1817; took orders in the Ch. of Eng., and was Savilian prof. of geom. at Ox. from 1827 till his death, at Lond. June 11, 1860. Wrote *An Historical View of the Physical and Mathematical Sciences, The Connection of Natural and Divine Truth*, etc.

**Powell** (JOHN HARE), b. at Phila. Apr. 1786, ed. at Phila. Coll.; was sec. of legation in Lond., returning Dec. 1811; became brigade-major to Gen. T. Cadwallader Sept. 1814, and inspector-gen. Dec. 1814; was a successful merchant and a scientific agriculturist; one of the founders of the Pa. Agricultural Society 1823; was instrumental in improving the breeds of horned cattle and sheep in the U. S.; wrote much for agricultural journals, and author of *Memoirs of the Pa. Agricultural Society and of Hints for Amer. Farmers*. D. June 14, 1856.

**Powell** (JOHN WESLEY), b. at Mt. Morris, N. Y., Mar. 24, 1834; removed in childhood to Wis., where he became a teacher; spent 2 yrs. at Oberlin Coll. 1854-56; devoted himself to nat. hist.; travelled in the W. States collecting specimens; was a volunteer in the c. war; lost his right arm at Shiloh; rose to be major; became prof. of geol. in the Wesleyan Univ., Bloomington, Ill., 1865; undertook in 1867, under authority of Cong., a scientific exploration of Col. Terr., upon which he was engaged for several yrs. with great success, consisting chiefly of a topographical survey of the valley of Col. River.

**Powell** (LAZARUS W.), b. in Henderson co., Ky., Oct. 6, 1812, grad. at St. Joseph's Coll., Bardstown, Ky., 1833, and at the Transylvania Law School 1835; became a successful lawyer and agriculturist; gov. of Ky. 1851-55, U. S. Senator 1859-65. D. July 3, 1867.

**Powell** (WILLIAM BYRD), M. D., b. in Bourbon co., Ky., Jan. 8, 1799, grad. at the Transylvania Univ. 1820, at its med. school 1823; gave special attention to the physiology of the brain and of the temperaments, prosecuting this study among the Indian tribes; became prof. of chem. in the Med. Coll. of La. 1835; organized the Memphis Med. Inst. 1840, taking the chair of cerebral physiology; removed to Covington, Ky., 1851; prof. in Eclectic Med. Inst. at Cin. 1856-59; wrote largely for med., scientific, and literary journals; author of treatises on eclectic med. practice and *Nat. Hist. of the Human Temperaments*. D. May 13, 1866.



**Power-Loom.** See Loom.

**Power of Attorney** (law), a written instrument by which one person authorizes another, as his agent, to perform certain acts therein named, in his name and on his behalf. They may be either general or special. They are general when the agent is empowered to represent the principal generally in some designated business. They are special where the agent is restricted to the performance of some particular act. P. of A. may be either sealed or unsealed, and revocable or irrevocable. They are irrevocable when the authority conferred is also coupled with an interest. All others are revocable.

**Powers,** in law. In its most important technical signification this term denotes the peculiar species of authority conferred upon a person by a will or a deed, which enables him to create and bestow some estate in lands greater than, or in addition to, the interest in the same lands held by himself. They are chiefly used in family settlements, and by their means the original proprietor can retain, as it were, an active control over his property even after his own death. P. are divided into several classes, the first and most important being collateral and those coupled with an interest. A P. is collateral when held by a donee to whom no estate or interest in the land itself has been given. P. coupled with an interest are those given to a donee upon whom some estate in the same lands is also conferred. They are subdivided into *appendant* and *in gross*. An *appendant P.* is one which the donee must exercise out of the estate conveyed to himself. A P. in gross is one that enables the donee to create estates which do not take effect out of his own, but are in addition to it, not coming into enjoyment until it is ended. Another classification is into those of *appointment* and those of *revocation*. A P. is one of *appointment* when the donee is enabled to create and bestow new and different estates from those originally given in the deed or will; it is one of *revocation* when the donee is enabled to divest, abridge, or revoke estates already given.

**Powers (Hiram),** b. in Woodstock, Vt., July 29, 1805. In 1817 his parents removed with their large family to Cin. Here the future artist remained till 1835, availing himself of any honest employment that came in his way. While in the workshop of a clockmaker he displayed such ingenuity in the construction of a hand-organ with 12 automatic figures that his services were sought for by the manager of a city museum. P. accepted this offer in 1839, having in the mean time received some valuable hints about modelling, and especially as to the method of taking casts from models. He had been already 2 yrs. in the employment of the manager, preparing mechanical contrivances, groups of wax figures, etc., when he beheld for the first time a bust in marble. It was a portrait of Washington by Canova, and after silently gazing at it a long time P. said, quietly and as if to himself, "That is what I shall do." But it was not till 1835 that he was able to go to Wash., where he began his new career by constructing a revolving *jet d'eau* for the Capitol grounds, and by modelling the heads of Adams, Jackson, Van Buren, Webster, Calhoun, Preston, and other distinguished men. After spending 2 winters in Wash., P. removed with his family to Florence, It., where he could have greater facilities for executing his works in marble, as well as for study. Here he settled in 1837, and his busts soon acquired a wide reputation for fidelity to nature and the highest possible finish. But he devoted every spare moment to ideal work, and the *Greek Slave*—finished in 1843—secured for him a high position among modern sculptors. The lovely head of *Proserpine*, the *Fisher Boy*, and other large and small ideal works followed as the artist could spare the time from his more productive portrait-busts. Beside the above-named works, he executed a large number of portrait and ideal busts of great merit, as well as many statues; among the latter, those of Washington, America, Eve Disconsolate, The Last of the Tribes, etc. D. June 27, 1873. [From orig. art. in J.'s Univ. Cyc., by CAROLINE C. MARSH.]

**Powhatan,** the prin. chief of several confederate clans or tribes of E. Va. at the time of the settlement of Jamestown in 1607; was hostile to the Eng., with whom he repeatedly came into collision. Having taken Capt. John Smith prisoner, it is said that he was about to put him to death when his daughter, Pocahontas, interfered and saved the life of the capt. P.'s prin. residence was at Werowocomoco on York River, within the present limits of Gloucester co. D. Apr. 1618.

**Pownall** (THOMAS), LL.D., b. at Lincoln, Eng., in 1722, grad. at Cambridge 1743; became sec. to the coms. for trade and plantations 1745; was employed in the commissariat dept. during the war in Ger.; came to N. J. as sec. of the prov. 1753; became lieut.-gov. 1755; was a member of the colonial cong. which met at Albany in 1754 to devise measures of defence against the Fr.; was gov. of Mass. 1757-60, of S. C. 1760-61, after which he became director-gen. of the office of control; sat in Parl., where he opposed in many well-considered speeches the rash policy of the Crown toward the Amer. colonies, and pub. *The Administration of the Colonies, A Topographical Description of the Middle Brit. Colonies*, etc. D. at Bath, Eng., Feb. 25, 1805.

**Poydras** (JULIEN), b. probably in La. in the latter half of the 18th century; accumulated a large fortune; was the first delegate in Cong. from the Terr. of Orleans (the present State of La.) 1809-12; gave \$100,000 to found a female orphan asylum and \$20,000 for a coll. at Point Coupée. D. June 25, 1824.

**Pozzo** (pot'so) di **Bor'go** (CARLO ANDREA), b. at Alata, in Corsica, Mar. 8, 1768; settled as an advocate at Ajaccio, where he lived in great intimacy with Joseph and Nap. Bonaparte, which relation assumed a bitter character when P. di B. espoused the cause of Paoli. In 1791 he represented Ajaccio in the National Assembly, and sided with the Girondists, but returned to Corsica in 1792; held a high position in the govt. of the island during its occupation by the Eng., and fled, after their expulsion, to Lond. Here he be-

came the agent of the Fr. *émigrés*. In 1803 he entered the Rus. diplomatic service. After the Peace of Tilsit he fled, first to Aus., then to Eng. But he was soon able to resume his work; he brought about the rupture between Alexander and Nap. at the close of 1810; seduced Murat and Bernadotte; persuaded Alexander to continue the war in 1813; determined the allies to reject Nap.'s offers of peace; wrote the proclamation which preceded the entrance of the allies into Fr.; signed the Treaty of Paris in 1815 as Rus. ambassador. D. at Paris Feb. 15, 1842.

**Pozzuoli**, pot-suo-o'le (Gr. *Disacarchia*; Lat. *Puteoli*), town of S. It., prov. of Naples, on the seashore about 6 m. W. of the city of Naples. The streets are narrow, irregular, ill-paved, and many of them very steep. The public buildings are of little interest, except when they are transformed pagan temples. The large and safe harbor, which once swarmed with foreign ships from all the commercial world, is now so filled up as to be frequented only by small fishing-craft. The neighborhood of P. abounds in interest both for the antiquarian and the geologist. The famous temple of Serapis, the temples of Neptune, etc., the theatre, the amphitheatre, the Grotto of the Sibyl, the Solfatara, Lakes Lucrinus and Avernus—all are near P. Pop. about 16,000.

**Prætor** [Lat.], in anc. Rome, was the 3d officer in rank in the state, inferior to the consuls only. He was first chosen in 396 b. c., and after 246 b. c. called *P. urbanus*. No plebeian was ever a P. until 337 b. c. The *P. peregrinus* (appointed n. c. 246) had oversight of the relations between the *peregrini* and full citizens.

**Prætorians** [Lat. *prætoriani* or *cohors prætoris*], the personal guard of the Rom. emps. During the time of the republic the gen. in command had a guard, a *cohors prætoris*. But at the end of a campaign this guard was dissolved. Augustus transformed (in 27 b. c.) his *cohors prætoris* into a standing body of troops, consisting of 10 cohorts, each numbering 1000 men. Tiberius built them a fortified camp in the N. E. corner of the city, and Vitellius increased their number to 16 cohorts. The P. became one of the most important political bodies in the Rom. empire. In order to secure their favor every new emp. bestowed upon them new privileges and great dotations, and ere long they assumed the right of electing and deposing the emp. At last they even sold the purple. Their power and its frightful abuse continued until Constantine (in 312 a. d.).

**Pragmatic Sanction**, a diplomatic term which originated with the Byzantine court, and denoted the highest and most solemn state ordinances issued by the emp. It has become historical as applied to 4 important instruments—viz. (1) that by which Charles VII. and the States-General of Fr. in 1438 adopted those decrees of the Council of Bâle which authorized the election of bps. by cathedral chapters, and which were condemned by the pope. (2) That by which the same decrees were adopted by the Ger. Diet, assembled at Mentz in 1439. (3) That by which Charles VI., emp. of Ger., settled the right of succession to his Aus. dominions on his daughter, Maria Theresa. (4) That by which Charles III. of Sp. in 1759 settled the right of succession to the kingdom of the Two Sicilies on his son Ferdinand.

**Prague** (Bohemian, *Praha*), the cap. of Bohemia, nearly in the centre of the country, on both sides of the Moldau, presents a picturesque aspect. The city proper consists of 5 parts—the Altstadt, Neustadt, and Josephstadt on the right bank of the Moldau, and the Hradschin and Kleinseltz on the left—connected with each other by several bridges. The Hradschin and Kleinseltz consist almost exclusively of palaces and public buildings. Here is the imperial castle, one of the largest and most magnificent royal residences in Europe. The Hradschin Place, formed by immense palaces, extends in front of the castle. On the terrace in the rear of the castle stands the ch. of St. Velt, a beautiful Gothic structure built 1343-85. Among the most prominent buildings of the Kleinseltz are the Sachsenhaus, built in the 13th century; the gorgeous ch. of St. Nicola, erected in 1628 by the Jesuits; the palaces of Waldstein, of Fürstenberg, and of Nostitz. In the Altstadt is the ch. Am Teyn, the old Hussite ch., founded in 1407, containing the monuments of the 2 Bohemian martyrs, Cyrillus and Methodius, and of the astron. Tycho Brahe. The most celebrated of the public insts. of the city is the univ., with a library of about 140,000 vols., a botanical garden, a laboratory, and an observatory. The commerce and industry of the city are considerable. Three important annual fairs are held here. Pop. 218,077.

**Prairie**, *prâ're* [Fr. *prairie*, a "meadow"], a tract of country in its natural state covered with grass. The most extensive P. known are in the central part of the great continental mass which includes Europe and Asia. Here they are called *steppes*, and they cover all S. Siberia, reaching far into European Rus. Toward the E. they pass into the great Desert of Gobi, which sustains almost no vegetation. The greater part of the Siberian plains is covered with grass, and they afford pasturage for the herds of a large nomadic pop. In S. Amer. there are 2 great areas of P.—viz. the plains bordering the river Orinoco, called *llanos*, which are more than 200,000 sq. m. in area, and the plains of Buenos Ayres, in the S. part of the continent E. of the Andes, locally known as *pampas*. Beside these there are great grass-covered areas on the tributaries of the Amazon. In N. America it is estimated that fully  $\frac{1}{4}$  of the surface is P., the most extensive dist. of this character being that lying between the Miss. and the Rocky Mts., a belt 500 m. in width, reaching from the interior of Mex. far into the Brit. possessions. That portion of this area which belongs to the U. S. is popularly known as the *Plains*. E. of the Miss. most of the country was originally occupied by forest, but in Ill., Wis., and Ind. more than  $\frac{1}{2}$  of the surface is covered with grass to the exclusion of trees.

The origin of P. has been a matter of considerable difference of opinion, and has given rise to much discussion. Mr. Leo Lesquereux takes the view that P. have all been lake-beds, first occupied by aquatic plants, and then, as



filled or drained, covered with grasses, which have excluded trees by complete occupation. Prof. J. D. Whitney attributes the prevalence of herbaceous and the absence of arborescent vegetation in P. dists. to the fineness of the soil. Prof. Alexander Winchell has suggested that the vegetation of P. is pre-glacial. Other writers have contended that annual fires—which sweep over the P. and burn the tops of the grass without destroying the roots, while fatal to young trees—afford a sufficient cause for the absence of trees from the W. P. Several of the influences mentioned above have had some local effect in creating, extending, and maintaining P., but they are all inadequate to explain the broader and more gen. facts in the distribution of herbaceous and arborescent vegetation. Any one who has seen much of the P. of this continent, or who in the study of the subject has looked beyond the limits of a single State, can hardly have failed to discover that climatic influences have had more to do with the distribution of forest and P. than all local causes combined. The forest-covered area E. of the Miss. is swept by the rain-bearing winds that come from the Gulf of Mex. with a N. E. direction. The average annual rainfall in this dist. is about 45 inches. The grass-covered area of the Plains lies along the W. N. W. margin of the great Gulf Stream of our atmospheric circulation, and the rainfall there ranges from 10 to 30 inches, with an average of not more than 20 inches. No forest of mixed growth will flourish where the rainfall is less than 20 inches, and the variation of precipitation on the Plains sometimes carries down the annual rainfall to less than 10 inches over large areas. It should be noticed that the streams that cross the Plains rise in the mts. and are perennial. Their banks are generally lined with timber, showing that the local supply of water is there sufficient to maintain a forest growth, while the deficiency of moisture on the adjacent plains has through ages proved an insurmountable barrier to the spread of timber. In the interval between the humid and dry regions just described the forests and P. interlock, and here local peculiarities of soil seem to determine the prevalence of trees or grass. Where the soil is peculiarly fine and impervious it is with difficulty penetrable by the roots of trees, and during wet seasons or the rainy months of the yr. such surfaces are flooded with water, while in the dry season they are completely desiccated. Thus they become now too wet and again too dry for the growth of trees. On the contrary, where there are sandy or gravelly soils or subsoils, these become deeply saturated with moisture, and, penetrated by the roots of trees, afford them a constant supply of water. Hence, the groves and belts of forest in P. countries are generally limited to tracts of this kind of soil.

An examination of the distribution of forest over other continents will lead to the same conclusion. As the sea is the great evaporating surface from which the rains that vivify the land are derived, those portions of the land nearest the sea are usually well watered and forest covered while the interiors are dry and treeless. The distribution of forest, P., and desert in other dists. than the interiors of great bodies of land will be found to depend upon the local atmospheric circulation, the tracts of the rain-bearing wind-currents being marked by forests, those avoided by them being left as deserts, while intermediate areas are more or less generally clothed with grass.

The question of the origin of P. is not one of merely abstract and scientific interest, but is of great practical importance to the inhabs. of large portions of our own and other continents. If the rainfall chiefly controls the distribution of forest, any effort to propagate trees in P.-regions will be only measurably successful. It is true that the area of forests is diminished by the annual fires that sweep over the P.; and this cause of the limitation of forest-growth may be removed by art. It is also true that a forest, by excluding the sun and wind and checking drainage, retains in some degree the moisture that falls upon it; and this tends to create the conditions upon which its growth depends. But it should be remembered that along the line of junction between forests and P. the variations of climate are not only extreme, but peculiarly calamitous. Observations made along our frontier show that droughts of months' and even years' continuance are liable to occur there; and when the forest has spread or has been extended to a line beyond which there is no reserve of moisture—no maxima of rainfall that can compensate for the minima—droughts are liable to occur which will destroy the forest-growth of many yrs. The life of a tree continues for centuries, and during its continuance, should a period of extreme drought occur, whether at the tenth or hundredth year, it would be fatal. Hence, it will require not less than 100 yrs. to determine accurately how far the forest-growth can be carried by human aid into P. from which it is excluded by natural causes. Fortunately, the value of the great grass-covered plains is not dependent on the solution of this problem, for they form the finest area for grazing and stock-raising which we possess. It is even probable that the higher and drier P. will be more useful to the inhabs. of the country if devoted to stock-raising than though persistent efforts should be successful in covering them with forests or crops.

**Prairie-Dog**, not at all related to the dogs, but very closely allied to the tree and ground squirrels; the name has been obtained simply because the ordinary utterance of the animals is a chattering noise somewhat recalling the yelp of a dog. They are considerably larger than the squirrels, being generally about a foot in length, exclusive of the tail, which is short and about 2 to nearly 5 inches in length. They affect the prairies of W. Amer., congregate in large numbers, and form communities designated as "villages."

**Prairie du Chien**, *prairie du chien*, city and R. R. June, cap. of Crawford co., Wis., on Miss. River, near the mouth of the Wis., on a long prairie, 1 m. wide, stretching from the river to a range of bluffs on the E.; has 2 Catholic colls.

(male and female). First settled by Amers. in 1835. Pop. 1870, 2700; 1880, 2777.

**Prairie-Hen**, or **Pinnated Grouse**, a peculiar form of the grouse family, restricted to the U. S. and found chiefly on comparatively open plains and prairies. It inhabits from the E. States to the prairies of the Wis. Valley, and southward to La., but is now very rare or extinct in the E. portion of its range. It is found in great numbers on the plains of the W. States, and forms a favorite object of sport; it is also from those sections that birds are sent in considerable numbers to the E. markets. The species is at once recognizable by the extension of feathers to the lower end of the tarsus, the air-bladders, and the long and lanceolate feathers of the sides of the neck, and the short sub-truncate tail; beneath the long neck-feathers on each side is a bare and distensible air-sac developed in the male, and connected with the organs of voice.

**Prairie-Squirrels** are simply squirrels, affecting the ground rather than the trees, and having a shorter tail than the tree-squirrels, and also provided with cheek-pouches. They live on the prairie-lands of the W. States and Terrs., make burrows, and generally associate together in considerable communities.

**Prairie-Wolf**. See **WOLF**.

**Prakrit** [Sans. "natural," "unrefined"], a name applied to those obsolete tongues and dialects of India which were derived from the Sanskrit or kindred to it. There were many dialects of this class. Most of its lit. is found in dramas and inscriptions.

**Prase** [Gr. *πρασον*, a "leek"], a leek-green variety of quartz, containing hornblende, sometimes cut as a gem.

**Prati**, *prah'te* (GIOVANNI), b. Jan. 27, 1815, at Descendo, It. Tyrol. His youthful poem *Edmenegarda* marks an epoch in modern It. poetry, and his early *Canti Lirici*, *Canti per il Popolo*, *Memorie e Lacrime*, and the *Ballate* increased his popularity. In 1847 appeared his 2 vols. of *Pasceggiate Solitarie*; in 1849 *Canti Politici*, followed by 3 epic poems, *Rodolfo*, *Arioberto*, *Armando*, and a collection of sonnets entitled *Anima e Mondo*.

**Pratt** (BENJAMIN), b. at Cohasset, Mass., Mar. 13, 1710, grad. at Harvard 1737; became a lawyer; was representative of Boston in the legislature 1757-59; wrote some fugitive verses and made preparations for a hist. of N. Eng.; was appointed chief-justice of N. Y. upon the nomination of Gov. Pownall. D. Jan. 5, 1763.

**Pratt** (CHARLES). See CAMDEN, EARL OF.

**Pratt** (DANIEL D.), b. at Palermo, Me., Oct. 26, 1813, removed in childhood to Central N. Y.; grad. at Hamilton Coll. 1831, went to Ind. 1832; taught school; became a clerk in the office of the sec. of state; studied law; settled at Logansport 1836; was a member of the legislature 1851 and 1853; elected to Cong. 1868; chosen U. S. Senator before taking his seat, and appointed com. of internal revenue 1875. D. June 17, 1877.

**Pratt** (DANIEL JOHNSON), PH. D., b. at Westmoreland, N. Y., Mar. 8, 1827, grad. at Hamilton Coll. 1851; was for 10 yrs. prin. of Fredonia Acad., after which he became assistant sec. of the regents of the Univ. of the State of N. Y., and in 1869 recording sec. of the Albany Inst.; was one of the originators of the annual "convocation" of the profs. in the colls. and acads. of N. Y.; author of *Annals of Public Education in the State of N. Y. from 1626 to 1800*, and (in greater part) of the *Hist. of the Boundaries of the State of N. Y.*; prepared reports upon education.

**Pratt** (ORSON), b. at Hartford, N. Y., Sept. 19, 1811, became a Mormon and one of the "twelve apostles"; prof. of math. in Deseret Univ. and Ch. historian, and was several sessions speaker of the Ut. house of representatives. Author of *Cubic and Bi-Quadratic Equations*, *The Great First Cause*, *The Absurdities of Inmaterialism*, etc.; wrote *Mss. Lectures on Astron. and Differential Calculus*. D. Oct. 4, 1881.

**Pratt** (ZADOCK), b. at Stephentown, N. Y., Oct. 30, 1790; commenced business 1812 as a saddler and harness-maker; turned his attention to the tanning business 1817; located a tannery in 1824 on Schoharie Kill, Greene co., which became the largest establishment of the kind in the country; State Senator 1830; Presidential elector 1836 and 1852; was elected to Cong. 1836, and again 1842; advocated cheap postage; procured the establishment of the national bureau of statistics, and prepared the plans for the new P. O. building at Wash.; was pres. of the Mechanics' Inst. of New York, and of other industrial and benevolent insts. D. Apr. 6, 1871.

**Pratz**, du (LE PAGE), b. in Hol. about 1660; entered the Fr. army in early youth; was engaged in campaigns in Ger.; became a member of a Fr. "Western Land Co.," which obtained the grant of a tract of land near New Orleans, La.; conducted an expedition thither 1718; made fruitless efforts at colonization; ascended the Miss. 1720, and settled among the Natchez; explored Mo. and Ark. rivers; was treas. of the land co. at New Orleans; returned to Fr. 1734; pub. a *Hist. of La.* D. in 1775.

**Prawn**, a name applied to the long-tailed decapod crustaceans of the family Palaemonidae, easily distinguished by the long and serrate-edged beak. There are many species. All have 2 pairs of antennae and stout legs. They are often very richly colored and sometimes transparent.

**Praxiteles**, a Gr. sculptor, head of the Attic school, b., it is thought, at Athens about 392 B. C. Of his life nothing is known; of his works we have an idea through tradition, descriptions, images on coins, copies, and fragments. His favorite material was marble, though he wrought also in bronze. P. has been called the sculptor of the beautiful, as Phidias was of the sublime.

**Preble** (EDWARD), b. at Falmouth (now Portland), Me., Aug. 15, 1761; embarked in a privateer 1777; in 1779 entered as mdpn. in the provincial navy, serving on board the Protector, and taken prisoner; upon his release he joined the sloop-of-war Winthrop as first lieutenant, until 1782, distinguishing himself by boarding with 4 men an armed Eng. brig off Castine, and capturing her. From Dec. 1782 until 1799 he



followed the merchant service, when appointed lieutenant in the navy, and in June promoted to be captain, and placed in command of the Essex; in 1803 he took command of the frigate Constitution, and sailed in command of the squadron sent against Tripoli; arriving at Tangier, he concluded negotiations with the emp. of Morocco, after which proceeded to Tripoli, which he subjected to repeated bombardments; in Sept. 1804 he returned home, and received the thanks of Cong. and a gold medal. D. Aug. 21, 1807.

**Preble** (GEORGE HENRY), b. in Me. Feb. 12, 1816; entered the navy as midshipman 1835, became a lieutenant 1848, a commander in 1862, a captain in 1867, a commodore in 1871, a rear-admiral in 1876; served in Mex. war, participated in capture of Alvarado and Tampico; in several actions with Chl. pirates in 1854-55, and complimented by Amer. and Eng. naval commanders-in-chief in the E. I.; commanded the Katahdin at taking of New Orleans in 1862, and fleet brigade in battles of Honey Hill, Tullifinny Cross-roads, and De Vaux's Neck in 1864. Wrote *Our Flag*, etc. Retired in 1878. D. Mar. 1, 1885.

**Preble** (WILLIAM PERRY), LL.D., b. at York, Me., Nov. 27, 1783, grad. at Harvard 1806; became a lawyer and a leader of the Dem. party; U. S. dist. atty. 1813; settled at Portland 1818; member of the convention which formed the State const. of Me. 1819; on the inauguration of the new State govt. was appointed a judge of the State supreme court 1820; minister to the Netherlands 1829; held many other public offices. D. Oct. 11, 1857.

**Precession of the Equinoxes** (see EQUINOX and EQUINOCTIAL POINTS), literally, the slow motion of the equinoctial points in the reverse direction to the earth's orbital motion, by which each semi-annual solar passage through those points is in advance of (*precedes*) the time it would otherwise occur. This motion amounts to  $50\frac{1}{10}$  seconds of arc per annum, and hence a period of 25,868 yrs. is required for an entire revolution.

**Precious Metals**, a term used to distinguish the uncommon, highly valuable metals, such as gold and silver, from the common metals, such as iron, copper, and lead. Gold and silver have been prized through all ages as ornaments and as money. Platinum may be included, as also palladium and the other metals of the platinum group.

**Precious Stones, or Gems, Natural and Artificial**. The term *gem* includes natural and artificial products whose beauty, rarity, and durability fit them for objects of personal ornament.

The *diamond* is the hardest known substance, being classified as 10 in the scale of hardness of minerals. Unaffected by chemicals, infusible, and only combustible after long exposure to a high temperature, it is the least destructible of gems, and being at the same time one of the rarest and most beautiful, it stands foremost among P. S. It is pure carbon, and is of all colors, and also colorless and black. It only shows its beauty when cut, and then, owing to its extraordinary refracting powers, it throws back a very large proportion of the light falling upon it, whence results the unusual lustre of a well-cut diamond. Diamonds are found by washing alluvial deposits, chiefly in India, Brazil, Borneo, Australia, and S. Afr. A diamond of 5 carats is a very large stone; above 100 carats few are known.

Next in hardness to the diamond stand the members of the *sapphire* or *corundum* group, which are all composed of alumina. Foremost in value, exceeding even the diamond itself if larger than 2 or 3 carats, is the *ruby*. The best rubies are found in Siam, and stones of more than 10 carats are exceedingly rare. The *sapphire* differs from the ruby in having a rich blue color.

*Chrysoberyl*, composed of glucina and alumina, stands next to corundum in hardness. Although a very lustrous yellow stone, it is now rarely worn, but a variety known as *chrysoberyl cat's-eye*, or *cymophane*, is quite esteemed. The *spinel*, a compound of alumina and magnesia, hardness 8, is of all colors. *Topaz* (Brazilian topaz), silico-fluoride of alumina, varies from colorless to deep yellow, and sometimes is blue (Brazilian sapphire). *Emerald*, silicate of alumina and glucina, hardness 7.5 to 8, is a rich green stone, generally cut flat, and presenting a fine appearance when surrounded by brilliants. The finest emeralds are found in New Granada. *Beryl*, or aquamarine, is a pale green or blue stone of the same composition as emerald, but of trifling value. *Zircon*, silicate of zirconia, hardness 7.5, is a very lustrous stone, and the white varieties are sometimes sold as diamonds, but it is rarely met with. *Tourmaline*, silicate of alumina, magnesia, iron, etc., with a little boracic acid, hardness 7-7.5, occurs of all colors, and is of small value. *Garnet*, comprising several varieties, silicates of alumina, lime, magnesia, with iron and manganese, hardness 6.5-7.5, although at times a very handsome stone, is so abundant as to be of comparatively little value.

*Quartz*, silicic acid with various coloring matters, hardness 7, is known under different names. Clear and white, it is rock-crystal, a stone of some beauty, but very cheap. Yellow crystals are called *catrings* or false topazes. Amethyst, when set with diamonds or chrysoberyl, chalcedony, onyx, sardonyx, carnelian, jasper, agate, and blood-stone are all varieties of quartz, distinguished by various markings. *Opal*, softer than quartz and differing from it in containing water, is one of the most precious gems. Its blending of soft hues and changing fire imparts to it a strange beauty which defies imitation. *Turquoise*, hydrated phosphate of alumina, when of a fine azure-blue color, is of high repute, and shows well in contrast with gold and diamonds or pearls. It is found in Pers. *Lapis-lazuli*, a deep-blue silicate and carbonate of alumina, lime, and iron, with some sulphuric acid; *malachite*, hydrated carbonate of copper; *labradorite*, a feldspar showing changeable colors; *amber*, a fossil hydrocarbon; and *coral*, carbonate of lime secreted by polyps in the ocean—are often used as ornaments.

*Pearls*, carbonate of lime with organic matter, found in the shells of pearl-oysters and of certain mussels, are, when

fine, among the most beautiful and valuable of gems. The best are found about Ceylon, Pers., and other E. coasts, and inferior ones on the tropical coasts of Central and N. Amer. A perfect pearl must be round, pure white, translucent, lustrous, and free from flaws.

*Artificial gems* of all kinds except opal can now be made so perfectly that by the eye alone even the most expert dealer cannot always detect the imitation. By applying physical tests as to hardness, specific gravity, optical and electrical properties, however, any gem can be identified, and almost any fraud readily detected. [From orig. art. in *J. N. Univ.* (N.Y., by PROF. H. B. CORNWALL).]

**Predestination**, the doctrine according to which God has foreordained from eternity and unchangeably whatever takes place, was first defined and debated during the controversy between Pelagius and St. Augustine. In the R. Cath. Ch. the Jansenists became the champions of P. It was generally adopted by the earliest Reformers, but while in the Reformed Ch. it received a very strict and explicit development by Calvin, to which the Arminians opposed a milder explanation, it was for some time entirely given up by the Lutheran Ch. until Schleiermacher revived it in a somewhat mystical form.

**Pre-emption** [Lat. *præ*, "before," *emere*, "to buy"], the act of one belligerent in seizing upon the sea, and taking at a price, certain articles not strictly contraband intended for importation within the territory of his foe. (See INTERNATIONAL LAW.) T. D. WOOLSEY.

**Pre-existence**, the doctrine that the human soul has had an existence in some past state of being. This was the doctrine of the Pythagoreans, also of Plato, Philo, Origen, and many other ancients. The doctrine was condemned in 543 by the Council of Constantinople. It is defended by Kant, Schelling, and the younger Fichte.

**Prefect** [Lat. *præfectus*], the title of many officers and magistrates of anc. Rome. The *præfectus urbi* was the warden of the city, but his duties varied much at different periods. The prætorian P. commanded the imperial body-guard. The *præfectus annonæ* presided over the corn-market and the distribution of public charity. In modern Fr. a P. (*préfet*) is the chief of police in each dept. and a kind of justice of the peace.

**Premonstratensian Monks and Nuns, or Norbertines**, were established at Prémontré, near Laon, in Fr., in 1120, by St. Norbert, afterward abp. of Magdeburg (1080-1134). They followed the rule of St. Augustine, and were in part canons regular.

**Prentice** (GEORGE DENISON), b. at Preston, Conn., Dec. 18, 1802, grad. at Brown Univ. 1823; was admitted to the bar in 1829; edited the *Weekly Review*, Hartford, Conn., 1828-30, and from 1830 to his death was ed. of the *Louville Journal*; author of many fugitive poems and of a *Life of Henry Clay*. D. Jan. 22, 1870.

**Prentiss** (BENJAMIN MATTHEW), b. at Belleville, Va., Nov. 23, 1819; removed with his parents to Mo., and in 1841 settled at Quincy, Ill., where he learned the trade of rope-maker. In the war with Mex. he was adjutant of the 1st Ill. Volunteers; capt. subsequently, and distinguished at Buena Vista. At the outbreak of c. war he was appointed col. 7th Ill. Volunteers, and soon after brig.-gen. of 3 months' troops. Appointed brig.-gen. of U. S. volunteers May 1861, he commanded in S. Mo.; at the battle of Shiloh in Apr. 1862 he was surprised and captured with most of his division; released in Oct., and made maj.-gen. of volunteers Nov. 29, 1862. Commanded at Helena, Ark., July 4, 1863, when he defeated Gen. Holmes.

**Prentiss** (CHARLES), b. at Reading, Mass., Oct. 8, 1774, grad. at Harvard 1795; began in the same yr. the publication at Leominster of *The Rural Repository*; issued a *Collection of Fugitive Essays in Prose and Verse*; afterward edited political, literary, and theatrical papers at various places; visited Europe 1804; was for some yrs. reporter of debates in Cong.; wrote the *Life of Gen. Eaton* and the *Life of Robert Treat Paine*. D. Oct. 30, 1820.

**Prentiss** (GEORGE LEWIS), D. D., b. at Gorham, Me., May 12, 1816, grad. at Bowdoin Coll. 1835; was assistant in Gorham Acad. 1836-37; studied theol. at the univ. of Halle and Berlin in Ger. 1839-41; was settled over the S. Trinitarian ch., New Bedford, Mass., in Apr. 1845; became pastor of the Mercer st. Presb. ch., New York, Apr. 1851; resigned on account of ill-health in the spring of 1858, and went abroad for 2 yrs.; on his return gathered a new congregation on Murray Hill (Ch. of the Covenant), and was installed its pastor in the spring of 1862, and resigned in Apr. 1873, in order to accept a professorship in Union Theological Sem. During the c. war he was an ardent champion of Union principles. Beside numerous sermons and addresses, he has pub. *A Memoir of Sargent S. Prentiss and a Discourse in Memory of Thomas Harvey Skinner, D. D., LL.D.*—His wife, ELIZABETH PAYSON PRENTISS, youngest daughter of Dr. Edward Payson, b. in Portland, Me., Oct. 26, 1818, was married in Apr. 1845. Her three *Song* books first brought her into notice as a writer. Wrote *Stepping Heavenward* (1869). Most of her books have been republished in Eng. D. Aug. 13, 1878. A memoir of her was pub. in 1882.

**Prentiss** (SAMUEL, LL.D., b. at Stoughton, Conn., Mar. 31, 1782; began the practice of law at Montpelier, Vt., 1803; was chief-justice of the State supreme court 1829-31, U. S. Senator 1831-42, and U. S. dist. judge from 1842 until his death. D. Jan. 15, 1857.

**Prentiss** (SARGENT SMITH), b. at Portland, Me., Sept. 30, 1808, grad. at Bowdoin Coll. 1829; went to Natchez, Miss., as a teacher 1827; was admitted to the bar 1829; removed in 1832 to Vicksburg, where he acquired great reputation, especially as a jury-lawyer; was sent to Cong. 1837, but unseated by the casting vote of J. K. Polk, the speaker; was returned in 1838 by an overwhelming majority; removed in 1845 to New Orleans. D. July 1, 1850.

**Presburg**, one of the finest towns of Hungary, on the N. bank of the Donau, near the frontier of Lower Aus.



From 1541 it was the cap. of the country until Joseph II., in 1784, once more transferred this dignity to its old possessor. It has a fine cathedral, built in 1090. Its educational and benevolent insts. are numerous and good; its manufactures are extensive, and its transit-trade in corn and wine active. Pop. 48,006.

**Presbyter** [Gr. *πρεσβύτερος*, "elder"], the title of an officer in the Chr. Ch., given at first on account of age, length of service, or dignity. It was a Jewish-Chr. name, and came from the synagogue. In the N. T. the words "presbyter" and "bishop" are interchangeable. In each early ch. there was a board of P. Their duties were to superintend the ch. order, discipline, and doctrine, to teach, preach, visit the sick, receive strangers, and preside at the meetings. They were appointed by the apostles or their representatives, or may have been elected or nominated by the people. They were ordained with prayer and the laying on of hands.

Clement (earliest of the Fathers), 96 A. D., makes no distinction between P. and bps. Ignatius, 115 A. D. (Syriac), speaks of bps. as distinct from P. Irenæus, about 182-188, in some places distinguishes between bps. and P. In Tertullian (160-240?) bps. and P. are kept distinct. Cyprian (200-258) says bps. are successors of the apostles, and all authority resides in them. They only can ordain. All bps. are equal, and are related to the whole Ch., though laboring in their own dioceses. Special dignity, though at first apparently no superior authority, was attached to the bps. of Jerusalem, Rome, Antioch, Alexandria, Ephesus, and Corinth. Metropolitan dignity came to chief men of provincial synods. At Council of Nice the patriarchate appears, and after a time the bp. of Rome secured the primacy.

The episcopalian form of ch. gov't. claims that there were 3 ecclesiastical orders among the Israelites—the high priest, priests, and Levites; 3 during the time of our Lord—Christ, the apostles, and the Seventy; 3 while the apostles lived—apostles, P.-bps., and deacons; and 3 appointed for the Ch. permanently—bps., P., and deacons; that the N. T. interchange of "bishop" and "presbyter" ceased at the death of the apostles. The presb. form rests on the parity of the clergy. It claims that there has been no continuance of an office that was from its nature for a temporary purpose; that the apostles were called to be eye and ear witnesses; that when they died their office ceased; that the titles P. and bp. in the N. T. both belong to the same office—P. is a title of age or dignity, bp. of office or duty; that every P.-bp. has authority to ordain, and that they are equal among themselves; that Timothy and Titus were not diocesan bps., but representatives of the apostles for a peculiar, temporary duty, as evangelists and messengers; that if the apostles had appointed men to the diocesan episcopate they would not have taken the inferior name of presbyter; that the true apostolic succession has been kept up through the Ch. simply by the officers of one generation approving of those who were to follow; that bp.-P. have authority only in single chs. or as their representatives; that the episcopate grew up from natural causes, without any divine institution; that the very small jurisdiction of the early bps.—as e. g. in N. Afr.—shows that they were over parishes rather than dioceses. [From orig. art. in *J.'s Univ. Cyc.*, by Rev. ISAAC RILEY.]

**Presbyterian Church.** I. *Name*.—The distinctive title "Presbyterian" as descriptive of one division of the Ch. of God, is derived from the Gr. word *πρεσβύτερος*, used in both the Septuagint and the N. T. to designate a body of officers to whom was committed the gov't. of the Ch. At its earliest appearance in the Septuagint the term is used to designate a council of elders, and in later writings it designates the officers of the synagogue. The title and the duties it implies were retained under the new dispensation, as the Chr. Ch. was the outgrowth of the Jewish.

II. *Constitution*.—In the P. C., as it now exists, a particular congregation is generally organized by some recognized authority, but is complete in itself. It elects its own officers, which are—(1) a pastor, (2) a bench of elders, (3) a board of deacons. A pastor, once elected, is installed by the ecclesiastical body called presbytery, with which the congregation is connected. The elders are elected by the people and ordained by the presiding minister or by presbytery. To them is committed the spiritual oversight and gov't. of the congregation. The board of deacons is also elected by solemn congregation, and its members are "set apart" by solemn ceremony, as are the elders. Their duty is to care for the poor of the congregation and for such temporal interests as may be committed to them. In many congregations in Amer. pecuniary affairs are managed by a board of trustees, also elected by the people, but not ordained. In Scot. and in some parts of the U. S. the duties of trustees are discharged by the deacons; this is, in fact, most harmonious with the constitution of the Ch. Governmentally, there are in the P. body 4 "judicatures," styled in order the session, the presbytery, the synod, and the General Assembly.

III. *History*.—Modern Presbyterianism dates in Switz. from the time of John Calvin, and in Scot. from that of John Knox. The P. C. became fully established in Scot. in 1560, when the first General Assembly was held. Since that period, in fact, the P. C. in Scot. has held the same relation to the state that the Epis. Ch. has held in Eng. since the reign of Henry VIII. In 1733, during the reign of Queen Anne, an act was passed vesting in certain individuals the power to nominate pastors for vacant chs. In 1843 nearly 500 ministers of the Established Ch. gave up their "livings" and formed the "Free Church of Scotland." Beside these prin. groups, there is at present another, known by the name of the "Reformed Presbyterian Church," and claiming to represent Presbyterianism as it was before the Revolution. In Eng. the first presbytery was formed at Wandsworth, a v. near Lond., Nov. 20, 1572. There are now two Presb. bodies in Eng., one of which, bearing the gen. title

of "Presbyterian Church of England," is self-governed, but affiliated with the Free Ch. of Scot.; while the other, the "United Church," is a branch of the United P. C. of Scot. In Switz. the Ch. remains substantially as it was organized by Calvin. In Ger. the elements of Presbyterianism still exist in the "Reformed Church." In the Netherlands, Presbyterianism, brought from Switz. in the time of William, prince of Orange, found a congenial soil, and at this time  $\frac{1}{4}$  of the Prots. of the Netherlands are Presbs. The P. C. in Amer. owes its origin and cast principally to Scot., although it has spread from 3 centres—established by the Dut. in N. Y., by the Scotch in Va., and by the Huguenots in Carolina. The first Dut. ch. was formed in New Amsterdam 1619. Scotch Presbs. settled on the Elizabeth River, Va., between the yrs. 1670 and 1680. The Huguenots, banished from Fr. by the Revocation of the Edict of Nantes in 1685, established their chs. in this country about this period. The first presbytery in Amer. was formed in 1705, and was called the Presbytery of Phila. The first synod, composed of 4 presbyteries, was formed in 1717. The first General Assembly met in Phila. in 1789, there being then twelve presbyteries and four synods. In 1897 the General Assembly was divided because of disagreement on certain questions of ch. polity and method. In 1899, the Ch., thus divided, was happily reunited, and the first General Assembly of the reunited Ch. was held May 1870, in the same city and under the roof of the same congregation which welcomed the Assembly of 1789. The less prominent groups are these: (1) the United P. C. formed in 1858 by a union of 2 bodies of Scotch affiliations known as the "Associate" and the "Associate Reformed" chs.; (2) the Reformed P. C., whose first presbytery was formed in 1774; (3) the Associate Reformed Synod of the S., originally one of the synods of the "Associate Reformed Church," alluded to above; (4) the Cumberland P. C., which became a distinct body in 1810, and whose field is principally in the S. and S. W.; (5) the Reformed (Ger.) Ch., 1819; (6) the Reformed (Dut.) Ch., dating from early in the 17th century. In the Dominion of Canada Presbyterianism has had, until recently, more of a colonial character.

IV. *Doctrines*.—Their prin. points are: (1) God in three Persons, Father, Son, and Holy Ghost, these three "the same in substance, equal in power and glory." (2) Man morally depraved by nature. (3) Jesus Christ an atoning Saviour. (4) Justification by faith in the Redeemer. (5) Regeneration and sanctification by the Holy Ghost. (6) Eternal happiness in the other world for "believers," eternal suffering for the finally impenitent. (7) God in all his acts and purposes, including those of "election," sovereign; man in all his acts free. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. Z. M. HUMPHREY, D. D.]

**Presbyterianism.** See PRESBYTERIAN CHURCH.

**Prescott**, cap. of Ari. Terr. and Yavapai co., the military head-quarters of Ari. Pop. 1870, 608; 1880, 1836.

**Prescott** (OLIVER), M. D., b. at Groton, Mass., April 27, 1781, grad. at Harvard 1790; studied and practised med.; was a col. of militia before the Revolution; appointed brig.-gen. for Middlesex co. 1776, and maj.-gen. of State militia 1778; served as a member of the board of war and of the supreme executive council; was influential in the suppression of the Shays rebellion, and was judge of probate for Middlesex co. from 1779 until his death. D. Nov. 17, 1804.

**Prescott** (OLIVER), M. D., son of the preceding, b. at Groton, Mass., Apr. 4, 1762, grad. at Harvard 1783; studied med. with his father; was surgeon of the expedition against the Shays rebellion 1787; frequently a member of the legislature; settled at Newburyport 1811; wrote a *Dissertation on the Nat. Hist. and Medicinal Effects of the Scale Cornutum or Argot*, and contributed articles to the *N. Eng. Journal of Med. and Surgery*. D. Sept. 23, 1827.

**Prescott** (RICHARD), b. in Eng. about 1725; served in the Brit. army in Ger. during the Seven Years' war, attaining the rank of col. of the 7th foot 1772; came with that regiment to Canada, where he held the local rank of brig.-gen. 1773; surrendered to the Amer. invading army on the St. Lawrence Nov. 17, 1775; was exchanged for Gen. Sullivan Sept. 1776; participated in an expedition against R. I. Dec. 1776; remained in command of Newport; was surprised and captured at a country-seat on the island by a party under Lieut.-Col. Barton; was exchanged for Gen. Lee; resumed the command of the R. I. station until the evacuation of Newport, Oct. 25, 1779; was noted for his brutal treatment of Amer. prisoners; became maj.-gen. Aug. 1777, and lieut.-gen. 1782. D. in Eng. Oct. 1788.

**Prescott** (ROBERT), b. in Lancashire, Eng., in 1725; served in the Brit. army in the expeditions against Rochelle (1757) and Louisbourg (1758); was aide-de-camp to Gen. Jeffrey Amherst in the campaign against Crown Point and Ticonderoga 1759; was with Wolfe at Que.; participated in the capture of Martinique 1761, in the battle of I. L. and other engagements near New York 1776, and in the battle of Brandywine 1777; was sent with Gen. Grant against the Fr. W. I., with the rank of brig.-gen., 1778; became maj.-gen. 1781, lieut.-gen. 1793; captured in 1794 the islands of Barbadoes and Guadaloupe, of which he became civil gov.; succeeded Lord Dorchester as gov. of Lower Canada 1796; was recalled 1799, and became full gen. 1798. D. near Battle, Sussex, Eng., Dec. 21, 1816.

**Prescott** (WILLIAM), brother of Gen. Oliver, b. at Groton, Mass., Feb. 20, 1726; served in the expeditions against Cape Breton (1754) and Acadia (1756), attaining the rank of capt.; became a farmer in Pepperell; commanded a regiment of minutemen 1775; took part in the battle of Lexington, and commanded in that of Bunker Hill (according to the usual account); resigned from the army 1777, but took part as a volunteer in the campaign against Burgoyne in the same yr., and sat in the Mass. legislature for several yrs. D. Oct. 13, 1795.

**Prescott** (WILLIAM), LL.D., son of the preceding, b. at Pepperell, Mass., Aug. 19, 1762, grad. at Harvard 1783; taught



school for some yrs.; studied law, and settled at Salem; served in both houses of the legislature; twice declined a seat on the supreme bench of Mass.; removed to Boston 1808; was a delegate to the Hartford Convention 1814, a member of the gov.'s council for some yrs.; judge of common pleas for Suffolk co. 1818, a member of the State constitutional convention of 1820. D. Dec. 8, 1844.

**Prescott** (WILLIAM HICKLING), D. C. L., son of the preceding, b. at Salem, Mass., May 4, 1796; removed to Boston 1808; prepared for coll. at a private school; entered Harvard as a sophomore 1811; suffered in the following yr. an injury to his left eye which rendered his subsequent studies through life a matter of extreme difficulty; grad. 1814; spent several months (1815-16) at St. Michael's, Azores Islands, with his maternal grandfather, who was U. S. consul on that island; visited Eng., Fr., and It. 1816-17; founded a literary and social club at Boston (June 1818), for which he edited several numbers of a periodical, *The Club-Room* (Feb.-July 1820); devoted several yrs. to an elaborate course of study of anc. and modern hist. and lit., performed with the disadvantage of being able to use his eyes but a short time daily, being forced to employ a reader; furnished to the *N. Amer. Review* several studies upon It. and Fr. poetry and romance; selected, Jan. 19, 1826, the subject of his first historical work, to which he gave the labor of 10 yrs., procuring from Sp. extensive materials, both printed and in MSS.; put forth, Dec. 25, 1837, his *Hist. of the Reign of Ferdinand and Isabella the Catholic*, which was soon translated into Fr., Sp., It., Ger., and Dut.; added to his reputation by the *Hist. of the Conquest of Mex.*, 1843, which had a popularity even greater than its predecessor; completed his cycle of Sp.-Amer. hist. by the *Conquest of Peru*, 1847; produced a vol. of *Biographical and Critical Miscellanies*, 1845; was welcomed by the literary circles of Lond., Edinburgh, Paris, Brussels, and Antwerp in the summer of 1850, receiving the degree of D. C. L. from Ox. Univ.; completed 2 vols. of a *Hist. of the Reign of Philip the Second* in 1855, and a third in 1858; edited Robertson's *Charles the Fifth* in 1857, with a supplement on the life of the emp. after his abdication, and was at work upon his *Philip the Second*, which was intended to comprise 6 vols., when his labors were cut short by death. He had also written brief biographies of John Pickering and Abbott Lawrence. By general consent, P. is associated with Irving at the head of the Amer. authors of his time. (See his *Life*, by GEORGE TICKNOR; the *Proceedings of the Mass. Historical Society in Memory of W. H. Prescott*, and ALLIBONE'S *Dict. of Authors*.) D. Jan. 28, 1859.

PORTER C. BLISS.

**Presentation Nuns**, an order of R. Cath. ladies devoted to the work of instructing poor children and to the care of aged women. They were first established in 1777 at Cork, Ire., by Honora Nagle (1728-84); received papal approbation 1791; were cloistered 1805; first came to the U. S. in 1854; have more than 50 houses in Ire.—There is also an order of the PRESENTATION OF MARY, whose mother-house is at Bourg in the diocese of Viviers, Fr. Its especial work is the education of young ladies.

**Preservation of Food** is an art which in modern times has received an immense development by the invention of more appropriate methods. Drying, salting, and smoking were the oldest methods by which flesh and fish were preserved; to fruits were first applied the methods of drying and making into preserves, either jellies or jams. Pickling seems to be of a more recent date; fruit was generally kept in brandy; flesh in a strong brine mixed with vinegar; fish in olive oil or melted lard. Pickling with vinegar was for a long time the only method by which vegetables, such as cucumbers, cabbages, etc., were preserved. The 2 methods which at present have acquired great commercial importance are those of canning and freezing. By the former, articles of food, flesh, fish, fruit, and vegetables, are prepared for eating in different ways, and then packed in air-tight cans; by the latter they are kept in refrigerators at a temperature near the freezing-point.

**Preservation of Timber**. Decay of wood proceeds from agencies both internal and external. *Cellulose*, which constitutes the great bulk of woody tissue, is by itself an exceedingly imperishable substance, but appears, when in contact with fermenting or putrefying nitrogenous matters, to be capable of entering into decomposition like its isomers and congeners sugar and starch, forming humus-like substances, devoid of coherence. The ferments in this case are the albuminoid matters, chiefly *Legumine*, which exist in the wood. It is evident that these should not enter into fermentation or putrefaction if perfectly devoid of moisture, and hence perfect seasoning of the wood is a powerful preservative. This process, however, is exceedingly consumptive of time and expensive, being nugatory, moreover, in case the wood is to be exposed to moisture. Other internal destructive agencies arise from the eggs of insects deposited in the wood or under the bark. External destructive agencies are many, the most powerful being when the wood is exposed to simultaneous action of air and moisture, which engender and foster a number of destructive processes. Under sea-water, and between high and low tide, the *teredo* is another destructive agent. In tropical countries ants are enemies of timber structures. Contact with iron also destroys cellulose rapidly through a slow combustion set up between the carbon of the cellulose and the oxygen of ferrous oxide. Among the more prominent methods of treatment for rendering wood durable we first allude to

*The Method of Kyan*.—Impregnation with a solution of *corrosive sublimate*, bichloride of mercury. This was the first method experimented with in the U. S. It is founded on the known property of corrosive sublimate to form insoluble compounds with albuminoid bodies. This process has now been generally condemned.

*The Methods of Boucherie*.—Impregnation with *sulphate of copper*, also with *bichloride of calcium*. Sulphate of copper has much preservative power, but is removed gradually from

the wood by moisture. Chloride of calcium renders the wood *fire-proof*, adding also great strength and toughness. Dr. Boucherie was also the author of a method of making the preservative liquids penetrate the tree while still standing. Notches are cut in the trunk near the roots, and caoutchouc bags holding the solution bound on. The tree sucks up the liquid through evaporation from the leaves.

*The Method of Burnett*.—A solution of *chloride of zinc*. This agent, like *corrosive sublimate*, operates by combining with the fermentescible albuminoids, but is much cheaper and not noxious. It has come into use in the U. S. much more largely than any other.

*The Method of Bethell*.—The impregnation of the wood with heavy oils of coal-tar, called in Eng. "creosote oil," in the U. S. "dead oil." The oil was forced into the pores of the timber by a pressure of 13 or 14 atmospheres.

*The Method of Seelye*.—The wood is immersed in the oil—a crude carbolic acid being used, which is believed to be much more efficient than the common dead oil—in a closed tank, and the temperature raised to 300° F. The air and moisture are thus expelled from the timber, which is then suddenly introduced into a bath of cold carbolic acid. By this process an absolute impregnation is accomplished.

There are numerous other methods; indeed, it would be difficult to mention any cheap chemical agent which has not at some time or other been proposed for the preservation of wood. Our knowledge of the whole subject remains, nevertheless, largely empirical. [*From orig. art. in J. s. Univ. Cyc.*, by PROF. HENRY WURTZ, Ph. D.]

**Pressensé**, pra-sen-sâ', de (EDMOND), D. D., b. at Paris Jan. 7, 1824, ed. in Paris, Lausanne, Halle, and Berlin; became pastor of the chapel Taitbout, Paris (Evangelical or Independent Prot.), 1848. His energies have been devoted to the maintenance of the freedom of the Ch. from state interference and from dependence upon state aid, and to the presentation of Christianity as the means of solving the moral and social questions of the day. After the proclamation of the Republic he was elected a member of the Fr. Assembly and a senator in 1883. Among his works are *Conférences sur le Christianisme dans son Application aux Questions sociales, Catholicisme en France, Histoire des Trois Premiers Siècles de l'Eglise, and Jésus Christ, son Temps, sa Vie, etc.*

**Press, Freedom of the**, liberty of publication unrestrained by any official authority. As it is necessary, however, that this liberty of publication shall be followed by a corresponding responsibility, it was formerly thought necessary to define by law the responsibility of publication, and to subject all works before publication to the inspection of a censor. The pope was the first inventor of such an instrument, and the Inquisition and the Jesuits the first to handle it. In 1496 Alexander VI. established a regular censorship. In 1515 Leo X. increased its power and enlarged its jurisdiction. Cardinal Chieregati demanded of the Diet of Nuremberg in 1522 that all books pub. without ecclesiastical permission should be seized and burned, and the penalties imposed for reading or owning heretical books were very severe. The secular govts. were not slow in following the lead of the popes, and the censorship became one of the most effective, but also one of the most fatal means which royal power could employ to stay the movements of the people. In Eng. the censorship was established by Henry VIII., and abolished by the Commons in 1693. In Ger. it was introduced as a law of the empire in 1529 by the Diet of Spire, but existed only in a loose form, different states at different times—such as Prus. under Frederick the Great—being exceedingly liberal. The Cong. of Vienna promised to abolish it, but the Diet of 1819 re-established it in a more stringent and rigorous form than ever. Thrown aside in 1849, it reappeared in 1854, but with the dissolution of the old *Bund* in 1866 and the establishment of the Ger. empire in 1870 it finally vanished. In Fr. freedom of the press was introduced in 1793, 1814, 1830, 1848, and 1871, but restrictive measures against newspapers and pamphlets were each time found necessary after the lapse of a very short period. The only country in Europe in which a censorship still exists in full vigor is Rus. The const. of the U. S. forbids its introduction.

**Presidential Electoral Commission**, a board appointed during the second session of the 44th Cong. of the U. S. to determine questions arising out of the presentation of two or more discordant certificates of the votes of the electoral colleges of certain States in which the election of Presidential electors had been contested. The canvass had been one of the most exciting in the hist. of the gov't., and at its close the vote was almost evenly balanced. The result depended on the voice of 3 States, Fla., La., and S. C., in which both parties claimed the victory; and of a fourth, Or., in which one elector was claimed to have been elected by a minority, in consequence of a constitutional disqualification affecting one of the candidates of the majority. An angry controversy arose as to the constitutional mode of deciding between these competing certificates. The dispute assumed proportions which even threatened the peace of the country. With a view to avert the impending danger, a joint committee of the two houses was appointed early in Jan. 1877 to devise, if possible, some means satisfactory to all of ascertaining the legal result of the election. On Jan. 18 this committee almost unanimously reported a bill providing for the creation of a tribunal to be composed of 6 senators, 5 representatives, and 5 associate justices of the supreme court of the U. S., to which tribunal should be referred the conflicting certificates and accompanying documents from the contested States, and all questions relating to the powers of Cong. in the premises, with the authority to exercise the same powers in ascertaining the legal vote of each such State. The bill further provided that the decisions of such tribunal in every case should stand, unless rejected by the concurrent vote of both houses. Also that objections which might be made to any votes from States not presenting double certificates should be considered, not



by the commission, but by the houses separately, and unless sustained by both should be of no effect. The bill, after a sharply contested debate in both houses, passed the Senate Jan. 25 and the House of Reps. Jan. 26. On Jan. 31 the commission was elected, 3 Reps. and 2 Dems. being taken by agreement from the Senate, and 3 Dems. and 2 Reps. from the House. On March 2 the pres. of the convention announced that Rutherford B. Hayes of Ohio had been duly elected Pres., and William A. Wheeler of New York duly elected V.-P. of the U. S.

**Prester John.** See JOHN, PRESTER.

**Preston,** town of Eng., in Lancashire, on the Ribble, at the head of its estuary. It is an old town, substantially built, but without any remarkable edifices; has breweries, distilleries, and malting establishments, iron and brass foundries, tanneries, ropewalks, and glass-works, but the prin. manufacture is cotton. Pop. 96,532.

**Preston,** Minn. See APPENDIX.

**Preston** (ISAAC TRIMBLE), b. in Va. in 1793, grad. at Yale 1812; studied law; was a capt. in the war with Eng.; became a lawyer at New Orleans and a judge of the supreme court of La. D. July 5, 1852.

**Preston** (JAMES P.), b. in Va. in 1775, studied 1790-95 in William and Mary Coll.; became col. 12th Inf. 1812, col. 33d Inf. 1813; was disabled for life at Chrysler's field by a wound; gov. of Va. 1818-19; long P. M. of Richmond, Va. D. May 4, 1843.

**Preston** (THOMAS SCOTT), b. at Hartford, Conn., July 23, 1824, grad. at Trinity Coll., Hartford, 1843; entered the P. E. ministry 1846; became a R. Cath. 1849, a priest 1850; was appointed vicar-gen. and chancellor of the diocese of New York and parish priest of St. Ann's, New York; author of *Ark of the Covenant, Christian Unity, Reason and Revelation, Christ and the Ch.*, etc.

**Preston** (WILLIAM), b. at Louisville, Ky., Oct. 16, 1816; studied at the coll. at Bardstow, Ky., and at New Haven; grad. at the Cambridge Law School 1838; practised law at Louisville, Ky.; served as lieutenant in the Mex. war; was a Whig member of the Ky. constitutional convention of 1850, of the State legislature 1850-51, M. C. 1851-53; became a Dem. on the dissolution of the Whig party; was minister to Sp. 1859-61; endeavored to induce Ky. to secede from the U.; proceeded to Richmond as a com. to negotiate the admission of Ky. into the Confederacy; became a brig.-gen. in the Confed. army and aide-de-camp to his brother-in-law, Gen. A. Sidney Johnston; participated in the battle of Shiloh and in Bragg's invasion of Ky.

**Preston** (WILLIAM BALLARD), b. in Va. about 1810; M. C. 1847-49, sec. of the navy in the administration of Taylor 1849-50, and a senator in the Cong. of the Confed. States. D. Nov. 14, 1862.

**Preston** (WILLIAM CAMPBELL), LL.D., b. at Phila. Dec. 27, 1794, grad. at S. C. Coll. 1812; studied law, came to the bar in 1820, and in 1822 settled at Columbia, S. C.; entered Cong. in 1824, U. S. Senator 1834-42, pres. of S. C. Coll. 1845-51; founder of the Columbia Lyceum; was a prominent expounder of free trade and the State Rights doctrine. D. May 22, 1860.

**Pretender** (THE OLD AND THE YOUNG), the names given by supporters of the Brunswick dynasty to the son and grandson of James II., the lineal heirs to the throne of Eng., which they respectively attempted to recover by means of the "Jacobite" insurrections in Scot. in 1715 and 1745.

**Pribilof** (pre-be-lov) **Islands**, a group of small islands in Bering Sea, lie 192 m. N. of Oonakla, 200 m. S. of St. Matthew, and about the same distance W. of Cape Newenham on the mainland. The climate is most disagreeable; but the perfect isolation of these islands, the mist and fog which always prevail, cause the fur-seal to select these grounds for the purpose of breeding. The great seal-producing island is St. Paul, with a shore line of 42 m., of which 16½ m. are frequented by the fur-seals.

**Price** (RODMAN M.), b. in Sussex co., N. J., Nov. 5, 1816, ed. at Princeton Coll.; studied law; became pursuer in the U. S. N. 1840; was the first person who exercised judicial authority as alcalde under the Amer. flag in Cal.; was appointed navy agent on the Pacific coast 1848; M. C. from N. J. 1851-53, gov. of that State 1854-57; was instrumental in founding the N. J. Normal School, and was a delegate to the "Peace Congress" of 1861.

**Price** (STERLING), b. in Prince Edward co., Va., Sept. 1809; settled in Charlton co., Mo., 1830; served in the legislature; M. C. 1845-47; col. of Mo. volunteers in the Mex. war; captured Taos, N. M.; commanded at the battle of Canada, N. M., Jan. 24, 1847; was made brig.-gen. July 20, 1847, and appointed military gov. of Chihuahua; gained the battle of Santa Cruz de Rosales, Mar. 16, 1848; was gov. of Mo. 1853-57; became a leader of the secession party; presided over the State convention of Feb. 1861; was appointed maj.-gen. of the State forces by Gov. Jackson, and endeavored to precipitate the withdrawal of Mo. from the U.; recruited an army of nearly 10,000 men, and being joined by McCulloch with 5000 from Ark., defeated Lyon and Sigel at Springfield Aug. 7; captured Lexington Sept. 20, for which he was thanked by the Confed. cong.; was forced to retreat into Ark.; appointed maj.-gen. in the Confed. service Mar. 1863; took part in the battles of Pea Ridge, Iuka, and Corinth; was in command of the dept. of Ark. 1863-64; invaded Mo. Sept. 1864, with nearly 20,000 men; pushed westward to the Kan. border, but being closely pursued by Pleasanton and Curtis, had to retreat to Ark. After the war he went to Mex., obtained from the archduke Maximilian a grant of lands, and founded a colony of ex-Confed. officers, but the downfall of Maximilian having involved that of the colony, he returned to Mo. D. Sept. 27, 1867.

**Prichard** (JAMES COWLES), M. D., b. at Ross, Herefordshire, Eng., Feb. 11, 1786; studied med. at Bristol, Lond., and Edinburgh; pursued a course of math. and theol. at Trinity Coll., Cambridge, and other special studies at St. John's and Trinity colls., Ox.; commenced practice as a

phys. at Bristol in 1810, and received med. appointments at the Clifton Dispensary, St. Peter's Hospital, and the Bristol Infirmary. In 1845 he became com. in lunacy; was for many yrs. pres. of the Ethnological Society, and pub. several works on med. subjects. D. at Lond. Dec. 22, 1848. Wrote *Researches into the Phys. Hist. of Mankind, The E. Origin of the Celtic Nations, and Nat. Hist. of Man.*

**Prickly Ash**, or **Toothache Tree**, the *Xanthoxylum Americanum*, a large prickly shrub found in most parts of the U. S., and belonging to the Rutaceæ. The leaves have the smell of lemons. The bark is aromatic and stimulant, and is used as a remedy for toothache, for rheumatism, and other diseases. *X. Carolinianum*, the S. P. A., has a more S. range. It becomes quite a large tree. Its bark is extremely pungent, and is armed with curious prickly warts. *X. Floridanum* and *X. pterota* grow also in Fla. Chi., Japan, S. Amer., and the W. I. abound in species of this genus, nearly or quite all aromatic, pungent, and medicinal.

**Prickly Heat**, a popular name for eruptive skin diseases occurring in hot weather and characterized by itching and sensations of stinging. In India there is quite a formidable variety of lichen called by this name. A popular remedy is the use of saline cathartics, which doubtless are sometimes advantageous. Frequent bathing and the avoidance of exposure to the sun's rays are recommended.

**Prickly Pear**, a name given the cactuses of the genus *Opuntia*, especially to *O. vulgaris*, a native of many places in the U. S. from Mass. S. and W. It is naturalized extensively in the Old World. Its fruit is smooth and eatable, but not so good as that of *O. Ficus Indicus*, which is prickly. Some of the numerous species are used for forage in Mex. The erect kinds are serviceable hedge-plants. One species is the official emblem of Mex. Some species support the cochineal insect.

**Pride of China.** See CHINA, PRIDE OF.

**Priessnitz** (VINCENT), b. at Gräfenberg, Aus. Silesia, Oct. 5, 1799, of peasant parents; became the inventor of hydrotherapy and the founder of the Gräfenberg water-cure. D. Nov. 28, 1851.

**Priest** [Gr. *ἱερεῖς*, *hierēs*, "elder"]. In all nations of antiquity among whom a system of worship received any considerable development there existed also a priesthood, to whose care that system of worship was more especially committed. The P. stood in a sort of mediatorial relation between God and man, and under the Heb. legislation this was divinely recognized and received the emphatic sanction of divine appointment. In earliest times the functions of the P. appear to have been discharged by the head of the family, who, as the recognized superior of all its members, was the fittest person to appear for them before God. Hence came what is called the "patriarchal priesthood." As the family multiplied into the tribe the duties of its head became too numerous for the proper discharge of the priesthood, as well as often incongruous, and persons were specially selected to fill the office. When the tribe became a nation a class of men was set aside for the same purpose, although the monarch often remained at the nominal head of the priesthood thus established.

**Priestley** (JOSEPH), LL.D., b. at Birstal-Fieldhead, near Leeds, Eng., Mar. 24, 1733, ed. at the Presb. acad. at Davenport; was ordained in 1755 assistant minister to an Independent congregation at Needham-Market, Suffolk; left that post in 1758 on account of having adopted Unitarian views; taught a private school at Nantwich, Cheshire, 1758-61, writing his first pub. work, *The Script. Doctrine of Remission*; was teacher of lang. and lit. in an acad. at Warrington 1761-67; prepared his *Hist. and Present State of Electricity, with Original Experiments*; was pastor of Mill-Hill Chapel, Leeds, 1767-73, made there important researches in pneumatics and chem., which he gave to the world in his *Directions for Impregnating Water with Fixed Air and Hist. and Present State of Discoveries relating to Vision, Light, and Colors*; pub. his *Institutes of Natural and Revealed Religion*; was from 1773 to 1780 librarian and literary companion to the earl of Shelburne; made in that yr. the discovery of oxygen, soon followed by that of nitrous, carbonic, and sulphurous oxide and other gases, beside many ingenious contributions to theoretical chem. set forth in his *Experiments and Observations on Different Kinds of Air*; pub. *An Examination of Dr. Reid's Inquiry into the Human Mind, Disquisitions relating to Matter and Spirit* (1777), *The Doctrine of Philosophical Necessity* (1777), and *A Free Discussion of the Doctrines of Materialism and Philosophical Necessity in a Correspondence between Dr. Price and Dr. Priestley*. The 3 latter works excited much controversy and elicited many replies, in which the author was, with some reason, accused of materialism. In 1780 Dr. P. retired from the service of Lord Shelburne with a life-pension of £150, became minister to the principal Independent congregation at Birmingham, addressed to an eminent Frenchman his *Letters to a Philosophical Unbeliever*, and wrote *Hist. of the Corruptions of Christianity, Hist. of Early Opinions concerning Jesus Christ, compiled from Original Writers, proving that the Chr. Ch. was at first Unitarian*, and *Letters to Burke, occasioned by his Reflections on the Revolution in Fr.* (1791). The latter treatise procured him an honorary citizenship in the Fr. republic, and was the cause of a riot at Birmingham (July 15, 1791), in which Dr. P.'s house was pillaged and his library, MSS., and scientific apparatus scattered through the streets, he himself escaping personal violence by opportune flight. In 1794 he removed to the U. S., where his sons already resided, and was received with great honor. D. at Northumberland, Pa., Feb. 6, 1804.

PORTER C. BLISS.

**Prim** (JUAN), count of Reus and marquis of Castillejos, b. in Reus, Catalonia, Sp., Dec. 6, 1814; became col. in 1837; was soon afterward elected to the Cortes; headed insurrections in 1843 at Reus; materially aided in the overthrow of Espartero by Narvaez, and in effecting the return of Queen Maria Christina, who rewarded him with the title of count, the rank of gen., and the military command of Ma-



drid; was commander-in-chief in the war against Morocco 1859-60, gaining a great military reputation and the title of marquis; was made commander of the Sp. contingent in the allied intervention in Mex. 1861, but soon withdrew his forces from that enterprise; was banished from Madrid Aug. 1864; devoted himself thenceforth to the overthrow of Isabella, and succeeded in organizing the movement which in Sept. 1868 resulted in the flight of the queen to Fr.; became commander-in-chief, marshal, minister of war, and head of the cabinet in the new provisional govt.; furnished the pretext for the Franco-Ger. war of 1870-71 by his offer of the crown of Sp. to Prince Leopold of Hohenzollern, and in the autumn of 1870 obtained from the Cortes the election of the It. prince Amadeus, duke of Aosta. On the day that the new king landed at Barcelona (Dec. 28) P. was attacked by assassins in a street of Madrid and received 8 balls in his body, and d. 2 days later (Dec. 30, 1870).

**Prime** (SAMUEL IRENEUS), D. D., b. at Ballston, N. Y., Nov. 4, 1812, grad. at Williams Coll. 1829; studied theol. at Princeton; was ordained to the ministry of the Presb. Ch., and preached several yrs., but on account of ill-health withdrew from the pulpit in 1840, when he became ed. of the New York *Observer*, the leading religious paper of his denomination; has several times visited Europe. Among his books are *Travels in Europe and the East, Letters from Switz., The Bible in the Levant, Memoirs of Rev. Nicholas Murray, The Alhambra and the Kremlin, and a Life of Samuel F. B. Morse.*—His brother, EDWARD D. G. PRIME (b. 1814), grad. at Union Coll. 1832 and at Princeton Theological Sem. 1838, was pastor of a Presb. ch. at Scotchtown, N. Y., 1839-51; Amer. chaplain at Rome 1854-55; associate ed. of New York *Observer* 1855; wrote *Around the World*, etc.

**Prime** (WILLIAM COWPER), brother of the preceding, b. at Cambridge, N. Y., Oct. 31, 1825, grad. at Princeton 1849; became a lawyer in New York; in 1861 ed. and one of the proprietors of the New York *Journal of Commerce*; travelled in the East 1855-56. Has contributed largely to periodicals; edited several works in archaeology and hymnology; author of *Boat-Life in Egypt and Nubia, Tent-Life in the Holy Land, and Coins, Medals, and Seals, Anc. and Modern, Illustrated and Described.*

**Prime Mover.** The term "prime mover" is employed to designate machines the office of which is to transform the energy expended in some natural source of power into useful or available work. For example, a quantity of water falling from one level to another represents an expenditure of energy due to the force of gravity, equivalent in foot-pounds to the product of the weight of the water multiplied by the height of fall in feet. In falling without obstruction or resistance the velocity of the water continually increases, and the accumulated energy represented by the living force is usually dissipated in the shock at the bottom of the fall. To render this source of power available, a water-wheel may be introduced, which, receiving the impulses of the falling particles, causes a portion of the work to be transformed into useful work, and the water reaches the bottom of the fall with its energy diminished by precisely the quantity which has been so transferred or transmuted into the work absorbed by the water-wheel.

While P. M. generally have the characteristics of other machines in many respects, yet only a few machines can be classed as P. M. The definition of a machine given by Ampère, and adopted by Poncelet, Willis, and other writers, is "an instrument by means of which the directions and velocities of given motions are changed," forces being left out of consideration, because few machines, except the P. M., are dependent in their construction on the nature or source of the power which drives them. P. M. are exceptions to this general rule, because their construction and the arrangement of their parts are necessarily dependent on the nature or source of the energy which is to be utilized, their office being primarily that of receiving, transforming, and transmitting power from some natural source, by which means they drive or move other machines.

The sources of energy in nature which are made available for useful purposes by the aid of P. M. are heat, the energy of falling water, the motions of the atmosphere, and electricity or magnetism. The latter being, however, regarded as referable to heat, and the second and third sources mentioned being manifestations of the force of gravity, the ultimate sources of available energy may be considered to be *heat and gravitation.* As regards muscular energy, men and animals may be regarded as P. M.—perfect exhibitions, in this respect, of the imperfect results of human efforts in artificial constructions.

The heat-engine, under the form of the steam-engine, holds the first place in importance among all the P. M. In the investigations and experiments connected with economy in its use and its adaptation to various purposes, especially to the propulsion of steamships, it has engaged the attention of scientific men, practical engineers, and artisans to a greater extent than all others combined; and the developments arising from its use have given rise to a special branch of engineering science. The use of the water-wheel in the form of the turbine, the second P. M. in importance, has been greatly extended through the new facilities afforded for its construction by steam machinery and the arts and industries developed by it. Hot-air engines, gas-engines, and electro-dynamic engines are P. M. more restricted in their applications, but they possess respectively peculiarities which render them advantageous under certain conditions. The windmill is another P. M. which in favorable localities is of great value. Water-engines, in which the construction of the apparatus is nearly identical with some form of the steam-engine, the pressure upon the piston being produced by a head of water, are also "motors" in common use.

**Prime Numbers.** A whole number is said to be prime when it cannot be exactly divided by any other whole number except 1. Two numbers are prime with respect to

each other when they cannot both be divided by any whole number except 1. Thus, 2, 3, 5, etc. are P. N.; 6 and 7 are prime with respect to each other. No rule has been found for discovering P. N. by a direct process. A method of sifting out numbers not prime was described by Eratosthenes, and for that reason is generally known as Eratosthenes's sieve. The method is as follows: Since every even number is divisible by 2, we may omit or sift out all such numbers, and remembering that 2 itself is prime, we write down the series of odd numbers up to any limit, say up to 99: 1, 3, 5, 7, 11, 13, 17, 19, etc. We begin with the first P. N. after 2, which is 3, and counting from it, we strike out every third number, because all such numbers are divisible by 3, and therefore are not prime. We then begin with 5, and counting from it we strike out every fifth number, because all such numbers are divisible by 5. We then begin with 7, and counting from it, we strike out every seventh number. The remaining numbers are prime. In this way we find that the P. N. less than 100 are 1, 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, and 97. The operation of sifting may be extended to any series of whole numbers, but beyond a certain limit the operation becomes tedious. In applying the method just described it is to be remembered that if a number cannot be divided by a P. N. less than its own square root, that number must be prime. Thus, in the case supposed we need not go farther than 7, because 7 is the greatest P. N. less than  $\sqrt{100}$ . From the nature of the process of Eratosthenes it is evident that the number of P. N. in a given interval will be less the higher that interval commences.

W. G. PECK.

**Primitive Wesleyans.** See METHODISM.

**Primogeniture** [Lat. *primus*, "first," and *genitura*, "birth"], or the right of the eldest son to inherit the real estate of his father to the exclusion of his brothers and sisters, who inherit only part of the personal property the father may have accumulated, originated in Europe with feudalism.

**Primulose** [*prime-rose*, from its early flowering], a genus of handsome flowering herbs, largely European, of the order Primulaceæ and genus *Primula*. The true P. is *grandiflora* of Europe. *P. officinalis* is the cowslip, of which the polyanthus is a cultivated form, all of these running into many varieties. *P. auricula*, the parent of the auriculas of the gardens, is a native of S. Europe. The Chl. P. (*P. Sinensis*), now one of the commonest house-plants, represents a different section of the genus. The evening P. are species of (*Ethiopia*), of a wholly different natural order, and took the name from a very superficial likeness of the corolla to that of the true P.

ASA GRAY.

**Primulæcæ** [from *Primula*, the typical genus], a natural order of exogenous gamopetalous herbs widely distributed over the world, but chiefly in the cooler parts of the N. hemisphere. The order is readily characterized by having stamens of the same number as the lobes of the corolla, and opposite them on the tube or throat a single style and stigma, and a 1-celled ovary with a free central placenta, bearing several or numerous ovules. P. are nearly inert plants, of no economical importance beyond the beauty of their blossoms. Beside the PRIMULOSÆ (which see), the *Cyclamen*, our beautiful *Dodecatheon*, and one species of *Asagallia* are familiar in ornamental cultivation.

ASA GRAY.

**Prince** [Lat. *princeps*], a title which sprang from that of the Rom. *Princeps Senatus*. It became a title of the Rom. emps., and from them passed to mediæval and modern sovereigns. There are also sovereign rulers who have no higher title than prince.

**Prince** (OLIVER H.), b. in Conn., moved to Ga. in early youth; studied law, and was admitted to the bar; was one of the first settlers in Macon, and one of the 5 coms. who laid out that city; was the author of many humorous sketches; one of these, giving an account of a Ga. militia muster, was republished in several foreign langs.; he was also author of *Prince's Ga. Digest*, a work compiled with great ability; was U. S. Senator 1828-29; was lost at sea in the wreck of the steamer Home on the coast of N. C. Oct. 9, 1837, aged about 50 yrs.

A. H. STEPHENS.

**Prince** (THOMAS), b. at Sandwich, Mass., May 15, 1687, grad. at Harvard 1707; visited the W. I. and the island of Madeira; went to Eng. 1709; returned to Mass. 1717; was ordained colleague pastor of the Old South ch., Boston, 1718; devoted many yrs. to the collection of materials for the civil and religious hist. of N. Eng., and gathered a valuable library, which he bequeathed to the Old South ch. When the ch. was desecrated by Brit. soldiery during the war of the Revolution, many documents in the P. library were stolen or destroyed; the remainder are now in the Boston Public Library. He began the *Annals of N. Eng.*, of which only a part appeared, bringing the hist. down to 1633. D. Oct. 22, 1758.

**Prince Edward Island** [named in 1798 in honor of Edward, duke of Kent, father of Queen Victoria], an island in the Gulf of St. Lawrence, constituting a prov. of the Dominion of Canada, Brit. N. Amer.; 24 minor islands belong to the prov. There are numerous bays, harbors, and promontories. Northumberland Strait, on the S. and W., separates it from the mainland of N. S. and N. B. The area of the island is 2173 sq. m. The soil is wonderfully fertile. The surface is generally level, and remarkably healthful. The mate is mild for the lat., and remarkably healthful. The forests consist of birch, elm, maple, ash, beech, pine, spruce, fir, hemlock, cedar, juniper, or tamarack, poplar, and willow. There are some quantities of sea-manure are everywhere accessible. The waters surrounding the prov. teem with fish—mackerel, herring, cod, and many other species; the fisheries are consequently very important. The manufacturing interests (except ship-building) are not extensive, and but few valuable minerals are known to exist. Copper and bog-iron ore are found. Wheat, oats, barley, rye, pota-



toes, buckwheat, and garden vegetables are raised. Cattle, horses, swine, sheep, and poultry are bred extensively. The island is divided into three *cos.*—King's, Queen's, and Prince. There has been a system of public schools since 1821. During the summer the island is visited by regular lines of steamers and by thousands of fishing vessels. During the winter it is not accessible except by ice-boats, which run from Cape Traverse to Cape Tormentin, N. B., 9 m., carrying the mails. There is also a submarine telegraph.—The prov. sends 4 senators to the Dominion Parl. Cap. Charlottetown. Pop. 108,891.

**Princeps Senatus**, an officer of the Rom. senate. Under the kings he was the first in rank of the *decem primi*, was *custos urbis*, and was appointed for life by the king. After 457 a. c. he was appointed by the curies, but not for life, and might be chosen from the *patres minorum gentium*. It was afterward given to the oldest *censor*. It still later might be given to any senator, but, though a title of great dignity, no power belonged with it. Finally the emps. took the title, and with it assumed a will an authority over the acts of the senate.

**Prince Rupert's Drops** are formed by throwing melted glass into water. They have an elongated, tapering form. A smart blow upon the large end makes no impression, but if the smallest part be picked off the small end, the whole falls into powder.

**Prince's Metal** [named from Prince Rupert] is a kind of brass, nearly the same as pinchbeck; but the term is vaguely used for other alloys.

**Princeton**, on R. R., cap. of Bureau co., Ill., 105 m. W. of Chicago. Pop. 1870, 3264; 1880, 3439.

**Princeton**, R. R. junc., cap. of Gibson co., Ind., 27 m. N. of Evansville. Pop. 1870, 1847; 1880, 2566.

**Princeton**, Ky. See APPENDIX.

**Princeton**, Mo. See APPENDIX.

**Princeton**, on R. R., Mercer co., N. J., on Del. and Raritan Canal, 49 m. S. W. from New York and 11 m. N. E. of Trenton, is the seat of the Coll. of N. J. and of the Theological Sem. of the Presb. ch. The Continental Cong. assembled here June 30, 1783, and here was fought the battle of Princeton, Jan. 3, 1777. Pop. 1870, 2798; 1880, 3209.

**Princeton, Battle of.** A week after the battle of Trenton (Dec. 25, 1776), Cornwallis marched against Washington and encamped near Trenton, with the intention of attacking the Amers. on the following day. Washington, perceiving that he would fight to a disadvantage at Trenton, and learning that only 3 Brit. regiments and a few dragoons remained at Princeton, made a bold night-march upon that place, surprised the enemy at daylight (Jan. 3, 1777) in the vicinity of the coll., and routed and dispersed them within 20 minutes, inflicting a loss of 200 killed and wounded and of 230 prisoners. The Amer. loss was not above 30 men. This result was of immense value in reanimating the courage of the colonists, and the action was the precursor of a series of operations by which the Brit. were driven from the greater part of the two Jerseys.

**Printing** [Lat. *premere*, to "press"], or **Typography**, the art of combining movable type, and from their surface, through the medium of coloring-matter and paper, multiplying copies by pressure.

**History.**—From the earliest historic period some mode of engraving and producing impressions or devices has been known, but seems not to have advanced beyond the form of seals until the time of the Babylonians and Assyrians. Their buildings were built of burnt brick generally, which were stamped with an inscription according to the character of the edifice, and bearing the name of the reigning monarch. These impressions in many instances show clearly that the stamp was engraved in relief and applied to the plastic clay. The Egyptians also used stamps to impress the bricks used for their buildings. The Chl. have used a simple mode of P. from an early date. According to their chronicles, the early attempts of their present mode of P. were made about 50 a. c., but no great advance was made till the reign of Ming-Tsong (927-934 A. D.), when Foong-Taou printed copies of the classical books by taking impressions from stone plates, the letters being cut into them, which thus showed white on a field of black. This mode is still employed in Chl. lithography. P. Foong-Taou then printed an edition of the nine *King*, or classical books, for the Imperial coll. at Peking, from wooden blocks engraved in relief, which edition was completed in 952. This process of P. has been practised to the present time. The Gs. were early acquainted with engraving on metal, their maps being cut with lines below the surface, but seem never to have multiplied copies from them. The anc. Roms. made use of metal stamps, with characters engraved in relief, to mark their articles of commerce and brand cattle. With the decline of Roman civilization lit. was despised by all ranks of society, and a passion for military glory alone occupied their minds. With the introduction of the art of paper-making, about the beginning of the 8th century, epistolary correspondence increased, books were multiplied more rapidly, and with the endeavor to supply the people more cheaply with religious reading wood-engraving was invented.

**Block-Printing and Block-Books.**—Toward the beginning of the 13th century wood was engraved upon in lt., Sic., and Sp. to produce designs with the aid of ink on fabric of linen and silk. Playing-cards were produced by the same method, and afterward colored by hand or by means of stencil-plates. Old MSS. of this time are in existence which have initial letters, and sometimes pictures printed, while the text is in handwriting. About the beginning of the 15th century single prints appeared, of a religious character, from Ger. and Hol. These pictures or image-prints were made of many sizes, generally engraved in outline, and highly colored. Manuals of devotion followed, of a limited number of pages, generally containing pictures with a few words beneath or in the interior, some having the pictures

on one leaf and the explanation or text on the other. This is the type of all the block-books.

**The Discovery of Typography.**—The anc. witnesses and contemporaries clearly state that the first inventor of typography is John Gutenberg of Mentz, and the first work most befittingly accomplished was the Lat. Bible; the capital was furnished by John Faust; the improvements appertain to Peter Schöffer. John Gutenberg was b. about 1400 at Mentz. He d. in Feb. 1468. The works printed by Gutenberg appear to be the following: (1) A little vocabulary called the *Catholicon*, printed perhaps at Strasbourg, but of which no copy remains. (2) One or more editions of the *Donatus*, printed perhaps at Strasbourg, with the characters which served later for the Bible of 36 lines, of which several fragments are in existence. (3) The *Letters of Indulgences*, printed from 1454 to 1455. (4) The *Calendar* of 1457, printed with the characters of the Bible of 36 lines, of which one page is in the Imperial Library of Paris. (5) The *Appeal against the Turks*, which appeared in 1454, printed with the characters of the Bible of 36 lines, a copy of which is in the Library of Munich. (6) The *Bible* of 36 lines, 3 vols. folio, 2 columns to a page, of which the first essays, begun perhaps at Strasbourg, may have determined John Faust to associate with Gutenberg for the execution of that great work. (7) The *Psalter* of Mentz.

**Printing in America.**—The date of the introduction of P. into Amer. is uncertain, but from the record of 3 early Sp. authorities it is believed that the art was introduced into Mex. by Viceroy de Antonio de Mendoza, probably after his arrival, in Oct. 1535. The first book with date establishes the fact that a press was working in the city of Mexico in 1540. The next press established in the New World was at Lima, Peru, about 1584. Between 1540 and 1600, before the introduction of the art into N. America, there is recorded the issue of 93 works in the city of Mexico and 7 in Lima. In 1639 the first press was erected in the house of the pres. of Harvard Coll., Rev. Henry Dunster, at Cambridge, Mass., through the efforts of Rev. Joseph Glover, who d. while bringing the press and materials to this place. It was placed under the direction of Stephen Daye, by whom the first work issued was the *The Freeman's Oath*, followed by *An Almanack* in the same yr. Daye was succeeded by Samuel Green about 1649, under whom, in 1660-63, was printed the celebrated Indian Bible of Elliot, and other of his works in the Indian lang. This press is still active, and known as the "University Press." The next press was established in Boston in 1674, after which P. gradually extended throughout the colonies. In 1775 the whole number of printing-houses in the Brit. colonies was 50.

**Early Printed Books.**—It is interesting to note the peculiarities of the first printed works. An edition consisted of a limited number, for 200 or 300 was then esteemed a large impression. The size was either large or small folio, sometimes quarto. The leaves were without running title, direction-word, folios, or paragraphs. The character was a rude Gothic, mixed with secretary, imitating the handwriting of the time; the words were printed close together; abbreviations were numerous; the orthography was arbitrary; the sentences were distinguished only by the single or the double point, but subsequently the virgule (/) was used for the simple pause, answering to our comma. Capitals were not used, but titles and initial letters were left blank to be filled in by hand. The printer's name, residence, and other information were either omitted or put at the end. The date was often omitted, sometimes obscurely indicated, or printed either at full length or by numerical letters. No variety of characters was used, a Gothic letter of the same size being used through the work.

**Varieties of Type.**—As already mentioned, the Gothic or old Ger. text was used in the first printed works until 1465, when quotations in Gr. characters were introduced into Cicero's *Offices*; but the first work in Gr. type was the Gr. gram. of Lascaris, printed by Paravisinus at Milan in 1476 in 4to. The first work printed with Rom. type was Cicero's *Epistole ad Familiare*, by Sweynheym and Pannartz, at Rome, in 1467. Italic type was invented by Aldus Manutius about 1500, who also introduced Rom. type of a neater cut. The first Heb. Bible was printed by 2 Jewish rabbins, named Joshua and Moses, in 1488, at Soncino, in the duchy of Milan. The first book printed in the Eng. lang. was a translation of *Le Recueil des Histoires de Troyes* of Raoul le Fèvre by Margaret, sister of Edward IV. of Eng., assisted by William Caxton, who also set up and printed it at Cologne in 1471.

**Type**, the characters used in typography. The type itself is a thin metallic bar, composed of type-metal, a composition of which the principal ingredient is lead. In the infancy of the art it was mixed with various hard metals to strengthen the lead and to bear pressure. The type-founders of the present day use alloys which each has determined will wear best, and they are generally trade secrets.

**Type-Founding.**—From the discovery of P. to the beginning of the 17th century printers cast their own type, when it became a distinct business from P. Nuremberg contained the best punch-cutters, and supplied Ger. with punches. Bodoni (1740-1813) of It., the Didots of Fr., and Breitkopf (1719-94) of Leipzig are the most distinguished names in the subsequent hist. of type-making. About 1735 Christopher Saur (or Sower) began P. at Germantown, Pa., and cast the type which he required, executing the second Bible printed in Amer., a quarto, in Ger., in 1743. Several unsuccessful attempts were subsequently made to establish type-foundries in Amer. among them one by Dr. Franklin. Binney & Ronaldson of Edinburgh commenced type-founding in Phila. in 1796, and after a severe struggle and by State aid were the first to establish the business there. Before the close of the century David Bruce, from Edinburgh, established the same business in New York, and in 1813 the firm of David & George Bruce commenced the first stereotype foundry in the U. S.

**Type-casting Machines.**—About 1826 William M. Johnson of



L. I., not a founder, conceived the idea of casting type by machinery, but it resulted unfavorably, the type being light and porous. After several attempts by others, David Bruce, Jr., of New York, after yrs. of study and experiment, patented the only thoroughly successful type-casting machine Mar. 17, 1838. Subsequently improved, it is now in gen. use in Amer. foundries, and was slowly adopted, with modifications, by European foundries. A recent improvement is the type-casting machine of J. A. T. Overend of San Francisco, Cal., patented in 1875.

**Wood Type.**—The large letters used in handbills and posters are made of wood, usually maple or bay mahogany, which is prepared as for wood-engraving. William Leavenworth of Allentown, N. J., in 1834 applied the pantograph to the cutting of wood type.

**Composing Machines.**—Labor and ingenuity have been expended in efforts to substitute machinery for hand-labor in composing type, and perhaps have not been wholly fruitless. Nearly 100 patents have been granted for such machines in Europe and Amer., yet at the most perhaps no 5 printing-offices in the world use the same machine, and the number using machines is certainly small.

**Imposition.**—This is the method of so arranging the pages that they will be in consecutive order when the sheet or section of a book is folded. When the pages are to be stereotyped or electrotyped, only a few pages in their regular order are secured together and cast. For over 400 yrs. imposition remained merely a trial process, the few early modes having been handed down to the present time without any attempt at systematic explanation. George H. Bidwell of New York, in his *Treatise on the Imposition of Forms* (1864), was the first one to show the principles which govern imposition, giving the reasons, and the results to which they lead.

**Signatures.**—The signature is a figure or a letter of the alphabet placed at the foot of the first page of every form, or a section or sub-section of a form, to denote the order of the sheets, and serves as a guide to the binder. Catchwords were once extensively used, placed at the foot of the page, to show the connecting word on the next page. The Eng. generally use the letters of the alphabet. The Amer. practice, and that of most European nations, is to use figures, a section to be inset being distinguished by a star after the signature figure, and is the simplest and readiest for the binder.

**Stereotyping.**—This is the art of making plates cast in one piece of type-metal from the surface of one or more pages of type. To Firmin Didot of Paris is due the word *stereotype* (Gr. *στερεός*, "fixed," and *τύπος*, "impression"), under which the eds. printed by his process were known, and which is now a word used in literary as well as technical language. Indeed, the first known instance was the Bible, which Van der Mey of Antwerp in 1698 printed from type which had been soldered at the bottom. The *Larger Catechism of the Westminster Assembly* claims on its title-page to have been the first work stereotyped in Amer., dated June 1813. Three processes are now in gen. use—the *plaster*, the *clay*, and the *paper-mâché* process.

**Electrotyping.**—For large numbers of copies electrotyping is more durable than stereotyping. It originated with Joseph A. Adams, a wood-engraver of New York, in 1839-41, who reproduced an engraving, and afterward, in 1843, the various borders around the large engravings in *Harper's Illustrated Bible*. The process rapidly extended, and improvements were made by Wilcox, Filmer, Gay, Lovejoy, Knight, and others. In all the processes for stereotyping and electrotyping, machinery has been introduced to expedite the moulding and finishing, and may be run by steam and employ steam for the drying.

**Printing Ink.**—The requirements of printing ink are—intensity of color, impalpability, covering the surface of the type perfectly, quitting the surface when the paper is pressed upon it and adhering to the paper, not smearing after printing, and retaining its appearance without change.

**Paper.**—The paper used in P. is always dampened before use, as wet paper takes the ink better than dry, and is now generally wet by a wetting-press. After printing, for book-work the sheets are hung up to dry, placed between sheets of thin smooth mill-board, placed in an hydraulic press, and subjected to great pressure, which smooths and restores the brilliant appearance of the paper.

**The Printing Press.**—The earliest form of the printing-press was an adaptation of the wooden screw-press. About 1620 Blaew of Amsterdam made some improvements. This press, with little alteration, was used for nearly a century and a half. In 1725 the press upon which Franklin worked in Lond. was a Blaew press, with minor details, known as the Ramage press, and it is now preserved in the Patent Office at Wash. George Clymer of Phila. made the first important Amer. improvement in his "Columbian" press about 1817. This was succeeded by Peter Smith's hand-press, which gave way to the hand-press invented by Samuel Rust in 1829, now known as the "Washington."

**Job-Presses.**—A great variety of handy job-presses are made in Amer., generally known from their makers or by some trade-mark, as the Hoe, Adams, Ruggles, Wells, Degener, Globe, Cincinnati, Universal, Gordon, and others, which print cards or sheets up to half medium. A large number of small presses are also in use specially to print cards, and also adapted to print cards in colors, number them consecutively, and print coupons with the tickets.

**Power-Press.**—The hand-press was deficient in speed, and attempts were made to print more rapidly. In 1790 W. Nicholson patented a cylinder press, which, though unsuccessful, contained the principles of all the modern presses. The first working press was invented by T. König, a native of Sax., in 1814, for the Lond. *Times*, the issue of Nov. 28 being the first newspaper printed by machinery. König in 1815 formed a press for printing both sides of the sheet.

**Bed and Platen Presses.**—The first power-press used in

Amer. was a flat-surface press, made by Daniel Treadwell of Boston in 1822, in which the platen came down on the type, 2 of which were used by the Bible and Tract societies, and one at Wash. The best press of this class is that of Samuel Adams of Boston, invented in 1830, improved by Isaac Adams.

**Rotary Presses.**—The idea of the rotary press was suggested by Nicholson in 1790, but it was not put into successful operation, on account of the attempt to use beveled type and for lack of the refinements of the more modern press. The first successful rotary press was invented by Col. Richard M. Hoe, put into operation in 1846, and had at first 4 impression-cylinders, and afterward 6, 8, and 10.

**Cylinder Presses.**—There are a great many kinds of cylinder presses, adapted to all work, from common posters to the finest cut and book work, known as Hoe's, Taylor's, Potter's, Campbell's, Cottrell & Babcock's, according to the makers. The 10-cylinder was first used by the *Public Ledger* of Phila., and employed by the leading newspapers in Amer. and Europe for many yrs. It will print about 20,000 impressions an hour. A. Applegath of Lond. invented a rotary press, introduced in 1848. It will print 12,000 impressions an hour.

**Web Perfecting-press.** a press in which both sides of the sheet are placed on cylinders, usually by plates, and the paper fed automatically from a single web. The first practicable press of this kind was invented by William A. Bullock of Phila. in 1861, and patented in Eng. in 1862, and completely revolutionized the printing-press. It requires no attendants to feed it, and delivers the sheets printed on both sides. The paper, in the form of an endless roll, is moistened by passing through a shower of spray. A single roll will contain enough for several thousand sheets, and the printing operation, including the cutting of the paper into proper lengths, proceeds uninterruptedly until the roll is exhausted. The roll of paper having been mounted in its place, the machinery is started, and the paper unwinds. The paper is cut into sheets by a knife on a roller acting against a cylinder. The sheets are seized by grippers, carried between the impression-cylinder and the form, receiving the first impression. The printed sheet then follows the large cylinder to the second form, receiving its second impression from this form acting against the large drum. From the large cylinder the sheets are automatically delivered to the receiving-board at the rate of over 11,000 an hour. To the press is attached a counting device or arithmometer. This press was first used on the *Cin. Times* in 1861. In 1869 Mr. Walter of Lond., after some yrs.' experimenting, brought out the Walter press. It is the same principle as the Bullock, with some minor details. It will print about 11,000 copies an hour. About 1870 Messrs. Duncan & Wilson of Liverpool, Eng., invented the Victory press. This machine will damp, print, cut, fold, paste, and deliver 6000 to 8000 per hour of an 8 or 24 page newspaper. The Marinton press was used in Paris and in Lond. It printed and perfected paper supplied by 6 feeders, at the rate of 10,000 copies an hour. In 1873, at the Vienna Exhibition, it was improved and made a web perfecting-press. In the web perfecting-presses the Messrs. Hoe have made some improvements, so as to deliver 12,000 to 15,000 perfected sheets an hour. To these web perfecting-presses folding-machines have recently been attached. A web perfecting-press was introduced about 1875 by A. Campbell, the inventor. It will print, inset, paste, and fold any number of pages up to 24. The press has been driven up to a printing speed of 10,000 per hour.

**Printing in Colors.**—This is accomplished properly by having the page or pages separated into as many forms as there are colors. Presses are adapted to color-printing, but are modifications of the cylinder and Adams.

**Polychrome Printing** accomplishes the printing of one or more colors at the same time. Several attempts had been made to do this, but Congress in 1830 was the first to carry it out successfully with metal plates. Many improvements of this have been made, but the principle remains the same.

**Laws relating to Printing.**—Europe has many restrictive laws relating to the printing and publication of books and newspapers. In the U. S. the const. by the first amendment prohibits the passage of any laws abridging the freedom of the press, which is sustained by the const. of the respective States. The law of libel defines the limit of privileged communications and reports, and printers are protected in the necessary publication of charges, etc. demanded by Cong. Some States prohibit the publication of lottery advertisements and similar schemes, and objectionable drugs or nostrums. Obscene illustrations and books are generally prohibited. It is the policy of the govt. to free the press from high postal rates free through the P. O. in the eos. where printed. Indeed, the U. S. enjoys the most unlimited freedom for its press and in the interest of the people. (See FALKENSTEIN, *Geschichte der Buchdruckerkunst*.) [From orig. art. in *J. N. Cyc.*, by WILLIAM S. PATESON.]

**Prior** (MARTEW), b. at Wimborne-Minster, Dorsetshire, Eng., July 21, 1664, the son of a joiner; ed. at St. John's Coll., Cambridge, where he obtained a fellowship and formed an intimacy with Charles Montagu, afterward earl of Halifax, and with him wrote a poem, *The City Mouse and Country Mouse* (1687), intended as a travesty upon Dryden's *Hind and Panther*. Introduced at court, P. was appointed in 1690 sec. to the embassy at the Hague; became a favorite with William III., by whom he was made gentleman of the bedchamber; was sec. of the coms. who concluded the Treaty of Ryswick 1697; sec. of embassy at Paris 1698, under sec. of state 1699, com. of trade 1700, in which yr. he pub. his *Carmen Seculare*, in praise of King William; entered Parl. 1701; became a vehement Tory; was sent to Paris with Bolingbroke 1711 to make private proposals for peace; was charged with treason for his conduct in this negotiation on the accession of the Whigs to power in 1714; was imprisoned 2 yrs. in his own house, during which time he wrote *Alma*, or *the Progress of the Mind*. D. Sept. 18, 1721.



**Priscian**, prish'ee-an, surnamed CESARIENSIS, probably because he was b. at Casarea, flourished about 450 or 500 A. D., and lived as a teacher of Lat. at Constantinople, where he received a salary from the court. Of his works are still extant *Institutionum Grammaticarum Libri XVII.*, etc.

**Priscianus** (TAKBOURIS), a celebrated phys., a pupil of Vindicianus, lived at the court of Constantinople in the 4th century A. D., and was the author of a Lat. work of small value, *Reverum Medicarum Libri Quatuor*.

**Priscillian**, belonging to a noble family of Cordova, Sp., founded a sect whose doctrines were a blending of Manichæism and gnosticism. In 379 the existence of the sect became known, and in 380 the Council of Saragossa condemned its doctrine and banished its founder. The influence of P. was too powerful, however, and his most zealous adversary, Bp. Ithacius of Assonuba, was compelled to fly. He sought refuge with the usurper Maximus, who had P. brought to trial before the Council of Treves, condemned, and put to death in 385. The sect disappeared entirely in the 6th century.

**Prison Discipline**, as a science, is, so to speak, but of yesterday. For ages public punishment appears to have had but one object—to terrify and deter through torture. The cruelties and horrors of the prison-house were almost past belief. But Christianity has at length wrought a change which, sooner or later, was inevitable under its benign and refining influence; and the merciless scourings, ponderous irons, torturing thumbscrews, underground dungeons, and chainings to dead bodies once inflicted on prisoners have given place, if not wholly, at least in great part, to looks and tones and acts of sympathy and kindness.

P. D. must have a profound interest for all lovers of the human race. In all the wide range of social science there is scarcely one more important, or more abundant in the fruits which a wise culture will be likely to yield than this. We have neither time nor space to traverse the hist. of the past, but at the present moment 3 gen. systems of P. D. divide the study and the suffrages of the civilized world—viz. the Auburn, or congregate silent system; the Phila., or separate cellular system; and the system of progressive classification. The essential principle of the Auburn system is that of absolute separation of the prisoners by night and associated silent labor by day. Outside of Phila. this system is found everywhere in the U. S., and has also a foothold, more or less extensive, in various European countries. The essential principle of the cellular system is that of a complete bodily separation of the prisoners in labor, recreation, and rest. In the U. S. this system is restricted to the State penitentiary in Phila. In Belg. it has been adopted as the national system of P. D. In Hol. there is a prevailing public opinion in its favor, but with many dissentients, and the system is steadily gaining ground. A strong, though perhaps not predominant, public opinion favors it in Ger., and in many other European states, particularly Fr., the cellular system has its partisans and supporters. Capt. Alexander Maconochie was, on his own application in 1840, invested with the governorship of the Brit. penal colony of Norfolk Island, at that time containing a criminal pop. of 1500 souls, made up of the worst convicts ever sent out by the mother-country. He there became the originator and founder of the system of progressive classification as an agent in P. D. and the reformation of prisoners. His system rests on 4 fundamental principles: (1) Instead of a time-sentence, it imposes a labor-sentence, thus setting the prisoners to earn back their freedom by the sweat of their brow. (2) It teaches them self-denial, by enabling them to purchase a speedier liberation through the sacrifice of present gratification. (3) It appeals to their social nature, giving them an interest in each other's good conduct, and thus making them helpers in the maintenance of discipline. (4) It prepares them for a return to society by gradually relaxing restraint and strengthening their powers of self-control. To carry out these principles, Capt. Maconochie sought to work with nature instead of against it. He treated the convict as a laborer, with marks for wages. His marks were made to play the part of money, for with them the prisoner was required to purchase his food, clothes, schooling, etc., while only the surplus of these earnings counted toward his liberation. Under this system the prisoner is not to be sentenced to a certain number of months or yrs., but to earn a certain number of marks over and above his keep. Maconochie fixed on 10 marks as a fair day's wages, the men being paid by piece-work, and not by time, and for every 10 marks saved the convict shortened his imprisonment by a day. At the stores he purchased his daily supplies, paying for them in marks. The rations were served out at 3 rates. The coarsest cost 3 marks per day, the next 4, and the best 5. The self-denying prisoner might thus save 7 and the self-indulgent 5 marks each day for the purchase of his liberty. As extra marks were allowed for overwork, it was possible to hoard at the rate of 8 or 10 a day as the fruit of diligence and self-denial. Moreover, the marks furnished the means of disciplinary punishment, a proportionate fine in marks being the penalty for every act of disobedience or failure in duty. And while, by this machinery of marks, Capt. Maconochie trained his convicts to habits of industry and frugality, he adopted different means to accomplish his other objects. He divided the convicts' sentences into 3 periods. During the first or penal stage the men worked under a sharp and stringent discipline. At the conclusion of this they were allowed to form themselves into companies of 6 each—the members of each company being left to choose their own companions—and then they entered into the second or social stage. In this stage the 6 prisoners forming a company had a common fund of marks, into which common stock the daily earnings of each member were paid, and from which the supplies and fines for the whole company were deducted. They were thus made watchful both over themselves and their companions. In

the last or individualized stage the companies were broken up, and, though every man was still kept at work to earn his daily tale of marks, he was in other respects comparatively free. He had his own hut and garden, his own piggery and poultry-yard, the products of which he might sell to the officers of the colony or the ships that touched at the island. Capt. Maconochie was 4 yrs. on Norfolk Island. He threw himself, heart and hand, into the work of regenerating the degraded beings who formed his pop. He built a ch., founded schools, imported a catechist, and on Sundays toiled as ministering deacon himself. His success was wonderful. [From orig. art. in *J.'s Univ. Cyc.*, by REV. E. C. WINES, D. D., LL.D.]

**Privet** [Scot. *privie*], or **Prim**, the *Ligustrum vulgare*, an oleaceous shrub of Europe, now naturalized to some extent in the U. S., is chiefly used as a hedge-plant, both in the Old and New Worlds. It makes a close, handsome hedge, though it is not thorny. Its wood, though small, is saved for turners' use in Europe. Its berries yield a pink coloring-matter which is used by map-colorers.

**Privilege** was at first a law against, afterward in favor of a particular person. It may be *positive*, as a *patent*, or *negative*, as an *exemption* for taxes or arrest; or, again, personal or real—that is, going with a person, or with a property or political condition.

**Privy Council.** See CABINET.

**Privy Seal**, the minor seal of the Brit. govt. affixed to papers of minor importance, is in care of a great officer of state, usually in the cabinet, called the lord privy seal.

**Prize.** See INTERNATIONAL LAW, SUMMARY.

**Probability** [Lat. *probabilitas*], **Theory of, or Calculus of Probabilities**, is the application of mathematical reasoning to the art of judging in cases where only probable evidence can be obtained. Suppose a die to have 2 of its 6 sides painted black, the remaining 4 being left white, and a person to be required to judge whether, upon the die being thrown, a white or a black side will be uppermost. Common-sense will teach him to guess the white side, because it will be more likely to be thrown. In common lang. it would be said that the chances were 2 to 1 in favor of white. In mathematical lang. a slightly different expression is used. In the case just supposed, for instance, there are 6 sides to the die, of which one and one only must be thrown. Four of these sides being white, the probability of white being thrown is  $\frac{4}{6} = \frac{2}{3}$ , and that of black is  $\frac{2}{6} = \frac{1}{3}$ . If one of the 4 white sides were painted yellow, the probabilities would be white  $\frac{3}{6}$ , black  $\frac{1}{6}$ , yellow  $\frac{1}{6}$ . If the event is impossible, there are no cases which favor it, and in the notation just indicated its probability is 0. If all the cases favor it, and its occurrence is therefore certain, the probability is 1. As no degree of probability can exceed certainty, all degrees of probability are somewhere between the limits of 0 and 1.

The mathematical solution of problems in probabilities consists, first, in dividing the possible processes or results into elementary and equally probable cases; and, secondly, in finding how many of these cases favor the proposed event. Suppose, for instance, that 2 dice are thrown. Then, any one of the 6 sides of 1 die may be combined with any side of the other, making, in all, 36 combinations. To find the probability of any result from the throw of such a pair, we must find how many of these combinations will give rise to the combination in question, and divide the number by 36. Suppose that a sharper should offer to a countryman to give him 3 cents every time 2 ones were thrown with 2 dice, provided the other would give him 2 cents every time a one and a two were thrown. At first sight the countryman might consider the two results equally probable, and therefore feel sure, in the long run, of gaining. But he would be sure to lose, because 2 different numbers are twice as likely to be thrown as a pair of the same number. To have 2 ones each die must fall with one uppermost. But to have a one and a two, one may be a one and the other a two, or the first may be two and the second one; so that for this result there are 2 cases out of 36, while in the first there is but 1.

One of the most generally useful rules of this calculus is that although an event may be extremely improbable if it has but one opportunity to happen, yet if we increase the number of opportunities indefinitely it will be sure to happen in the long run. By the same principle, if the concurrence of a large number of circumstances is necessary to the production of an event, each of these circumstances may be, in itself, very probable, and yet their concurrence, and consequently the event itself, very improbable. The mathematical rule for determining probability in such a case is that the probability of the concurrence of all the events is equal to the continued product of the probabilities of all the separate events. One of the most curious and important results of this calculus is seen in what is termed the law of averages, or the tendency of chance events which occur in great numbers to follow regular laws. The life of an individual is proverbially one of the most uncertain things in human affairs. But when we take large bodies, like the pop. of a State or great city, the deaths follow a law so exact that mathematical tables of their probable number can be formed, and on these tables life insurance can be arranged, their rates of premium with the moral certainty that the death-rate will not vary seriously from that calculated. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. SIMON NEWCOMB, LL.D.]

**Probate** [Lat. *probatus*], in law, a judicial proceeding by which an instrument is established as the last will and testament of the deceased person whose act it purports to be. In Eng. prior to 1857 the ecclesiastical courts possessed the sole jurisdiction in testamentary matters. Subsequently such jurisdiction has been conferred upon a new tribunal, called the court of probate and divorce. In this country such jurisdiction has been conferred upon special courts, whose powers and modes of procedure are governed by statute.

JOHN NORTON POMEROY.



**Probus**, b. at Sirmium, Pannonia, about 230 A. D.; entered the army very early; attracted the attention of the emp. Valerian by his valor; rose rapidly; commanded with success in Gaul, Ger., Afr., on the Nile, and on the Euphrates, and was made gov.-gen. of all the Rom. provs. of the E. On the death of the emp. Tacitus in 276 he was chosen emp. by the armies of the E., and his short reign was a series of brilliant exploits. He drove the Germanic tribes back into their own country, compelled them to give up the plunder they had carried away from Gaul, pacified the whole N. boundary from the Rhine to the Euphrates, and suppressed with great promptness several attempts at revolt in the interior. But having established general peace, he employed the army in works of public utility; and the discontent occasioned thereby grew into an uncontrollable fury when he one day said that a standing army soon would be superfluous. The soldiers immediately turned from their work, and killed him in his native city in 282.

**Procession of the Holy Spirit.** This term is based on John xv. 26, where Christ says of the Spirit whom he will send from the Father that "he proceedeth from the Father." It designates in the orthodox theol. the characteristic individuality of the Third Person of the Holy Trinity, as the eternal generation is the characteristic property of the Son, and the unbegotten paternity the exclusive peculiarity of the Father. There is an old difference between the Gr. and Lat. chs. about the *single P.* (from the Father alone) and the *double P.* (from the Father and the Son). The Nicene creed (381) asserts only the P. from the Father (*Sp. S. qui ex Patre procedit*), in verbal adherence to the passage in John, and the Gr. Ch. understands this in an exclusive sense (from the Father alone). The Lat. Ch., after Augustine, taught the double P., and afterward embodied it, without asking the consent of the Grs., in the Nicene creed by the insertion of *filioque* ("and from the Son"). This difference has caused a great deal of bitter controversy since the days of Photius, patriarch of Constantinople (d. 891). The councils of Lyons (1274) and of Florence (1439) endeavored to settle it, but in vain. A compromise was suggested by the formula that the Spirit proceeds from the Father *through the Son*. When Pius IX. invited the E. patriarchs to the Vatican Council in 1870, they renewed the old protest against the heretical *filioque*.

**Proclus**, b. Feb. 8, 412 A. D., at Byzantium; ed. at Xanthus in Lycia, from which his family descended; studied at Alexandria and Athens, and became a celebrated teacher of philos. in the latter city, where he d. Apr. 17, 485. He was the last member of the Neo-Platonic school that acquired any celebrity.

**Procopius**, b. at Cæsarea, Pal., in the beginning of the 6th century A. D.; studied at Constantinople; accompanied Belisarius as his sec. on his campaigns in Asia, Afr., and It., and held after his return to Constantinople the highest dignities in the civil service. Wrote *Historia*, *Klismata*, a work on public buildings, and *Anecdota*.

**Procopius the Great**, to be distinguished from PROCOPIUS the Less (a friend and companion of his), b. of a rich and noble Bohemian family; was ordained a priest, but on the outbreak of the Hussite war he joined the army, and distinguished himself so greatly that in 1424 he was chosen commander-in-chief by the Taborites. On the approach of the Ger. armies of crusaders the different Hussite parties, among which were the Orphans under P. the Less, united under the leadership of P. the Great, and a war ensued (1427-32), remarkable at once for the eminent valor and the unheard-of cruelty which the Hussites evinced. They made campaigns into Sax., Silesia, Moravia, Hungary, Aus., and Bavaria. The Ger. armies which were sent against them were defeated, towns and villages were burned and their inhabs. massacred, and an immense amount of booty was carried back to Bohemia. The emp.'s officers of concessions were rejected, but in 1432 Sax. bought a truce of 2 yrs. for a large sum of money. In 1433 the Hussites consented to send 8 delegates to the Council of Bale. P. was one of them, and he took part with great energy in the debate, but after the lapse of 50 days the Bohemian delegates returned to Prague. Papal coms. followed them, and at last a compromise was brought about between the R. Caths. and the Callixtines. The Taborites, however, refused to have anything to do with the pope, and thus arose a controversy between them and the Callixtines which soon grew into open warfare. At the battle of Böhmischbrad (May 30, 1434) a sudden panic seized the Taborite army, and both P. the Great and P. the Less fell.

**Procrustes** [from the Gr. *Προκρούτης*, the "stretcher"], a surname commonly given to the famous robber Polyphemus or Damastes, who used to place all persons that fell into his hands on an iron bed, and cut off or stretched out their limbs until they fitted the bed. He was slain by Theseus on the Cephissus in Attica.

**Procter** (BRYAN WALLER), familiarly known under his pseudonym of "Barry Cornwall," b. in Wiltshire Nov. 21, 1789; ed. at Harrow, with Byron, Lord Palmerston, and Sir Robert Peel as contemporaries; in 1819 pub. a vol. entitled *Dramatic Scenes and other Poems*. In 1821 his tragedy of *Mirandola* was produced at the Covent Garden Theatre with much success. But it is as a writer of refined, melodious, and inspiring songs that he is best remembered. D. Oct. 5, 1874.

**Proctor** (HENRY A.), b. in Wales in 1765, came to Canada in 1812 as col. of the 42d regiment; repulsed Gen. Hull at Amherstburg; gained the victories of Brownstown and the River Raisin; was repulsed from Ft. Meigs by Gen. Harrison May 1813, and from Ft. Stephenson (Lower Sandusky, O.) by Major Croghan Aug. 2, and totally defeated by Harrison at the battle of the Thames, Oct. 5, 1813. D. at Liverpool, Eng., in 1859.

**Proctor** (RICHARD ANTHONY), b. at Chelsea, Eng., Mar. 23, 1837; entered King's Coll., Lond., in 1855, and St. John's Coll., Cambridge, in 1857, taking the degree of B. A. from

the latter in 1860. Wrote *Saturn and its System*, *Other Worlds than Ours*, *Transits of Venus*, etc. He has often lectured in the larger cities of the U. S.

**Profits** [Fr. *profit*, from the Lat. *profectio*], in political economy, the net proceeds after all necessary expenses of a business are deducted. In necessary expenses are included wages paid for labor, salaries for superintendence and administration, interest on capital, taxes, and all miscellaneous items. Holding to this meaning of the term, it is evident that P. can be legitimately increased only by one or both of two means—i. e. by reducing expenses or by increasing production. Hence, the amount of P. will be varied by whatever affects favorably or unfavorably either the efficiency and fruitfulness of industry or the expenses of carrying it on. Absolute constancy can never be realized. It is an accepted principle of political economy that P. tend to an equality in all places and in various employments, for self-interest prompts both capital and labor, when free, to flow into that locality or that form of industry which promises the largest gains. The proposition must be understood, however, as affirming a *tendency* rather than an actual fact. Many influences are continually counteracting the tendency, the most powerful of which are monopolies, whether natural or artificial. One of the most difficult problems of political economy relates to the distribution of P. It would seem but just that laborers as well as owners of capital should share in the proceeds of their joint efforts. Fit arrangements for effecting this would do much to harmonize labor and capital.

**Progression** [Lat. *progressio*], a series in which each term is derived from the preceding one by a uniform law.

An *arithmetical P.* is a series in which each term is formed from the preceding one by the addition of a constant quantity called the *common difference*. If the common difference is *positive*, each term is greater than the preceding one, and the P. is said to be *increasing*; if the common difference is *negative*, each term is less than the preceding one, and the P. is said to be *decreasing*.

A *geometrical P.* is a series in which each term is equal to the preceding term multiplied by a constant quantity called the *ratio of the P.* If the ratio is *positive* and greater than 1, each term is greater than the preceding one, and the P. is said to be *increasing*; if the ratio is positive and less than 1, each term is less than the preceding one, and the P. is said to be *decreasing*; if the ratio is negative, the terms of the P. are alternately positive and negative. In all cases if two consecutive terms are given, we can find the ratio by dividing the second by the first.

**Progressive Muscular Atrophy**, or creeping palsy, a disease occurring mostly in artisans, as gold-beaters and mechanicians, who by striking or other incessant action transmit a shock to the nerves of the arm and to the spinal cord. The anterior or motor roots of the spinal nerves degenerate, and the muscles of the hand, arm, and trunk progressively are paralyzed and wasted. Exposure to wet and cold may cause the disease.

**Projectile** [Lat. *pro*, "forward," and *jacere*, to "throw"], a missile thrown from a weapon, instrument, or engine, generally for war-purposes, as the arrow from the bow, the dart from the catapult, stones from the ballista, and stone or iron bodies from cannon. A more modern and limited definition is, a body intended to be projected from a cannon by the force of an explosive agent. In the case of small-arms the P. is called a bullet. A rocket is a P. which is set in motion by a force residing within itself. The most gen. classification of P. is into smooth-bore or spherical and rifle or elongated P., the former being mainly intended for smooth-bores, and the latter more exclusively adapted to rifled guns. Smooth-bore P. are generally classified into shot, shell, and case-shot. *Spherical shot* are cast solid. Amer. 15-inch shot are made of the best quality of gun iron, having a density close upon 7,300 and a tensile strength of at least 30,000 lbs. per square inch. To insure greater solidity and uniformity in casting them of so high a grade of iron, they are cast in vertical clusters of 4 or 5, and afterward turned in a lathe. (Fig. 1 represents such a cluster of 15-inch shot.) *Spherical shell* are cast with a core of sand, which is afterward removed, leaving the P. hollow. *Case-shot* are a collection of small P. in shot, in closed or bound together in a case or envelope. There are three prin. kinds of case-shot in use—i. e. grape, canister, and shrapnel. A *grape-shot*, or stand of grape, is composed of a number of cast-iron balls in the U. S. service usually 9, disposed in 3 layers of 3 balls each, bound together in such shape as to fit the bore of the gun. A *canister-shot* (Fig. 3) consists of a large number of cast-

FIG. 1.



Solid Shot, in closed or bound together in a case or envelope.

cluster.

There are three prin. kinds of case-shot in use—

i. e. grape, canister, and shrapnel.

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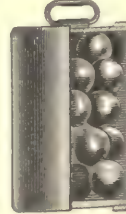
A canister-shot (Fig. 3) consists of a large number of cast-

FIG. 2.



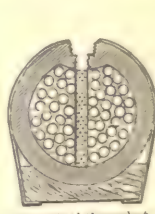
Stand of Grape.

FIG. 3.



Canister.

FIG. 4.



Spherical Case-shot.

iron or lead balls, inclosed usually in a tin cylinder, the interstices between the balls being filled with sawdust. A *shrapnel-shot* may be of spherical or elongated form, according as it is intended for a smooth-bore or rifled gun; in the



former case it is generally called a spherical case-shot. Spherical case-shot (Fig. 4) consist of a cast-iron shell of sufficient strength and thickness to resist the shock of discharge, filled with musket-balls, and the interstices filled up by pouring in melted sulphur or resin, in order to solidify the mass. A bursting-charge just sufficient to produce rupture is inserted. *Carcasses* are shells filled with a burning composition, which escapes through holes bored for the purpose in the case. *Chain-shot* consist of 2 hemispheres or spheres connected together by a chain, formerly used for cutting, at short ranges, the spars and rigging of vessels. *Grenades* are intended to be thrown from the hand or rolled down ramparts against troops in mass, and are simply light cast-iron shells containing a bursting-charge and provided with time or percussion fuzes.

An elongated P. to be successful must keep point foremost throughout its flight. There are apparently 2 prin. plans for attaining this end: (1) To so fashion the P. that its centre of gravity will be much in advance of its centre of figure, as in the arrow; (2) to impart to the P. a rapid motion of rotation about its longer axis.

Rifle P. are classified into *shot, shell, battering-shell or cored shot, and shrapnel*. The shot are solid castings; the shell have full capacity for a bursting charge; the battering-shell have small capacity, thick walls, and strong heads. Shrapnel for rifled guns were until recently constructed similarly to spherical case-shot, but a prevailing plan is to confine the bursting-charge to the rear or bottom of the shell, to connect it by a small tube with the fuze at the head of the shell, and to dispense in some cases with the sulphur between the bullets, in order to prevent their separating into cemented clusters. (Fig. 5 represents an Eng. shrapnel-shell in partial section and elevation.) A rifle P. is usually associated with a particular form of rifling best adapted to it, and this association of the P. and rifling is called a "system." There are 3 prominent systems of the present day—viz. (1) *The flanged system*, embracing all P. upon the cylindrical portion of which are projections, which, in loading, are intended to be inserted into corresponding grooves in the bore of the gun. (2) *The compressive system*, embracing all P. which are loaded in a chamber, and then forced by the action of the powder through the bore of the gun, the diameter of which, across the lands (i. e. omitting grooves), is less than the superior diameter of the P. P. for breech-loading guns have heretofore been of this class, the most prominent of which are those used in the well-known rifles of Krupp and Broadwell. (Fig. 6 represents a Prus. breech-loading P. of large calibre.) (3) *The expansive system*, embracing all P. which in loading are inserted in the gun without respect to the rifling, but which "take the grooves" by the action of the gases of discharge upon a device or feature of the P. which is readily expanded thereby into the grooves of the gun.

In the past few yrs. marked improvement has been made, and a former objection—that expansive P. cannot sustain heavy charges—no longer obtains, heavy P. of this class being now fired with charges of  $\frac{1}{10}$ , instead of  $\frac{1}{16}$ , the weight of the P. as formerly. Fig. 7 represents one of the large P. now used in the U. S. service. It consists of the usual cast-iron body, having a brass or copper ring or "sabot" attached to the base. A deep annular groove divides this otherwise solid ring into an upper and a lower flange or lip. The sabot may be cast or screwed upon the P. For experimental firing the screw thread is preferred, as it affords an opportunity of attaching a new sabot and firing the same P. several times. This P. is inserted at the muzzle of the gun and rammed "home" to the charge; when the gun is fired the powder-gases enter the annular groove in the sabot, and while the lower or inner flange is pressed down upon the P., the upper or outer flange or lip is forced into the rifling of the gun, and is kept thus distended during the passage of the P. through the bore. [From orig. art. in *J's Univ. Cyc.*, by CAPT. J. G. BUTLER.]

**Projection** [Lat. *projectio*], the representation of a magnitude on a plane or other surface made in accordance with some geometrical law. There are 2 prin. methods of projecting a magnitude on a plane; in the first method the P. is made by a system of parallel lines, and in the second it is made by a system of lines diverging from a common point. The former method is the one usually employed in descriptive geom. and its applications; the latter in perspective and in many kinds of spherical P. In both methods the projecting lines are called *projectors*, and the plane on which the drawing is made is called the *plane of P.* In descriptive geom. 2 planes of P. are used at right angles to each other, and the projectors are perpendicular to these planes. One plane is assumed to be horizontal, and the representation of the magnitude on this plane is often called the *plan*; the drawing on the vertical plane is then called the *elevation*. In perspective and spherical P. only one plane of P. is used, and then the point common to all the projectors is called the *point of sight*.

**Spherical Projections.**—This name is applied to the representation of the principal points and lines of a spherical surface on a plane. When the entire sphere is to be represented, the P. is usually made on the plane of a great circle; this circle is called the *primitive circle*, and its plane is called the *primitive plane*. There are 3 prin. methods of projecting the entire sphere: (1) When the eye or point of sight is taken in the axis of the primitive circle, and at an infinite distance from the centre of the sphere. In this case the projectors are perpendicular to the prin. plane, and the P. is then said to be *orthographic*. (2) When the eye is taken at the pole of the primitive circle; this is called the *stereographic* P. (3) When the eye is taken in the axis of the prin. circle, and at a distance beyond the surface equal to the radius of the sphere into the sine of  $45^\circ$ ; this is called the *globular P.* In projecting a sphere by any of the preceding methods the prin. circles are first projected to form the basis of the map or chart; these circles are the *equator*, the *tropics*, the *polar circles*, a certain number of *circles of lat.*, and a sufficient number of *meridians* or *hour circles*. The P. of the prominent points to be laid down on the chart or map are then determined.

When only a portion of the surface of a sphere is to be projected other methods of P. are used, of which the following are some of the most important:

The *gnomonic P.*, in which the eye is taken at the centre of the sphere and the plane of P. is tangent to the sphere. This method gives a map of a limited portion of the sphere with but little distortion. The *polar P.*, in which the eye is at the centre of the sphere, and the plane of P. coincides with that of one of the polar circles. The *conical P.*, in which the eye is at the centre of the sphere, and in which the P. is made on the surface of a cone tangent to the surface of the sphere, along the middle circle of the zone represented; after the P. is made the conic surface is developed, or rolled out on a tangent plane. The *cylindric P.*, in which the eye is taken at the centre of the sphere, and in which the P. is made on the surface of a cylinder which is tangent to the sphere along the equator; after the P. is made the cylinder is developed on a tangent plane. The *polyconic P.*, in which each parallel of lat. is developed symmetrically from an assumed meridian by means of a cone tangent to the surface along that parallel. This is the method of P. used by the U. S. Coast Survey in projecting small maps and charts.

W. G. PECK.

**Projection, Method of**, in geom. [Lat. *pro*, "forward," and *jacere*, to "throw"], in general, such a delineation of an object upon a plane surface as would result were the contours of points of the object *thrown forward* upon it by lines drawn from some fixed point assumed as the point of vision. If the point be supposed infinitely distant, and in direction perpendicular to the plane, we have the usual orthographic P.; if the direction be not perpendicular, we have *oblique P.*; if the point is at a finite and proper distance for ordinary vision, we have *perspective P.*, or *linear perspective*. Other systems of P. are used for delineating the earth's surface (see MAP).

**Prolapsus Uteri.** See UTERINE DISEASES.

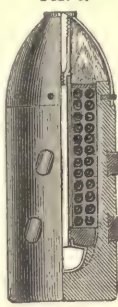
**Prometheus** was a son of Iapetus and Clymene, Themis, or Asia, the brother of Atlas, Menotides, and Epimetheus, and father of Deucalion. The myths relating to him are very variously told. According to some, he was the creator of man; according to others, he only brought to him fire and the arts depending on the use of fire. Next, they all agree that those benefits which he conferred on the human race for some reason excited the wrath of Zeus, who chained him to a rock and sent a vulture or eagle to feed daily on his liver. From these sufferings Hercules at last delivered him by shooting the vulture and unlocking the chains, after which P. returned to Olympus.

**Prom'ise** [Lat. *promissum*], in law, a unilateral undertaking to do or not to do some specific act. It is a necessary element in the legal conception of a contract. A P. without a consideration, however morally binding, does not in general create a legal obligation; but when contained in a sealed instrument the common law did not permit the consideration to be denied.

**Prom'issory Notes.** According to the general law-merchant, unaffected by statute, a P. N. is the written, unsealed, absolute promise of a person, called the "maker," to pay a certain sum of money at a certain time to a designated person, termed the "payee," or to his order or to the bearer. From this definition the following requisites are indispensable: The promise must be written, unsealed and signed by the maker; it must be absolute, not depending upon any contingency; it must be to pay money in a certain amount, or in an amount capable of being made certain by computation; the time of payment must be certain, or such as will become certain, but when no time is expressed the law implies that payment is due immediately, and the time in such case is certain within the meaning of the rule; lastly, the promise must be accompanied by words of negotiability—that is, it must be made payable to a designated payee or to his order, or to bearer.

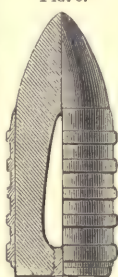
**Pronunciation**, pro-nun-she-ä'shun [Lat. *pronunciatio*], treats of the spoken form of words and the mutual influence of their component parts. Until recently, the laws of speech, apart from the laws of lang., have not attracted much attention, and in the absence of science literary experimenters undertook to bring lang. into correspondence with the imperfections of the spelling-book, instead of investigating the living speech. There is a difficulty in Eng. P. due to the fact that it has 2 systems of accent—the Teutonic and the Romance—the conflicting influences of which have not had time to produce uniform results. While Lat. monumentum gives *mon'ument* to Ger., in accordance with Teutonic analogy, Eng. treats *non'ument* as an entire Lat. word, and carries with it (dérivément) *del'rivment* and (*désperatus*) *dés'perate*. Although a Lat. word cannot have a final accent, we have a valid reason for say

FIG. 5.



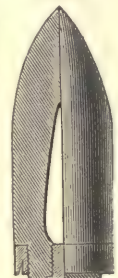
English Shrapnel-shell, muzzle-loading.

FIG. 6.



Prussian Cored Shot, breech-loading.

FIG. 7.



U. S. Cored Shot, muzzle-loading.



ing *proceed* and *decay*?; and while that *la* cannot have an accent behind the antepenult, we have *du'ciator*, where *crea'tor* should give *du'cida'tor*, and (Lat. *dra'tor*) *dra'tor* should give *du'cid'a'tor*. In long words the accent seems to be left to chance. As a Teutonic lang., Eng. tends to the preservation of the radical accent, which a false classicism and an incorrect view of syllabism have injured.

It was unfortunate that the Eng. name of the universal *u* (oo) should have become *yoo*, and attempts have been made to force this power into places where Eng. speech cannot accept it, particularly after *j*, *ch*, *sh*, *r*, *s*; and the endeavor to say *s-yoo-gar*, *s-yoo-r*, *is-s-yoo*, has caused the *s* and *y* to coalesce upon *sh* at the intermediate point of formation, resulting in the now legitimate *P.* of *sugar*, *sure*, *issue*. When *ci*, *ti*, *si*, become *sh* before a vowel, a syllable is lost, turning ad-vent-i-tious and per-ni-cious into ad-vent-ish-us and per-nish-us, where "iti" spells *ish*, and not *ish*; and as that which has been *i* or *y* has been advanced up the palate to form *sh*, it cannot remain to represent a vowel. The law of speech in such cases is, that the presence of *sh* removes the *i* or *y*; and, reversely, the presence of *i* or *y* prevents the formation of *sh*. Where the letter *k* does not exist, some nations use *qu*, as in Fr. *liqueur*, the meaningless *u* of which appears in writing *qu* (kee), *musquito*, *quinine* (kee-neen'), *colocynthida*. The most agreeable and musical of all the vowels, that of *arm*, is assigned to *arms* and *almond*; and although this power is enforced by *h* in *dahlia*, this name has been perverted to *dalea* in ignorance of the fact that *Dahl*, a Swede, is commemorated in the former, and *Dale*, an Englishman, in the latter. The vowel of *arm* occurs in *palaver*, *cantata*, *sonata*, *capibara*, *banana*, *casava*, *tomato*, *Tatar*, *yaghtian*, *palm*. The dits, join the incompatibles *z-h*, giving *egg-hort*, *egg-haut*, *egg-hibit*, where *egg-* requires the exclusion of *h*, or *h* requires the presence of *eks*, giving either *egg-aust* or *eks-haut*. Stability in Eng. *P.* cannot be attained until the alphabetism of the primer is replaced by a study of the laws of speech. Under the former an *e*-sound may be turned into an *i*-sound if the accidental spelling is of a certain kind. The pronouncing dits, are in most cases correct, and they are useful in a widespread lang. like Eng., with a vocabulary so extensive that the reader may be familiar with many book-words which he never heard from persons who had learned them as speech-words. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. S. S. HALDEMAN, LL.D.]

**Propaganda** (*Congregatio de Propaganda Fide*), a congregation of cardinals at Rome, first fully established in 1622 by Gregory XV., for furthering the spread of the R. Cath. religion among the heathen. The Congregation sustains a great coll. (Collegium Urbanum), often called The Propaganda, for training missionaries. It has also a library and printing establishment.

**Prophētus** (SEXTUS AURELIUS), b. in Umbria near the frontier of Etruria; lost while still a youth most of his fortune by some agrarian law, and lived in Rome in rather straitened circumstances; devoted himself to poetry; attracted the attention of Mæcenas, and resided on the Esquiline in familiar intercourse, as it seems, with Mæcenas, Virgil, and Ovid. The exact dates of his birth and death are unknown. His *Elegies* are much appreciated.

**Prophet**, prof'et [Gr. *προφήτης*], (1) he who speaks for another, *proclaimer*, preacher; or (2) one who predicts future events. We find in all nations from the most remote antiquity traces of men who were believed to have special and immediate intercourse with the Deity. The most remarkable and familiar instances of these phenomena appear in the nations of the E., more particularly among the Hebs. In the earlier ages they appear chiefly as seers, leading a contemplative life apart from the world. About the time of Samuel, with whom the prophetic age begins, they seem to have been organized into communities, established in various places under the charge of old and experienced *P.*, devoting their time to the study of the sacred writings and ecstatic religious exercises. After the Exile we lose all trace of these organizations; the *P.* appear separately and at intervals, and from Malachi to John the Baptist there arose no *P.* in Israel. The *P.* led in the main an ascetic life, supported by the contributions of the charitable, by the gifts of those who sought counsel from them, or by fruits, herbs, etc. gathered by themselves. Their costume was a mantle of skin girded around the loins. The call to the prophetic office was an inward one from God. The *P.* had mainly in view the reformation and elevation of the people, and but incidentally point out future calamity or deliverance as an aid to present guidance.

**Propionic Acid**. This acid was called *metacetic acid* by Gottlieb, its discoverer—a name which is now, however, entirely lost sight of for reasons that are not apparent. *P. A.* is the third in the series of the "fatty acid" homologues. It seldom occurs in nature, though found in some wines. It has been formed by several other methods. At normal temperatures it is a solid, soluble in water in all proportions. It melts readily, and boils at 140° C. Its smell is singular, but remotely resembles that of butyric acid.

**Propolis** [Gr. *πρόπολις*, "before the town,"] because it is used to close small approaches to the hive], a resin which the honey-bee collects upon its posterior tibiae and carries to the hive, where it is used in filling crevices, finishing combs, and the like. In this country it is mainly collected from the buds of the birch, the horse-chestnut, and the balsam-poplar.

**Proportion**, an equality of ratios. Four quantities are said to be in *P.* when the ratio of the first to the second is equal to the ratio of the third to the fourth. The principles of *P.* are employed in comparing quantities either in algebra or in geom. The primitive comparison lies between 2 quantities of the same kind, and the result of this comparison is a *numerical* ratio; if the quantities compared are commensurable, their ratio is *exact*; if they are incommensurable, their ratio is *approximate*; and in all cases of this

kind the degree of approximation may be made as close as desirable. Taking this view, the operations for transforming *P.* become purely numerical. W. G. PRICK.

**Proportional Representation** is a generic designation to comprehend all of the plans proposed for representing electoral masses or bodies by *all* their prin. divisions or parts. A representative house, convention, or board in theory should embody in its composition all the essential elements of the constituent mass. But this result is not accomplished upon the anc. plan of taking the sense of the electors at elections. By that, substantially, the largest division of the electors is alone regarded, and representation is assigned to it, not in proportion to its magnitude as a part of the constituency, but as if it were the whole constituency. It gets its own share of representative power, and in addition an unjust share or shares of power that ought to belong to other electors. Need we feel surprised when we learn that elections based upon this plan become costly and corrupt? that the strong motive to grasp at unjust power which the plan creates operates to debauch electors and degrade elections?

The *limited vote* obtains where the voter is forbidden to vote for the whole number of persons to be chosen, but is authorized to give votes singly to each of a less number or a single vote to one. The most conspicuous instance of its application to popular elections is furnished by the Eng. Reform bill of 1867, relating to the election of members of Parl. The 9th clause of that bill, adopted after full debate in each house, is as follows: "At a contested election for a county or borough represented by three members no person shall vote for more than two candidates." The next following clause of the bill further provides that "at a contested election for the city of London" (entitled to 4 members) "no person shall vote for more than three candidates." In the U. S. the limited vote has been often resorted to in recent yrs., as affording the means of facilitating or securing constitutional or legal reforms.

The *free vote* has been described as obtaining at plural elections, when the voter has assigned to him a number of votes equal to the number of persons to be chosen, and is permitted to distribute them among or to concentrate them upon one or more candidates, as he shall think fit. Mr. Lowe's amendment, proposed in the House of Commons to the Reform bill of 1867, and applicable to any co. or borough whenever 2 or more seats of members of Parl. therefrom should be vacant, was in the following words: "Every voter shall be entitled to a number of votes equal to the number of vacant seats, and may give all such votes to one candidate, or may distribute them among the candidates, as he thinks fit." And in the bill reported by a select committee to the U. S. Senate Mar. 2, 1869, embodying a proposed plan for electing members of Cong., we have the free vote expressed as follows: "In elections for the choice of reps. to the Cong. of the U. S., whenever more than one rep. is to be chosen from a State, each elector of such State, duly qualified, shall be entitled to a number of votes equal to the number of reps. to be chosen from the State, and may give all such votes to one candidate, or may distribute them, equally or unequally, among a greater number of candidates, and the candidates highest in vote upon the return shall be declared elected."

In Eng. the free vote has had an extensive trial in recent yrs. under the act of Parl. which applied it to the election of school boards throughout the country; and we believe it has been used in this country in some cases in the choice of delegates to nominating bodies. A more conspicuous application of it has been to stockholder elections for choosing certain officers of incorporated companies. Several State const. of recent adoption have made provision for such application of it, beginning with that of Ill. of 1870. [From orig. art. in *J.'s Univ. Cyc.*, by HON. CHARLES R. BUCKALEW.]

**Proselytes** [Gr. *προσέλυτοι*, a "new-comer"], among the post-exilic Jews, were Gentiles who conformed to Judaism. The rabbins speak of "P. of the Gate," who simply observed the 7 precepts of Noah; and "P. of the Covenant," or of "Righteousness," who were circumcised, baptized, and allowed all the privileges of the Jews.

**Proserpine** [Gr. *Περσεφόνη*], in classic mythology, a daughter of Zeus (Jupiter) and Demeter (Ceres); was carried off by Pluto to Hades, but afterward permitted by him to spend half of the yr. in the upper world. She was worshipped in all Gr. towns, generally in connection with her mother, as the goddess of vegetation.

**Prosody** [Gr. *προσῳδία*] treats of structure and laws of verse, which is to be studied like other phys. phenomena within reach, and it is not to be adapted to anc. systems, the details of which are of difficult application. The *P.* of Gr. and Lat. depends primarily upon the distribution of long and short syllables—that of Eng. upon strong and weak effects, due chiefly to the presence or absence of accent; and in both systems the metric foot is composed of 2 or of 3 syllables. Emphasis upon monosyllables has the same rhythmic effect as the accent stress, and in a line of monosyllables the alternation of strong and weak effects becomes obvious to the listener if the longer or the more important words occupy the accentual points. According to the classic system, "hár'moný" and "pár'mon'éy" are dactyls, having one long syllable followed by two short ones. In Gr. *P.*, beside being a dactyl, "pár'mon'éy" is also a paroxytone, in having the accent next the end syllable, while "hár'moný" is a proparoxytone, a word like "decáy" or "réfít," with a final accent, being an oxytone; and these are the proper terms for the feet in Eng. versification. But as oxytone and paroxytone are equally applicable to dissyllabic and trisyllabic feet, we should be able to distinguish them; and for this purpose we may prefix *sh-* to the former, and (*tri-*) to the latter. When the syllables seem to exceed 3 in a foot they may be disposed into shorter feet, or massed as bits of prose or as recitative groups, of which



examples occur in songs. As P. (*πρός*, "with," *ὄδῃ*, "song") implies the union of words and music, the two require to be studied together, and obscurities in verse may often be explained by a comparison with a corresponding phrase in music. Binary music is often adapted to triple verse, and triple music to binary verse, but in all adaptations the foot and measure must commence with an accented syllable, so that in oxytonic lyrics the first unaccented syllable is cut off as an anacrusis.

The amount of poetic license in P. should be little, and it is not to be judged from writers whose sense of rhythm is deficient. In the Gr. theatre, although the gen. audience were ignorant of the rules of versification, if a line was offered to their ear with a single syllable too much or too little it was received with disapprobation from all parts of the house; and the very close correspondence of the Gr. strophe and antistrophe demonstrates a high degree of rhythmic cultivation. Great excellence was attained by the Troubadours, and the Minnesingers of Swabia had a wonderful development of the rhythmic sense. [From *orig. art. in J.'s Univ. Cyc.*, by PROF. S. S. HALDEMAN, LL.D.]

**Prosper of Aquitaine**, SAINT, commemorated June 25, was b. in the S. W. part of Gaul about 400, and d. about or not long after 455. He visited Rome during the pontificate of Celestine (in 431), but was probably never sec. to Leo the Great. The greater part of his life appears to have been spent in Marseilles, where he came in contact with Semi-Pelagianism, and wrote those tracts against it on which his fame now principally rests. His *Carmen de Ingratis*, in defence of Augustine and his anthropology, shows him to have been a poet of considerable merit. He was author also of a *Chronicon Consulare*, in continuation of Jerome, reaching down to 455.

**Protagon** [Gr. *πρωτός*, "first," and *γωνή*, "procreation"], a phosphuretted fatty compound which forms the chief constituent of nervous tissue. It is prepared from brain-substance, first washed with water and ether, by the action of warm alcohol, in which it is soluble. At melting ice the P. precipitates from the alcoholic solution, and may be obtained crystallized by further purification and resolution. *Neurine* is a derivative from it.

**Protagoras**, b. about 480 B. C., at Abdera; was instructed by Democritus; lived afterward at Athens, where he was the first who taught philos. and rhetoric for money, and assumed the title of *sophist*, "teacher of wisdom," but was banished on account of his doubts concerning the existence of the gods. D. in exile 411 B. C.

**Protea'ceæ** [named from the genus *Protea*], a natural order of exogenous trees and shrubs found chiefly in the dry and hot regions of Australia, Afr., and Chili. Not one is N. Amer. They are mostly very handsome evergreens, and are allied to the laurels. For greenhouse shrubbery no plants are finer. Some are useful timber trees, and a few bear edible nuts.

**Protection**, as a term in political economy, means the promotion of home industry by imposing duties on the importation of the products of foreign industry.

(1) The industrial state consists of 3 classes—the agricultural, the manufacturing, and the commercial. When these are in a normal condition they are in a sort of equilibrium of production and consumption. When the manufacturers and traders are numerous enough to consume the farmers' ordinary production of food, and the farmers are numerous enough to supply food for all, then there is a balance of the industries. By the operation of the laws of demand and supply these classes continually approximate toward this equilibrium. A bad education or a wrong state of public opinion may offer hindrances by drawing an undue proportion of young men to commerce or to other unproductive employments. But ordinarily the tendency, when undisturbed by foreign interference, is toward the right relation.

(2) As the actual world is full of inequalities and disadvantages, experience shows that unrestricted trade between its stronger and richer and its weaker and poorer countries puts very great hindrances in the way of the latter. Thus the foreign competition crushes out the home production of all but the rudest and coarsest articles of manufacture, and prevents the establishment of a varied industry, unless the govt. interfere, as the personification of the nation and its co-ordinating power, to restore the equilibrium by discouraging these imports. Especially is this difficulty experienced in new countries, whose settlers bring with them the Old World's appreciation of modern appliances, comforts, and luxuries, while the home industries needed to supply these wants are still undeveloped. Until such a country has attained a diversified industry, advanced at nearly all points to a full equality with that of the most advanced nations, its manufacturing class are, in the absence of P., at the mercy of their foreign competitors.

(3) Commerce between the richer and the poorer nations is little more than the exchange of raw materials and the precious metals for manufactured goods more or less elaborate. The producers of raw materials send to the great centres of wealth, pop., and industry the cotton to be spun and woven into cloth, and the food to feed the spinners and weavers, and they receive in return so small a proportion of the product that they must spend what money they have in purchasing more to supply their necessities. Now, without united and national action there is no possibility of correcting this state of things. But through their organ, the govt., the people can say to the home manufacturer, "Build your factory and put in your machinery; we will buy of you. We choose to possess a varied industry on our own soil, and to destroy the monopoly now possessed by the foreigner, that we may have the choice between two markets, the home and the foreign."

(4) P. is a boon to the agricultural class as much as to that engaged in manufacturing. It aims at bringing the artisan and the farmer into neighborhood, and thus to secure to the latter an abundant, steady, and remunerative

market for his crops. The farmer whose customers are in the far distance must spend a bushel of wheat in getting 3 to market. The farmer whose market is at hand can keep up and increase the wealth of the soil by rotation of crops, and by the large returns to the soil which are rendered possible by the neighborhood of town and factory with their demand for dairy products. He can produce those lighter and finer staples which bring large and immediate returns. He has a steady market and steady prices, and little or no cost of transportation to pay.

(5) P. is a boon to the working-classes, who have not commodities, but labor to sell. It creates for them alternative occupations, in the absence of which there is rarely any competition between employers for labor. Even agricultural labor is poorly paid wherever there is no manufacturing. In a merely agricultural country, again, there is employment only for able-bodied men in the open air. The rest of the poorer classes must live in idleness and dependence on the earnings of the few who have work. But a varied industry employs all sorts of labor. To find work for all is the chief economic problem for any nation.

(6) Every true protectionist believes that nations are a part of the world's providential order, and that their industrial power and independence are essential to their political power and independence. National boundary-lines restrict the movements of capital and the capitalist as does nothing else; while, on the other hand, a nation's wealth ordinarily tends to diffuse itself over the whole country, and to create a certain equality of industrial condition and capacity. Under P. the newer and less developed portions of our country have come forward in manufacturing far more rapidly than the others. (See CAREY'S works, especially *The Harmony of Interests, Principles of Social Science, and The Unity of Law*. Also, FREE TRADE AND TARIFF.) [From *orig. art. in J.'s Univ. Cyc.*, by PROF. R. E. THOMPSON.]

**Protector**, a title several times conferred by the Parli. of Eng. upon some individual other than the legitimate sovereign, usually accompanied with extraordinary powers to meet a crisis. Among those who have borne this title were Oliver Cromwell and Richard Cromwell, his son.

**Protocols**. See ALBUMINIDS.

**Protest**. See NOTARY PUBLIC.

**Protestant**, a gen. name comprising all the various Chr. denominations, in contradistinction to the R. Cath. and E. chs., came into use after the second Diet of Spire, Ger., in 1529. The majority of the diet passed a resolution that all alterations in religious matters, especially in the celebration of the Lord's Supper and the mass, should cease until an oecumenical council could be convoked and decide the questions at issue. Against this resolution the elector of Sax., the margrave of Brandenburg-Anspach, the duke of Brunswick-Lüneburg, the landgrave of Hesse, the prince of Anhalt, and 14 free cities of the empire made a solemn "protest," hence the name. See REFORMATION.

**Proteus**, in classic mythology, a subject, or according to some a son of Poseidon, whose flocks of seals he tended, was gifted with the power of foretelling the future.

**Protagenes**, b. at Canus, Caria, in the middle of the 4th century B. C.; lived mostly at Rhodes, and was one of the most celebrated painters of his time, though he was a middle-aged man when Apelles brought him into notoriety. When Demetrius Poliorcetes besieged Rhodes he refrained from attacking one of the weakest points because here was found the masterpiece of P., *Iadysus*.

**Protoplasm** [Gr. *πρωτός*, "first," and *πλάσμα*, "form"], the fundamental living substance, the lowest form of life, is an albuminoid matter belonging to the class of protein compounds, varying considerably in its chemical composition according to circumstances, existing in forms of different degrees of density from fluid to solid, but exhibiting under the microscope in all its forms an almost perfect homogeneity, and possessing the power of spontaneous motion, of growing through the assimilation of matters from the surrounding media, and of reproducing its kind by separating into new individuals.

**Proudhon**, proo-dōn' (PIERRE JOSEPH), b. at Besançon July 15, 1809, became a partner in a printing business in 1837, and in 1838 the acad. of Besançon gave him a stipend of 1500 francs yearly for 3 yrs. as a reward for an essay on gen. gram. He went to Paris with his stipend, and sent in 1840 2 essays to the acad. of Besançon—viz. *La Célébration du Dimanche* and *Qu'est-ce que la Propriété?* In the latter he develops his famous definition of property: "La propriété, c'est le vol." From 1843 to 1847 P. lived in Lyons as supt. of some carrying business on the rivers Saône and Rhone, but his 2 large works from this time were pub. in Paris—*De la Création de l'Ordre dans l'Humanité* (1843), in which he gives a new theory of political organization; and *Système des Contradictions Économiques* (1846), in which he criticises the different schools of political economists in Fr. and Eng. very severely. When the revolution of Feb. burst out in Paris, he immediately repaired to that city, and (Apr. 1) began the issue of a daily paper, *Le Représentant du Peuple*. His paper was suppressed for its anarchical tendencies, but he started a new one. But in Mar. 1849 he was sentenced to 3 yrs.' imprisonment for illegal publications, and he fled to Geneva. Shortly after, however, he returned and delivered himself up to the police. During his imprisonment he wrote *La Révolution sociale démontrée par le Coup d'état*, in which latter book he showed that anarchy and Cæsarism were the 2 only alternatives which Fr. had to choose between at the moment of the *coup d'état*. After his liberation he lived retired for a long time, but he had to flee once more after the publication of *De la Justice dans la Révolution et dans l'Eglise* (1858). In 1860, when Nap. granted an amnesty for all press offenses, he returned to Paris. D. Jan. 19, 1865.

**Provençal** (pro-voñ-sahl') Language, called also **Langue d'Oc** (the "language of oc"), because oc was its word for "yes," instead of the *oui* (formerly *oïl*) of the N. French, which was called the *Langue d'Oïl*. The P. was the



most important of the so called Romance langs. It is still a spoken tongue. It is a much softer and more flowing lang. than the true Fr., and abounds in Latinisms. Its extensive poetical lit. is a thing of the past; at present it is chiefly a colloquial tongue.

**Provence.** See APPENDIX.

**Proverbs.** See APPENDIX.

**Proverbs, Book of.** This title comes through the Vulgate from its Gr. equivalent, *Παροιμια*, in the Septuagint. The term proverb, however, as applied to the species of divine utterance which the book contains, must be taken in its widest acceptation. The P. exhibit the results of reflection upon the moral and spiritual value of the precepts of the Law in the concerns of life. Their enforcement and manifold illustration of the practical bearings and utility of the previous portions of revelation account for the insertion of the book in the canon, and the selection and inspiration of Solomon as its chief author.

**Providence,** the doctrine that God upholds, preserves, and governs the entire universe which he has created. It implies not only foresight, but forethought, and therefore control.

That there are powers, unseen and supernatural, operating to sustain and control both nature and man seems to be the instinctive faith of the race, aside from the special teaching of revelation. The belief in a P. of some kind seems wellnigh universal. It is affirmed or implied in the writings of anc. classical poets and philos., although disfigured with crude and unworthy conceptions of the divine nature or character. The doctrine of P. was affirmed with great unanimity by the most distinguished early Chr. Fathers, and maintained with equal subtleness of discrimination and strength of argument. The objections, too, early brought against the doctrine, were nearly the same as those revived and reaffirmed in our day. By some it was held to be unnecessary, or an implication of imperfect work on the part of the Creator, rudely supplemented afterward. Others "maintained that God concerned himself only about the genus, but not about the species." Still others held it to be derogatory to the Supreme Deity to suppose that he would condescend to notice the small concerns of men.

The doctrine of P. is not inconsistent with the idea of a govt. of law. The Scriptures affirm that God is the creator of the universe. He is the author of what we call the laws of nature, and can surely change or suspend or overrule them. But he does not govern the world arbitrarily, but according to a fixed plan and for a great end. The laws of nature are the ordinances of God, but a man even may use some powers of nature to control or limit other powers. So, in a far higher sense, and with a method infinitely more perfect, may the Creator control that which he has made. Nor can we deny that he may act directly upon the rational mind, as one finite mind may seek to modify another; or upon both nature and spirit by methods to us now, and perhaps always, incomprehensible.

Some of the proofs of the doctrine are the following: (1) It is inferred from the idea of a personal God, infinite in intelligence, wisdom, goodness, and power; (2) from the evidence of intelligence and design in nature; (3) from the evidences in hist. of moral order and law; (4) from the experience of individuals, which may be misinterpreted, but cannot be overlooked altogether; (5) the proofs from the Holy Scriptures: (a) in the passages which indicate or declare the govt. of God over nature, over irrational animals, over men and nations; (b) in the lives of eminent men—e. g. Abraham, Moses, Elijah, Saul, David, Daniel, Paul; (c) in the Jewish hist., conspicuously everywhere; (d) in passages which affirm the truth of prophecy; (e) and in those which affirm the efficacy of prayer. (See HAGENBACH'S *Hist. of Doctrines*.) [From orig. art. in *J.'s Univ. Cyc.*, by PRES. S. G. BROWN, D. D., LL.D.]

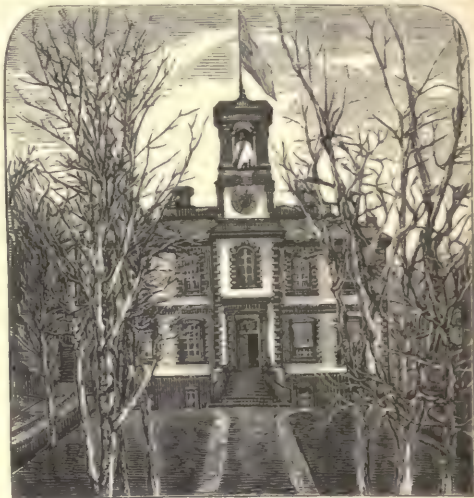
**Providence,** an important R. R. and commercial centre, is the second city in N. Eng., chief cap. of R. I., and cap. of Providence co., lat. 41° 49' 22" N., lon. 71° 24' 48" W., at head of navigation on Narragansett Bay, on one of the chief R. R.



The City Hall.

ing it into 3 parts—E. side, W. side, and Tenth Ward; the latter annexed to P. In 1874: area of P., 14.76 sq. m.

**Streets, Buildings, Etc.**—The streets are very generally narrow, and in the central portions of the city are well paved with stone, while the remainder are macadamized. There are 12 lines of horse R. Rs. radiating from Market Square, near the centre, to all parts of the city and vicinity. P. is noted for its elegant residences, with beautiful and extensive grounds. The city hall, built of granite, completed in 1878, cost \$1,050,000, and is a magnificent structure. Among other recent notable buildings are the Narragansett and Dorrance hotels, the Butler Exchange, the Library building,



State Capitol (Providence, R. I.).

Sayles Memorial Hall, Slater Hall, belonging to Brown Univ., and the c-h. built by the State. It has also the Butler Hospital for the Insane, the R. I. Hospital, the Home for Aged Women, the Dexter Asylum, the R. I. Catholic Orphan Asylum, and others, and contains Brown Univ. and many other incorporated educational insts.

**Public Free Schools.**—These consist of 1 high school, 11 grammar, 35 intermediate, and 38 primary schools, with 282 teachers in all. The expense of the public schools for the yr. ending Sept. 30, 1882, was \$308,796, beside \$28,700 for new school-houses and lots.

**Commerce and Finance.**—The commerce of P. is mostly coastwise. The arrivals in 1881 were—coastwise, 5094; foreign, 100; total, 5194 vessels; duties for the yr., \$135,133. Some of the receipts for 1881, by vessels and by R. R., were—327,955 bales of cotton, 259,915 barrels of flour, 2,067,557 bushels of grain, and 787,845 tons of coal. The expenses of P. for the yr. ending Sept. 30, 1882, were \$2,411,160.94. P. has excellent water-works, with an abundance of pure water; cost to Sept. 30, 1882, \$5,404,508.90; a scientific system of sewerage is being constructed, which has cost \$1,612,341.97. The net debt of P., Sept. 30, 1882, was \$8,479,818.61.

**Churches.**—P. has 82 ch. organizations—Bap. and Free Bap., 19; Episcopalian, 12; Meth., 12; R. Cath., 10; Congl., 8.

**Manufactures, Etc.**—P. is the centre of a large manufacturing dist., and has a large trade in manufacturers' supplies. By the census of 1880 it had 1205 manufactures; capital, \$27,177,006; hands employed, 22,891; wages for the yr., \$9,404,110; cost of materials, \$22,794,237; value of products, \$42,597,512. The prin. manufactures are jewelry, woollen goods, machinery, worsted goods, cotton goods, etc.

P. has the Roger Williams Park, 102.6 acres; Field's Point Park, 37 acres, and Cove Park, the latter in the centre.

The registration of vital statistics in P. has for many yrs. been very complete. The results for 27 yrs., ending with 1881, show 1 birth in 35.79 pop.; 1 person married in 41.33, and 1 death in 50.73.

**History.**—P. was founded in 1636 by Roger Williams, was incorporated as a town in 1649, and as a city in 1832. It increased very slowly until after the war of the Revolution, its pop. in 1776 being only 4355. Pop. in 1820, 11,767; 1840, 23,172; 1860, 50,696; 1870, 68,904; 1880, 104,857. E. M. SNOW.

**Provincetown,** on R. R., Barnstable co., Mass., at the extreme end of Cape Cod, has one of the finest harbors in the U. S. The Pilgrim Fathers first landed here from the Mayflower. The prin. occupations are whaling, cod and mackerel fishing. Pop. 1870, 3865; 1880, 4346.

**Provo City.** See APPENDIX.

**Provoost** (SAMUEL, D. D., b. in New York Mar. 11, 1742, grad. at King's Coll., New York, 1758, and the Univ. of Cambridge, Eng.; entered the Ch. of Eng. ministry 1766, and in the same yr. became assistant minister of Trinity ch., New York; lived in retirement during the Amer. Revolution; became in 1783 rector of Trinity ch., and in 1785 was consecrated bp. of New York at Lambeth, Eng. In 1785 he was chaplain of Cong., and in 1789 chaplain of the U. S. Senate. He resigned the care of Trinity ch. in 1800, and in 1801 received a coadjutor. D. Sept. 6, 1815.

**Prudentius** (AURELIUS (LEMONS), b. 348 probably at Caesaraugusta, Sp.; studied law, practised as an advocate, held several high positions, and was elevated into the patriarchian order by the emp. Theodosius, but retired afterward from public life and devoted himself exclusively to theological studies and religious poetry. Wrote *Liber Cathemerlon* and *Liber Peristephanon*, 2 collections of hymns; *Ha-*

lines between Boston and New York, about 44 m. S. S. W. from Boston. Two small rivers unite in centre of P., divid-



*martigenia*, on the origin of sin; *Psychomachia*, on the contest between good and bad in the human soul; *Contra Symmachum Libri Duo*, etc.

**Prune** (Lat. *prunus*, a "plum," the dried fruit of certain kinds of plums. The finest sorts are called *prunelles*. Table-P. are prepared by drying choice plums, like the green-gage and the St. Catharine. The best P. are from Fr., but Ger. furnishes large amounts of a coarse kind. Tur. and Sp. also export P.

***Prunus Virginia'na***, the botanical name indicating the genus and species of the wild or choke cherry of the U. S., belongs to the natural order Rosaceæ, sub-order or family Amygdaleæ, is found chiefly on river-banks in the N. States, is a tall shrub, with grayish bark, flowers in May, bears a reddish fruit which turns to dark crimson, has a smooth stone, and is very austere and astringent until fully ripe. It is the *P. obovata* of Bigelow, the *P. serotina* of several other botanists.

**Prussia**, prûsh'ya [Ger. *Preussen*], **Kingdom of** (area 137,066 sq. m., pop. 27,279,111 in 1880), is divided into the following provinces: East Prussia (14,729 sq. m., 1,933,936 inhabs.); West Prussia (10,151 sq. m., 1,405,898 inhabs.); Brandenburg (18,805 sq. m., 3,389,155 inhabs.); Pomerania (12,130 sq. m., 1,540,034 inhabs.); Posen (11,330 sq. m., 1,703,397 inhabs.); Silesia (15,666 sq. m., 4,007,925 inhabs.); Saxony (9729 sq. m., 2,312,007 inhabs.); Sileswick-Holstein (5324 sq. m., 1,127,149 inhabs.); Hanover (14,846 sq. m., 2,120,168 inhabs.); Westphalia (7771 sq. m., 2,049,442 inhabs.); Hesse-Nassau (5943 sq. m., 1,554,376 inhabs.); Rhine (10,289 sq. m., 4,074,000 inhabs.), and the principality of Hohenzollern (453 sq. m., 67,624 inhabs.). To the Crown belongs, furthermore, the duchy of Lauenburg. The country forms one continuous mass, comprising the whole of N. Ger. to the river Main. The N. part is flat, dotted with lakes, sandy in some places, fertile in others; the S. is traversed by the Riesengebirge, Sudetes, Rhön, Spessart, Taunus and Weser mts. and the slate mts. of the lower Rhine. The coast has numerous bays, of which Kiel and Jade bays are used as naval stations, and some large inlets, of which the Kurische and the Frische Haffs are the most important. The prin. rivers are—to the N. Sea, the Elbe, with its affluents, the Havel, Spree, and Saale; the Weser, with its affluents, the Fulda and Werra; the Rhine, with its affluents, the Main, Mosel, Lahn, Sieg, Wupper, Ruhr, and Nahe; and to the Baltic, the Memel, Vistula (Ger. *Weichsel*), and Oder.

The prin. occupation of the inhabs. is agriculture; next follow cattle-breeding and mining; finally, manufactures and commerce. Agriculture is chiefly carried on in Schleswig-Holstein, Hanover, Pomerania, Posen, and Prus. Rye, wheat, beet-root, tobacco, and hops are the prin. products. The cultivation of the vine flourishes on the Rhine and its affluents. The mines and salines yield coal, chiefly mined at Leuthen and Waldenburg in Silesia, on the Saar and the Ruhr; iron, zinc, copper, lead, and rock-salt. Much amber is found on the Baltic coast. The prin. manufactures are metallic wares, cotton goods, silk, velvet, linen, and cloth. Westphalia, Rhenish Prussia, Silesia, and Sax. are in this respect the most important provs. The trade is principally carried on in the produce of the country, though the transit-trade with S. Ger. is considerable.

Popular education has reached a comparatively high standard, being maintained by the state and compulsory on the citizens. There are about 30,000 elementary schools, more than 500 middle schools, 195 gymnasiums, with 26 progymnasiums, about 80 normal schools, 9 univs., an acad. of science at Berlin, 5 acads. of art, polytechnic and agricultural schools in several cities, schools of industry and art, and an acad. of music at Berlin.

The organization of the army is very comprehensive, and regulated with the greatest care down to the most minute details. It is so closely connected with all the administrative insts. of the country, and plays so conspicuous a part, that the whole country may well be called one immense camp, in which the civil organization has to adjust itself to the military. Every Prus. capable of bearing arms belongs to the standing army for a period of 7 yrs., generally from the 20th to the 27th yr. of his age, serving the first 3 yrs. in the ranks and the last 4 in the reserve. Then he belongs for a period of 5 yrs. to the *Landwehr*, thus making military service for 12 yrs. in all. Beside this, all men capable of bearing arms, but not serving in the army or navy, belong to the *Landsturm*. The number of the recruits annually levied amounts to about 143,000. The organization of the army is based on a territorial principle—that is, the divisions of the army correspond to those of the country into provs., govts., etc., and in each v. throughout the whole country tables are hung up by the govt. indicating to which regiment and battalion the men of the dist. belong. In consequence of military conventions concluded with the minor states, and the establishment of the Ger. empire, the Prus. army was combined with that of the rest of Ger.

A Prus. country and a Prus. people first appear in hist. toward the end of the 10th century. The country comprised the present prov. of Prussia, and received its name from the Chr. missionaries. In the 10th century Bp. Adalbert of Prague endeavored to convert the Prus., but was killed by them in 997. In the beginning of the 11th century Duke Boleslaw Chrobry of Poland invaded and subjugated the country, and baptized a number of the inhabs., but after a long and bloody contest the Prus. once more made themselves independent. In the beginning of the 13th century the Bernardine monk Christian raised an army of crusaders and penetrated into the country. Having been defeated by the heathens, he founded in 1225 the order of the Knights of Christ, and as this order also was defeated, he sought aid from the Ger. order, which subjugated the whole country. In 1283 the conquest was accomplished. In 1309 the grand master moved his residence from Venice to P., and made Marienburg the head-quarters of the order. The national

colors of the present kingdom were derived from the official dress of the order—a white cloak with a black cross. For more than 200 yrs. the order ruled the country, but after that time the order broke down from the enmity of Poland and Lithuania and by its own internal deterioration and discord. By the Peace of Thorn (Oct. 19, 1466) it ceded the whole W. half of its possessions, which was incorporated with Poland, and took the oath of allegiance to the Polish king for the rest. The order now endeavored to regain its former importance by electing for grand masters foreign princes, who added an independent power of their own to that of the order; but in this way it lost all, even its existence. In 1511 the margrave of Brandenburg, Albrecht, was elected grand master, and he dissolved the order and transformed the country into a temporal dukedom. Thus, the connection between P. and Brandenburg was introduced. It was not finally accomplished, however, until after the death of Duke Albrecht Frederick (Aug. 28, 1618). It was, however, still a fief of the Polish crown, and continued so until 1656, in the time of Frederick William, the great elector—*Der Grosse Kurfürst*—whose long and successful reign (1640–88) denotes one of the most prominent stages in the development of the Prus. state. His son, Frederick III., made great sacrifices to obtain the royal dignity, and succeeded at last. Jan. 18, 1701, he was crowned at Königsberg as king of P., under the name of Frederick I. (For the subsequent history of P., see the biographies of her kings—FREDERICK WILLIAM I., II., III., and IV., FREDERICK II., WILLIAM I., GERMAN EMPIRE, and SEVEN YEARS' WAR.) [From orig. art. in *J's Univ. Cyc.*, by AUGUST NIEMANN.]

**Prussic Acid**, or HYDROCYANIC ACID (which see).

**Pruthi**, a river of Europe, rises in the Carpathian Mts. in Galicia, runs through Bukowina, forms the boundary between Moldavia and Bessarabia, and enters the Danube at Reni, after a course of 350 m. and 75 from the Black Sea. It becomes navigable at Jassy.

**Pruyn** (JOHN V. L.), b. in Albany 1806; studied law; was admitted to the bar in 1832; chancellor of the univ. 1832; State senator in the same yr.; M. C. 1863–65, 1867–69. D. Nov. 23, 1877.

**Prynne**, prin (WILLIAM), b. at Swanswick, Somersetshire, Eng., in 1600, grad. at Oriel Coll., Ox., 1620; studied law at Lincoln's Inn; was converted to Puritanism; in 1633 issued *Histrio-Mastix*, the *Player's Scourge*, which was construed into a libel upon the queen; was fined £5000, expelled from the Univ. of Ox. and from Lincoln's Inn, set on the pillory at Westminster and Cheapside, had both ears cut off, and was sentenced to imprisonment for life. Having issued from his prison a tract entitled *News from Ipswich*, he underwent a repetition of the above punishments. Great crowds of Puritans witnessed the execution of this atrocious sentence, manifesting their sympathy with P., who in 1640 was released by warrant from the House of Commons. Elected M. P. for Newport, P. conducted the proceedings against Laud; became recorder of Bath 1647; took an active part in favor of the Presbs. in their struggle with the Independents; advocated a reconciliation between Parl. and the king; was arrested for denying the supremacy of Parl. in a pamphlet entitled *A Brief Memento* (1648); was with others ejected from Parl. by the army Dec. 6, 1648; attacked Cromwell and the army in his writings; was again imprisoned in 1650 and 1651; advocated the restoration of Charles II.; was elected to the new Parl. 1660; was made keeper of the records in the Tower; was reimprisoned by the House of Commons 1661 for new offences in his writings, and pub. a vast number of treatises. D. Oct. 24, 1669.

**Pryor** (ROGER A.), b. near Petersburg, Va., July 19, 1828, grad. at Hampden-Sidney Coll. 1845, and at the Univ. of Va. 1848; studied law; became connected with the press at Petersburg 1851; was an ed. of the Wash. *Union* 1852 and of the Richmond *Enquirer* 1853; went as special com. to Gr. 1855; was visitor at the Univ. of Va. 1856; edited a newspaper entitled *The South* 1856–67; M. C. 1857–59; was again elected in 1860, but did not take his seat on account of the secession of Va.; was chosen to provisional cong. of the Confed. States at Montgomery, and to the first regular Confed. cong.; entered the Confed. army as col. of the 3d Va. regiment; was made brig.-gen. after the battle of Williamsburg; was taken prisoner Nov. 1864, and imprisoned in Ft. Lafayette, but was soon released; was for a short time ed. of a paper in Tenn., and in the autumn of 1865 commenced the practice of law in New York.

**Psalmody**, sal'mo-de, is usually defined to be the act, art, or practice of singing psalms. Employed in a wider sense, it includes their origin, hist., and tunes to which they are sung. That God was worshipped publicly in song before David's time is clear. No direction, however, was given for such worship in the Law. It was David, the Psalmist as well as the Psalmist of the O. T., who instituted the formal, stated, liturgical services of praise. He had a trained choir of 4000 Levites, who, however, came out in full force only on great occasions. Over these were 3 leaders who directed them by beating time upon cymbals. The treble was led by the harps, and the bass, not in harmony, but simply an octave lower, by lyres or citharæ.

In the N. T. little is said of praise in public worship. The services were no doubt a selection from the temple-psalms, with the old tunes, which held a place far into the hist. of the early Ch. To these were gradually added Chr. hymns. The Syrian Ch. had a larger hymnology and more elaborate music than its sister chs.

The development of P. in modern times in accordance with the needs of the Ch. has been due chiefly to 2 causes—the gradually increasing and ultimately predominant use of metrical songs as supplementing the old rhythmical forms with a corresponding change in the tunes, which improved with the progress of musical science; and the growth of an hymnology in which the manifold experiences of Chrs. have found full expression. Music became a regularly constituted portion of ch. service in the 4th century. Its early



development in the W. Ch. was largely due to Ambrose, bp. of Milan, and its progress during the Middle Ages to the improvements effected by Pope Gregory I. Until the Reformation sacred music was under the control of the clergy. But the efforts of Luther and many of his helpers, by the adaptation of secular airs and the composition of new tunes, resulted in a widespread enthusiastic interest in sacred music among the Prots. in that country. Ever since then, also, it has been from Ger. that the greatest influence and the healthiest tone have been given to the musical dept. of P. [From *orig. art. in J.'s Univ. Cyc.*, by PROF. J. F. McCURDY.]

**Psalm**, *shalm* [Lat. *Psalmus*, *Psalma*; Gr. *ψαλμός*, *ψάλλω*, from *ψάλλειν*, to "play on a stringed instrument"], the title given in the Septuagint version to the inspired songs of the O. T., which form one distinct book in the canon. They are sometimes called the P. of David, because so many of them were composed by that royal poet. As a collection they are also sometimes designated the Psalter, a term which in Eng.-speaking countries is commonly but not exclusively employed in connection with their use in the act of worship.

For the *authorship* of the several poems the superscriptions attached to many of them are in gen. our most reliable guide. Seventy-three of the P. are thus assigned to David, and in nearly every case the correctness of the title is attested by strong evidence in their matter and style. The same criteria enable us to assign with great confidence a certain number of the anonymous P. to the same author, making his whole contribution to be about 80. Twelve are ascribed to the singer Asaph, which designation also included certain of his descendants who inherited his poetical and musical gifts. Thirteen or 14 proceeded from the "sons of Korah." Two were written by Solomon. One, Ps. xc., is accredited to Moses. It is difficult or impossible to assign the remaining P. with certainty to their true authors.

The *dates* of the composition of most of the P. may be determined by our knowledge of their authors or by their historical allusions. Thus it is easy to follow the course of the development and decline of this part of sacred lit., and its relations to the gen. religious life of Israel and to the inner experience of the writers themselves. Nearly all the P. will be found to have been composed when such feelings were deepened and vivified by great national vicissitudes or religious commotions. In David's time these influences met in full measure. Many were indited under Hezekiah and Jehoshaphat. The spiritual awakenings that followed the Exile also gave rise to many others. In Solomon's time, on the other hand, though it was the period of highest literary cultivation, yet attention was given to didactic and reflective rather than to lyric poetry.

As to the *matter* of the P., it must suffice here to say that they were the outflow of the spiritual life of the most highly endowed natures of a long period of Israel's hist. [From *orig. art. in J.'s Univ. Cyc.*, by PROF. J. F. McCURDY.]

**Psammētichus**, the name of 3 Egyptian kings belonging to the 26th dynasty. The name is written *Psametik* in hieroglyphics, but was altered by the Grs. to *Psammis*, *Psammetichus*, and *Psammenitus*. *Psammētichus* I. (664-610 B. C.) subdued, by the aid of Gr. mercenaries, the 11 other rulers between whom Egypt was divided at that time, and founded the dynasty. He opened Egypt to Gr. commerce, and the intercourse which now sprang up between the Egyptians and the Grs. had the greatest influence on the prosperity of both nations. With *Psammētichus* III. the dynasty ceased to reign. He ascended the throne in 526 B. C., but was put to death in the following yr. by the Per. king, Cambyses, who then became the ruler of Egypt.

**Pseudepigrapha** [Gr. *ψευδεπίγραφα*, "false additional writings"], in ecclesiastical bibliography, the gen. name of a vast number of books and fragments, great and small, of spurious works not usually reckoned in the Apocrypha, but like them designed to be foisted into the sacred canon. By some writers, the term P. is applied to spurious writings claiming a place in the O. T. canon. The term *Apocrypha* is applied to the spurious N. T. writings; while these writers call those books named Apocrypha by Prots. by the title of deuterocanonical books. While some of the so called apocryphal and deuterocanonical books are in themselves genuine and valuable, the P. as a rule are not. They are not even fictions. They are mostly self-evident forgeries—some anc. and others medieval; some Jewish, others Gnostic, and still others Chr.

**Psyche**, *st'ke* [Gr. *ψυχή*, the "soul"], in a Gr. legend preserved by Apuleius was a lovely mortal, the daughter of a king. Venus was jealous of her beauty, and ordered Cupid, her son, to inspire P. with desire for the basest of men, but the god of love, on beholding her, himself loved her. Thenceforth he visited her every night, requesting her never to see him or inquire who he was. But from curiosity she came to him with a lighted lamp while he slept. Overcome with joy at his loveliness, she carelessly allowed a drop of hot oil from her lamp to fall upon his arm. Cupid therefore left her with reproaches. After many calamities she became the menial slave of the jealous Venus, who treated her with great cruelty. But her lover invisibly assisted her, and finally, having secured her immortality, made her his wife.

**Psychology**, *st'-kol'-o-je* [from *ψυχή*, "soul," and *λόγος*, "reason"], the science of the soul. That mind exists, and is different from matter, can be established on 2 grounds: First, it is made known by a different mental faculty; body is made known by the senses; mind by self-consciousness. Secondly, we know the two as possessing different properties: mind has thought, feeling, will; matter has extension and powers of attraction, and can be weighed and measured. The science of P. shows that mind follows laws of its own. The common division of the faculties in the present day is a threefold one: (1) the cognitive, (2) feeling, (3) the will. The following may be found a convenient distribution of the faculties:

FIRST, COGNITIVE.	SECOND, MOTIVE.
I. Simple cognitive, or presentative.	IV. Conscience, or moral faculty.
II. Reproductive, or representative.	V. Emotions.
III. Comparative, discovering relations.	VI. Will, or optative power.

The cognitive give us knowledge and ideas; the motive stir up feeling and prompt to action.

I. *The Simple Cognitive*, so called because they give us knowledge in the first and simplest form; called also presentative, because the object is now present. It embraces sense-perception and self-consciousness. In sense-perception we have a knowledge (not a mere idea) of things external to the mind. From the very beginning and all along we have with our knowledge of body, and indeed as associated with every mental operation, a consciousness of self in its present state. By these two powers we have the knowledge with which the mind starts of things without and within us. Other powers may now work.

II. *The Reproductive or Representative*.—By these the knowledge gained comes up once more in old forms, in ideas of objects, not present, but thus represented. (1) The knowledge is kept; this is retention. (2) The object is actually recalled by an image, say, of a lily or of a state of grief or joy. The faculty which does this we call the phantasy, and the product an idea. (3) It is recalled according to the laws of association, which are of a twofold nature—primary and secondary. (4) Things are recognized as having been before the mind in time past. (5) The compositive power, putting things known in new forms and combinations, and this both by increase and decrease. (6) The symbolic power, which enables us to think by means of signs, and especially lang.

III. *Comparison*.—The mind can discover relations between the objects thus made known and recalled. (1) Identity, whereby the mind perceives that the same is the same. (2) The faculty of whole and parts, called comprehension and abstraction, whereby we separate a part from the whole, and form abstract ideas. The mind can also discover (3) the relations of space, which gives locality and the science of geom.; (4) of time, which gives arith. and chronology; (5) of quantity, from which proceeds math. as the science of quantity; (6) resemblance, which enables us to classify, and reach gen. notions; (7) active property, which notices the correlation of forces; (8) cause and effect, by which we rise from effect to cause till we reach a first cause.

IV. *The Moral Faculty*.—(1) It is partly cognitive; it discovers not a new object, as the senses may do, but a quality in certain objects. (2) It is also motive. Its exercises are accompanied with emotion, with feelings of approbation and disapprobation.

V. *The Emotions*.—These imply 4 elements: (1) an appetite or spring of action, such as the love of pleasure or sympathy with our fellow-men; (2) an idea of an object as appetible or inappetible; (3) the actual emotion, an excitement of mind, with attraction toward an appetible object and repugnance from an inappetible. (4) There is an organic affection of the brain and nerves.

VI. *The Will*.—The essential element here is the power of choice and its opposite, rejection. This power includes volition, or the final decision to act. But it includes more: it includes wish. It should be resolutely maintained that the will has an essential freedom of which it can never be deprived.

It should be observed that every one of these groups of powers gives us one or more new ideas. The senses give us the idea of extension and resisting power; self-consciousness, the idea of mind and mental operations; the reproductive, of time and the infinite; the comparative, of connections; the conscience, of moral good and evil; the emotions, of the lovely; and the will, of freedom. [From *orig. art. in J.'s Univ. Cyc.*, by PRES. J. McCOSH, D. D., LL.D.]

**Ptah**, or **Pthah**, a divinity of anc. Egypt, usually identified with the Gr. Hephaistos. His worship was connected with the adoration of the sun as the author of light and heat.

**Ptarmigan**, *tar'me-gan*, the vernacular generic name for the species of grouse of the genus *Lagopus*, which are distinguished by the legs being densely feathered to the claws, the nasal grooves closed over with feathers, and the development of 16 or 18 tail-feathers. The species are characteristic of the high N. regions of the globe, and, with the exception of one species, assume a white coat during winter; in summer they are of a more or less reddish or buff color. In winter they seek the shelter of thickets of willows, birches, etc., but in summer they frequent plains. When pursued in winter they frequently dive in the loose snow, in which they work their way with great ease.

**Pterichthys**, *ter-ik'this* [Gr. *πτερόν*, "wing," and *ἰχθύς*, "fish"], the most remarkable member of the strange group of placoderm fishes, of which the remains are found in the Devonian rocks of Europe. It was of small size—the largest 1 ft. in length—the body almost inclosed in a case or trunk of enamelled bone. From this projected a tail covered with angular scales and provided with a dorsal and a caudal fin.

**Pterodactyls**, *ter-o-dak'tilz* [Gr. *πτερόν*, "wing," and *δάκτυλος*, "digit"], an extinct group of flying animals, confined to the Mesozoic or Reptilian age. The anterior limbs were adapted for flight by the elongation of the forearm and fifth or outer digit. By this means the expanse of membrane was supported as in the bats, which these animals in some respects resembled. The head was large, the jaws long, and armed with teeth. In many other points the skull approaches that of birds. Nearly all the bones were pneumatic, with very thin walls, as in most birds. The skin seems to have been destitute of scales or feathers, as no traces of either have been discovered.

**Ptolemais**. See ACRE.

**Ptolemy**, *tol'e-me*, the name of 13 kings of Egypt belonging to the Greek or Macedonian dynasty, of which the



most remarkable were—PTOLEMY I., SOTER (323-283), the founder of the dynasty. The surname *Soter*, "the preserver," was given to him by the Rhodians, whom he saved when they were attacked by Demetrius Poliorcetes. The first part of his reign was occupied by wars with Perdicas and Antigonus, in which he suffered a terrible defeat in the naval battle off Salamis in 306, but succeeded in baffling and defeating first Perdicas, and subsequently Antigonus, when they invaded Egypt, and conquered Syria, Palestine, Coelestria, and Cyprus, which were added to his realm.—PTOLEMY II., PHILADELPHUS (283-247), b. in 309; continued successfully the work which his father had commenced. He founded Arsinoë at the head of the Red Sea, and Berenice farther to the S. The former he connected with the Nile by restoring and completing the canal of Necho; the latter by constructing an excellent road to Coptos. He built the celebrated light-house on the island of Pharos; founded colonies and mercantile stations, such as Ptolemais on the confines of Ethiopia for the trade in elephants; concluded commercial treaties even with India, and brought the material prosperity of his country to its culmination. No less successful were his exertions for the establishment of the literary and scientific supremacy of Egypt. The number of rolls in the library increased to 400,000; its librarian was Callimachus. To the school were added botanical and zoological gardens. Among its teachers were Euclides, Aristarchus of Samos, and Aratus, Hegesias, and Theodorus. At the court lived Theocritus, Manetho, Apelles, etc., and a widespread tradition says that the Septuagint was undertaken at the command of the king.—With PTOLEMY IV., PHILOPATOR (222-205), PTOLEMY V., EPIPHANES (205-181), and PTOLEMY VI., PHILOMETOR (181-146), begin the degeneration of the dynasty and the influence of the Romans.—The later members of the family, although the men retained their eminent gifts for science and art, and the women their wonderful beauty, were seized with a sort of madness which burst forth in the most unnatural freaks of sensuality and cruelty. With Cleopatra the family lost its royal dominion; her son by Cæsar was sometimes called Ptolemy XIV., but died in childhood. CLEMENS PETERSEN.

**Ptolemy** (CLAUDIUS I. PTOLEMAÏUS), b. at Pelusium in Egypt; flourished at Alexandria in the middle of the 2d century after Christ. Of his personal life nothing more is known. Of his works, the *Syntaxis Mathematica*, the *Geographia*, and the *Tetrabiblos* are still extant. The first-mentioned work is a representation of the science of astronomy, so far as developed by the ancients, and formed the foundation of all astronomical science down to the times of Copernicus (Ptolemaic system).

**Publicans**, farmers of the public revenues of the Rom. state. The immediate lessees were of the wealthiest Romans. The provs. were sublet by dists., and the actual collection of taxes was made sometimes by even slaves.

**Publius Syrus**, a Syrian slave who attracted great attention in Rome in Cæsar's time as a writer of mimes.

**Puccoon**, a gen. name applied in the U. S. to several dissimilar plants which yield a yellow or reddish juice, often utilized for dyestuffs. The best-known representative is the *Sanguinaria Canadensis* or blood-root. Other P. are of the borage and crowfoot families, the latter being medicinally used as a substitute for quinine, and being popularly regarded as a specific for cancer.

**Puebla**, pweb'lah, state of the Mexican confederation, bounded by the states of Mexico, Vera Cruz, and Oaxaca. Area, 12,021 sq. m. Pop. 784,466. The surface is an elevated plateau, which to the W. rises into a lofty mt.-range, comprising the volcano Popocatepetl. Agriculture is the prin. occupation, and excellent wheat is produced. Some manufactures of cotton fabrics and earthenware are carried on.

**Puebla, or La Puebla de los Angeles**, town of the Mex. confederation, cap. of the state of the same name, in a fertile plain at the foot of Mt. Popocatepetl. It was founded in 1531, and has broad and regular streets and many fine public squares provided with fountains. Its cathedral is a magnificent building. There are 3 hospitals, an ecclesiastical sem. with 9 professional chairs, a theatre, museum, public library, and 15 elementary schools. Soap, pottery, and a peculiar kind of cotton shawl used all over Mex. are extensively manufactured. Pop. 65,000.

**Pueblo**, R. R. junc., cap. of Pueblo co., Col., on Ark. River, 120 m. S. of Denver. Pop. 1870, 666; 1880, 3217.

**Pueblos** (Sp. *pueblo*, "village"), a class of Indians of N. M. and Ariz., so named from their communal houses, sometimes of several stories in height, which serve as the habitations of entire clans. They raise grain, cotton, vegetables and fruits, manufacture pottery and cotton stuffs, and preserve the same grade of civilization which they had 8 centuries ago. Many are R. Caths., but the majority retain their original religious beliefs and practices, prominent among which is the maintenance of the sacred fire and the worship of Montezuma, a divinity who must not be confounded with his namesake, the Mex. emp. They constitute several tribes and speak different langs. Their internal administration is carried on by themselves in accordance with their ancestral customs, each v. having a gov. and a court or council of 3 elders.

**Puerperal Fe'ver**, a fever occurring only to women, following childbirth, and characterized by acute inflammation of the uterus and peritoneum. It may occur in isolated cases in private practice, but more commonly develops in hospitals and lying-in asylums, where numerous patients are aggregated, the air vitiated, and especially if unfavorable surgical cases—erysipelas, gangrene, suppurating wounds, pyæmia, or septicæmia—are present. Under such circumstances many cases coexist or occur consecutively, and often spread to individuals in the surrounding community. Such epidemics, and its spread by seeming contagion, have led some to regard it as a specific and contagious disease. But a counter-opinion has greater weight of authority, that it is indeed only a condition of blood-

poisoning by the absorption of septic or purulent matter on the recently exposed and often lacerated interior of the uterus, or the inflammation of that organ and the peritoneum by the presence of septic matter in the blood. The treatment comprises venætrium viride to control the circulation, opium as a specific in peritonitis, and antiphlogistic local applications to the abdomen. Cold cloths or ice, sedulously employed at the outset, may abate the inflammation or lessen its severity, but when the disease is established warm anodyne fomentations are preferable. Nutritious liquid food, quinine, and alcoholic stimulus must be administered at regular intervals and in doses determined by the degree of prostration. E. D. HUDSON.

**Puerperal Mania**, perversion of the mind in women immediately after childbirth and during the first week thereafter, exceptionally occurring before delivery, or developed weeks or months after labor by excessive and exhaustive nursing. It may be considered as a derangement of the mind due to the influences of the childbirth upon the sympathetic nervous system and emotional nature of the mother. E. D. HUDSON.

**Puff Ad'der**, the *Clotho arietans*, a deadly serpent of S. Afr., so called from its habit of puffing up the neck when irritated. It is very large and thick, and is ordinarily slow, but can move very quickly upon occasion. It is of most frightful appearance, and is frequently seen half buried in the sand. There is no known remedy for its bite.

**Puff-Balls**. These plants are placed in the order Trichogaster of the gasteromycetous group of Fungi, and are characterized by a single or double covering (*peridium*), with the spore-bearing interior (*hymenium*) at first spongy, but soon opening into a dry, dusty mass of threads and spores. Like other fungi, they are parasitic, living usually on decaying vegetable matter, and pass rapidly through their stages of growth. Among the most common of our P.-B. are some of the species of the genus *Lycoperdon*, recognized by the thin membranaceous peridium, easily breaking away when ripe, allowing the escape of the spores from within. In the genus *Scleroderma* the peridium is firm, with distinct veins throughout the interior, spores large and granulated, arranged in masses. The genus *Bovista* is known by having a persistent peridium, usually very thin, and a continuous outer covering which breaks away. In the genus *Gaster* the peridium is distinct and double, the outer one bursting and dividing into several stellate lobes, which often become much reflexed, giving a star-like appearance, warranting the common name of "starry puff-balls." In some species of this genus the outer wall is divided into 2 parts, and a peculiar appearance is produced by the inner portion becoming separated and reflexed, raising the P.-B. into the air while it rests itself by its tips upon the upturned lacinae of the outer wall. In the genus *Polyascon* the peridium is simple, with the interior divided by masses of threads into many cavities or chambers. The remaining genera, *Batarrea* and *Tulostoma*, are characterized by having a stem of considerable length, and their species serve to connect the P.-B. with the neighboring group of Phalloidei.

**Puffendorf, von** (SAMUEL), BARON, b. at Chemnitz, Sax., Jan. 8, 1693; studied theol. at Leipzig and math. at Jena; went as tutor to the son of the Swe. ambassador to Copenhagen, where he wrote *Elementa Jurisprudentiæ Universaliæ*; was appointed prof. of natural law at the Univ. of Heidelberg in 1661; pub. in 1667, anonymously at Geneva, his *De Statu Imperii Germanici*, which contained a very severe criticism on the const. and legislation of the Ger. empire, and was burned by the hangman in Aus.; went in 1670 to Swe., first as prof. of law at Lund, afterward as royal historiographer at Stockholm; pub. in 1672 his celebrated work, *De Jure Naturæ et Gentium*; returned in 1688 to Ger. as historiographer to Frederick William of Brandenburg. D. at Berlin Oct. 26, 1694.

**Puffin**. See AUK.

**Pugatcheff**, poo-gah-chef' (YEMEL'YAN), b. in 1726 at Simovskoe, a village on the Don, in the terr. of the Cosacks; grew up as a member of a band of robbers; served in the Seven Years' war, first in the Rus., then in the Pruss., and at last in the Aus. army, and was imprisoned for some time after his return to Rus. for attempts at sedition. A rumor was spread that Peter III. was not dead. In Aug. 1773 a proclamation from the emp. was issued. Shortly after P. presented himself as the monarch, and was joined by a few other adventurers, but he was sold by his comrades for 100,000 rubles to Suwarow, and executed at Moscow Jan. 21, 1775.

**Puget Sound**, a large irregular bay in Wash. Terr., forms one of the safest and best harbors on the Pacific coast. From it coal, lumber, fish, and fruit are exported. It is surrounded by a broken but fertile region, covered with dense and lofty forests.

**Pugh**, pŭ (GEORGE ELLIS), b. at Cin. Nov. 28, 1822, grad. at Miami Univ. 1840; served in the Mex. war as capt. 4th O. Volunteers; city solicitor of Cin. 1850, atty.-gen. of Ohio 1851, U. S. Senator 1855-61. D. July 19, 1876.

**Pulaski**, R. R. junc., Oswego co., N. Y., has a custom-house, jail, and acad. Pop. 1870, 1560; 1880, 1501.

**Pulaski**, on R. R., cap. of Gilles co., Tenn. Pop. 1870, 2070; 1880, 2080.

**Pulaski** (CASIMIR), COUNT, called in Polish, KAZIMIERZ PULAWSKI, b. in Lithuania Mar. 4, 1747, son of Count Joseph Pulaski, who in 1768 formed the Confederation of Bar for the preservation of the liberties of Poland; ed. for the law; in 1769 joined his father and 2 brothers in the national struggle against the despotism of King Stanislaus Augustus; escaped to Tur. 1772; participated in a war against Rus.; proceeded to Fr., where he made the acquaintance of Franklin, and offered his services to the cause of Amer. independence. Arriving at Phila. in the summer of 1777, he joined the army as a volunteer; distinguished himself at the battle of Brandywine, and 2 days later was appointed by Cong.



brig.-gen. (Sept. 13), and given command of the cav. He took part in the battle of Germantown, and in Mar. 1778, having resigned his command, he formed at Valley Forge an independent corps called "Pulaski's Legion." By a surprise at Little Egg Harbor, N. J., a large part of his inf. was bayoneted, but the legion was again recruited to 330 men. In Feb. 1779 he set out for the South; reached Charleston May 8; made a vigorous but unsuccessful attack upon the Brit. advance-guard May 11; accompanied Count D'Estate to the siege of Savannah, where he was given the command of the Fr. and Amer. cav.; was mortally wounded in the assault of Oct. 9. D. Oct. 11, 1780.

**Pullman, Ill.** See APPENDIX.

**Pullman** (JAMES MINTON), D. D., b. at Portland, N. Y., Aug. 21, 1836, grad. at St. Lawrence Divinity School 1860; pastor of First Univ. parish of Troy, N. Y., same yr.; ordained in 1862; pastor of the Ch. of Our Saviour, New York, 1867-85; organized the Young Men's Univ. Association of the city of New York in 1869; sec. of General Convention of Univts. 1868-77, and chairman of the publication board of the N. Y. State convention of Univts., having in charge the *Chr. Leader*, 1869-73.

**Pulmonaria.** See LUNGWORT.

**Pulque**, pul'ka [Mex.], the fermented juice of various species of Agave. It is obtained by scooping out a cavity in the crown of the plant just as the flower-stalk is about to form. In this cavity the sap collects for many weeks, one plant furnishing a large amount of juice.

**Pulsatilla.** See ANEMONE.

**Pulse** [Lat. *puls*, *pultis*], a gen. name for such seeds of leguminous plants as are used for human food, as peas, beans, and lentils; abounds in vegetable caseine, and is highly nutritious.

**Pulse** [Lat. *pulsus*, from *pellere*, to "beat"], the result of the blood-wave sent through the arteries of the body by the ventricles of the heart. Each contraction of these ventricles sends into the arteries 2 to 4 ounces of blood, which, entering vessels already full but contracted, expands, elongates, and uplifts them, and produces a sudden lifting and impulse on the finger applied to them. The frequency of the P. in a healthy adult, at rest, is 72 to 75 beats in a minute—in women a little more frequent than in men; more frequent while standing than while sitting, least frequent in the recumbent position. Muscular exertion increases the number of heart-beats in a given time, and consequently the frequency of the pulse, in proportion to its amount and duration. The P. in disease sometimes becomes very frequent, and sometimes very slow. In inflammation of the membranes of the brain in children it has been often found, toward the termination, beating at the rate of 180 for a day or more; it has sometimes reached 300. There is nothing more wonderful in physical life than the lively sympathy of the heart, expressed by the varying P., in the various diseases that afflict the body. It "speaks a various language," which the educated alone can properly interpret. It is small or full, rapid or slow, hard or soft, quick or prolonged, irregular in various ways, giving a varying number of beats in the different fractions of a minute, the beats tumultuous, frequent, and slow alternately, or is double (*dicrotic* or *bisferiens*). It is often intermittent—that is, a single beat is lost. This occurs both with and without disease of the heart; it is often caused by the use of tobacco. In some states of imperfect innervation of the heart its pulsations cease entirely, to be resumed after the lapse of a considerable fraction of a minute. In two such cases the writer found the period of absolute inaction of the heart to be 15 seconds. It was attended by extreme paleness, complete loss of consciousness, suspension of the breathing; indeed, temporary death. An instrument has been invented by which many conditions of the P. can be inscribed on paper attached to a revolving cylinder. It is called a "sphygmograph."

**Pulte** (JOSEPH HIPPOLYTE), M. D., b. at Meschede, Ger., Oct. 6, 1811; took his med. degree at Marburg; settled in Allentown, Pa., 1834, and was one of the founders of a homœopathic coll. there; removed in 1840 to Cin.; prof. of clinical med. in the homœopathic coll. at Cleveland 1852, of obstetrics 1853-55; afterward prof. of clinical med. in Fulte Med. Coll., Cin.; ed. of professional journals; author of *The Homœopathic Domestic Phys.*, etc.

**Pulteney** (WILLIAM), earl of Bath, b. in Eng. in 1682, ed. at Westminster School and at Christ Ch., Ox.; entered Parl. as a Whig 1705; took part in the prosecution of Dr. Sacheverell; defended Walpole in the prosecution made in 1712; became on the accession of George I. privy councillor and sec. at war 1714-17; became cofferer of the household under Walpole 1730, but went over to the opposition 1735; fought a duel with Lord Hervey, in which both combatants were wounded, 1731; became extremely popular as the leader of the gen. crusade against Walpole; was the real framer of the cabinet of 1742 on the downfall of Walpole; was created at this time earl of Bath; lost much political influence by his transference to the Upper House of Parl., and was premier for 2 days in Feb. 1746, but was unable to form a cabinet. D. July 8, 1764.

**Puma**, or **Cougar**, [*Felis concolor*, Linn.], a carnivorous animal found throughout S. Amer. and a great part of N. Amer., known in Sp. Amer. countries as the Amer. lion, and in the U. S. as the catamount or wild-cat, and vulgarly as "painter" (a corruption of "panther"). The adult male is from 4 to 5 ft. long, has a thick fur, brown above and grayish-white beneath, with the ears and tail nearly black, and sometimes partially striped along the sides. It climbs trees, lives chiefly upon deer, and has a shrill scream.

**Pumice** [Lat. *pumex*], a light, porous mineral, a sort of soft trachyte, found near active or extinct volcanoes, and formed by steam in blast furnaces when water is poured over melted cinder. It is considerably used in the arts, in polishing hard materials, and in dressing parchment and fine leather. It is chiefly exported from the Lipari Islands.

**Pump.** A pump is a machine for elevating water or other liquid. The height to which the water is raised is called the "lift." P. sometimes act not by raising water, but by forcing it into a vessel against a pressure, as in the case of the feed-P. of steam-boilers. Such pressure may, however, be always represented by a head of water. Fig. 1 shows the simplest form of this machine. It is used for lifts of but a few feet, for draining shallow pits and balling flat-bottomed boats. It consists of a square wooden barrel, a foot-valve *a*, and a piston *b*. The foot-valve is a leather flap on a wooden seat; the flap has a leaden back to give it due stiffness and weight. The piston *b* is a leather cup attached to a wooden rod. On its downward stroke the water folds it together, and allows it to pass freely. In its upward movement the water distends or bags it out, causing it to press against the interior of the barrel, and making it tight. The water above the piston is simply lifted, while the water follows the piston and flows through the valve *a* in virtue of the atmospheric pressure. Fig. 2 is a section of a force-P. used for domestic purposes. The valves, the most important organs of the P., are fully shown here and at Figs. 3 and 4. Fig. 3 is the valve *m* or *k*, which serves at the same time

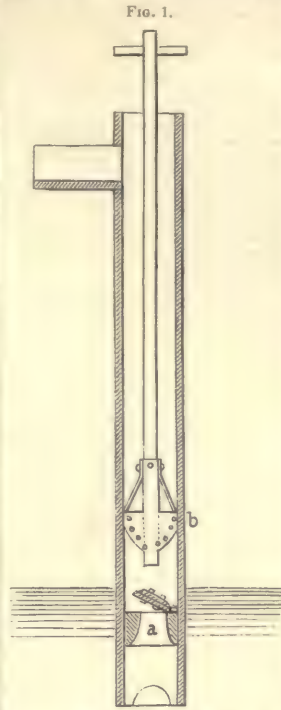


Fig. 2.

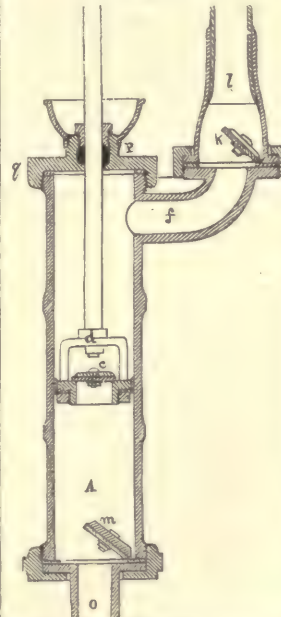


Fig. 3.



suction-P. is more commonly made as shown at Fig. 4. It has a joint at *c*, as the piston-rod does not move in a straight line. The P. above mentioned are single acting, furnishing a stream only during the ascent of the piston.

Fig. 5 is an outline sketch of a double P. for supplying the city of Brooklyn, N. Y. It is driven by an enormous steam-engine, and is capable of raising 10,000,000 gals. 170 ft. in 16 hours. *a a* are the P.-barrels; *b b* the pistons, each having a valve; *d d* are the piston-rods, each passing through a stuffing-box and attached to the opposite ends of the balance-beam of the steam-engine, so that one piston descends while the other rises; *c c, e e*, are valves in the annular spaces around the P.-bar-



rels. The operation of this P. is as follows: The upper piston while rising draws the water through the valve of the lower piston and the valves *c c*. The lower piston while rising forces the water through the valve of the upper piston and the valves *c c*. The traverse or stroke of each piston is 10 ft., and each stroke advances the column of water in the form-main by this distance.

In the centrifugal P. the water is caused to revolve with great velocity in a circular chamber. The tendency which water, in common with all heavy bodies, has to move in a straight line causes a pressure upon the circumference of the chamber sufficient to make the water rise to a greater or less height, depending on the velocity. The centrifugal P. is placed at the lowest point of the pit to be drained, and, being once put in position, cannot be readily changed. The water receives a rotary movement from arms attached to a vertical shaft. It enters the P. at the centre and rises through a pipe at the circumference. The shaft is driven by a

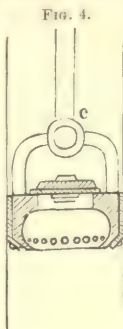
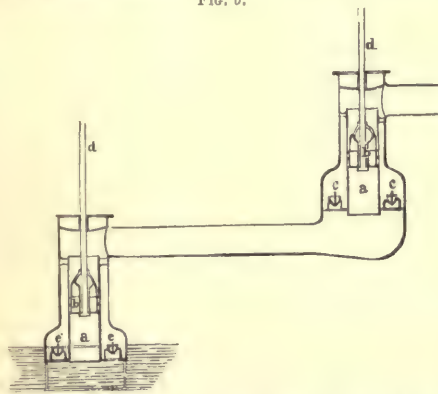


FIG. 5.



steam-engine by means of a belt and pulley at the top. [From orig. art. in *J. s. Univ. Cyc.*, by J. P. FRIZELL, C. E.]

**Pumpelly** (RAPHAEL), b. at Owego, N. Y., Sept. 8, 1837, ed. at Paris, Hanover, and Freiberg, 1854-60; was engaged in mining operations in Ari. 1860-61; was employed by the govt. of Japan to explore the island of Yezo 1861-63; by the govt. of Chi. to report upon the coal-supply of that empire 1863-64; returned to the U. S. through Mongolia, Siberia, and Rus.; became prof. of mining engineering at Harvard 1866; made a survey of the copper-region of the upper peninsula of Mich. 1870-71, and was Stategeol. of Mo. 1871-73. Author of articles in scientific journals, of *Geological Researches in Chi., Mongolia, and Japan, Across Amer. and Asia*, and of vols. of the *Geological Survey of Mich. and of Mo.*, each accompanied by an atlas.

**Pumpkin**, or **Pompon** [Lat. *pepo*; Fr. *pompon*], the fruit of *Cucurbita Pepo*, a coarse annual vine of the gourd family. It is much cultivated in the U. S. as food for cattle, and is often employed in making pies. Many varieties are known.

**Punch** [Hindoo *pantsch*, "five," because once made of 5 substances—arrack, water, lemon-juice, sugar, and tea], a name applied at present to a great variety of mixed drinks having some alcoholic liquor as the basis.

**Punctuation** [Lat. *punctum*, "point"], the art of dividing literary composition by points or stops to show more clearly the sense and relation of the words (grammatical P.), and of noting the different pauses and inflections required in reading (rhetorical P.). The prin. points indicating the grammatical construction are—the period (.), the colon (:), the semicolon (;), the comma (,), the dash (—), the curves, or marks of parenthesis ( ), the erote, or note of interrogation (?), and the ephoneme, or note of exclamation (!). These are used in the European langs. with the same meaning generally. There are other marks usually treated under P., but serving merely to point out some particular fact; as, the apostrophe ('), to indicate the elision of a letter or letters and for the sign of the possessive case; the hyphen (—), placed between compound words and at the end of a line when a word is divided; the quotation marks (" "), which inclose quotations from other books or a speaker's words; the brackets [ ], which inclose a remark made by an author within the remarks of another; and the reference-marks—star or asterisk (\*), dagger (†), double dagger (‡), section (§), parallel (||), paragraph (¶), which refer to foot-notes in connection with the reading; and also the index (☞), used to point out a remarkable statement.

**Punic Wars**, the 3 great wars between the Carthaginians (*Punici*) and the Romans. The First P. W. lasted 23 yrs. (264-241 B. C.). It was a contest for the possession of Sic., which was finally won by the Romans. The Second war lasted 16 yrs. (218-202 B. C.), and was closed by the Rom. victory at Zama. The Third war lasted 3 yrs. (149-146 B. C.). Carthage made a persistent defence, but was at last utterly destroyed.

**Punishment** [Lat. *pæna*, "penalty"]. In its most gen. sense, P. is the suffering or deprivation of rights which the state inflicts upon the violator of the penal law. The various P. now recognized by the penal codes of Christendom may be reduced to the following classes: death, per-

petual imprisonment with or without labor, imprisonment for determinate periods, enforced labor in mines, galleys, and the like, banishment to penal settlements, pecuniary fines, and in special cases the infliction of the lash.

**Punjab** (the land of the "five rivers;" by the Grs. called *Pendapotamia*), a terr. of N. W. Hindostan, bounded N. by Cashmere, E. and S. by the Sutlej, and W. by the Sulman mts., and belonging to Brit. India. Area, 106,632 sq. m. Pop. 18,850,437. The N. part of the country is mountainous, covered with spurs of the Himalayas from 17,000 to 20,000 ft. high, and inclosing deep valleys. The S. and W. part is a great plain around the Indus and its 5 powerful affluents, the Jhyllum, Chenuab, Ravee, Beas, and Sutlej, hot, dry, and treeless, consisting of a hard clay or loam which in many places becomes sandy and arid. Sugar, rice, cotton, wheat, and indigo are raised in large crops and of superior quality. The manufacturing industry of the country is highly developed in the large cities of Amritsir, Lahore, Multan, etc.

**Puppets**. See MARIONETTES.

**Purbeck Beds** (from the Isle of Purbeck, Dorset, Eng.), in Brit. geol., a group of 3 beds, upper, middle, and lower P., together constituting the uppermost member of the Oolite. The upper bed affords the P. marble, and the whole group is singularly rich in organic remains.

**Purcell** (JOHN BAPTIST), D. D., b. at Mallow, Ire., Feb. 26, 1800, was ed. at Emmitsburg, Md., and the Sulpician seminary, Paris; entered the R. Cath. priesthood at Paris 1826; became a prof. in Mt. St. Mary's Coll., Emmitsburg, Md., and was its pres. 1829-33; was consecrated bp. of Cin. 1833, and in 1850 made abp. of the same see, the first of the title. Wrote *Lectures and Pastoral Letters*, etc. D. July 4, 1883.

**Purchase** (law). In its popular sense, this term describes the mode of acquiring property either in lands or chattels by a sale for money or other valuable consideration. In its technical and legal signification, it denotes the acquisition of property in lands alone by any mode known to the law except that of descent.

**Purgatives**, in med., substances that produce more or less fluid discharges from the bowels. Many drugs are purgative in sufficient dose, but those available in med. as cathartics, and in common use at the present time, are castor oil, rhubarb, aloes, and calomel, forming a group of comparatively mild agents, causing only fluid feculent stools; certain salts, producing watery discharges, of which the most prominent are magnesium citrate and sulphate, sodium phosphate, acid potassium, tartrate and potassium and sodium tartrate; and, finally, a group of vegetable nature, producing watery stools, but also being more or less irritant to the intestines. These are senna, jalap, podophyllum, scammony, colocynth, gamboge, croton oil, and elaterium. Setting aside senna, the others last mentioned are commonly spoken of as the *drastic* cathartics, from their highly irritant properties. Beside the foregoing, there are many substances which have a very mild effect upon the bowels, and are called *laxatives*. P. are used for the primary object of emptying the bowels, and also to relieve congestion of distant organs and to induce the absorption of dropsical collections of fluid.

**Purgatory**. The papal notion of P. was first clearly taught by Gregory the Great in the 6th century. According to this the believer, between death and resurrection, goes through a painful process that cleanses him from remaining sin. The Protestants reject this, and affirm that at death the soul of a believer is made perfect in holiness.

**Purification of the Virgin, Feast of**, called also **Candlemas Day**, and the **Presentation of the Child Jesus**, is the celebration of the visit of the Virgin and her Child to the temple at Jerusalem, in accordance with the Levitical law for the ceremonial purification of puerperal women. It occurs on Feb. 2.

**Purim** [Heb.-Per. *pûr*, plural *pûrim*, a "lot," because Haman cast lots for the destruction of the Jews], a Jewish feast, lasting 2 days, which falls on the 14th and 15th of the month Adar (Feb. and Mar.), in commemoration of the deliverance described in the book of Esther.

**Puritans**, a name applied in derision to certain Eng. reformers in the reign of Elizabeth. They desired *pur*er forms of worship and a *pur*er life according to the *pure* word of God. The genuine P. were mostly of the commoners of Eng., men of strong minds, good judgment, and sterling character. They adopted the Calvinistic creed, and rigidly conformed their lives to its principles. This gave an aspect of precision to their manners and stern severity to their lives, but it made them strong in their integrity and persistent in the struggle for liberty and right. Much as they have been ridiculed and maligned, Eng. owes to the P. some of the best features of her free const.; and never before had her power in Europe been felt as it was under the Commonwealth, when, through Cromwell, they controlled the govt. During the struggle with the Stuarts many of them emigrated to N. Eng., and there embodied their principles in a framework of govt., on which, as a stable foundation, the republic of the U. S. has been built up. A. L. CHAPIN.

**Purneah**, town of Brit. India, presidency of Bengal, on both sides of the river Kosi, occupies an area of 9 sq. m., mostly single houses surrounded with gardens, orchards, and indigo plantations. Pop. 50,000.

**Purple of Cassius**, a substance precipitated, generally of a brown color, but sometimes purple, by adding solutions of stannous chloride to those of gold salts. Its composition is yet uncertain.

**Purple, Tyrian**. See TYRIAN PURPLE.

**Purpurine**, pur-pu-rin (*madder-purple* of Runge; *matère colorante rose* of Gaultier de Claubry and Persoz; *oxilizaric acid* of Debus; *oxalylazine*, *trioxo-anthraquinone*), discovered by Robiquet and Colin in 1828. It exists in madder in the form of a glucoside, which is included in the *rubian* of Schunck, which is an amorphous mixture of several glucosides.



**Properties.**—P. appears as a red powder in red feathery crystals (by sublimation), in orange-red needles (from boiling alcohol). It is slightly soluble in boiling water, giving a rose-colored solution. It dissolves in alcohol, ether, benzol, glycerine, concentrated sulphuric acid, and acetic acid. Its solution in sulphuric acid may be heated to 400° F. without decomposition, the P. being thrown down unchanged on pouring the solution into water. It dissolves in a boiling alum solution to a pink fluorescent liquid, and does not separate on cooling, even from concentrated solutions. It dissolves in alkaline hydrates and carbonates, forming cherry-red or poppy-red solutions, from which acids reprecipitate it in orange-yellow flocks. The solutions in alkaline hydrates lose color on standing in the air, the P. being oxidized and destroyed. P. dissolves in ammonia, but on standing or on the application of heat, *purpuramide* or *purpureine* is formed, which is precipitated by acids in deep-violet flocks. Boiling nitric acid converts P. into phthalic and oxalic acids. Heated with zinc-dust, it yields anthracene. With bases it forms compounds; those with the alkalis are soluble in water. Sod. purpurate may be obtained in crystals by adding an alcoholic solution of caustic soda to one of P., and then adding some ether. The basic, calcic, and aluminic lakes are soluble in boiling solutions of carbonate of soda.

**Application to Dyeing and Calico Printing.**—P. produces with alumina mordants bright reds; with iron, grayish violet. These tints resist cleaning with soap and nitro-muriate of tin tolerably well, but are not so permanent as those produced by alizarine, nor do they resist light as well. There is a difference of opinion as to the part played by P. when madder, garancine, etc. are used in dyeing calico. Some think the P. of little importance; others consider it essential to certain pinks and reds. C. F. CHANDLER.

**Purree**, a yellow coloring-matter brought from India and Chi. in lumps weighing 3 or 4 ounces, brown on the outside and deep orange-yellow within. It is used for the preparation of Indian yellow, a fine, rich, durable yellow color, much used by artists, and often adulterated with chrome yellow. It consists mainly of exsanthate of magnesium.

**Purslane** [a corruption of the word *porcelain*, from its appearance], a common garden-weed, *Portulaca oleracea*, found wild in various parts of the world, of anc. use as a potherb. To the same genus belong the showy flowering *Portulaca grandiflora* and *P. Gussii* of the gardens, natives of S. Amer.

**Pusey** (EDWARD BOUVIERE), D. D., D. C. L., b. in 1800, nephew of first earl of Radnor, was ed. at Eton and Christ Ch., Ox.; grad. with high honors 1822; became fellow of Oriel Coll. 1823; studied in Ger., and in 1828 became regius prof. of Heb. at Ox. and one of the canons of Christ Ch. cathedral. His contributions to the *Tracts for the Times* gave to the Tractarian movement the name of Puseyism. He was (1843-46) suspended from preaching in the univ. for 3 yrs. in consequence of the supposed utterance of heretical doctrine in a sermon on the real presence. Wrote *On the Benefits of Cathedral Insts.*, *On the Royal Supremacy*, *On the Real Presence*, etc. D. Sept. 16, 1882.

**Pushkin** (ALEXANDER SERGEVITCH), b. at Pskov, Rus., June 6, 1799; studied at Tzarskoje Solo; entered in 1817 as clerk in the gov't. office of foreign affairs, but was discharged in 1820 for an *Ode to Liberty*, and banished to his estates; was recalled in 1825 by the emp. Nicholas, and killed in a duel at St. Petersburg Feb. 10, 1837. By his countrymen he is considered the greatest poet Rus. ever produced. He wrote romantic epics—*Ruslan and Lyudmila*, *Plennik Kavkaskoi*, etc.; one drama—*Boris Godunow*, and several novels.

**Pustule, Malignant.** See MALIGNANT PUSTULE.

**Puteoli.** See POZZUOLI.

**Putnam**, R. R. Juuc., Windham co., Conn., about midway between Norwich and Worcester. Pop. tp. 1870, 4192; 1880, 5827.

**Putnam** (FREDERICK WARD), b. at Salem, Mass., Apr. 16, 1839, ed. at home until 1856, when he entered the Lawrence Scientific School under Agassiz, with whom he remained until 1864, when he returned to Salem; took an active part in the Essex Inst. as supt. of its museum; originated and conducted the *Naturalists' Directory*. On the foundation of the Peabody Acad. of Science in 1867 he was elected director of the museum; with others, commenced the publication of the *Amer. Naturalist* 1867; succeeded Prof. Wyman as curator of the Peabody Museum of Archaeology and Ethnology at Cambridge 1875; permanent sec. of the Amer. Association for the Advancement of Science 1875; was appointed Dec. 1875 civilian assistant on the U. S. surveys W. of the 100th meridian, being intrusted with the special duty of reporting on the archeological and ethnological material that had been collected; in 1876 took charge of the Agassiz collection of fishes at the Museum of Comparative Zoology.

**Putnam** (ISRAEL), b. at Salem, Mass., Jan. 7, 1718. In 1739 he removed to Pomfret, Conn., where he became a farmer and wool-grower. After having suffered severe losses from the depredations of a she-wolf and her whelps, the neighbors turned out to destroy her, and drove her into her den, a rocky cavern. After exhausting all means to force her out, P. at midnight descended the cavern on his hands and knees, bearing a torch in one hand and a musket in the other, and shot the beast at the moment she was about to spring upon him. In the Fr. war he commanded a company of Conn. troops at Crown Point and Ticonderoga. In Aug. 1756 he was captured and bound to a tree, where during the continuance of the action he was frequently exposed to the fire of both friend and foe, but escaped unhurt. He was borne away by the enemy in their retreat, and at night the fire had been lighted to burn him alive when he was saved by the intervention of a Fr. officer. Taken to Ticonderoga, and subsequently to Montreal, he was exchanged in 1759, and promoted to be lieut.-col. The

news of the battle of Lexington reached him while ploughing. Turning his cattle loose, he left his plough and rode rapidly to Cambridge. After his return to Conn. he was made a brig.-gen. by the legislature, of which he was a member, and a week later was on his way back to Cambridge at the head of a regiment which he had raised. At the battle of Bunker Hill he displayed his usual bravery. Upon the arrival of Washington to assume command (July 2, 1775) he bestowed upon P. one of the 4 major-gens.' commissions he bore from Cong., but the other 3 were not then delivered. Upon the evacuation of Boston, P. was ordered to take command at New York, and after the battle of L. I. and evacuation of New York was sent to Phila. to complete the fortification of that city; subsequently stationed at Crosswick and Princeton, N. J., he was in May 1777 assigned to command the army in the Highlands of N. Y. Owing to the dissatisfaction created by the surprise and loss of Fts. Montgomery and Clinton in the summer of 1777, P. was removed from his command, although a subsequent court of inquiry acquitted him from blame, and he was restored to command. While in the Highlands he selected W. Pt. as the site for a fortification; the ruins of the old fort bearing his name yet exist. In the winter of 1778, P., while in command in Conn., at Horseneck one of his outposts, guarded by 150 men and 2 cannon, was attacked by Gen. Tryon with a force numbering 1500. After exchanging a few shots P. directed his men to a swamp, but being himself closely pursued, he turned his horse toward a steep hill, down which he dashed, escaping with a bullet through his hat. D. May 19, 1790. [From orig. art. in *J.'s Univ. Cyc.*, by G. C. SIMMONS.]

**Putnam** (MARY LOWELL), sister of James Russell Lowell, b. at Boston Dec. 3, 1810, was early distinguished by her attainments in langs., anc. and modern, including the Oriental, Slavonic, and Scandinavian groups; was married in 1832 to Samuel R. Putnam, a merchant of Boston (d. 1861); resided in Europe 1851-57; has written a *Hist. of the Const. of Hungary and its Relations with Aus.*, *Records of an Obscure Man*, *The Tragedy of Errors*, *The Tragedy of Success*, and a *Memoir* of her son, William Lowell Putnam (killed at the battle of Ball's Bluff 1861); contributed largely to *N. Amer. Review* and the *Chr. Examiner*.

**Putnam** (RUFUS), b. in Sutton, Mass., Apr. 9, 1738; a millwright by trade, he abandoned his occupation to serve as a private in the Fr. war of 1757-60; resuming his business, he acquired a good knowledge of math. and surveying; in 1773 visited Fla., and was appointed deputy surveyor of that prov. In the war of the Revolution was appointed chief engineer with rank of col., and charged with the defence of New York by fortifications; constructed the fortifications at W. Pt., and commanded a regiment in Wayne's brigade until the close of the war; in 1783 was appointed a brig.-gen.; was frequently a member of the Mass. legislature; formed the Ohio Co., which purchased large tracts of land in that State and founded Marietta, the first permanent settlement in the N. W.; was judge of the supreme court of the N. W. Terr. 1792; brig.-gen. 1792, he accompanied Wayne's army to Detroit against the Indians, and subsequently as U. S. com. negotiated a treaty with numerous tribes. From 1793 to 1803 was U. S. surveyor-gen. D. May 4, 1824.

**Putrefaction.** See FERMENTATION.

**Putrid Sore Throat.** See DIPHTHERIA.

**Putty**, a cement used by glaziers for fastening window-glass in place, and by painters for filling holes in wood over nail-heads, etc. It is composed of whiting and linseed oil, often colored with different pigments.

**Putty Powder**, oxide of tin, or a mixture of this oxide with oxide of lead, used for polishing glass, etc. It is prepared by calcining tin or a mixture of tin and lead. For the optician's use it is prepared by precipitating a solution of tin in aqua regia with ammonia, washing, drying, and igniting the product.

**Pyæmia**, pi-ë-me-a [Gr. πῦον, "pus," and αἷμα, "blood,"], a very fatal disease which occurs during the progress of suppuration in some part of the body, and believed to be due to the entrance of purulent matters into the blood. This disease is ushered in with a chill, followed by a febrile and then by a sweating stage. The chills are often repeated and at irregular periods, sometimes as many as 3 occurring in a day. Toward the termination of the case they are less frequent. Though the surface feels cold during the chill, the temperature of the body rises, and in the hot stage may reach 105° to 106° F. There are loss of appetite, thirst, want of sleep, emaciation, sallow skin, and prostration. Acute cases run a course of from 6 to 10 days, and chronic cases from 3 to 4 weeks. Death results from exhaustion, due to the poisoning of the blood; secondary inflammations, as pleurisy; and the formation of abscesses in internal organs, as the lungs, liver, and spleen, or in the joints and cellular tissue. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. STEPHEN SMITH.]

**Pyat**, pe-ah' (FELIX), b. at Vierzon, dept. of Cher, Fr., Oct. 4, 1810; studied law and was admitted to the bar, but devoted himself exclusively to lit.; became a contributor to the *Siècle*, and afterward ed. of the *National*; produced in 1832 the play *Une Révolution d'autrefois*; composed several other plays which were performed with success; left in 1846 the *National* for the radical *Réforme*; was elected a member of the Constituent Assembly in 1848; sided with the Socialists; fled in 1850 to Switz.; returned in 1859 to Paris; was arraigned and sentenced to imprisonment in 1870 for some articles in the *Rappel*, but escaped to Lond.; returned again to Paris after the fall of the Empire; edited the *Combat* and the *Vengeur*; was elected a member of the Commune in 1871.

**Pydna**, a Gr. colony on the Thermaic Gulf, became, after various vicissitudes, a Macedonian possession during the reign of Philip II. The battle of Pydna, June 22, 168 B. C., sealed the fate of the Macedonian kingdom.



**Pygmalion**, a king of Cyprus, fell, according to ancient legends, in love with an ivory statue of a maiden he himself had made, and prayed to Aphrodite to make the statue living, which prayer was granted.

**Pygmy** [Gr. *πυγμαῖος*, "one who measures a *πυγμαῖος*," the length from the elbow to the hand], one of a race of dwarfs mentioned by Gr. writers. Many writers speak of them as living on the upper Nile, and the existence of a race of very small men near the upper Nile has been fully confirmed by recent travellers.

**Pylius**, town of Messenia, on the promontory of Coryphasium, and one of the last towns taken by the Spartans in 2d Messenian war. The present name is *Navarino*.

**Pym**, *pim* (JOHN), b. at Brymore, Somersetshire, Eng., in 1584, of an ancient and wealthy family which possessed large estates at Woolavington Pym, near Bridgewater; studied law at one of the Inns of Court; was elected to the Parl. of 1614, in which he became one of the leaders of the "country party"; was one of the 12 coms. chosen in 1621 to confront James I. at New Market in behalf of the privileges of Parl.; was, with other leaders, at the expiration of the session of that yr., imprisoned for his opposition to govt. measures; was returned to the first Parl. of Charles I., in which he was actively engaged in the impeachment of the duke of Buckingham 1626; presented himself to the country, along with Hampden, in 1639 as the champion of the popular cause, and negotiated with the coms. of the Scotch Covenanters; was the recognized leader of the "Short Parl." of 1640 and of the "Long Parl." which assembled in 1641; managed the impeachment of Strafford and the trial of Laud; presented the "grand remonstrance," which set forth all the evils endured from the beginning of the reign of Charles I.; was the chief of the "five members" whose attempted seizure by the king precipitated the civil war (Jan. 1642); was the real head of the provisional executive established at Lond. after the king's flight; issued a manifesto in 1643 defending himself in moderate lang. from the king's accusation of treasonable dealings with the Scots; was appointed lieut. of the ordinance. D. Dec. 8, 1643.

**Pynchon** (JOHN), the only son of William (1590), b. in Eng. in 1627, and brought to N. Eng. at a very early age; succeeded his father in the govt. of Springfield and in the management of the affairs of the Conn. River Valley, the greater part of which he purchased from the natives; distinguished for his public spirit, and for his skill in the management of the Indians, by whom he was greatly beloved; was one of the gov.'s council for N. Eng. under Sir Edmund Andros, and a councillor under the new Mass. charter. D. at Springfield June 17, 1703.

**Pynchon** (THOMAS RUGGLES), D. D., b. at New Haven Jan. 19, 1823, grad. at Trinity Coll., Hartford, 1841; was tutor 1843-47; ordained deacon 1848, and priest 1849; rector of Stockbridge and Lenox, Mass., 1849-55; elected Scovill prof. of chem. in Trinity Coll., 1854; elected pres. of Trinity Coll., 1874, and resigned 1883; author of a treatise on the chem. forces and of sermons and pamphlets.

**Pynchon** (WILLIAM), one of the original patentees of the Mass. Bay Co., b. in Essex, Eng., about 1590; came to N. Eng. in 1630, and settled at Roxbury; in 1636 removed to Conn. River and founded Springfield; in 1650 pub. in Eng. a book entitled *The Meritorious Price of Man's Redemption*; returned to Eng. in Sept. 1652. D. Oct. 29, 1662.

**Pynol**, an oily base found in the products of the destructive distillation of all animal and vegetable substances, containing nitrogen. It occurs in tobacco-smoke. It is made from bone oil, and by distilling mucate of ammonia alone or with glycerine. P. red is formed by heating P. with hydrochloric or sulphuric acid. C. F. CHANDLER.

**Pyramidal** [Gr. *πυραμῖς*, *πυραμίδος*], a polyhedron having any polygon for a base, the remaining faces being triangles meeting at a common point called the *vertex*. The triangular faces taken together make up the *lateral surface* of the P. A spherical P. is a portion of a sphere bounded by any spherical polygon, the *base*, and by corresponding sectors of great circles. The vertex is at centre of sphere.

**Pyramids**. The P. of Egypt are collected into several groups at a considerable distance from each other; only 38 are entitled to the name, and of these many are in the most ruinous condition. Fifteen m. S. of Cairo are the P. of Dashoor. They are 5 in number—2 of stone and 3 of crude brick. The 2 former exceed all the other P. in Egypt in size, except the first and second at Jeezeh, of which the first was 484 ft. 10 in., and the second 454 ft. 3 in. high. The N. one is partly cased, and has an entrance in the N. face, leading by a descending passage to the sepulchral chambers, which stand upon a level with the foundation. The S. stone P. of Dashoor has a disagreeable peculiarity of form. The lower portion is at an angle of 54° 14', but about half way up the inclination suddenly changes to 42° 59'.

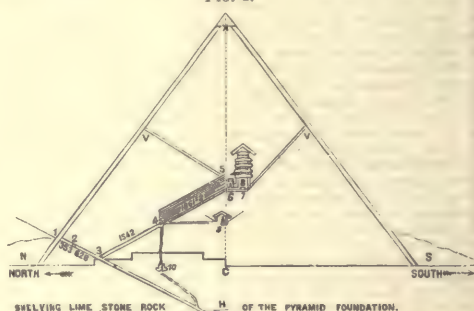
Two m. N. of Dashoor are the P. of Sacara, 9 in number. The largest and most remarkable is called, from its peculiar construction, the P. of Steps. It is not square at the base, like the Jeezeh P. Beneath it are several passages and a gallery. In the centre, but below the surface-level of the ground, is a narrow, lofty chamber, and near it a small one lined with blue tiles. In the latter an inscription was found containing the name and titles of an early king, Ranub-rokee. Two m. N. of the Sacara group are the P. of Abooseir, the largest about equal in size to the third of Jeezeh. The group consists of 3 large and 1 very small.

The P. of Jeezeh are about 12 m. from Cairo and 7 from the banks of the Nile, at the S. apex of the Delta-land of Egypt and the point of curvature of the N. coast. The group consists of 9, 3 of which, the so-called first, second, and third, are of great size; of the smaller ones, 3 are on the E. side of the first, or Great P., and 3 on the S. side of the third P. The smaller ones are all in a ruined condition. The smallest and most southerly is the third P., with 3 still smaller ones in a ruinous condition directly S. of it. When Col. Howard Vyse entered it in 1837 he found a very elabo-

ately carved sarcophagus (which was lost at sea near Carthage on its way to Eng.) and part of a mummy-case, bearing the name Ram-en-ka, which is now in the Brit. Museum. In its construction it is inferior to the second P., which is at a distance from it of about 700 ft. in a N. E. direction. On its E. side are the remains of a small temple; still farther eastward, and a little S., is the tomb of Cheops, near which, in a S. E. direction, is the Sphinx, and still farther in the same direction the magnificent tomb of Shafre, the builder of this P. The Great P. stands upon the extreme N. E. boundary of the hill, so near the margin of the cliff that the anc. builders have strengthened the hill in that direction by all the stone clippings, forming immense rubbish-heaps. Like all the other Jeezeh P., it is oriented, but much more exactly. The base covers some 13 acres, and the huge structure is reared with the distinctive peculiarity that each layer is of uniform height throughout. The angle of the slope of the P. is 51° 51' 7.7", differing only 6.4" from the theoretical angle of a P. whose height is to the perimeter of the base as the radius of a circle to its circumference.

The true entrance to the Great P. is by an inclined passage in the N. face, some 40 ft. from the base and 25 ft. E. of the centre. The angle of slope is 26° 27', and it is lined with polished limestone with exquisitely fine joints. The passage ends in a subterranean chamber cut out of the living rock, but never finished. It is shown at H in the accompanying diagram, the commencement of the descending passage being at (1). The ascending passage commences at (3).

FIG. 1.



Plan of the Great Pyramid.

about 83 ft. from the original face of the P., and ascends at an angle of 26° 18'. Below (3) the descending passage is now blocked. The length of the ascending passage is about 128 ft.; it is blocked above (3) by 2 granite stones, and is entered behind these stones. At (4) is the commencement of the grand gallery, which is 157 ft. in length, with a height of 28 ft. and breadth of 7 ft., nearly; a ramp, or stone bench, 2 ft. high, is on either side, and by means of holes in these one is enabled to climb up the steep and slippery floor to the entrance of the antechamber at (6). A horizontal passage, the entrance, originally covered by the floor of the grand gallery, and just at its commencement near (4), conducts to the so-called queen's chamber (9), a distance of some 126 ft. Just within the entrance of the grand gallery a small and tortuous passage, now closed, leads to a subterranean grotto (10) cut in the living rock, and thence descends until it meets the prin. entrance-passage. Entering into the antechamber (6), by a small passage-way from the top of the grand gallery with its 7 overlappings, we find ourselves in a remarkable little room with a floor mostly of granite, and 2 granite wainscots on either side. A low passage conducts to the king's chamber (8), with the so-called sarcophagus or coffer (7). This noble chamber is lined with polished granite—5 courses of equal height, 47 inches each, except the lower, which is reduced to 42 inches by a rise of the granite floor of 5 inches. The ceiling of the king's chamber is composed of 9 granite slabs carefully polished, and, like all the rest of the chamber, with exquisite joints. To remove the pressure of the superincumbent mass, 5 chambers of construction, so called, or rather hollows, are above it. A small passage leads from the upper portion of the grand gallery to the lower of these hollows, and forced passages have been made to the others; the roofs of all are carefully smoothed, but the floors are rough. Two ventilating shafts *v v* regulated the temperature of the king's chamber.

With regard to the date of erection, very little can be said. It has been placed by the Egyptologists at periods between 2000 and 6000 B. C. The astronomical theory gives for the date of erection 2170 yrs. B. C., so that, if this be correct, the P. was about 700 yrs. old at the date of the Exodus. The angle of slope of the second P. is 52° 30', somewhat near that of the Great P., of which it was probably, in external appearance, a copy. The Great P.—differing from all the others in having upper ventilated rooms, in its superior construction, in its peculiar angle of slope, in its remarkable situation and careful orientation—was built for higher purposes than sepulture, which was undoubtedly the object of the remaining P. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. H. L. SMITH, LL.D.]

**Pyrene**, or **Phenylene-Naphthalene**, a solid hydrocarbon occurring with chrysene in the last portions of the distillate obtained in distilling coal-tar to coke. The 2 bodies are separated by means of carbon disulphide, which dissolves the P. and leaves the chrysene. The carbon disulphide is distilled off, and the residue is repeatedly extracted with warm alcohol, and the cooled solution is mixed with an alcoholic solution of picric acid as long as a crystalline



precipitate of *P. picrate* is produced. The precipitate is washed with alcohol, decomposed by ammonia, washed with water, and recrystallized from alcohol till the melting-point is constant at 142° to 144° C. *P.* crystallizes from hot alcohol in laminae resembling those of anthracene. It is usually yellow, from impurities, but may be decolorized by exposing the solution in benzol to sunlight. It is very soluble in benzol, ether, and carbon disulphide. It melts at 142° C., and distils at a heat considerably above 360° C.

**Pyrenees**, *pir'en-éz*, a lofty mt.-chain which forms the boundary between Fr. and Sp., and stretches in one continuous range from the Mediterranean to the Bay of Biscay. Its entire length is 270 m., its greatest breadth 90 m. It is broadest and highest about midway—Pic Nethou, 11,168 ft.; Mt. Perdu, 10,950 ft.; Vignemale, 10,830 ft., and Pic du Midi, 9540 ft. In their E. course, toward the Mediterranean, the *P.* fall rapidly to an average height of 2000 ft., while the W. part of the chain retains an average height of 5000 ft. Northward, toward Fr., the *P.* slope gradually, sending out forest-clad offshoots which inclose beautiful valleys; southward, toward Sp., they present steep, abrupt, and barren but bold and picturesque slopes. There are 7 passes, the most important of which are those of Bidassao, Pamplona, and Perpiñan.

**Pyrenomyces**, an order of fungi, in which the asci are borne on the inner surface of cavities called perithecia, the walls of which are composed of a dense stroma, and not of a membrane consisting of a layer of polygonal cells, as in the Perisporiaceae. Beside the spores contained in the asci, most of the *P.* have several kinds of secondary fruit, known as conidia, stylospores, pycnidia, etc., which were supposed by the older mycologists to be distinct species of fungi. The *P.* inhabit stumps, branches, and leaves, and several of them grow upon insects. Ergot is the sclerotium state of *Claviceps purpurea*, found on rye and other grains. Most of the species are of slower growth, and are less affected by changes of temperature than other fungi.

**Pyrehelometer** [Gr. *πύρ*, "fire," *ἥλιος*, "sun," and *μέτρον*, "measure"], an instrument to measure the heat of the sun, consisting of a shallow circular silver vessel containing water or mercury, in which a thermometer is plunged. The upper surface of the vessel is covered with lamplack, and the thermometer enters the under side, extending below. In use, the rays of the sun are caused to fall perpendicularly upon the surface of the vessel.

**Pyridine**, an oily base found in bone oil, shale oil, peat, coal-naphtha, and the products of the destructive distillation of cinchonine. It occurs in tobacco-smoke. It is produced by the action of nascent hydrogen on azodinaphthylamine, and by the dehydration of amyl nitrite.

**Pyrites**, *pe-rit'ez* [Gr. *πύρις*, "firestone," because it strikes fire with steel], in its widest sense a native mineral, massive or crystalline, composed of a metallic sulphide or arsenide, or both. Iron, copper, nickel, and cobalt *P.* are the ones generally mentioned. Iron *P.*, from its bright yellow color, is sometimes mistaken for gold. It is a more or less pure iron-bisulphide. It is of great value for the manufacture of sulphuric acid and the sulphates and other commercial sulphur compounds. It also yields not unfrequently a handsome amount of silver, copper, or gold. Copper *P.* is an impure double sulphide of iron and copper. It is extensively employed, not only as a source of sulphuric acid, but of metallic copper.

**Pyrogallol**, called also **Pyrogallic Acid** [Ger. *Brenzgallesäure*], discovered by Scheele by subliming gallic acid of gall-nuts, but held by him to be identical with the latter. It forms a beautiful mass of snow-white crystals, extremely light and feathery. Having been held of late yrs. to be a body belonging to the phenols, the name has been changed to *pyrogallol*.

**Pyrola**, in bot., a genus of the Pyroleæ, a sub-order of the Ericaceæ or heathwort family, characterized by a calyx free from the ovary; the corolla polypetalous; anthers extrorse in the bud; seeds with a loose and translucent cellular coat much larger than the nucleus; is nearly herbaceous and evergreen, with broad leaves. The sub-order contains 3 genera—*Pyrola*, *Moneses*, and *Chimaphila*.

**Pyroletic Acid**. See SEBACIC ACID.

**Pyrolygneous Acid**, a name often applied to impure acetic acid, produced by the distillation of wood. It contains empyreumatic tarry matter, which gives it a dark color and peculiar smell. It may be completely freed from these impurities.

C. F. CHANDLER.

**Pyrometer** [Gr. *πύρ*, "fire," and *μέτρον*, "measure"], an instrument for measuring temperatures above the range of the mercury thermometer, or, as its name indicates, a measure of the temperature of fire. All the earlier instruments for this purpose depended on the change by heat of dimensions of various refractory solids. Instruments of this description have given place to the more exact instruments of Regnault, Deville and Troost, and Siemens.

Wedgwood's *P.* depended on the contraction of a cylinder of clay under heat, the dimensions of which were measured in a wedge-shaped groove in a plate of porcelain graduated on the edges by an arbitrary scale. But it was soon found that a long-continued low red heat produced the same contraction in the dimensions of a clay cylinder as a much higher temperature for a shorter time, and there was no certainty of finding any two samples of clay having the same coefficient of expansion.

Daniell's *P.* depends on the accurate measurement of the difference in linear expansion between a rod of platinum and a solid bar of black-lead earthenware highly baked. This instrument was well considered, and furnished the first reasonably exact means of measuring high temperatures, and it is yet in vogue for a large number of observations. By it the melting-points of many metals and alloys were for the first time determined, but it is not adapted to meet numerous cases, as, for example, the interior of furnaces and other heated spaces.

Whitwell's *Zinc P.* is an application of this mode of observation, with the addition of limits of time. He states that a rod of zinc  $\frac{5}{16}$  inch in diameter melts in  $2\frac{1}{2}$  seconds at 1400° to 1450° F.; in 6 seconds at 1100°; in 7 seconds at 1000°.

**Deville and Troost's Iodine P.**—In place of an air thermometer of glass, which is limited to comparatively low temperatures, there is a globe of difficultly fusible porcelain, having a long neck, in which iodine by its volatilization replaces air. The globe, charged with a sufficient quantity of iodine to expel all or nearly all the air, is placed in the furnace or other medium to be measured, and when it has attained the same temperature its mouth is sealed hermetically by the oxyhydrogen jet. It is, after cooling, cleaned and weighed, and its neck is then broken under water or mercury. The flask is then weighed again with the water or mercury which had entered. If a portion of air remains unexpelled, this will displace just its own volume at that temperature, and will require more water or mercury to be added, and a second weighing to determine this value. The empty flask is then dried and weighed. From the several weights obtained are calculated the capacity of the globe, the volume of air not expelled by the iodine vapor, and the excess of the weight of the flask and iodine vapor over the empty globe.

**Regnault's Hydrogen P.** depends on the conversion of pure hydrogen into water, and from the weight of the water thus obtained calculating the space it filled at the temperature to be determined.

**Regnault's Mercurial P.** is a vessel, shaped like a bottle of cast iron, in which is placed a sufficient quantity of mercury to expel all the air from the iron vessel. The temperature of the space is determined by weighing the residual mercury found in the vase after it is cooled. This method is more simple than that by iodine, but both fail to meet the case of the highest temperature of furnaces in which iron melts, and even the most refractory porcelain softens. Hence the necessity for a method which shall meet the conditions of very high temperatures.

**Siemens's Resistance Thermometer** depends on the circumstance that the electrical resistance of a metallic conductor conveying an electric current increases with an increase of temperature. In measuring furnace temperatures the platinum wire constituting the *P.* is wound upon a small cylinder of porcelain contained in a closed tube of iron or platinum, which is exposed to the heat to be measured. In this way heats exceeding the welding-point of iron and approaching the melting-point of platinum can be measured by the same instrument, by which slight variations at ordinary temperatures are told. A thermometric scale is thus obtained, embracing without a break the entire range of temperature from the lowest to the highest. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. B. SILLIMAN, M. D.]

**Pyrope** [Gr. *πύρ*, "fire," and *ὄψις*, "appearance"], the precious garnet, a fine dark-red garnet, much used in jewelry, and incorrectly called hyacinth, ruby, and carbuncle. It comes from Ceylon, Ger., Scot., etc.

**Pyrophori** [Gr. *πύρ*, "fire," and *φέρειν*, to "bear"], a term applied generally to some substances which kindle spontaneously and enter into combustion when exposed to the air, the term being confined, however, to solid substances, and not applied to spontaneously inflammable liquids. Carbon, phosphorus, and many easily oxidable metals may be made pyrophoric by preparation in a state of extreme division.

**Pyrosis** [from *πύρωσις*, a "burning"], This name is applied to an affection of the stomach characterized by the regurgitation of a considerable quantity of liquid when the stomach is empty of food. The liquid expelled may be insipid to the taste or salish, and it is sometimes acid. It is not vomited, but regurgitated, and the regurgitation is not accompanied by the sense of nausea which usually attends acts of vomiting. The popular name for the affection is water-brash. The regurgitation takes place especially in the morning before food has been taken. A sensation of burning is generally felt in the region of the stomach, and frequently in the throat during and after the passage of the liquid. This burning sensation is implied in the name *pyrosis*. The regurgitations in *P.* are to be distinguished from those which are incident to indigestion. The latter consist of food or drink which has been taken into the stomach, and which excites irritation in consequence of the chemical changes arising from defective digestion; whereas the liquid regurgitated in *P.* is the morbid product of secretion from the glands of the stomach. *P.* is generally controlled very speedily by the carbonate or subnitrate of bismuth in doses of from 20 to 30 grains given twice or thrice daily. The treatment, in other respects, embraces the use of tonic remedies, nutritious alimentation, and hygienic influences. (See INDIGESTION.) [From orig. art. in *J.'s Univ. Cyc.*, by PROF. AUGUSTUS ELIOT, M. D.]

**Pyrosoma** [Gr. *πύρ*, "fire," and *σῶμα*, "body"], a genus of tunicates of the family Pyrosomidae, remarkable for the intense light they emit by night. Each *P.* is a compound mass of innumerable molluscs. In the Mediterranean they often clog the fishermen's nets by their great numbers, and sometimes so illuminate the sea as to render fishes visible.

**Pyrotechny**, *pi-ro-tek'ne*, the art of making fireworks of different colors for the purpose of amusement or for signals at night. The powder for fireworks is compounded upon the same principle as gunpowder. The prin. ingredients are potassic chlorate, nitre or some nitrate, and sulphur, with which gunpowder is sometimes mixed. To obtain various colors the following are generally used: *Violet*, potassium salts, chlorate and carbonate mixed; *blue*, potassa salts, with ammonio-copper sulphate and antimony sulphide or copper carbonate and alum; *greenish blue*, zinc filings, copper sulphate, with sal ammoniac; *green*, barium carbonate or nitrate, verdigris, with copper sulphate and sal ammoniac or boric acid; *yellow*, sodium salts, resin.



or amber; *orange*, lime salts, usually the carbonate; *red*, strontia nitrate or carbonate, or a mixture of lampblack and gunpowder; *rose-red* or *pink*, potassic chlorate and chalk, or other mixtures of potassium and calcium salts, or lampblack, gunpowder, sulphur, and nitre, or lycopodium. For *white fire*, nitre and sulphur. Iron-filings are frequently introduced into the mixtures to cause brilliant scintillations. Bengal lights are made with nitre, 7 parts; sulphur, 2; antimony sulphide, 1. Rocket and Roman candle stars are compressed portions of the powder. Camphor, gum benzoin, and storax are frequently used to mask the unpleasant odors arising from the firing of the mixtures.

**Pyroxylic Spirit.** See METHYL ALCOHOL.

**Pyroxylene** [Gr. *πύρ*, "fire," and *ξύλον*, "wood"], the technical name for gun-cotton. It is manufactured by steeping dry and clean cotton in a mixture of 3 parts nitric acid to 5 of sulphuric acid. The cotton is withdrawn after 20 minutes, and washed with water containing a little ammonia, then dried with great caution at a temperature not exceeding 200° F. It is extremely combustible, inflaming at a temperature of 277° F., and has an explosive force nearly 4 times greater than gunpowder. A solution of P. in a mixture of alcohol and ether forms collodion, a substance largely used in photography.

**Pyrrha.** See DEUCALION.

**Pyrrho**, a native of Elis, was first a painter, but afterward studied philosophy, and followed his teacher, Anaxarchus, in the expeditions of Alexander the Great, which brought him into connection with the Magians and the Indian gymnosophists. On his return he was elected high priest by the Eleians, and gathered a great number of disciples around him, but his teaching was oral only, and his system was one of the earliest forms of scepticism.

**Pyrrhus**, king of Epirus, b. about 318 b. c., d. 272, a cousin of Alexander the Great, and not unlike him, made a campaign against Rome and Carthage to aid the Gr. cities in S. It., and achieved many brilliant victories, but was finally defeated at Beneventum, 275, and forced to return.

**Pythagoras**, a Gr. philos., probably b. at Samos about 582 b. c.; travelled through Ionia, Phœnicia, and Egypt, where he was initiated into the mysteries by the priests. He repaired to Crotona in Lower It., 529 b. c., and there established a society with ethical, political, and philosophic tendencies. His school was allied with the aristocratic party, and consequently incurred the animosity of the democratic party. This occasioned (about 510 b. c.) the retirement of P. to Metapontum, where he d. soon after. P. is said to have anticipated the Copernican doctrine, making the sun the centre of the cosmos; also to have discovered the numerical ratio between musical tones of the gamut.

**Pythæas**, a native of Massilia, who in the time of Alexander the Great made 2 voyages of discovery along the W. and N. W. coasts of Europe, which he described in 2 works written in Gr. By many anc. authors his statements were considered as fables, or even lies, but in the light of modern science most of them have proved true. The most remarkable particulars of P.'s statements refer to a land which he calls *Thule*, situated at a distance of 6 days' sail to the N. of Britain. Here, he says, the day and the night were each 6 months long, and adds that there was neither earth, sea, nor air, but a sort of mixture of all these, like to the Mollusca, and that earth and sea were suspended in this mass, which was impenetrable to travellers; he affirms that he has seen this with his own eyes.

**Pythian Games.** See GRECIAN GAMES.

**Pythias.** See DAMON AND PYTHIAS.

**Python.** See BOA.

**Pyx** [Gr. *πύξ*, "a box of boxwood"], a sacred vessel, having usually the form of a covered cup with a foot, used in the R. Cath. Ch. to contain the sacred wafer when preserved after consecration.—Also the strong box used in the mint for the safe keeping of coins set apart from each successive coinage to be examined by a commission of experts for the purpose of testing their accuracy as to weight and fineness. The examination of these reserved coins is called the "trial of the pyx," and in Great Britain by the coinage act, passed in 1870, it is provided that this trial shall take place "at least once in every yr. in which coins have been issued from the mint." In the U. S. it is provided that a trial of the pyx shall be made at the mint in Phila. on the second Wednesday in Feb. annually. This takes place before the judge of the dist. court of the U. S. for the E. dist. of Pa., the comptroller of the currency, the assayer of the New York assay-office, and such other persons as the Pres. shall from time to time designate for the purpose. A majority of the coms. constitute a competent board. Their examination is to be made in the presence of the director of the mint.

## Q.

**Q**, a mute in most langs., is followed by *u*, which is often silent, as in Sp. and Fr. *Q* is the abbreviation for *Question*, *Queen*, and *Quintus*, the proper name, and *q* for *quart*.

**Qua-Bird**, or **Quawk**. See NIGHT-HERON.

**Quack'enbos** (GEORGE PAYNE), LL.D., b. in New York Sept. 4, 1826, grad. at Columbia Coll. 1843; taught school in N. C.; studied law in New York; established there a private school 1847; edited the *Literary Amer.* 1848-50; contributed to literary periodicals; edited Spier and Surenne's *Fr. Dict.*; wrote numerous school-books and a *Hist. of the U. S.* D. July 24, 1881.

**Quadi**, an anc. people of what is now Austro-Hungary. They were associated with the Marcomanni, and were long among the most formidable enemies of Rome in this quarter. We read, in later times, of *Q*, in Sp., where they were associated with the Suevi.

**Quadragesima** [Lat. "fortieth"], a fast called Lent, preceding Easter. Originally it was a fast of 40 hours only.

In the beginning of the 7th century it had been extended to 36 days, and was afterward extended to 40, but whether by Gregory I. (d. 604) or Gregory II. (d. 731) writers are not agreed. It is also the name of the first Sunday in Lent.

**Quadrant** [Lat. *quadrans*, the "fourth part"], in its common signification, a quarter of the circumference of a circle, or 90°. In navigation and astron. an instrument for measuring angles, having a limb divided to 90°. The nautical *Q*., commonly called Hadley's *Q*., is an instrument in which, by an ingenious use of the principle of reflection, angular measurements of great accuracy are made practicable, notwithstanding that the observer and the instrument are both in motion. The limb is an octant rather than a quadrant, but each half degree of the division corresponds to an entire degree in the measurement, and the numbering on the limb accords with the real measurement. The sextant, which measures angles to 120° on a limb which is actually  $\frac{1}{6}$  part of a circumference (60°), has to a large extent taken the place of the *Q*. for nautical purposes. (For the construction of these instruments see *SEXTANT*.)

**Quadra'tus**, a bp. of Athens, author of an *Apology* presented to the emp. Hadrian about 130 A. D. It is now no longer extant, though a MS. copy of it was in existence in the 7th century.

**Quadrum'ana, Fossil.** Remains of Quadrumana or monkeys are rare in fossiliferous deposits. Nevertheless, their remains have been found in both hemispheres, and in regions far beyond the zones to which existing species are now confined. The first quadrumanous fossils known were discovered in 1836 in India, and the species were allied to living monkeys, one of them closely resembling the orang. Early in the following yr. M. Lartet announced to the Fr. Acad. the discovery of a fossil monkey in the S. of Fr. These remains are apparently allied to the gibbons. In Gr., near Athens, and at the base of Mt. Pentelicus, many bones of a fossil monkey have been found. The bone-caves of Brazil have yielded several species closely allied to existing S. Amer. forms. The most interesting forms yet known are from Wyo., where their remains occur in considerable abundance. The only known N. Amer. monkey of any later formation than that above mentioned is *Leopithecus robustus* from the Bad Lands of Neb.

**Quagga.** See ZEBRA.

**Quahaug.** See CLAM.

**Quail** (family Tetraonidae, sub-family Ortyginae). The European *Q*. is about 7 inches long, gen. color brown above, yellowish-white below. The males are polygamous; the nest is on the ground; eggs 7 to 12. This bird is migratory; its flesh is very highly esteemed. The N. Eng. *Q*., the partridge of the S., is strictly neither a *Q*. nor a partridge, but partakes of the nature of both. It is 9 inches long; upper part of the body reddish-brown, variously striped; bluish white below, striped and barred with reddish-brown; its nest is on the ground; eggs 12 to 18; food, grains, seeds, and berries; they live in coveys of a dozen or more. Its flesh is delicious.

**Quakers, or Friends**, called by themselves **The Religious Society of Friends**. See FRIENDS.

**Quak'ing-Grass**, a genus (*Briiza*) of ornamental grasses. *B. maxima* and *media*, from Europe, are cultivated in gardens, and the latter is partly naturalized here. In Europe it is considered a good pasture-grass for poor mt.-lands.

**Quanti'ty** [Lat. *quantitas*], in math., anything that can be measured—i. e., whose numerical value can be found in terms something of the same kind taken as a unit of measure.

**Quantity**, as a term in prosody, is the length of syllables as employed in Gr. and Lat. versification. It is not adapted as a basis for verse in a lang. like Eng., where it would be overpowered by the strong accents, yet a careful poet can make efficient use of it, while many bad lines are due to its neglect.

**Quarantine**, kwor-an-teen' [It. *quarantina*, "forty days"]. The word is designed to express the measures of isolation imposed upon persons or things susceptible, on account of their nature or from contact with contaminated persons or things, of transmitting an epidemic or contagious affection of exotic origin.

**History.**—For our purpose it is most desirable to study this under 3 divisions of time. The first, comprising all the Middle Ages, may be styled the period of *leprosy*; the second, commencing at the end of the 14th century to end with the early part of the present, the period of *Q*. against *plague*; the third, wholly modern, corresponding to the sanitary measures employed against *yellow fever* and *cholera*.

**First Period.**—Leprosy is one of the oldest of known diseases, and still exists as an endemic over vast regions of Asia and Afr. The isolation of lepers was an early law of societies; prescribed by Moses, it is still adhered to in the East. The most primitive method was to drive those affected with leprosy out from among the pop., and they settled either in the suburbs of a town or in huts by the travelled waysides. Gradually, establishments were built to receive them, usually at certain distances from the cities. Ultimately, the sequestration was sought to be more effectual by subjugating them wholly from the pop., and concentrating them on the island of Samos, in the Mediterranean Archipelago.

**Second Period.**—At the appearance of the plague in 1348-50 the régime of *Q*. against pestilential affections was fully inaugurated. In looking over the regulations which existed in many of the places on the shores of the Mediterranean, we see that they were those adopted with regard to leprosy, save that the definitive isolation of the one was changed to the temporary sequestration of the other. Soon it was noticed that vessels and passengers coming from the E., though not attacked themselves, brought with them the morbid germ. Venice was then the chief commercial city of the world; her port, more than any other, was subject



not only to the black plague, but especially the Egyptian. Induced by their frequent appearance, she proscribed the sale and destroyed the effects of those who had died. She created a health bureau, and finally a lazaretto, which subsequently formed the models for all other ports. For the first time med. men interested themselves in the question, "How far contagion was concerned in the transmission of the plague?" About the middle of the 16th century the celebrated work of Fracastorius appeared. It is the first work which speaks of contagion as now understood. Masaria showed the immunity enjoyed by persons who during an epidemic had remained shut up in their châteaux or in monasteries. He limited the ravages in isolating the sick outside the city. The success which followed this advice made his work an article of faith, and it was followed by the organization of similar establishments in all the Mediterranean ports. From the beginning of the 17th century Europe found herself relative to the plague in analogous conditions to those in which we are relative to cholera. The disease had reached its maximum of diffusion through the civilized world, and was especially terrible in all the large capitals. Sanitary police were established in nearly all, and the most vigorous measures were adopted for the sequestration of those stricken. The spirit of isolation was carried to such extremes that without doubt the scourge was intensified, by compelling the inhabs. to remain in the infected dists., and often by the inadequate supply of food to those so restricted. The 18th century was marked by the more decided use of lazarettoes. The effect was soon observed: the disease declined from the interior portions of Europe, and was chiefly confined to the maritime ports. The regulations assumed a more explicit and in some sense rational form, though the penalties were very severe and enforced with intense rigor. During the early part of the present century the doctrine of Q. was affirmed with renewed energy; and the privileges accorded were if possible more decided; gradually a more exact appreciation of facts induced a more eclectic tendency, preserving that which was useful, and rejecting that which was exaggerated. We notice, too, in European govts. the first steps taken to stifle pestilential maladies in their place of origin. The development of this idea resulted in the call of an international cong. to consult upon the principles to be laid down in order to prevent their widespread diffusion. An additional interest arises in the study of this subject from the modification of the list of diseases to which restrictive measures should be applied. Up to the commencement of this century no other disease than the plague had occupied the attention of Q. From 1821, however, the interest in this disease gradually subsided, to be replaced in a far greater degree by the questions of yellow fever and cholera.

**Prophylactic Value.**—On looking closer at the school opposing all sequestration it will be found that its opinions are based on the surroundings and climate of their particular localities—where, from the nature of their position to neighboring countries, no restrictive measures could be applied; and, on the other hand, countries situate in lats. where the exotic pestilences, all of which find their endemic dwelling in the torrid zone, can, with the exception of cholera, find but a short season when temperature and hygrometric conditions favor their development. Such persons, studying alone from their own standpoint, attempt to apply gen. principles for all localities. Q. are not essential to the higher regions of the temperate zone, nor to the localities in the torrid where climate and temperature readily make cholera and yellow fever endemic.

**Value of Sequestration.**—Sequestration is only valuable in localities where a gen. supervision of the means by which disease may be brought is easily made, and which are separated by a natural zone from suspected dists. Such are localities on islands or in cities where the entrance of the disease would be almost wholly by sea. On the other hand, where topographical conditions are less favorable this isolation from contagious diseases is almost impossible.

**The Quarantine of New York** was originally established to guard against the importation by shipping of yellow fever or any other infectious distemper in 1784. The diseases against which it now applies are "yellow fever, cholera, typhus or ship fever, and small-pox, and any new disease, not now known, of a contagious, infectious, or pestilential nature." All vessels arriving from a foreign port during the entire yr., and all vessels from any place in Amer. in that ordinary range from which they pass S. of Cape Henlopen, arriving between the first day of Apr. and the first day of Nov., and all vessels on board of which any person shall have been sick of quarantinable disease, are subject to the visitation, inspection, and decision of the health officer of the port. After inspection they are permitted to proceed without detention if free from contagious diseases to the public health. [From orig. art. in *J. S. Univ. Cyc.*, by S. OAKLEY VANDERPOEL, M. D.]

**Quarles** (FRANCIS), b. at Stewards, Essex, Eng., in 1592, was ed. at Christ's Coll., Cambridge; studied law at Lincoln's Inn; was sec. to Abp. Usher in Dublin; was driven from Ire. with the loss of his property by the rebellion of 1641; appointed chronologist to the city of Lond.; espoused the royal cause in the great rebellion, joining Charles I. at Ox., and suffered sequestration of his property. D. in Lond. Sept. 8, 1644. Wrote *Divine Emblems*, *The Enchiridion of Meditations*, and *The Loyal Convert*.

**Quarry** (Old Fr. *quarré*, "square"), an excavation made for procuring building-stone—sandstone, granite, marble, etc. Q. are more generally open to the day, but are sometimes completely subterranean. The ordinary processes of quarrying are so simple and so frequently seen that they do not demand detailed description. As the stone is usually required to be of symmetrical form. It is generally split out in large quadrangular blocks, a series of drill-holes or shallow pits being sunk along a line parallel with the face of the ledge, and in these wedges are placed which are driven

simultaneously. Wooden wedges are also sometimes used; these are subsequently wet, and by their expansion, which develops almost irresistible force, the rock is split. Blocks of granite of immense size are sometimes thus detached.

**Quartz.** See GEOLOGY, CHEMICAL, AND SILICA.

**Quassia**, *Kwosh'-e-a*, in med., the wood of certain trees of the natural order Simarubaceae. All the species are noted for the intense bitterness of their wood, and until about the end of the last century Q.-wood was obtained from *Q. amara*, a small tree or shrub native in Panama, Venezuela, Guiana, and N. Brazil. But the wood of *Simaruba excelsa* being found to have the same properties, and being a tree of much greater size, the Q. of commerce is now almost wholly obtained from this source. *S. excelsa* is a native of Jamaica and the Caribbean Islands, where it goes by the name of *bitter ash*. It has no smell, but a most intense bitter taste. The bitterness depends upon a neutral crystallizable principle called *quassine*. Commercial Q.-wood consists of pieces of the trunk and branches of the tree. For use by the druggist it is supplied in the form of raspings or turnings. Q., like other pure vegetable bitters, tends in small quantity to excite appetite and promote digestion. In large dose it nauseates. Cups turned out of the solid wood are sometimes employed to prepare a weak infusion by simply allowing cold water to stand for a few minutes in them. The water speedily becomes impregnated with the bitter principle, and may then be drunk.

**Quaternions** [Lat. *quaternio*, "a set of four"]. The calculus of Q. is an algebra of 4 units, invented by the late Sir William Rowan Hamilton, Andrews prof. of astron. in the Univ. of Dublin and royal astron. of Ire., for the purpose of expressing and investigating the relations of Space, directional as well as quantitative. The 4 units, in the common presentation of the subject, are the unit of number and 3 unit-lengths, denoted by *i, j, k*, taken in mutually perpendicular directions, are corresponding to the 3 dimensions of extension; but any 4 independent functions of these units may be substituted for them.

**Quatrefages de Bréan.** See APPENDIX.

**Quebec, Province of**, formerly **Lower Canada**, or **Canada East**, prov. of Dominion of Canada. Area, 193,355 sq. m. It lies almost entirely in the valley of the St. Lawrence, extends indefinitely northward toward Hudson's Bay, is bounded E. by Labrador and the Gulf of St. Lawrence, S. E. by N. B., Me., and N. H., S. for a short extent by N. Y. and Vt., and S. W. by the prov. of Ont., from which it is for the most part separated by the navigable river Ottawa.

**Geology and Physical Geography.**—The level country (the Champaign of Canada) on either side of the St. Lawrence is limited by a range of mts.—the Laurentides on the N. and the Notre Dame range on the S. The former are connected by transverse spurs with the Adirondack system; the latter are continuous with the Green and White mts. The great N. hill-region is composed of Laurentian rocks, and affords immense supplies of timber. On the S. E. of the Champaign of the valley of the St. Lawrence occurs the wooded hill-country called the Seignories; and still farther E. and S., the "Eastern Townships." The crystalline rocks of this region are softer than those of the Laurentides, and the country is a succession of fertile, prosperous valleys, with hills densely timbered and rocks bearing copper ores, iron, galena, small quantities of silver and gold, many varieties of marble and serpentine, and excellent granites, slates, and soapstones.

**Crown and other Lands.**—Three-fourths of the area of Q. consist of crown-lands, the timber of which is sold by agents, who have also the power to sell lands to settlers and others, the settlers having easy terms granted them for payment. There are also limited areas of free-grant lands which are given away to actual settlers.

**Climate.**—The climate of this prov. is severe in the long winter and warm in summer, except on lower St. Lawrence, where the summers are usually cool. Wheat, oats, barley, potatoes, buckwheat, dairy products, fruit, and wool are raised, and cattle and horses exported to the U. S.

**Territorial Divisions.**—Q. is divided into 64 cos., inclusive of Saguenay, Labrador (the S. coast), and the Magdalen Islands, and exclusive of the proposed cos. on the island of Anticosti.

**Ecclesiastical Affairs.**—The majority of the people of the prov. are R. Caths. The Anglican Ch. has a bp. at Montreal, and another at Quebec. The Presb. Ch. of Canada is a branch of the Kirk of Scot.

**Education** is under a minister of public instruction, assisted by a council of 21 members—14 R. Caths. and 7 Prots. Public schools are maintained by a moderate tax, and in small municipalities are assisted by a prov. contribution. There are 2 R. Cath. and one Prot. normal school supported by the prov. The other public schools are called primary, model, and special schools (agricultural, high, commercial, industrial, classical, reformatory, etc.). There are 15 classical schools and 2 Prot. univs. The Laval Univ. at Quebec is a R. Cath. inst.

**Industry and Commerce.**—The accessible Dominion returns upon these subjects do not fully discriminate between the statistics of the various provs. But the trade of Q. is enormous. The exports (chiefly to G. Brit., the U. S., and Brit. and Sp. W. I.) are manufactured forest products, fish and fish oils, horses, wool, furs, cattle, hides, shipping, grain, flour, and the ores of metals.

**History.**—In 1534 Jacques Cartier entered and named the Bay of Chaleurs and took possession of the Gaspé country for the Fr. king. In the following yr. he entered and named the gulf and river of St. Lawrence, and sailed as far up as where Montreal now stands. In 1541 the Fr. temporarily colonized the country, but the first permanent settlement was at Quebec in 1608. In 1627 the vicereignty was abolished, Canada was granted to the "Company of One Hundred Partners," and the feudal system established. In 1693



Quebec was taken by the Eng., but in 1632 was restored by treaty to the Fr. Montreal was settled in 1642. From 1640 to 1701 the Fr. colonists were engaged in bloody warfare with the Iroquois. The frequent wars between G. Brit. and Fr. during this period extended to the colonies. In 1759 Quebec was taken by Gen. Wolfe, and in 1760 Canada was surrendered to the Brit.—a surrender confirmed by the Treaty of Paris (1763). The people were kept under military rule, which caused the greatest discontent, but in 1774 the "Quebec act" established the civil law and granted religious freedom to the R. Caths. In 1791, owing to jealousies between the Eng. and Fr. speaking colonists, the prov. was divided into Upper and Lower Canada, and representative govts. were established. But the mutual jealousies caused by differences of race and religion still existed, and in 1837-39 numbers of the Catholic party joined with the republicans of Upper Canada in insurrection. The union was accomplished in 1841, and Lower Canada took the name of Canada East, but the local govt. was abolished, and in 1858 Queen Victoria named Ottawa as the permanent seat of govt. Great discontent prevailed in Canada East, and this discontent led to the division (in 1867) of the prov. of Q. from that of Ont., and the formation of the Dominion govt. Pop. 1,359,027. Cap. Quebec; pop. 62,446. [From orig. art. in *J.'s Univ. Cyc.*, by CHARLES W. GREENE, M. D.]

**Quebec**, city and important R. R. and commercial centre, cap. of the prov. of the same name, was founded July 3, 1608, by Samuel de Champlain. The city lies on the left bank of the river St. Lawrence, at its confluence with the St. Charles. Mean temperature of the yr., 39°. The city is very picturesquely situated between the 2 rivers, at the N. E. extremity of a narrow but elevated table-land, which for about 8 m. forms the left bank of the St. Lawrence from Cape Rouge. Cape Diamond, the E. end of this promontory, is 333 ft. above the level of the river, to which it presents a nearly precipitous face; it slopes more gradually toward the little river St. Charles. Opposite Cape Diamond the St. Charles is contracted, but at the confluence of the St. Charles it spreads out into a broad basin, forming a capacious and excellent harbor. Q. is divided into the upper and lower town. The upper, which occupies the highest part of the promontory, is surrounded by high and massive walls. The lower, the seat of wholesale commerce and shipping, is built around the base of Cape Diamond, on a narrow strip of land reclaimed from the St. Lawrence by the construction of wharves.

Q. for more than a century was the Gibraltar of Fr. power in Amer., until its capitulation by Chevalier de Ramsay to Brig-Gen. Townsend, on Sept. 18, 1759. The fortress has played a remarkable part in the military annals of N. Amer., both under its Fr. and Eng. masters. The citadel, which occupies about 40 acres on the loftiest plateau of Cape Diamond, and its outlying fortifications were originally designed by Vauban, and several military strategists added much to them subsequently. The modern citadel and its surrounding walls, etc. are chiefly due to the imperial govt. of Britain. Q. is one of the few walled cities on the continent, and is supposed to be the strongest fortress in N. Amer. It is famous for the number of sieges it underwent, and more especially for saving Canada to Brit. rule in 1775.

Q., as a seat of learning, by its univ., old foundations, religious as well as educational, deserves notice. The Laval Univ., founded in 1854, is a seat of learning and education of which the whole prov. feels proud. The Ursuline convent was founded in 1641, the Hôtel-Dieu in 1639, the General Hospital in 1690, the Jesuits' Coll. in 1635; the Morrin Coll. was opened Nov. 6, 1862; the Literary and Historical Society was founded in 1824; there are also a number of educational or religious insts. of a later date. A number of manufactures have sprung up of late yrs. in the suburbs of the city, but the chief industry from the beginning of the century has been ship-building. Pop. in 1881, 62,446. [From orig. art. in *J.'s Univ. Cyc.*, by J. M. LE MOINE.]

**Queen's Metal**, the trade name for a sort of britannia or pewter used for making teapots and the like.

**Queens'town**, Ire., formerly **Cove**, 9 m. S. W. of Cork and on N. side of Cork harbor, a seaport-town. About 60 yrs. ago Cove was a mere v.; its rapid increase has proceeded principally from its convenient situation for the shipping in Cork harbor. Pop. 10,039.

**Quercitron Bark**, or **Quercitron Tinctoria**, a valuable dyestuff obtained from the *Quercus nigra*, containing a yellow crystallizable principle called *quercitrin*, scarcely soluble in water, but readily solved by weak alkalies. It yields a very durable yellow, much used in calico-printing.

**Queretaro**, ká-ra'tah-ro, one of the smallest states of the Mex. confederation, between the states of Mexico, Vera Cruz, San Luis Potosí, and Guanajuato; area, 3,207 sq. m.; pop. 203,290. The surface is an elevated plateau, the soil fertile; maize and cotton, beside all kinds of European grain and fruit, are produced; gold, silver, copper, and lead are mined, and some cotton manufactures are carried on.

**Queretaro**, town of Mex., cap. of the state of the same name, is beautifully situated on a fertile plain surrounded by forest-clad hills, at an elevation of 6365 ft. It is well built, contains several richly decorated chs., and has a fine aqueduct. Its manufactures of woollen and cotton goods are very important. In its cotton-spinning mills 3000 hands are employed. Its wood-carvings are noted. Pop. 34,383.

**Quern** [A.-S. *cweorn*], the old-fashioned hand-mill for grinding grain in use in Asia at the present day, as well as in the Hebrides, in Ire., and in various remote places.

**Quesada**. See XIMENES DE QUESADA.

**Quesnay**, ká-ná' (FRANÇOIS), b. at Mérey, dept. of Seine-et-Oise, Fr., June 4, 1694; studied med. at Paris, and was appointed first phys. to Louis XV. D. at Versailles Dec. 16, 1774. He is chiefly known as the founder of the physiocratic school of political economy.

**Quesnel**, ká-nel' (PASQUIER), b. at Paris July 14, 1634;

studied theol. at the Sorbonne; entered in 1657 the congregation of the Oratory; became director of the Paris house of the order in 1662; commenced in 1671 the publication of *Réflexions morales sur le Nouveau Testament*; left the congregation in 1681; repaired to Brussels, where he joined Arnould. His *Réflexions* was at first considered harmless by the R. Cath. authorities, but soon it was discovered that it really contained all the doctrines of the Jansenists, and it was condemned by the pope 1708. He fled to Amsterdam. D. Dec. 2, 1719.

**Quetelet**, ket-la' (LAMBERT ADOLPHE JACQUES), b. at Ghent Feb. 22, 1796, was appointed prof. of math. in 1814 in his native city and in Brussels in 1819; superintended the erection of the observatory of that city in 1826, and was its director to his death, Feb. 17, 1874. His writings on phys. science have procured for him a world-wide reputation.

**Quetzalcoatl** [Aztec, "feathered serpent"], a mythical personage of great fame in the religious system of the ancient Mex. According to the legends, Q. appeared on the coast of the Gulf of Mex., near the mouth of Pánuco River, dressed in a long white robe, adorned with feathers, accompanied by many followers, and assumed the religious and political leadership of the Huastecos, whom he guided first to the valley of Tula, and afterward to that of Cholula, where they erected the famous pyramid still existing there, and then disappeared to the S. W. to Huehue-Tollan or "ancient Tula," promising to return at a future day. When Cortes appeared on the coast in the same quarter in 1519, it is alleged that he was regarded by Montezuma and the Aztecs generally as Q., and that this belief was the cause of their non-resistance to the strangers on their first advance to the Aztec cap.

**Quevedo y Villegas, de** (FRANCISCO GOMEZ), b. at Madrid, Sp., Sept. 26, 1580, ed. at the Univ. of Alcalá de Henares; went to Naples in consequence of a duel; rose there to high civil and diplomatic posts; was concerned in the conspiracy of the marquis of Bedmar at Venice (1618), after which he returned to Sp.; suffered two imprisonments for political causes; wrote several religious treatises and many satirical works in prose and verse, and edited the poems of Fray Luis de Leon (1631). D. Sept. 8, 1645. Q. is the most prominent name in the Sp. satirical lit. Wrote *Hist. of the Great Sharper*, *Paul of Segovia*, *The Letters of the Knight of the Forceps*, and the *Visions*.

**Quichua** (**Quichu**, **Quichhua**, or **Quitto**) **Indians**, one of the great Peruvian castes or races of the old civilization. They are very numerous, and are found in Bolivia, Peru, and Ecuador, to the cap. of which country, Quito, they give the name. Their lang. is very harsh.

**Quicksilver**. See MERCURY.

**Quietism**, a peculiar movement within the R. Cath. Ch., originating from the devotional work of the Sp. priest Molino, *Guída Spirituale* (1675), and found its most conspicuous spokesman in Fénelon. Q. consists in concentration of the soul in quiet prayer and contemplation. It is a sentiment, not a doctrine. It founded no sect, though it met with much sympathy outside of the R. Cath. Ch., especially among the Pietists.

**Quills**, the shafts of the large wing-feathers of birds. They are obtained chiefly from geese, but also from swans, turkeys, and other birds. Crow-Q. are valuable in some kinds of drawing. The so-called Q. (spines) of the European porcupine have considerable commercial value.

**Quin** (JAMES), b. in Lond., Eng., Feb. 24, 1693, was ed. at the Univ. of Dublin; studied law in Lond., but soon devoted himself to the stage, and was considered the head of his profession prior to the rise of Garrick. He retired from the stage 1748. D. at Bath Jan. 21, 1766.

**Quinby** (ISAAC F.), b. in N. J., about 1823, grad. at W. Pt. 1843; served 2 yrs. as assistant prof. of math. and of natural and experimental philos. at W. Pt.; in the war against Mex., on duty with his regiment and as acting assistant adjutant-gen. until Mar. 1852, when he resigned to accept the chair of math. and of natural and experimental philos. in the Univ. of Rochester. On the outbreak of c. war he was appointed col. of the 13th N. Y. Volunteers, which he led at the first battle of Bull Run, resigning in Aug. to resume his professorship at Rochester. In Mar. 1862 he was appointed brig-gen. U. S. volunteer, and served in the S. W., participating in the battle of Champion Hills and in the assault of Vicksburg, May 1863, but ill-health again compelled him to resign. Dec. 1863, and return to his former duties at the Univ. of Rochester.

**Quince** [Fr. *coing*], the fruit of *Cydonia vulgaris*, the Q.-bush, a shrub originally from the Levant, belonging to the Rosaceæ, related to the pear, but many-seeded, and the seeds mucilaginous. Its fragrant fruit is valued for making preserves and marmalades. The Japan Q. (*Cydonia Japonica*) is an ornamental shrub with profuse and beautiful blossoms; its fruit hard and austere.

**Quincy**, city and important R. R. and commercial centre, cap. of Adams co., Ill., on E. bank of the Miss., 163 m. above St. Louis and 263 m. S. W. of Chicago, upon a limestone bluff 125 ft. above the river; has 5 parks, a fine fair-ground, a med. coll., 2 hospitals, 3 asylums, a good city library, and extensive manufactures. Q. was settled 1822, and became a city 1839. Pop. 1880, 27,368; 1889, about 36,000.

**Quincy**, seaport of Norfolk co., Mass., on R. R., 8 m. S. of Boston, was formerly a part of Braintree, but in 1792 was set off and named in honor of Col. John Quincy. The first railway in the U. S. was built here in 1827 for moving granite, the cars being drawn by horses. Q. has a U. S. and a State home for infirm sailors, and is the birthplace of John Adams and his son John Quincy Adams. Granite is the chief production. Pop. 1870, 7442; 1880, 10,570.

**Quincy**, on R. R., Branch co., Mich., about 55 m. S. W. of Lansing. Pop. 1870, 1092; 1880, 1120.

**Quincy** (EDMUND), b. at Braintree (now Quincy), Mass., Oct. 24, 1681, grad. at Harvard 1699; became judge of the supreme court 1718; was long a member of the house of



reps. and of the council; was lieut.-col. of a militia regiment, and went to Eng. 1787 as agent of Mass. in the controversy with N. H. upon the boundary question. He was ancestor of noted Mass. statesmen. D. Feb. 23, 1788.

**Quincy** (EDMUND), son of Pres. Josiah, b. at Boston Feb. 1, 1808, grad. at Harvard 1827; was prominent as sec. of the Amer. and the Mass. anti-slavery societies; contributed to the magazines; wrote *Wesley, a Life of Josiah Quincy*, and edited the *Speeches of Josiah Quincy*. D. May 17, 1877.

**Quincy** (JOSIAH, JR.), b. in Boston Feb. 23, 1744, grad. at Harvard in 1763, and became a lawyer. His father, Josiah (b. 1709, d. 1784), was a merchant of Boston and a zealous patriot; hence the term "Junior" was applied to the son to distinguish them. He had already obtained prominence as an advocate of the cause of liberty when called upon, in conjunction with John Adams, to defend the soldiers implicated in the Boston Massacre. Although successful in securing the acquittal of their clients, popular feeling ran so high that they incurred much odium by their connection with the defence. In 1774 he went to Eng., where he was active in promoting the interests of his country, and wrote *Observations on the Port Bill*. He embarked for home Mar. 16, 1775. D. Apr. 26, 1775.

**Quincy** (JOSIAH), LL.D., son of the preceding, b. at Boston Feb. 4, 1773, grad. at Harvard 1790; studied law, and was admitted to the bar in 1793; member of the State senate 1804; M. C. 1805-13; opposed the embargo law and the war with G. Brit.; again State senator 1813-21; member of State legislature 1821-23, and speaker of that body during his last term; appointed judge of the municipal court in 1822, but resigned the following yr., having been elected mayor of Boston; continued in office until 1829, during which time many public improvements were inaugurated and completed under his auspices; in Jan. 1829 was elected pres. of Harvard Univ., and remained at the head of that inst. until Aug. 1845. Wrote a *Hist. of Harvard Univ.*; a *Hist. of the Boston Athenæum*, of which he was pres. 1820-30; the *Municipal Hist. of Boston*; *Life of John Quincy Adams*, and *Memoir of his father*. D. July 1, 1864.

**Quincy** (JOSIAH), son of the preceding, b. at Boston Jan. 17, 1802, grad. at Harvard 1821; became a lawyer at Boston; was a member of the city council 1833-37, pres. of that body 1834-37, pres. of the Mass. senate 1842, mayor of Boston 1845, and for many yrs. treas. of the Western R. R. and of the Boston Athenæum. During his mayoralty the Cochituate water was introduced into Boston, and he originated various other public improvements. D. Nov. 2, 1882.

**Quincy College and Seminary**, Quincy, Ill., a Meth. inst., established in 1856. The 2 depts. of instruction, with a graduating course of 3 yrs. each, are open to women as well as to men, but the sem. course is designed more especially for the women and the coll. for men.

**Quinet**, ke-nā' (EDGAR), b. at Bourg, dept. of Ain, Fr., Feb. 17, 1803; studied at Paris, Geneva, and Heidelberg; resided in the Morea 1828-30; was appointed prof. of foreign lit. at Lyons in 1839, and at the Collège de France in 1842, but was dismissed in 1846, because his opposition to the political and religious reaction of the age assumed too direct a form in his lectures; travelled in Sp.; fought in the Revolution of 1848, and was reinstated in his chair as prof.; was banished in 1852; lived in Hol. and Switz., and did not return to Fr. until after the fall of the Empire. D. at Paris Mar. 27, 1875. Wrote *Allemagne et Italie*, *Le Christianisme et la Révolution française*, *La Révolution*, *De la Grèce moderne et de ses Rapports avec l'Antiquité*, etc.

**Quinine**, kwe-nin' [Fr. from *quina*, "Peruvian bark"], the most important medicinal ingredient of Peruvian bark. To obtain it, it is first extracted from the bark as a sulphate by means of quite a complex process. By treating this salt with the solution of an alkali, the Q. is precipitated, and is then washed, dried, dissolved in alcohol, and reobtained by slow evaporation. As usually prepared, it is amorphous, but with care it can be obtained in silky crystals. Q. is an alkaloid with strong basic properties, and forms with acids crystallizable salts. It is without smell, but has an intensely bitter taste; is very insoluble in water, but dissolves freely in alcohol and moderately in ether. Solutions of the alkaloid or its salts, treated first with chlorine water and then ammonia, strike a brilliant green color. This test is very delicate, and distinguishes Q. from all other vegetable alkalies except quindia. Q. is used in med. principally in the form of sulphate or hydrochlorate. Q. salts are locally irritant, and internally in small dose are stomachic; in large, powerfully disturbing to the nervous system, while also tending to nauseate and vomit. In medicinal doses the most prominent symptoms of "cinchonism" are headache and deafness, with buzzing or roaring in the ears, muscular debility, some reduction of the force and frequency of the pulse and of the body-heat. In poisonous dose the individual may become completely blind, deaf, and paralyzed, but death is rare.

**Quin'sext Council** [Lat. *quinque*, "five," *sextus*, "sixth"], the Oriental Ch. council which was convened in 698 A. D. to supplement the acts of the 5th and 6th œcumenical councils. It was convened by Justinian II., and gave 102 stringent canons on clerical discipline.

**Quin'sextum**. See QUINISEXTUM.

**Quin'ssee**, on R. R., Menominee co., Mich. Pop. not given in census of 1880.

**Quinsy**, kwîn-zé, acute suppurative tonsillitis, or inflammation of the tonsil, terminating in abscess. It attacks adults, less often children. One attack usually leaves sub-acute or chronic disease of the tonsil, which predisposes the person to repeated attacks in subsequent seasons. Q. is most often unilateral, less frequently attacking both sides. Tonsils successively, and rarely coincident upon both sides. In from 5 to 8 days the suppurated tonsil bursts, all the symptoms vanish, and recovery is speedy. Ice in the mouth, cold gargles or spray, astringent gargles or applications, as of alum or tannin, saline cathartics, arterial

sedatives, and quinine boldly administered may abort it. When developed, the inhalation of steam, warm anodyne gargles, soothing poultices or fomentations externally, anodynes to secure rest, tonics and diet to sustain the strength, and early evacuation of pus with the knife, are the essentials of treatment.

E. DARWIN HUDSON, JR.

**Quint** (ALONZO HALL), D. D., b. at Barnstead, N. H., Mar. 22, 1823, grad. at Dartmouth 1846, at Andover Theological Sem. 1852; was pastor of the Mather ch. at Roxbury 1853-63, member of Mass. board of education 1855-61, chaplain of the 2d Mass. Volunteers 1861-64, and was pastor of the North Congl. Ch., New Bedford, 1864-75; member of N. H. House of Representatives, 1861-83. Author of *Army Notes* and *A Hist. of the Second Mass. Regiment*; is one of the eds. of the *Congl. Quarterly*.

**Quintard** (CHARLES TODD), M. D., D. D., LL.D., b. at Stamford, Conn., Dec. 22, 1824, grad. in med. at the Univ. of New York 1846; became a phys. to the New York City Dispensary 1847, prof. of physiology in the Memphis Med. Coll. 1851; contributed to med. periodicals; took orders in the P. E. Ch. 1855; was successively rector of chs. at Memphis and Nashville; was chaplain in the Confed. army, and was chosen bp. of Tenn. 1865.

**Quintilian** (MARCUS FABIVS), b. at Calagurris, Sp., about 35 A. D.; ed. at Rome, and gained there afterward the highest reputation as a teacher of eloquence; received a regular salary from the treas. fund established by Vespasian, and was loaded with the highest civil honors and titles by Domitian. D. under the reign of Hadrian. In 95 A. D. he pub. his *Institutio Oratoria*.

**Quintus Curtius Rufus**, the author of an historical work in 10 books on Alexander the Great, *De Rebus Gestis Alexandri Magni*. Of the author nothing is known; some critics fix the date of his life in the age of Augustus, others much later.

**Quintus Smyrnaeus**, or **Quintus Calaber**, a Gr. poet of uncertain age, though he is generally considered to have been a native of Smyrna and to have flourished in the 5th century A. D. His poem purports to be a supplement to or continuation of Homer's *Iliad*, and is the only extant specimen of the so called "cyclic poems."

**Quirinal**, a celebrated hill at Rome, N. of the Palatine, and connected with the Esquiline and Viminal, was so named from its temple to the god Quirinus. In modern times the hill has been crowned by the Palazzo Quirinale, which was begun by Pope Gregory XIII., continued under Sixtus V. and Clement VIII. by Fontana, and finished under Paul V. by Maderno. It has often been occupied by the popes as a summer residence, and since the annexation of Rome to the kingdom of It. has been the royal residence.

**Quirites** [early Lat. *quiris* or *curis*, "a spear"], the collective name of the early Romans, considered in their capacity as warriors, and consequently as citizens entitled to vote in the *curies* or assemblies of armed men. The name was closely connected with that of the Lat. spear-bearing divinity Quirinus, a synonym of Mars. To a late period of the empire the name Quirites enjoyed precedence as a synonym of the patrician order (*populus Romanus Quiritum*), and as a title of honor over the geographical name Romans, the senators being called *pater conscripti Quirites*.

**Quit-Claim**, a word often employed in deeds in which the grantor or seller undertakes no responsibility in regard to the validity of his own assumed right to the property in question, but merely conveys to the grantee or buyer his own interest, whether valid or the reverse.

**Quit'man**, Ga. See APPENDIX.

**Quitman** (JOHN ANTHONY), LL.D., b. at Rhinebeck, N. Y., Sept. 1, 1799, became a lawyer, and was prof. at the Mt. Airy Coll., Pa., 1819; practised law at Chillicothe, O., 1820-23; removed to Natchez, Miss.; was chancellor of the superior court 1828-31 and 1832-34, member of the State legislature 1835-32, pres. of the senate 1835 and gov. *pro tem.*, judge of the high court of errors and appeals 1839; distinguished in the Tex. struggle for independence, he was, on the outbreak of the war with Mex., appointed brig.-gen. of volunteers; promoted to be maj.-gen. Apr. 1847; was distinguished at Monterey, Chapultepec, and capture of the city of Mexico; for his services at Monterey Cong. presented him with a sword, and Gen. Scott appointed him gov. of city of Mexico; gov. of Miss. 1850; M. C. 1855-58, and chairman of committee on military affairs. D. July 17, 1858.

**Quito**, kee'to, city, cap. of the republic of Ecuador and of the prov. of Pichincha, in the dist. of Quito, in a valley between 2 parallel ranges of the Andes, 9520 ft. above the sea, is built on the declivities of several small hills on the E. flank of the volcano of Pichincha. Picturesquely located, it is laid out with little regularity, most of the streets being narrow, uneven, and ill-paved. The city is traversed by 2 deep ravines. Owing to the frequency of earthquakes, most of the houses are of a single story, but are solidly built around spacious courtyards adorned with rich tropical plants and flowers, and often display considerable taste in decoration. The healthful spring. The public edifices of Q. are built of stone, and comprise the palace of gov't., the archbishopric, cathedral, and city hall, grouped around the handsome Plaza Mayor, 3 hospitals, 2 asylums, 2 colls., a univ., a mint, and many churches, usually with convents attached. The public (formerly the Jesuits') library contains 20,000 vols. and there are several smaller collections. Education has of late yrs. been under the control of the Jesuits. A polytechnic school was established in 1872. The only good roads in the republic are those leading from Q. northward to Bogotá, and southward to Guayaquil. Commerce is languid, owing to the difficulty of communication with seaports by mule-paths. The chief articles of exportation are the precious metals, indigo, and liquors. Coarse cotton and woollen cloths are manufactured by hand, also fine articles of jewelry, and the women are skillful in embroidery, needlework, and gold-lace. The raising



of silkworms and manufacture of silk are of recent introduction. A telegraph line to Guayaquil has been recently opened. Pop. about 75,000.

**Quit'tor**, or **Quiltor**, a fistulous abscess in the foot of the horse, is best treated by cutting away enough of the hoof to give free vent to the fetid pus which burrows there. The discharge may be facilitated for a day or so by poultices, and then the sore should be washed out with a solution of sulphate of zinc, 2 or 3 grains to the ounce.

## R.

**R**, a consonant of the liquid class, approaching the character of a vowel. Its sound is to some extent interchangeable with that of *l*, and even in some langs. with *d* and *s*. *R*. (*reus*, *regina*) stands for king or queen.

**Rabanus Magnentius Maurus** was b. at Mentz about 776; was teacher at the monastery of Fulda from 817; was made abbot in 822, abp. of Mentz 847. D. at Winkel Feb. 4, 856. He opposed the doctrine of transubstantiation, first distinctly set forth by Paschasius Radbert in 831 (expanded in 844). (See Bach's *Rabanus Maurus, der Schöpfer des deutschen Schulwesens*.)

**Rab'ba**, town of Central Afr., kingdom of Gando, on the Niger, in a highly cultivated region among beautiful surroundings. It is a large and populous town, carrying on an extensive trade with Tripoli, Fezzan, etc. Its horses are celebrated. Pop. about 40,000.

**Rab'bi** (Heb. "my master"), a title of honor anciently employed by the Jews to designate those learned in the law. At the present time the term *rab* is applied by Oriental Jews in a manner similar to the Amer. use of "esquire."

**Rab'bit** [O. D. *robbe*], **The**, is found generally distributed throughout Europe (except in its more N. portions), as well as the contiguous portions of Asia and N. Afr., and is familiar as a semi-domesticated animal. Its habits are characteristic in that it lives in communities, burrows in the ground, and brings forth its young in a blind and naked condition. It is very prolific. The name "rabbit" is also generally given indiscriminately to Amer. species, the best known of which is the common small R. of the E. and Middle States; this species agrees with the hare in making forms instead of burrowing, and in bringing forth its young provided with hair and able to see.

**Rabelais**, rah-beh-lä' (FRANÇOIS), b. in 1483, or perhaps in 1495; entered the order of the Franciscans in 1511 or 1519, but left the monastery in 1530 without the permission of his superiors. He settled first at Montpellier, at that time the seat of the most celebrated school of med. in Fr., but in 1532 he went to Lyons as a hospital phys. While in Lyons he pub. the first 2 books (1533 and 1535) of his great satirical work, *Les Fables et Dicts du Géant Gargantua et de son Fils Pantagruel*. In 1536 he accompanied Cardinal du Bellay, an old schoolmate and friend of his, and now bp. of Paris, and by his influence he obtained from Pope Paul III. a release from the penalties which he had incurred by abandoning his order. In 1538 he entered the abbey of St. Maur des Fossés in the diocese of Du Bellay, and in 1551 he obtained the curacy of Meudon. D. in Paris in 1553.

**Rabies**. See HYDROPHOBIA.

**Ra'burn** (WILLIAM), b. in Halifax co., N. C., Apr. 8, 1771; went to Ga. in childhood; received a limited education, but became a judge, a leading member of both houses of the legislature, and gov. of the State 1817-19. D. Oct. 23, 1819.

**Racahout**, or **Racahout des Arabes**, is a starchy food prepared in Barbary from the acorns of *Quercus ilex* and *Q. balota*. It is flavored with herbs, and is sometimes prescribed for invalids' use. But the R. of the confectioners' shops is a compound of starch with chocolate, vanilla, etc., sold as a sweetmeat.

**Raconigi**, rahk-ko-nee'je, town of N. It., prov. of Cuneo, on the right bank of the Maira, S. of Turin about 19 m. by rail. It is a walled town, and is chiefly known for the royal castle and park in its immediate vicinity. R. was a favorite resort of King Victor Emmanuel during the hunting season. Pop. 10,000.

**Racoon** [Fr. *raton*], **The**, has a rather stout body; the snout pointed, and the tail rather long and bushy, and annulated with dark-colored rings; the feet are provided with long and slender digits, and with the fore ones the animal is able to grasp its food and other objects.

**Racemic Acid** [Lat. *racemus*, a "bunch" of grapes or fruit]; also called **Paratartronic Acid** and **Uvic Acid** [Ger. *Traubenäure*], found with tartaric acid in grape-juice, and identical with it in composition. It differs from it, however, in its action on polarized light and in some other characters. It was discovered by Kestner in wines of certain vintages. It may also be formed artificially by several methods. R. A. itself has no action on polarized light, but by certain treatment may be separated into 2 isomeric constituents, one of which is ordinary dextro-rotatory tartaric acid, and the other is levo-rotatory, the 2 being called *dextro-tartaric* and *levo-tartaric* acid.

**Ra'chel** (Heb. *rahel*, "ewe"), favorite wife of Jacob, and mother of Joseph and Benjamin. Her tomb, about 4 m. from Jerusalem on the road to Bethlehem, though of modern construction, undoubtedly marks the very site of her burial.

**Rachel**, rah-shel' (ELISA RACHEL FELIX), b. at Mumpf, Switz., Feb. 28, 1820, daughter of a wandering Jewish peddler. In 1836 she was admitted to the Conservatoire; in 1837 made her first appearance at the Gymnase in *La Vendienne*, an unsuccessful play; went back to her studies under Samson, and in 1838 astonished and captivated Paris by her performance at the Théâtre Français of Camille in *Les Horaces*. Her triumphs were in *Phédre*, *Camille*, *Roxana*, *Hermione*, *Electra*, and other parts in the older drama. In 1855 she came to Amer. D. Jan. 3, 1858.

**Racine**, ras-seen', city and R. centre, cap. of Racine co., Wis., on Lake Mich. at the mouth of Root River, was

incorporated 1848; has Racine Coll., an orphan asylum, and a city hospital. Pop. 1870, 9880; 1880, 16,031.

**Racine** (JEAN BAPTISTE), b. Dec. 21, 1689, at Ferté-Milon in Picardy, was ed. in the monastery of Pt. Royal; became a dramatic author. His first tragedies, *La Thèbaïde* (1664), *Alexandre* (1665), and his comedy *Les Plaideurs* (1668), had only a moderate success, but his following tragedies, *Andromaque*, *Britannicus*, *Iphigénie* (1669), *Bérénice* (1670), *Bajazet* (1672), and *Mithridate* (1673), won a great name for him; and when he brought his *Phédre* on the stage in 1677 he was generally acknowledged to be the first tragic poet of Fr. At the solicitation of Madame de Maintenon he wrote *Esther* (1689) and his masterpiece *Athalie* (1691) for the pupils of St. Cyr. At her solicitation he also wrote a memoir to the king on the state of Fr., and this memoir offended Louis XIV. very much. The loss of the favor of the monarch R. could not bear; he pined away, and d. Apr. 22, 1699.

**Rack** [A.-S. *ræcan*, to "stretch"], an engine of judicial torture formerly much employed in Europe to compel accused persons to plead their own guilt or to obtain satisfactory testimony from recalcitrant witnesses. The victim was stretched upon a platform of wood; cords were attached to his limbs, and then strained by pulleys until the sufferer yielded or had his joints dislocated.

**Radet'zky** (JOSEPH WENZEL), COUNT, b. at Trzebnitz, Bohemia, Nov. 2, 1766; entered the Aus. army in 1784; fought at Aspern and Wagram in 1809, and at Kulm and Leipsic in 1815; was made commander-in-chief of the Aus. troops in It. in 1831, and field-marshal in 1836; put down the revolution in Milan and Venice in 1848; won the victories at Custoza and Novara over the Piedmontese, and governed the Aus. possessions in It. to Feb. 28, 1857. D. Jan. 5, 1858.

**Rad'ford** (WILLIAM), b. in Va. Mar. 1, 1808; entered the navy as mdrpn. 1825; became lieut. in 1837; served on the W. coast during the war with Mex.; became commander 1855, capt. 1862, com. 1863; commanded the iron-clad division in both attacks upon Ft. Fisher; was made rear-admiral 1866, and retired 1870.

**Rad'ical** [Lat. *radix*, an indicated root of a quantity; thus,  $\sqrt{5}$ ,  $\sqrt[4]{16}$  are radicals. If the quantity under the R. sign is a perfect power of the indicated degree, the quantity represented is essentially rational, though under a R. form; if the quantity under the R. sign is not a perfect power of the degree indicated, the quantity is called a *surd*.

**Radicals**, in chem., sometimes called **Radicles**. It is, in its broadest sense, applied to all substances, simple or compound, which combine with any of the more electro-negative elements to form compounds either acid, neutral, or basic; but, more generally and narrowly, it is used to designate only "compound radicals" like *ammonium* and *cyanogen*, compounds of elements which have themselves an elementoid nature and perform elemental functions. One class of such R. which has played a great part in the hist. of chem. is that known as the "alcohol radicals."

**Radiometer** [Lat. *radius*, "ray," Gr. *μετρον*, "measure"], an instrument (Fig. 1) invented by Prof. Crookes of London. It is formed of 4 or more delicate arms supported

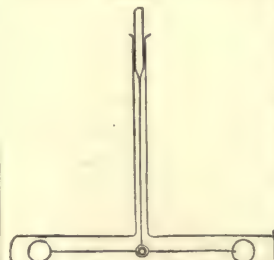
FIG. 1.



at their intersection by a needle-point, and carrying at their extremities thin disks of pith or of mica blackened on one side, the blackened surfaces all facing the same way. When the radiations from a luminous or a heated body fall upon this instrument, the vanes rotate, their blackened surfaces moving away from the source of radiation.

Crookes was led to the discovery of this phenomenon by the study of the behavior of heated bodies when weighed in a vacuum. It is well known that a body when hot weighs less in air than when it is cold, the explanation usually given being that the ascending currents of hot air buoy up the body. To get rid of this action during research on the atomic weight of thallium, he used a balance inclosed in a case exhausted of air. He found that even in these conditions the body appeared to weigh less when hot than when cold. He now suspended in an exhausted vessel a bar of pith, and in a similar vessel containing air he suspended another pith-bar, and found that a hot body repelled the pith-bar in the exhausted vessel, while it attracted the bar in the vessel holding air. To reach quantitative results, he constructed the apparatus shown in Fig. 2. It consists of a delicate horizontal rod suspended by a fine fibre of glass, and having disks of pith at each end coated with lampblack. The whole is inclosed in a glass case made of tubes blown together, and by means of a Sprengel pump the air is removed. In the centre of the horizontal rod is a mirror which reflects a beam of light on to a distant horizontal scale. The motions of this beam of light show the direction and amount of motion of the horizontal rod.

FIG. 2.



In the instrument described above, the radiation acts on a pith-bar, one end of



which is blackened on each side. But suppose the bar blackened on alternate halves, and a candle placed so near it that it drives the bar half round. The light will now have presented to it another black surface in the same position as the first, and the bar will be again driven in the same direction half round. This action will be repeated again and again, and the result will be *rotation*. If we now replace the suspended pith-bar by one supported on a point, we have a R., which can be improved by substituting for the pith-bar several arms, each carrying a blackened disk of pith, and then we have the R. shown in Fig. 1. Crookes called this instrument a "radiometer," because it can measure the intensity of the radiation falling on it by counting the number of its revolutions in a given time. He has constructed a R. with an attached electro-magnetic apparatus which registers the number of revolutions of the "light-mill," as some call it; and he proposes this instrument as a photometer, and as a meteorological instrument to measure the amounts of solar radiation received at different points of the earth. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. AUGER M. MAYER.]

**Rad'ish** (A.-S. *radice*), the *Raphanus sativus*, a cruciferous plant, a native of Asia, cultivated for its root, employed as a table relish. The root is stimulant, diuretic, and antiscorbutic.

**Radu the Black**, the first native prince of Wallachia (about 1280), celebrated for the negotiations which he carried on with the papal see for the introduction in his country of the R. Cath. conception of Christianity.

**Rae** (JOHN, M. D., LL.D., b. in the Orkney Islands early in the 19th century; was a member of Sir John Richardson's expedition in search of Sir John Franklin 1848; conducted a similar expedition 1850; reached Repulse Bay; discovered a large river flowing into Chesterfield Inlet, and found the first traces of Franklin's fate. Wrote *A Narrative of an Expedition to the Shores of the Arctic Sea*, etc.

**Rae'burn** (HENRY, R. A., b. at Stockbridge, near Edinburgh, Mar. 4, 1756; was apprenticed to a goldsmith; displayed genius for miniature-painting; studied some months under Sir Joshua Reynolds; spent 2 yrs. in it; established himself as a portrait-painter in Edinburgh 1787; soon became the most eminent artist of Scot.; became pres. of the Society of Artists, Edinburgh, 1812, and was knighted 1822. D. July 8, 1823.

**Raffaele**. See RAPHAEL.

**Raffles** (THOMAS), D. D., LL.D., b. in London May 17, 1788, ed. at Homerton Coll.; settled at Hammersmith in 1809, and in 1812 succeeded Thomas Spencer (who was drowned in the Mersey) as pastor of the Great George st. chapel, Liverpool. D. Aug. 18, 1863.—His son, THOMAS STAMFORD RAFFLES, of the Inner Temple, pub. an admirable biography of his father in 1864.

**Raffles** (THOMAS STAMFORD), cousin of the preceding, b. at sea off Point Morant, Jamaica, July 5, 1781, son of a seapt. in the W. I. trade; obtained at the age of 15 an assistant clerkship in the E. I. House. In 1805, on the formation of a govt. at Pulo-Penang (or Prince of Wales Island), the court of directors appointed him assistant sec., and in 1807 he was made prin. sec.; R. soon became a leading authority upon the ethnology of the Indian Archipelago; was sec. to the gov.-gen. of India, Lord Minto, during the expedition against Java 1811; was made lieut.-gov. of the newly acquired colony, and administered that important island with great judgment for five yrs., effecting the abolition of slavery. Returning to Eng. on account of ill-health, he was knighted in 1817, and pub. his *Hist. of Java*. Java having been restored to the Dut. R. was in 1818 made lieut.-gov. of the settlement at Ft. Marlborough, Bencoolen, on the coast of Sumatra. While in Sumatra he emancipated the slaves, formed the new Brit. settlement of Singapore (1819), endowed there a coll. for study of Malay and Chi. lit., and pub. *Malayan Miscellanies*. On his arrival in Eng. founded the Zoological Society of Lond. D. July 4, 1826.

**Rafflesia** (named in honor of Sir T. Stamford Raffles (1781-1826)), a genus of remarkable rhizogenous plants of the order Rafflesiaceae. The R. are natives of Sumatra and Java, parasitic upon stems and roots of *Cissus*. They are all stemless, rootless, and leafless, mere flowers, with a few scales for leaves; the seeds are of a rudimentary character, and once regarded as spore-like. The plant has a fungus-like, fleshy appearance, and an intolerable odor of carrion. *R. Arnoldi* is considered the largest flower in the world. It is some 3 ft. in diameter, and has been known to weigh 15 lbs. It is worshipped by the Javanese. *R. palma* has strong styptic power. *R. Horsfieldii* is but 3 inches across.

**Rafinesque**, rah-fe-nesk' (CONSTANTINE SMALZE), b. of Fr. parents at Galata, a suburb of Constantinople, in 1784; was sent to the U. S. 1802; he soon developed a fondness for nat. hist.; made many excursions for collecting botanical specimens; went to Leghorn 1805, and thence to Sic., where he resided 10 yrs., and wrote (in Fr.) several scientific works; sailed for New York 1815; lost by shipwreck all his effects; was for some yrs. prof. of bot. in Transylvania Univ., Lexington, Ky.; travelled and lectured in other States; settled finally at Phila.; wrote many monographs in various branches of nat. hist. Among his works are *Annals of Ky.*, *The Amer. Nations*, *Med. Flora of the U. S.*, and *A Life of Travels and Researches*. D. Sept. 18, 1842.

**Rag'lan** (FRITZROY JAMES HENRY SOMERSET), BARON, son of the fifth duke of Beaufort, b. in Eng. Sept. 30, 1788, ed. at Westminster School; entered the army as ensign 1804; attended Sir A. Paget to Constantinople 1807; accompanied the duke of Wellington in the Peninsula as a member of his staff, rising to the position of aide-de-camp and military sec. 1807; was wounded at Busaco 1810; distinguished at Badajoz 1812; lost his right arm at Waterloo; was knighted and made col.; was sec. of embassy at Paris 1816-19; entered Parl. as a Conservative 1818 and 1826; was again military sec. to Wellington 35 yrs., from 1819 to the death of the latter; was appointed master-gen. of the ord-

nance Sept. 1852; made Baron Raglan Oct. 1852; commanded the Brit. expedition to the Crimea with the rank of gen. Mar. 1854; defeated the Rus. at the battle of the Alma Sept. 20; fought the battles of Balaklava Oct. 25, and Inkermann Nov. 5, and was made field-marshal Nov. 1854. D. of cholera in the camp before Sevastopol June 28, 1855.

**Rag'stone**, or **Rag**, a siliceous limestone with a rough fracture, used for whetstones and for building material. The term is, however, quite loosely applied.

**Raguet**, rah-gā' (CONDY, LL.D., b. in Phila., Pa., Jan. 28, 1784, ed. at the Univ. of Pa., and studied law; went to St. Domingo as supercargo of a vessel 1804; returned there 1805; wrote 2 small books giving an account of the state of that island; went into business on his own account 1806; served in both branches of the legislature; became in 1822 consul at Rio de Janeiro; negotiated a commercial treaty with Brazil, to which in 1825 he was appointed *chargé d'affaires*; returned in 1827, and wrote much in favor of free trade. D. Mar. 22, 1842.

**Ragu'sa**, town of Aus., in Dalmatia, on a peninsula of the Adriatic, and built in terraces on the side of Mt. Sergio, the upper streets communicating with the lower by flights of steps. It is strongly fortified and has 2 harbors. Soap, liquors, silk, and leather are manufactured, and a lively transit trade is carried on. It was once an independent republic. It suffers often from earthquakes. Pop. 9304.

**Rah'way**, city and R. R. centre, Union co., N. J., on the river of the same name, about 30 m. S. W. of New York. Pop. 1870, 6288; 1880, 6455.

**Ra'ies** (Lat. *raia*, "ray" or "skate"), an order including the rays, torpedoes, and related types. The pectoral fins are much developed, and produced from the anterior margins forward, and connected with the rostral cartilages, thereby constituting an integral part of the form, and not abruptly differentiated from the body, as in the sharks and all true fishes; the branchial openings are in 2 converging rows of 5 each on the inferior surface of the body; spiracles are well developed behind the eyes. In other respects the order essentially agrees with the Squali, and the 2 form a common super-order or sub-class—the *Plagiostomi*. The form varies considerably in the several members of the order; on the one hand, the sawfishes have an outline much like that of the sharks, and with a long caudal portion; and on the other hand, the eagle rays and certain sting-rays have a disk extremely wide—much wider than long—and the caudal portion is whip-like.

**Rail** (Fr. *raie*), the Eng. name for various species of the family Rallidae. The genus *Rallus* has the bill comparatively slender and longer than the head; it embraces (1) the common or marsh R., and (2) the clapper-R. or mud-hen. The genus *Porzana* has a comparatively thick bill, which is not longer, and even shorter, than the head; to it belong (1) the common R. or sora; (2) the little black R.; and (3) the little yellow R. These frequent salt-water marshes, and are all sought after by the sportsman as game-birds.

**Rail'roads**, roads with parallel tracks of iron rails upon which the carriages run.

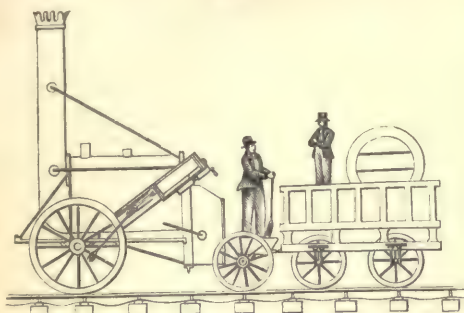
**History**.—The plan of facilitating the draught of carriages by forming a hard continuous surface for the wheels to run upon is old and simple. The use of iron was found to reduce the friction very sensibly; a ledge or flange on the outer edge of the plate of iron forming the rail enabled the ordinary wagon to keep on the rails without difficulty. This kind of track was long in use, and was known as a tramway. The next improvement was the introduction of the edge rail, formed by setting up a bar of cast or rolled iron in the form of a T. This required special supports called "chairs," spiked to the timber rails or to cross-supports of timber called "ties," or at intervals to stone blocks.

To produce uniform strength between the points of support, the iron rail was made of an elliptical profile—that is, the upper part of the rail upon which the wheels rolled was a straight line, while the stem of the T varied in depth, being thinnest at the points of support and deeper intermediately. These constituted the "fish-bellied rail," for a long time considered the proper form for iron rails. In 1802 Trevithick took out the first patent for adapting a steam-engine to move upon a road, although Watt is said to have invented one previously. As early as 1804 steam was used as a means of propulsion on some of these roads, but the speed was not greater than that of horses, owing to the imperfect construction of the boilers of the engines; and on grades as low as 18 ft. per m. they required to be assisted by auxiliary power of some sort; and, what is very remarkable, the progress of improvement in the engine used for roads was much retarded for many yrs. by the opinion that the friction, or the adhesion of the driving-wheels of an engine to the rails, did not offer sufficient resistance to slipping to allow of the power of the engine being applied to the axles so as to produce locomotion. In 1825 the Stockton and Darlington R. R., 37 m. in length, was completed, and was the first R. R. built for gen. traffic. It was the intention to operate it with horses, but locomotives were soon applied to it. The increased commerce between the manufacturing town of Manchester, Eng., and Liverpool led to chartering the Liverpool and Manchester R. R. in 1828, its main object being the transport of merchandise between the 2 places. In 1829, as it approached completion, an inquiry was instituted as to the respective merits of stationary and locomotive steam-power, and the directors of the road were induced to offer a reward for a locomotive engine which should be able to take three times its own weight on a level road at a speed of ten miles per hour—such performance being then unknown—the price of the engine to be restricted to £550. In Oct. of the same yr. the trial was had, and an engine built by Robert Stephenson, Jr., more than performed all the stipulated requirements; weighing but 7½ tons, it drew 44 tons at the rate of 14 m. an hour. But this success was not decisive as to the applicability of the locomotive to our Amer. roads. An Eng. road was virtually a



straight road; an Amer. road had curves sometimes of as small a radius as 200 ft. It was thought that this might debar the use of locomotives. To Peter Cooper is due the construction of the first Amer. locomotive, built for the Balti-

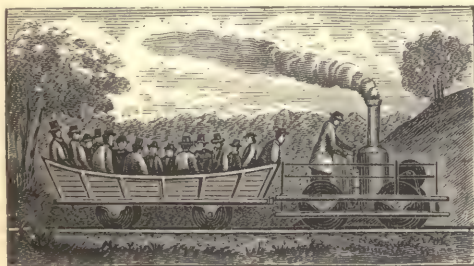
FIG. 1.



The Rocket—the first successful English Locomotive.

more and O. road, to show that steam might be adapted to curved roads. A trip made to Eliott's Mills, drawing a car filled with the directors and others, was the first land-journey by steam in Amer.

FIG. 2.



First American Locomotive.

**Construction.**—The principles of the construction of the accessory works of a R. R., such as embankments, bridges, tunnels, etc., differ in no essential dimensions from those required for first-class turnpike-roads; but the location of the curves, or horizontal deviations from a right line; the grades, by which we understand the rise or fall in the direction of the length of the road; and the gauge, or width between the rails of the track, are the elements which determine the capacity or classification of a R. R. as a machine for transport, and require careful study.

**Curves.**—The precise amount of resistance to locomotion occasioned by curves in a road has never yet been accurately determined. It is partly due to the effect of centrifugal force, causing the flange of the outer wheel of the cars to press against the rail; partly to the dragging of the wheels, which, being necessarily fixed on the axle, are obliged to perform an equal number of revolutions whether on the inner and shorter or outer and longer rail of the track; and partly to the axes being fixed parallel. The velocity of the train being an element in the calculation for the super-elevation of the outer rail of the track, what would be suitable for one speed of train would be unsuitable for another; hence a compromise has to be made, and the average speed of passenger trains is usually taken from which to calculate this super-elevation:

$$\begin{aligned} v &= \text{speed of train in miles per hour,} \\ r &= \text{radius of curve, in feet,} \\ g &= \text{gauge of track;} \end{aligned}$$

then  $g \times \frac{v^2}{15r}$  = elevation to be given to outer rail of track.

**Grades.**—The additional resistance to motion occasioned by the various grades or inclinations in a road is susceptible of precise calculation, and is a constant quantity for the same inclination, let the state of the road or the machinery be what it may, and is as the sine of the angle of inclination; or, virtually, it is that fraction of the weight which is represented by dividing the height of a given inclination by its length. If a locomotive engine be prevented from advancing on the track, and at the same time the proportions of the machinery be such that upon the application of the power to the wheels the latter will revolve by slipping on the rails, the engine is said to work up to its adhesion, and the latter becomes the limit of its traction force. This adhesion varies, in different states of the rail-surface, from  $\frac{1}{4}$  to  $\frac{1}{10}$  of the weight on the driving-wheels, and may be taken ordinarily at  $\frac{1}{4}$  of the insisting weight. If, then, we know the resistance to motion occasioned by the friction at the axes of the wheels of the engine and train, as also of the rolling of their surfaces on the rails, by dividing the adhesion by this amount we shall have the weight which the engine will draw on a level under the assumed condition of the rails and the machinery. The resistance of gravity is the same on a given plane at all speeds, but is overcome twice as fast at 20 m. per hour as at 10 m., and hence is said to vary with the speed. Friction is the same at all velocities, but varies with the load of the train; concussion, or resistance of the curves, varies both with the weight and

speed of the train. Atmospheric resistance varies with the speed and bulk of the train.

**Inclined Planes.**—Before the locomotive had been perfected, and before even the question of locomotive *vs.* stationary-engine power had been settled, it is not surprising that recourse was had to inclined planes for overcoming abrupt changes of level.

**Gauge.**—It is not known what, if any, principle governed the determination in the first instance of the gauge between the rails of 4.8½ inches. It was adopted in the roads from the collieries in the N. of Eng., believed to have arisen from the colliery-wagons in use on common roads having an outside width of axle of 5 ft., and the tram-roads having the flange on the outer edge of the rail admitted of their use also on the R. Rs.; and when the tramway was replaced by an edge-rail the same width of track was continued, but, measured from the inner edge of the rail, resulted in the 4.8½-inch gauge. Be this as it may, Mr. Stephenson, engaged in these collieries, was selected to build the Liverpool and Manchester road, and seeing no reason to change the gauge with which he was familiar, it was adopted there. When once established on a line of road looking to future extension, it was apparent that unless some special advantage called for a change there was a manifest propriety in continuing its use; accordingly, the success of the Liverpool and Manchester road led to the general adoption of this gauge. As the weight of traffic increased, and a corresponding increase of power was called for in the locomotive-engine, the impression prevailed that this could be best arrived at by increasing the space within which the machinery was placed, and an increase in the width of track on many roads was the consequence. In 1846 the inconvenience resulting from this lack of uniformity in the width of the R. Rs. in Eng. led to the matter being brought before Parl. The commotion which followed, known as the "battle of the gauges," led to experiments, investigations, and reports by a committee of Parl. The result was, that while Parl. declined to enact a law compelling all roads to adopt the narrow gauge, yet the evidence went to show that while for main-trunk lines of great traffic a wider gauge than the prevailing one of 4.8½ inches would probably prove advantageous, yet the advantages were not then so apparent as were the disadvantages resulting from a lack of uniformity with the prevailing gauge of the country; and the public mind settled generally to this belief. We have several different widths of track in this country.

**Drainage.**—The hist. of all failures in earthwork shows that in almost all cases it arises from unskilful or inadequate drainage; and the expense of the maintenance on any line will, other things being equal, vary very nearly in the proportion in which its drainage is good or otherwise. The surface-drainage of the slopes of excavations is equally important, to prevent the velocity of running water from tearing up the soil and choking the ditches, which should be kept open and of a sufficient depth to drain the bottom of the ballast.

**Ballast** should consist of porous material, on which the cross-ties rest, and in which they should be bedded. The cross-ties, of oak, chestnut, or other hard and durable wood, from 6 to 8 inches in depth, from 8 to 10 wide, and 8 ft. in length, are laid usually upon the road-bed at intervals of about 2 ft. between centres, upon which the iron rails are secured by brad-headed spikes  $\frac{5}{8}$  inch square and 6 inches in length. The material upon which the ties rest should be broken stone or gravel mixed with coarse sand free from loam or clay, and to a depth of at least 18 inches below the bottom of the ties, and the space between the latter should be filled in nearly to the level of the bottom of the rail.

**Rails.**—In the early R. Rs. much attention was paid to the quality of the iron of which the rails were composed, the weight of the rail then being light, but subsequently, when heavier rails were adopted, very inferior iron was worked into rails; recently, however, more attention has been paid to this matter. The use of the cheaper forms of steel has stimulated the iron manufacturers somewhat, but the enormous increase in the endurance of the steel rails, and the fact that the steel rail costs but about  $\frac{1}{4}$  more, will ultimately lead to their universal adoption on leading lines of road. In Europe it is customary to make the rail double-headed, and when worn on one edge to reverse it, and thus double its duration; but this method, beside rendering an expensive cast-iron chair necessary, with its complication of fastenings, is of doubtful expediency, as the effect of the chair is in many cases to indent the lower face of the rail. The system universally pursued in this country of dispensing entirely with a chair, and making the base of the rail some 4 inches in width, resting on the timber cross-ties without other support, and secured to the latter by 2 brad-headed spikes, is gradually gaining ground elsewhere as the most simple and efficient method of securing the rail. The rails are rolled in lengths of 30 ft., and the joints secured by fish-plates of a length of 28 inches placed on each side of the joint under the head, and fastened by 4 screw-bolts, with slightly elongated bolt-holes to allow of the expansion of the rail by heat. In Fr., the earliest railway was the Chemin de Fer de St. Etienne à Lyon, 84 miles in length, double track, commenced in 1825, finished in 1831. The roads connecting Paris with Lyons, Orléans, and Havre soon followed. In Aus., one of the earliest roads connected Budweis and Linz, and another Linz and Gmunden. These were single-track roads, worked by horse-power, with wooden rails covered with iron plates. In Switz., It., Sp., and Tur., for obvious reasons, the development was less rapid. Eng. soon recognized the importance to her Asiatic possessions of binding them together by railway connections. A similar need was felt by the Rus. govt. The road from St. Petersburg to Moscow was the first great road undertaken, and George W. Whistler, a graduate of the U. S. Military Acad., who had an experience on nearly all our earlier important roads, was appointed superintending

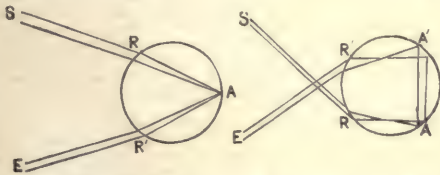


engineer. He was succeeded in 1849 by Thompson S. Brown, also a graduate of the acad. and once an officer of U. S. engineers, and (1842-49) chief engineer of the Erie R. R.

Gridley Bryant, the inventor of the 8-wheeled car, the turn-table, and the switch, was the projector, builder, and engineer of the first R. R. in Amer.—the Quincy, in 1826. It is a matter of interest that it was built to supply the Quincy granite for the Bunker Hill Monument. It was 4 m. in length; near the quarry was an inclined plane of 315 ft. length, rising 84 ft., worked by gravity. The Quincy was followed in 1827 by the Mauch Chunk road. The New Orleans and Lake Pontchartrain R. R., the first in the U. S. laid with T rail, was built in 1830-31, under supervision of the first graduate of the U. S. Military Acad., the late Gen. J. G. Swift. Between the yrs. 1823 and 1833 our actual system of railway communication may be said to have been inaugurated by the commencement of the Baltimore and O., the Baltimore and Susquehanna, the Camden and Amboy, the New Castle and Frenchtown, the Hudson and Mohawk, the Charleston and Augusta, the Boston and Providence, the Boston and Lowell, and other roads. The Baltimore and O. and (at a later date) the Pa. roads, connecting the O. with Baltimore and Phila., the Mobile and O., connecting that river with the Gulf, may be called the first through lines. The imperious necessity of connecting our newly developed Pacific States with the older body gave rise to the most extended system of reconnaissance and survey through a vast expanse of mt.-chain and desert for the determination of practicable routes, and finally to the rapid construction of the most remarkable *through lines* of railway in the world. [From orig. art. in *J's Univ. Cyc.*, by Col. J. W. ADAMS.]

**Raimondi** (MARCO ANTONIO), b. at Bologna about 1480; was first apprenticed to a goldsmith; received afterward the instruction of Francesco Francia in drawing and engraving; made his first engravings after Albert Dürer at Venice; repaired to Rome, and became very celebrated for his engravings of the works of Raphael; returned to Bologna. The date of his death is unknown.

**Raimundus Lullius**. See LULL (RAMON).  
**Rain'bow** [A.-S. *renboga*], an arch of concentric colored bands arranged in the prismatic order, violet being innermost. It is sometimes simple, and sometimes accompanied by an outer, secondary bow, which is broader and fainter than the primary, and has its colors in the reverse order. A rainbow occurs when the sun or moon, not far above the horizon, throws its beams upon a sheet of falling drops on the opposite side of the heavens. A beam of light



from the sun S falls upon a raindrop obliquely at R; a portion is reflected; the remainder, passing into a denser medium, is refracted toward the normal *nc* and converged to a point; at A the portion not transmitted is reflected and diverges; at R' the beam is again refracted from the normal *n'c*, and reaches the eye at E. The rays of light emerging are usually so greatly dispersed as to be practically invisible. The lunar bow is like the solar except that the colors are less distinct—sometimes not at all distinguishable, when it appears as an arch of white light.

**Rain-Gauge**, the apparatus by means of which the rainfall is collected and measured. For a standard gauge the collector may have a diameter of 8 inches, must be of thin sheet metal, of cylindrical form, and have its axis truly vertical. The mouth of the collector should be horizontal, and 1 ft. above the ground. The collected rain should flow at once, with the least possible loss, into a receiver or holder, where it will be kept safe from evaporation, and the quantity should be measured as soon as possible, although some gauges have been so constructed as to allow of measurements once a month; while in others the rain runs directly into a graduated glass tube, where the rate of fall may be observed from minute to minute. Either the weight, the volume, or the depth of the collected water may be measured, according to convenience.

**Rains** [A.-S. *regen*]. The distribution of rain is full of apparent anomalies. Here it is superabundant, and a luxuriant vegetation is the consequence. There it falls entirely, and the barrenness of the desert follows. In one place it falls at regular periods, in another at any time, without apparent rule. Now it is accompanied by terrific thunder and lightning, now it falls drizzling in gentle drops. The annual quantity of rain at a given place, again, is far from being the same; one yr. it may be double what it is another. To account for these phenomena, the law which governs the condensation of vapor into clouds and rain must be understood.

A column of air—a cubic foot, for example—at a given temperature can receive a definite amount of vapor, or humidity, as we call it, and no more. When it is thus filled with all the amount it can contain, evaporation ceases, and the air is said to be saturated or perfectly moist. Increase, however, its temperature, it will be able to hold more; evaporation begins again, and the air has a certain degree of dryness. We must, therefore, distinguish the *absolute humidity*, or the actual amount of vapor present in the air, and the *relative humidity*, or the degree of dryness, which is simply the relation of that real amount to the quantity which would be necessary to saturate the air at the same temperature. This is made clear by the following table:

QUANTITY OF VAPOR IN A CUBIC FOOT OF SATURATED AIR AT DIFFERENT TEMPERATURES.

Temp. of air.	Weight of vapor in saturated air, in grains troy.	Temp. of air.	Weight of vapor in saturated air, in grains troy.
20° F. ....	1.30	70° F. ....	7.99
32° " ....	2.13	80° " ....	10.95
50° " ....	4.09	90° " ....	14.81
62° " ....	6.15	100° " ....	19.79

If we call saturation 100, every other degree of humidity will be only a fraction of 100, or a fraction of saturation. Suppose the air has a temperature of 50° F., and contains only 2 grains of vapor, while it can contain 4, as shown by the table—there is room for 2 more; the fraction of saturation, therefore, will be  $\frac{2}{4}$ , or 50 per cent. will express the degree of moisture of the air. Two grains per cubic foot is the *absolute*, 50 per cent. the *relative*, moisture. Again, if the temperature is 70°, and the air only contains 4 grains per cubic foot, the temperature has to be reduced to 50° before the air is saturated, and condensation into dew, cloud, or rain begins. That temperature (in this case 50° F.) at which that process begins is called the temperature of the *dew-point*. When the air is saturated the temperature of the dew-point is that of the air, but when it is not saturated the temperature of the dew-point is lower than that of the air, and it is evident the greater the difference between the two the drier the air is, and the less the chance for rain. The comparison of these two temperatures, therefore, gives the degree of the relative moisture of the atmosphere. Thus, condensation, fogs, clouds, and rains are mostly due to the cooling of a moist air.

The application of these principles in meteorology is easy to understand. A warm wind setting from the tropics clear and dry toward the temperate regions comes into cooler places, and losing at every step its capacity for holding vapors, soon becomes moist, cloudy, and, farther on, rainy. A cold wind moving from the poles toward warmer climates may start full of clouds, but its capacity for holding vapors increasing with the heat, it becomes gradually drier, and its clouds dissolve in a clear, transparent sky. Warm winds blowing toward cold quarters bring rain; cold winds blowing toward warm quarters bring fair weather. When both meet and struggle together, as in our storms, the average temperature being lower, clouds and rain are the usual consequence. The same phenomena occur with vertical currents of wind. When the ground is powerfully heated, ascending currents carry the warm air into the cooler layers of the upper atmosphere, where its vapors are condensed and accumulate into clouds, soon to fall back in pouring rains. Such are the rains of the tropics and of our thunder-storms. When a mt.-chain opposes a horizontal wind, the air is forced up along the slopes, its vapors are condensed, and from the beclouded mt.-summits torrents of rain water the side exposed to the wind, while on the opposite slope the same wind descends dry and cloudless from the lofty mt.-crests. These principles prepare us to understand the following general facts. The greatest average quantity of rain falls in the tropical or warm regions of the globe, because of the increased amount of evaporation and a greater capacity of the air for holding vapor; and gradually decreases toward the cold regions, as shown in the following table:

AVERAGE ANNUAL FALL OF RAIN IN VARIOUS LATITUDES.

Latitude.	Rain in Eng. inches.	Latitude.	Rain in Eng. inches.
0° (Equator) .....	100	50° .....	30
20° .....	80	60° .....	20
30° .....	60	70° .....	10
40° .....	40	80° .....	5

It is the reverse with the amount of cloudiness and the number of rainy days. Both increase from the warm lats. toward the cold temperate regions, where the number of the rainy and cloudy days is greatest. In tropical regions the average number of rainy and cloudy days is from 80 to 90. It is double that amount in the middle lats., and 3 times in the N. temperate regions, as shown in the diagram of cloudiness and sunshine at the bottom of the Map of Rains.

The average height of the clouds is greatest in the warm lats. and in the summer of the temperate regions, and lowest in the polar regions and the winter season of the middle lats. As raindrops constantly increase while falling from the clouds to the ground, the size of the drops depends upon the height of the clouds as well as upon the abundance of condensation. Tropical rains and summer showers, therefore, fall in large and heavy drops, while slight, drizzling rains and fogs are characteristic of the winter season and the high lats.

The distribution of rain throughout the yr. is fully as important as its quantity, for its usefulness for the crops depends upon its falling in the right season—that is, in connection with a temperature favorable to vegetable growth. In this respect the great climatic zones differ very much. The warm zones have usually alternate seasons of rains and drought, the rains being *periodical* within the tropics, and *semi-periodical* in the warm temperate zones. Toward the colder temperate zones the rains become more and more continuous throughout the yr., or *perennial*, each month having an equal share.

**Rains within the Tropics.**—Within the tropics the temperature and winds being constant, seasons differing in temperature, like our summer and winter, are unknown; but there is a *dry* and a *rainy* season. Whenever the regular trade-wind blows, no cloud is seen in the deep blue sky; the air is dry, and even when moist, cloudless. The sun is then in the opposite hemisphere. But when the sun approaches the zenith the trade-wind becomes regular, the sky whitish, the clouds appear, first at the horizon, then higher; they rapidly accumulate, and sudden and heavy showers, accompanied by terrific thunder and lightning, ensue. These thun-



der-storms occur regularly in the hottest part of the day, and increase in frequency and duration as the rainy season advances, inundating the earth with torrents of water. With the progress of the sun the rains diminish, the trade-wind resumes its regular course, and the windows of heaven are again shut until the following season.

Such is the normal course of the tropical rains. They fall everywhere during the passage of the sun through the zenith. The heat of its vertical rays, being then greatest, causes a strong ascending current, which neutralizes the horizontal trade-wind. The warm air, hurried to the heights of the atmosphere, grows cool by expansion, and the abundant vapors it contains are condensed, and fall back in a deluge of rain. As the sun passes and repasses from one tropic to the other, there is, in most intermediate places, a twofold rainy season, the 2 periods of rain running more and more into one as the lat. is farther from the equator. Thus the time of the rains in each place can be easily remembered: when the sun shines vertically upon it the wet season is near its height.

The equatorial zone of calms, being the region of the constantly ascending current of air, is also one of almost daily rain throughout the yr. Thus, within the tropics we distinguish 3 zones of rain—the N. and the S. zone of periodical rains, corresponding with those of the trade-winds, separated by the equatorial zone of daily showers, corresponding with the zone of calms.

The quantity of water that falls from the atmosphere in the tropical regions during the few months of the rainy season is enormous. The yearly average in the tropical parts of the Old World has been estimated at 77 inches of water, and 115 in tropical Amer., but in some localities, under the influence of certain circumstances, it is much more considerable. At Mahabuleswar, in the W. Ghats, in India, at the height of 4300 ft., it rises to 254 inches. But the greatest quantity ever observed was in India, in the mts. of Cossyah, N. E. of Calcutta, where 610 inches have been collected in a single yr.—enough to cover the ground with a sheet of 51 ft. of water. At Cayenne, Fr. Guiana, 21 inches of rain have been seen to fall in one day. This is nearly as much as falls during the whole yr. in N. lats. The effect of these copious rains, falling during a short season, upon the tropical rivers may be easily conceived. The regular and so long mysterious overflows of the Nile we now understand, for all its sources are in the region of tropical rains, and we no longer wonder at those inland seas which in the season of rains cover for hundreds of miles the plains of the Orinoco, of the Amazon, and the Paraguay, to ooze away during the dry season.

The sub-tropical belt, which may be called the dry zone, extends from about the 24th to the 28th degree of lat., near the limit of the trade-winds. It forms an intermediate zone, in which the tendency to drought is strongly marked. Situated under the portion of the descending return trades which re-enters the tropical zone, which affords no chance for condensation, and beyond the region of the tropical summer rains, and in lats. too low to be reached by the N. branch of the descending return trades, which bring the copious winter rains of the following zone, it has no source of regular supply. It is a significant fact that all the great deserts of the globe are in a sub-tropical situation. In the N. hemisphere, the arid peninsula of Lower Cal., the dry plateaux of N. M. and Ari., the Great Sahara, and the deserts of Ara. and N. India; in the S. hemisphere, the desert of Atacama in S. Amer., that of Kalahari in S. Afr., and the arid wastes of Central Australia, are all traversed by one or the other of these remarkable sub-tropical belts.

The rains of the temperate regions offer a perfect contrast to those of the tropics. Instead of falling at regular periods, they are variable, as are the winds and the temperature of these zones, and fall at all seasons. The cause of this difference is found in the fact that while the tropical rains are due almost exclusively to ascending currents in the hottest part of the year, or of the day, those of the temperate lats. are mostly the result of the conflict of horizontal winds—that is, of the cold polar winds—with the warm and moist return trades, which takes place throughout the yr. In any given lat. however, the season at which the descending return trades reach the ground is likely to have a maximum of rain, which will travel with the declination of the sun. Thus, in the warm temperate zone, in the belt extending from 28° to about 35° N. lat., the return trades reach the ground when the sun is far away, near the S. tropic. The winter, therefore, is the rainy season, while the long summers are usually rainless. In the N. hemisphere, Cal., Algeria, a part of Pal., the old Babylonia; in the S. hemisphere, a part of Chili, the Cape Colony, and the greater part of Australia, belong to the zone of winter rains.

**Belt of Equinoctial Rain.**—The sun advancing to the equator, the return trades fall farther up, in the lats. of 35° to 45°. In this belt the winter rains diminish, the summers cease to be entirely dry, and most abundant rains fall about the time of the equinoxes, especially in the autumn. This is the régime of the rains in It., Gr., and Asia Minor.

**Belt of Perennial Rains.**—At the time of the solstice the equatorial winds reach the high lats. and bring copious rains, which cause a slight increase in the warm season. This is the region of perennial rains with a maximum in summer: Central and N. Europe, Fr., Ger., and the surrounding countries. In the polar regions the summer is also the wet season, but the long, sunless winters are dry and clear.

These gen. laws, however, are often considerably modified by the structure of the continents, the local features, and the climatic situation of the various countries in each belt. Cal., for instance, and the S. States E. of the Rocky Mts., are on the belt of winter rains; and still the régime of their rains is entirely opposite. While Cal. has the normal winter rains with rainless summer, the S. Atlantic States and the Valley of the Miss. have their maximum of rain in mid-summer. The quantity of rain is no less different. Los An-

geles has hardly 10 inches, while the lower Valley of the Miss., under the same lat., has no less than 50 or 60 inches. San Francisco has 23 inches, against 42 in the Atlantic States in the same parallel. Moreover, the amount of rain on the Pacific coast increases northward, and the régime of winter rains goes far beyond its natural limits to the 40th degree of lat.; while in the E. the quantity of rain decreases toward the N., according to the gen. law. This remarkable anomaly in the rains of the S. States is explained by that vast indentation forming the Gulf of Mex., which, like a great boiler, supplies the return trades that prevail throughout the summer with a large amount of vapors. These fall in copious showers on all the E. portion of the U. S., increase considerably the total amount of rain, and entirely obliterate the dryness of the summer, which usually characterizes the climate of these lats.

The situation and altitude of mt.-chains, and especially their direction in regard to the winds bearing vapors, has a great influence on the distribution of rain. No better example can be given than the effect of the long chain of the Andes on the condensation of rain. In the equatorial part, as far S. as their great bend at Punta Parina, both slopes are plentifully watered and clothed with a dense vegetation of forests; for here the frequent showers of the equatorial zone of calms fall equally on both sides. From Punta Parina to the S. tropic the E. side has an abundance of drenching rains and magnificent forests, while the Pacific slope is a rainless and parched dist. This is the region of the regular trade-winds coming from the Atlantic, whose vapors are condensed on the E. slope, leaving the W. rainless. Farther S., in Chili, the return trades from the N. W. water again the W. coast during the winter months, while the E. coast remains dry. Beyond the 40th parallel, the cool W. and S. W. winds prevailing in these lats. strike the W. slope of the chain, which nearly all the yr. is enveloped in clouds, and receives a quantity of water full as great as the tropics, while on the other side the Patagonian plains receive but a scanty supply. In N. Amer. the high border-chains from Or. to the Alaska peninsula, which bend like a gigantic arm, catching the return trade-winds of the Pacific, receive an amount of rain greater than any part of the continent, while the E. side of these highlands has but a stinted share of the precious element. In Europe the mts. exposed to the onset of the S. W. return trades, as those of the Brit. Isles and Scandinavia, condense an amount of rain often double that which falls in the E. portions of the same countries. In India the W. coast, in Malabar, has its rainy season during the S. W. monsoon, and the quantity of rain, as in Mahabuleswar, is 10 times greater than on the plateau E. of the mts. On the coast of Coromandel the rain comes by the N. E. monsoon at the opposite season. Extensive plateaux, increasing the summer heat of their atmosphere, prevent, in a degree, the condensation of moisture. As a rule, therefore, they are scantily provided with rain, and, like our W. highlands and the great plateaux of the Old World, are too often but dry and sterile wastes. ARNOLD GUYOT.

**Rainy Lake**, on the boundary between Minn. and Canada, receives the waters of the Nameken and many other rivers, and discharges its own waters through Rainy Lake River into Lake of the Woods. Elevation, 1035 ft.

**Rai'sin** [remotely from Lat. *racemus*, a "bunch of grapes"], dried grapes, the fruit of the sweeter sorts of grapes, dried on lines in the bunch or spread upon platforms in the sun, or over-ripened and allowed to wither on the vine, the stalk half cut off. They are dipped after drying into a lye of grape-wood ashes or soda and water, slightly salted and mixed with a little oil. Then they are drained and dried again. The sweet muscatel, the sultana, etc. are the varieties employed. Cal. produces many R. One kind of currant is a small variety of R.

**Raj'ah** [Hind. *rājā*, a "king"], a title of many princes in the East, assumed by many of the Rajpoot caste, and by the great landowners, even of low caste. Many princes have assumed the title *mahārājā*, or "great rajah."

**Raj'poot** [Hind. *rajaputra*, "king's son"], a name assumed in India by the Kshatriyas or warrior caste. The R. destroy nearly all their female offspring and marry into other tribes; hence their stock, originally Aryan, is now mixed. The caste numbers several millions.

**Rakóczy**, rah'kót-se, a celebrated Hungarian family, extinct in the male line. FRANCIS II., prince of Transylvania, b. in 1676, was ed. from 1688 at the Aus. court and in Prague by the Jesuits, but continued a Prot. After his marriage with a daughter of the landgrave of Hesse he lived on his estates in Upper Hungary, but, suspected of entertaining connections with the discontented party in Hungary, he was carried to Vienna in 1701 and confined in a dungeon. He escaped, fled to Poland, and lived in retirement until in 1703 he joined the Hungarian revolutionists. In 1705 he was placed at the head of the Hungarian confederacy; in 1707 elected prince of Transylvania, supported by Louis XIV. and Peter the Great. Nevertheless, Count Pálffy reconciled the Hungarians and the house of Aus. by the Peace of Szatmár (1711). R. refused to accept the amnesty offered him by Aus. D. Apr. 8, 1733. He wrote *Mémoires sur les Révolutions de Hongrie*.

**Rale**, rahl (SÉBASTIEN), b. in Franche-Comté, Fr., in 1658; went to Canada as a missionary 1689; labored at the Abenaki mission of St. Francis, near the falls of the Chaudière, and among the Ill. Indians, and settled in 1695 at Norridgewock on the Kennebec River, Me. He built a ch., converted many of the Abenaki Indians, learned their lang., and acquired so great an influence that he was believed by the Eng. settlers to be the cause of the frequent border forays. A price was set on his head, and his church was burned by Capt. Hilton in 1705, and having been rebuilt, was again destroyed in 1722, when the missionary escaped to the woods, but his papers were carried off. He was shot Aug. 2, 1724. Among his papers carried off in 1722 was an Abenaki dictionary.



**Raleigh**, raw'le, city and R. R. centre, cap. of N. C. and seat of justice of Wake co., 6 m. from the river Neuse, in about the geographical centre of the State. R. was selected as the cap. of the State in 1792. It is the seat of all



State Capitol (Raleigh, N. C.).

the prin. public buildings of the State, including the capitol, insts. for the insane, the deaf, dumb, and blind, and the State penitentiary; there is also a U. S. c.-h. and P. O. building, of white granite. R. is an extensive cotton-mart. Pop. 1870, 7790; 1880, 9265; 1885, about 11,500.

**Ralegh**, or **Ralegh** (Sir WALTER), b. at Hayes, parish of E. Budleigh, Devonshire, Eng., in 1552; was entered as a commoner at Oriel Coll., Ox., about 1568; enrolled himself in a volunteer corps of auxiliaries commanded by his relative, Henry Champenoun, 1569, and passed several yrs. fighting in behalf of the Huguenots in Fr.; served under Sir John Norris, and afterward under the prince of Orange, in the Netherlands 1576-79. He presented himself at court 1582; obtained the favor of Elizabeth, and received from her a patent for discoveries and colonization in N. Amer., by virtue of which an expedition sailed from Eng. Apr. 13, 1584, and explored Pamlico and Albemarle sounds in the summer of that yr. Elizabeth bestowed upon the newly discovered region the name of Virginia, and conferred knighthood upon R. 1585, who in the course of the yr. was made lord warden of the stanneries and seneschal of the cos. of Cornwall and Devon; took his seat in Parl. for Devonshire; obtained the passage of a bill confirming his proprietary rights, and despatched to Va. an expedition of 7 vessels and 108 colonists under Sir Richard Grenville, which made a settlement on Roanoke Island. Reinforcements were sent in the 2 following yrs., but the enterprise failed, the chief practical result being the introduction of tobacco and potatoes into Eng. After suffering a loss of \$40,000, R. transferred his patent to a company of merchants (1587), and was partially indemnified by a royal grant of the confiscated lands of Babington Mar. 1587. He took an active part in the preparations for repelling the Sp. Armada; accompanied Sir Francis Drake in his expedition to Port. 1589. In 1590 he equipped a fleet of 13 vessels, and with Frobisher cruised successfully against Sp. vessels in the W. I.; in 1592 he organized an expedition of 5 vessels, with which he sailed from Plymouth Feb. 9, 1595, explored the coasts of Guiana, and ascended Orinoco River, and on his return pub. *The Discovery of the Large, Rich, and Beautiful Empire of Guiana*. He served as rear-admiral at the taking of Cadiz, where he was wounded, June 1596; was readmitted at court May 1597; sailed with the earl of Essex to the Azores in the same yr. and took Fayal, but quarrelled with his commander and contributed to the ruin of Essex; went as ambassador to the Netherlands 1600; lost favor at court on the accession of James I.; was accused of conspiring to raise Lady Arabella Stuart to the throne, committed to the Tower in July, and condemned to death at Winchester Nov. 17, 1603; was kept 13 yrs. in the Tower, during which time he wrote and pub. his prin. work, *The Hist. of the World* (1614); recovered his liberty, though not his pardon, through the influence of Villiers Jan. 30, 1616; obtained from James a commission as admiral, and sailed with a fleet of 14 ships for the discovery of his promised El Dorado in Guiana Mar. 28, 1617; landed at Plymouth on his return, June 1618; was imprisoned on complaint of the Sp. ambassador, Gondomar, in consequence of his conduct in Guiana, and it having been decided by the judges that the sentence of death pronounced in 1603 was still valid, he was executed at the palace yard, Westminster, Oct. 29, 1618. See biographies by J. A. St. John and Edward Edwards. PORTER C. BLISS.

**Rāma**. See RĀMĀYANA.

**Rāmādan**, the 9th month of the Mohammedan yr., during which Mohammed is said to have received his first revelations. It is observed as a period of strict fasting. From dawn until sunset of each day it is forbidden to eat, drink, smoke, bathe, smell perfumes, or indulge in any bodily pleasures. As the Mohammedan yr. is strictly lunar, this month begins each yr. 11 days earlier than it did the preceding one, so that in a cycle of 33 yrs. R. occurs successively in each of the seasons.

**Rāmāh** [Heb. *Ramah*, "height"], the name of several places in Pal., 2 of which are historically interesting and important. One of these, first mentioned in Josh. xvii. 25, and identified by Robinson in 1838, is on the top of a high hill about 5 m. N. of Jerusalem. It belonged to the tribe of Benjamin. The other, where Samuel was born (1 Sam. i. 1), has not yet been identified with certainty.

**Rāmāyana**, the greatest Indian epic, composed at least 5 centuries after the reduction of the Vedic hymns into written characters. The old religion, inculcated by the *Rig Veda*, had in the process of time become altered in its

fundamental principles. The anc. worship of elements was superseded by the worship of heroes. The valiant Rāma and the 5 noble sons of Pandu were extolled in the place of the cloud-compeller and the dispenser of warmth.

The *Rāmāyana* means "The Sojourn of Rāma." Sans. was still a spoken lang. when it was composed. The date of its composition may perhaps be most safely placed at 250 B. C. Some portions of it may, however, have been added to the main work long after this early date. Yet the poem, as a whole, is the production of one poet, Valmiki. Valmiki was a rishi of the Vedic period. His name signifies "white ant-hill." It is still a disputed question whether Valmiki was a real historical personage, just as everything about these anc. poems is disputed, especially their precise date. We know that the *R.* is the work of one author, but it is a difficult question to decide whether Valmiki was the strange name of that author. At the time when it was composed the art of writing was unknown among the Aryans of N. India. So the poem was recited and sung from memory, and handed down from mouth to mouth. In the course of time, on account of this, several accretions added to the bulk of the poem, but as a whole the *R.* has wonderfully preserved its distinctive character intact. It contains 24,000 verses. It is divided into 7 books. The poem is in no way disjointed. It has but one aim and end—viz. the hist. of Rāma. The episodes it contains are few and far between, and do not seriously distract the attention of the reader. After the first portion of the work has been perused these episodes get still rarer, and the whole latter portion of the poem is one continuous, unbroken narrative. At the present day this truly Homeric poem, in the various vernacular dresses it has assumed throughout India, is undoubtedly the chief folk-song of the Hindoos. [From orig. art. in *J.'s Univ. Cyc.*, by R. C. CALDWELL.]

**Rambouillet**, ron-boō-yā', **Hôtel de**, the name generally given to a social circle which for more than half a century gathered around Catherine de Vivonne, marquise de Rambouillet, and her daughter, Julie d'Angennes, duchess de Montausier. Catherine de Vivonne was b. in 1588 at Rome, and married in 1600 to the marquis de Rambouillet. When she was presented at the Fr. court she found its tone and manners so coarse and frivolous that she determined to form a court of her own. She succeeded; her house soon became the place where all who had genius, wit, learning, talent, or taste assembled, and from these reunions originated the Fr. Acad., the highest authority of Fr. lit., and the *salons*, the most prominent feature of Fr. civilization.

**Rameau**, rah-mō' (JEAN PHILIPPE), b. Sept. 25, 1683, at Dijon, where his father was an organist; travelled from 1701 to 1717 in It. and S. Fr. as violinist in the orchestra of a troupe of actors; was appointed organist successively in Lille, Clermont, and Paris, and pub. *Traité de l'Harmonie, Nouveau Systeme de Musique théorique, et Dissertation sur les différentes Methodes d'Accompagnement*. In 1732 his opera *Hippolyte et Aricie* had complete success, and he then composed about 20 operas and ballets, beside minor pieces of music. D. Sept. 13, 1764.

**Ram'es**, the name of several Egyptian monarchs, signifying the "nascent sun," and used principally by the kings of the 19th and 20th dynasties. Rameses I., the first monarch of the 19th dynasty, restored the native rule in Egypt after the close of the 18th dynasty. He appears to have carried on war with the Khita or Hittites. His grandson, Rameses II., was one of the most remarkable of Egyptian monarchs, and the supposed Sesostris. He ascended the throne at an early age, and at the commencement of his reign directed his arms against Cush or Ethiopia on the S., which he reduced under his sway. The great event of his reign was the campaign against the Khita or supposed Hittites in his 5th yr. R. defeated a confederation of the Khita, the people of Carchemish, the Chalybes, Ilion, and the Dardani at the N. W. of Kadeshon (the Orontes). In his 21st yr. he concluded an extradition treaty with the Khita, and married a daughter of the king of that country. He also appears to have been engaged in wars with the Amorites, Canaanites, the Libyans, including the Tahennu and the Maxyes, and the Syrians. The affairs of the S. attracted his attention, especially the arrangements for the gold-mines, and he built or enlarged the temples at Gerf Hussein, Sebnā, and Abusimbel. Thebes rose to great magnificence during his govt. He reigned upward of 66 yrs. Rameses III. (the Rhampsinitus of Herodotus) was the second king of the 20th dynasty. In his 5th yr. he had to sustain an invasion of the Maxyes and Libyans, led by 5 kings; these he defeated with great slaughter. Three yrs. later a confederation composed of Pelasgi, Teukrians, Sicilians, Daunians, and Oscans landed on the coast of Pal., overran the land of the Khita, Carchemish, Aradus, and the Amorites, and advanced to the E. frontier and mouths of the Nile. R. assembled an army at Taha in Pal. and a fleet on the Nile, and defeated the invaders with great slaughter. He also had a successful campaign against the Libyans, who again invaded Egypt. The South he had also subdued. His later days were disturbed by domestic treason, and after a reign of above 31 yrs. he was buried in the Biban-el-Muluk at Thebes. His successors, Rameses IV., V., VI., VII., and VIII., were insignificant rulers, and the most remarkable event known of the reign of Rameses IX. is a sacrilegious robbery of the tombs of the anc. kings in the 16th yr. of his reign. Rameses X., XI., XII., and XIII. were unimportant and inglorious monarchs. Their reigns are supposed to have ended about B. C. 1000.

The name of Rameses, or Ramessé, was that of the treasure-city built by the Hebs., evidently named after one of these monarchs. [From orig. art. in *J.'s Univ. Cyc.*, by SAMUEL BIRCH, LL.D.]

**Ramie**, rā'm'e, or **China Grass**, the fibre of *Bahmeria nivea*, an Asiatic plant of the order Urticaceæ. This fibre is stronger than hemp, more durable when woven than linen, and almost as lustrous as silk. The goods known as grass-



cloth are made in Chl. from this fibre. Experiments have fully shown the fitness of the soil and climate of our cotton States for the production of R-fibre, superior in quality even to that of Java. It is perennial, requires comparatively little labor and attention, has few insect enemies, and stands a rainy season or a drought with little injury.

**Ram Mohun Roy**, b. at Burdwan, Bengal, about 1774, belonged to a wealthy Brahmanical family; studied Sans., Per., and Arabic; resided for some time in Thibet; learned Eng.; held for 5 yrs. the office of revenue collector in the dist. of Rungpoor; edited the *Bengal Herald* in Eng.; was in 1820 sent to the Brit. court from the sovereign of Delhi. D. at Bristol Sept. 27, 1839. Much attention was attracted in 1820 to his *Precepts of Jesus, the Guide to Peace and Happiness*, written from a Unit. standpoint.

**Ra'moth Gil'ead** (Heb. "heights of Gilead"), first mentioned in Deut. iv. 43, a Levitical city and one of the 3 cities of refuge on the E. side of the Jordan. Ahab, 7th king of Israel, fell in battle there about 897 B. C., and his son Jehoram, 9th king of Israel, was severely wounded there about 884. Its identification with *Es-Sall* is now disputed.

**Ram'plon**, the *Campanula rapunculoides* (order Campanulaceae), a perennial European herb cultivated in gardens for its white, carrot-shaped root, and for its leaves, which are used in salads. It is principally grown in It. and Fr., but little if at all in the U. S.

**Rampoor'** is the cap. of Bissar (Biss-ahir), a feudatory state in the Brit. Himalaya which stretches on both sides of the Sutlej River, borders N. on Chl. Thibet, and has 74,250 inhabs., mostly engaged in commerce with Thibet. The religion is Brahmanism; the first caste, the Rajpoots; the lang., a corrupted Hindoo.

**Ram'say** (DAVID), M. D., b. in Lancaster co., Pa., Apr. 2, 1749, grad. at Princeton 1765; studied med. at the Univ. of Pa.; settled as a phys. at Charleston, S. C., 1773; served in the war of the Revolution as a field-surgeon; member of the S. C. legislature 1776-83, and of the "council of safety" at Charleston, on the capture of which city he was treated by the Brit. as a hostage and kept 11 months in close confinement in St. Augustine, Fla.; was a member of the Continental Cong. 1782-84, and again 1785-86; acting pres. of Cong. during most of the latter period. Author of a *Hist. of the Revolution in S. C.*, *Hist. of the Amer. Revolution*, *Life of Washington*, *Hist. of S. C.*, *Memoir of Henry Laurens*, and an abridgment of *Universal Hist.* During the last 14 yrs. of his life he was a member of the S. C. legislature, and for much of the time pres. of the senate. D. May 8, 1815.

**Ramsay** (GEORGE D.), b. in Va. in 1800, grad. at W. Pt. 1820; in the war with Mex. served as ordnance officer of the army of occupation; was in the battle of Monterey, and was Taylor's chief of ordnance June 1847 to May 1848. Subsequently commanded various arsenals, and in Sept. 1863 became chief of ordnance with rank of brig.-gen. Retired Sept. 1864, though continued on inspection duty and in command of Wash. arsenal until 1870. D. May 23, 1882.

**Ramsay** (NATHANIEL), b. in Pa. May 1, 1771, brother of David, grad. at Princeton; studied law and became a member of the bar of Cecil co., Md. Soon after the breaking out of the Revolutionary war he entered the army, and was in active service for the greater part of the contest. At the battle of Monmouth he commanded a Md. regiment. Washington, when Pres., made R. marshal, and soon after naval officer, at Baltimore. D. Oct. 23, 1817.

**Ram'sey** (ALEXANDER), b. near Harrisburg, Pa., Sept. 8, 1815; M. C. from Pa. 1843-47; appointed by Pres. Taylor gov. of Minn. Terr. 1849, he negotiated treaties with the Dakotas and Chippewas, acquiring for the U. S. large tracts of land; was mayor of St. Paul 1855, gov. of the State 1858-62, U. S. Senator 1863-75, and sec. of war 1879-81.

**Ramus** (PETER), (PIERRE DE LA RAMÉE), b. at Cuth, dept. of Somme, Fr., in 1515, in humble circumstances; studied under great difficulties at the Univ. of Paris, and pub. in 1543 his *Animadversionum in Dialecticam Aristotelis Libri XX.* and *Institutionum Dialecticarum Libri III.*, in which he attacked Aristotle and the scholastic method of philosophizing. The univ., the Ch., the Parl., took great offence; the books were condemned, and the author forbidden to teach. By the favor of the king he was nevertheless afterward appointed at the univ. In 1561 he embraced Protestantism, and was killed during the massacre of St. Bartholomew, Aug. 24, 1572.

**Ram, Water.** See HYDRAULIC RAM.

**Ranéé**, FOUS-SÁ, (DOMINIQUE ARMAND JEAN LEBOUTILLIER), b. at Paris Jan. 9, 1636; enjoyed while yet a boy several large ecclesiastical benefices, and was ordained a priest in 1651, but led nevertheless a very dissipated life until in 1660 he gave all his property to the poor and retired to the monastery of La Trappe, where he introduced rules of the severest asceticism and founded the order of the Trappists. D. Oct. 27, 1700. He wrote *Traité de la Sainteté et des Devoirs de la Vie monastique* and *Relation de la Vie et de la Mort de quelques Religieux de la Trappe*.

**Rand** (ASA), b. at Rindge, N. H., Aug. 6, 1783, grad. at Dartmouth 1806; was for some yrs. pastor of a Congl. ch. at Gorham, Me.; edited the *Chr. Mirror* at Portland 1822-25; afterward conducted at Boston the *Recorder* and the *Youth's Companion*; established in 1833 the *Lowell Observer*; lectured against slavery; was pastor of chs. at Pompey (1837-42) and Peterborough, N. Y., and wrote several vols. of sermons and polemical theol. D. Aug. 24, 1871.

**Rand** (BENJAMIN HOWARD), M. D., b. at Phila., Pa., in 1827, grad. at the Jefferson Med. Coll. 1848; became prof. of chem. in the Phila. Med. Coll. 1853 and in the Jefferson Med. Coll. 1864; has written for med. periodicals; edited *Metcalf's Caloric*, and wrote *Med. Chem. for Students and Elements of Med. Chem.* D. Feb. 14, 1883.

**Rand** (ISAAC), M. D., b. at Charlestown, Mass., Apr. 27, 1743, grad. at Harvard 1761; accompanied Prof. Winthrop to Newfoundland in that yr. to observe the transit of Venus; studied med.; was pres. of the Mass. Med. Society

1798-1804; author of several med. essays and treatises. D. Dec. 11, 1822.

**Rand'all** (ALEXANDER WILLIAMS), b. in Montgomery co., N. Y., Oct. 1819; studied law; settled at Waukesha, Wis., 1840; became P. M. of that town and its rep. in the legislature; was judge of the second dist. 1856, gov. of Wis. 1857-61, and rendered eminent service in raising volunteers for the war; minister to It. 1861-65, assistant P. M.-gen. 1862-66, and P. M.-gen. 1866-69, after which he practised law at Elmira, N. Y. D. July 25, 1872.

**Rand'all** (ARCHIBALD), b. in Pa. 1800, admitted to the bar 1818; appointed judge of common pleas 1834, judge of the U. S. dist. court 1842, and (in addition) of the circuit court of E. Pa. 1844; was distinguished for his decisions in bankruptcy cases. D. May 30, 1846.

**Rand'all** (GEORGE MAXWELL), D. D., b. at Warren, R. I., in 1810, grad. at Brown Univ. 1835; was for some yrs. a Unit. clergyman; afterward ministered to an Epis. ch. at Fall River; rector of the Ch. of the Messiah 1844-65; became known as a champion of his Ch.; edit. the *Chr. Witness* and wrote tracts; was in 1835 chosen missionary bp. of Col., having jurisdiction also in Wyo. and N. M., and organized many chs., schools, and sems., beside Jarvis Hall at Denver, the first collegiate inst. in Col. D. Sept. 28, 1873.

**Rand'all** (HENRY STEPHENS), LL.D., b. in Madison co., N. Y., 1811, grad. at Union Coll. 1830; studied law and was admitted to the bar, but never practised; became sec. of state and supt. of public instruction of N. Y. 1851; wrote several vols. on agriculture, sheep-husbandry, and education, beside official reports on education; was for some yrs. one of the editors of Moore's *Rural New Yorker*, and author of *Life of Jefferson*. D. Aug. 14, 1876.

**Rand'all** (JAMES RYDER), b. at Baltimore Jan. 1, 1839, ed. at Georgetown Coll. D. C. His health failing, he was compelled to leave this inst. before graduation, and sought its recuperation by travel. He visited several parts of S. Amer., and returned not long before the outbreak of the c. war. In this he cast his fortunes with the people of the South. As his constitution was still frail and delicate, he resorted to his pen in the promotion of the cause he had espoused. His "Maryland, my Maryland!" was the Marcellaise of the Confed. cause. Shortly after the close of the war Mr. R. became ed.-in-chief of the *Constitutionalist* at Augusta, Ga.

**Rand'all** (SAMUEL J.), LL.D., b. at Phila. Oct. 10, 1823; became a merchant at Phila.; was for several yrs. member of city councils; served in the State senate 1858-59; was elected to Cong. as a Dem. 1862, since which time he has been continuously re-elected; was speaker of the U. S. House of Reps. from Dec. 4, 1876, to Mar. 4, 1881.

**Rand'olph**, on R. R., Norfolk co., Mass., 15 m. S. of Boston, has a fine public library building and an endowed high school, both founded by private individuals. Pop. tp. 1870, 5642; 1880, 4027.

**Rand'olph**, on R. R., Cattaraugus co., N. Y., 18 m. W. of Salamanca, has the Chamberlain Inst. and a female sem. Pop. 1880, 1111.

**Randolph** (EDMUND), b. in Va. Aug. 10, 1753; studied law; entered the Continental army at Cambridge as an aide to Washington Aug. 1775; represented Williamsburg in the Va. convention of May 1776; became atty.-gen. of the State in July; was a delegate to the Continental Cong. 1779-83, and to the convention which formed the Federal const. 1787; presented to that body the so called "Virginia plan," but without success; refused to sign the const., though he advocated its ratification in the Va. convention; was elected gov. of Va. 1788; was the first atty.-gen. of the U. S. on the organization of the Federal gov. 1789; succeeded Jefferson as sec. of state 1794, and resigned in Aug. 1795, in consequence of disapproval by his colleagues of his dealings with the minister of the Fr. republic, on which subject he pub. a *Vindication*. D. Sept. 12, 1813.

**Randolph** (GEORGE WYTHE), son of Gov. Thomas M. Randolph and grandson of Thomas Jefferson, b. at Edge Hill, Va., about 1820, ed. at the Univ. of Va.; was in early life an officer of the U. S. N.; became a lawyer at Charlottesville 1845, and subsequently at Richmond; entered the Confed. military service 1861; was made brig.-gen.; was sec. of war from Mar. to Dec. 1862, and resided in Fr. as agent of the Confed. treas. dept. 1863-65. D. Apr. 4, 1867.

**Randolph** (JOHN) of Roanoke, b. in Chesterfield co., Va., June 2, 1773, descended from Pocahontas; lost his father, from whom he inherited a large estate, in infancy; was ed. by tutors; spent some time both at Princeton and at William and Mary Coll.; studied law at Phila.; was elected to Cong. as a Dem. in 1799, and re-elected, with the exception of 2 terms, until 1825; chairman of the committee of ways and means 1801; chief manager of the impeachment of Judge Chase 1804; became conspicuous for his wit, eloquence, and eccentricities; was prominent as a champion of State Rights and as a partisan of Jefferson's administration until 1806, when he separated from his political associates, opposed the election of Madison, the embargo, and the war with Eng., in consequence of which he was defeated in 1812 in his candidacy for re-election, but was returned in 1814; opposed the Mo. Compromise; visited Eng. in 1822, and again in 1824; sat in the U. S. Senate 1825-27; had a duel with Henry Clay Apr. 8, 1826, growing out of his denunciation of the political alliance between the latter and J. Q. Adams; supported Jackson in the election of 1828; sat in the convention of 1829 for revising the const. of Va.; went as minister to Rus. 1830, but spent most of his time in Lond.; returning in 1831, was again elected to Cong. 1832, but d. before taking his seat. By his will he emancipated and provided for his slaves, numbering about 300. (See his *Life*, by HUGH A. GARLAND.) D. June 24, 1833.

**Randolph** (PEYTON), b. in Va. 1723, grad. at William and Mary Coll.; studied law at the Temple in Lond.; was appointed in 1748 royal atty.-gen. for Va.; was elected to the house of burgesses; became chairman of a committee







tract of 27,000 acres on Wabash River, Ind., and built up there a settlement called New Harmony. The Harmonists having become involved in pecuniary difficulties, the lands were sold in 1824 to Robert Owen, by whom the socialistic experiment was tried on another basis. R. and his followers removed to Beaver co., Pa., and founded the town of Economy (now Harmony), 17 m. N. W. of Pittsburg, where the community still exists. D. Aug. 7, 1847.

**Rapp (JEAN)**, COUNT, b. at Colmar, Alsace, Apr. 29, 1772; entered the army in 1788; was aide-de-camp to Desaix in 1794 and to Bonaparte in 1800; became brig.-gen. in 1804, and gen. of division after the battle of Austerlitz; was appointed gov. of Dantzic, and held the city in 1813 for 12 months against the Prus. and Rus.; joined Nap. during the Hundred Days; retired to Switz. after the second restoration; returned in 1818 to Fr. D. Nov. 8, 1821. Wrote *Mémoires*.

**Rappahan/cock River** rises in the foot-hills of the Blue Ridge, near the N. W. border of Fauquier co., Va., and flows in a S. E. course, generally parallel to that of the Potomac, reaching Chesapeake Bay through a broad estuary. Its largest branch is the Rapidan. Below Fredericksburg it is a noble tidal stream.

**Rask (RASMUS CHRISTIAN)**, b. in Denmark Nov. 22, 1787, studied at the Univ. of Copenhagen. In 1808 he pub. his *Introduction to the Study of the Icelandic Lang.* In 1813 he began his extensive travels, which lasted to 1823; spent 2 yrs. in Iceland, the result of which was his *Recherches concerning the Origin of the Icelandic Lang.*; spent 1 yr. in Stockholm, where he pub. a gram. of the A.-S. lang. and studied Finnish; proceeded by St. Petersburg to Astrakhan, through Pers., and to India, which he traversed in its whole length, returning home, by Ceylon, in 1823. He wrote essays on the Zend lang., the genuineness of the *Zend-Avesta*, the anc. Egyptian and Heb. chronology, and gave grams. of the Cingalese, Frisian, Eng., and Sp. langs. His richest work is his *Introduction to a Scientific Orthography of the Dan. Lang.* D. in Copenhagen Nov. 14, 1832.

**Raskolniks**. The Raskolniks of Rus. are the members of the *Raskól*, or "schism," the name being derived from *raskolot*, to "cleave." The schism dates officially from the yr. 1666. The R. objected to the alterations in and the printing of the ch. books, to the form of the cross, as well as the method of signing the cross adopted by the authorities, to the double instead of triple repetition of the hallelujah in the ch. service, and to various other matters of equal importance. They form the most industrious, honest, and sober portion of the Rus. community. They belong exclusively to "Great Russia," and are chiefly found among the most energetic of the Rus. people. In addition to the main body of the R., the Raskol comprises a number of minor sects, mostly of foreign origin. Some of these are respectable, such as the *Molokane* and the *Stundists*, both of which bodies hold what may perhaps be called Prot. doctrines. But some of the sects are of a terrible nature. The worst have either been crushed by the police or are but rarely met with, such as the *Detoubists*, or "child-killers," who put new-born babes to death in order to insure their salvation, or the *Dukhshichiki*, who kill their friends and relatives, when ill, or the *Sofigates*, who commit suicide by means of fire. Only one of the noxious sects flourishes to any extent. It is illegal, but still it exists. It is that of the *Skoptsy*, or "self-mutilators," a set of gloomy fanatics greatly addicted to money-getting.

**Rasp/berry** [so named because the stalk *raspe* the hand], the common name of those species of *Rubus* (order Rosaceae) which differ from blackberries in having a persistent receptacle, from which the ripe compound fruit slips off, while in the blackberries the receptacle is juicy and becomes a part of the fruit. The European R. is *Rubus Idæus*, and our *R. strigosus* or red R. is very near it. Our black R., black-cap, or thimbleberry, is the *R. occidentalis*. R. are valuable summer dessert-fruits, and are the foundation of many conserves, jellies, etc.

**Ras'tadt**, town of the grand duchy of Baden, Ger., on the Murg, a small tributary of the Rhine, a few miles distant. It is one of the modern fortresses, or "intrenched camps" of the former Ger. confederation. The town is well built; was the residence of the last margraves of Baden, whose palace (planned after that of Versailles) still exists. The place is historically interesting from the treaty of peace (1714) which ended the war of the Sp. Succession, and of the cong. of 1799, which terminated abruptly with the assassination of the Fr. deputies. Pop. 12,356.

**Rat** [A.-S. *ræf*], a name applied to numerous species of the family Muridæ. The best known species are the common brown rat, the black rat, the Florida or cave rat, and the cotton rat of the S. States. The common rat was originally a native of India and Pers., but has become cosmopolitan within recent times. It is generally believed not to have extended into Europe much before the middle of the 18th century, and to have been brought to Amer. about 1775. It was anticipated in its incursions by the black rat, but its superior strength and aggressiveness have driven that species before it, and have now supplanted it in almost all countries. It is very prolific. It is almost omnivorous, feeding upon grains, vegetables, and meat. The black rat is smaller than the brown species, and is much more timid. It also was originally peculiar to Asia, but in the course of time extended its range to many other countries. The Fla. or wood rat is about the size of the brown rat, for which it is often mistaken, but it has much larger eyes, and the details of the structure at once define it. Although found in the Middle and W. States, it is most abundant in the S. Atlantic and Gulf States. It is mostly found in the woods, and is chiefly granivorous. The cotton rat is much smaller than the others. It is quite abundant in the S. States, and lines its nest with cotton.

**Ratafi'a** [a word of Malay origin], a name given to a large class of liqueurs, or sweet alcoholic drinks strongly flavored with aromatics.

**Ratio**, rā'she-o [Lat.], the numerical measure of the relation which one quantity bears to another of the same kind. The only way in which 2 quantities can be compared is by division. The operation of dividing one quantity by another of the same kind consists in dividing the *number of times* that any assumed unit is contained in the former by the *number of times* the same unit is contained in the latter. The operation of finding a R. is therefore purely numerical, and the resulting R. is consequently an abstract number. In comparing 2 quantities of the same kind, one is assumed to be known beforehand, and for this reason it is called the *antecedent*; the value of the other is then found by division, and for this reason it is called the *consequent*. Inasmuch as the measure of a quantity is the number of times that it contains some quantity of the same kind taken as a unit, we say that the R. of one quantity to another is the *quotient obtained by dividing the second quantity by the first*. It is to be observed that mathematical writers differ in their methods of using the term *ratio*, some adopting the rule above given, and some defining it to be the *quotient of the first quantity by the second*; and all, however, agree in calling the first quantity the antecedent and the second quantity the consequent. From the meaning of these terms, as explained above, the former would seem to be the more natural definition of the term. It certainly has the advantage of *uniformity of meaning*, which is no minor quality, inasmuch as all writers regard the R. of a geometrical progression as the quotient of the second term by the first. No error can arise from the adoption of either definition, provided the meaning of the term is fully understood and uniformly adhered to.

**Rationalism** [Lat. *ratio*, "reason"] is that tendency in modern thought which claims for the unaided human reason the right of deciding in matters of faith. It asserts the prerogative of the intellect to be supreme arbiter in all depts. of revealed truth. It requires certainty as the condition of its favor, and promptly rejects what does not come before it with all the exactness and clearness of a mathematical demonstration. The scene where R. has exerted its chief sway is Ger.

**Rat'isbon, or Regensburg**, an old town of Bavaria, on the right bank of the Danube, opposite the influx of the Regen, is surrounded with walls pierced by 6 gates, and has a fine cathedral begun in 1275, a town-house, a magnificent stone bridge over the Danube, 1100 ft. long, and a monument of Kepler, who was born here. Gold, silver, brass, iron, steel, earthen, and porcelain ware, leather, tobacco, and glass are manufactured here. Pop. 34,516.

**Raton** New Mex. See APPENDIX.

**Rat-Mole**. See MOLE-RAT.

**Ratram'nus**, a learned monk of the famous abbey of Corbey, near Amiens, best known by his treatise *De Corpore et Sanguine Domini*, written to confute the transubstantiation doctrine of Paschasius Radbert (about 844 A. D.). He d. after 868.

**Rattan** [Malay, *rotan*, "cane"], the slender stem of various plants of the genus *Calamus*, etc. of the Palm family, climbing and trailing plants, often many hundreds of feet in length. Some produce good fruits, but the chief use is that of the stalks. From Borneo to Bengal great quantities are gathered for the markets. In Chi. they are used for a great variety of purposes; mats, sails, and cables are among the articles made from them. In this country they are used for making chairs, baskets, canes, umbrella ribs, etc., and splinters of R. are used in carriage-trimming, etc.

**Rattazzi**, raht-tah't-se (URBANO), b. at Alessandria, It., June 29, 1808, studied law at Turin; was elected a member of the Sard. Parl. in 1848; opposed the Aus. authority in It., and became a member of the cabinet of Gioberti, but retired immediately after the battle of Novara; entered the cabinet of Cavour (1853-58) as minister of justice, and carried the law for the dissolution of the monasteries; formed a cabinet in opposition to Ricasoli in 1862, and again in 1867, but only for a few months. D. June 5, 1873.

**Rat'tlesnake**, a name applied to all the species of the family Crotalidæ provided with a rattle to the tail. The rattle is composed of articulated horny segments in varying number—from 2 or 3 up to 30 or more. The species of the group are peculiar to Amer., and are especially numerous in the arid regions of the S. W. Terrs. of the U. S. Fifteen species are found within the limits of the U. S. The venom of the R. varies in intensity with the climate, season, and the condition of the animal. No certain antidotes to the venom are known. The best are believed to be active stimulants, among which alcoholic liquors are the most esteemed.

**Rau (CHARLES)**. See APPENDIX.

**Rauch**, fowk (CHRISTIAN), b. at Arolsen, Waldeck, Ger., Jan. 2, 1777; received his first instruction in art at Cassel and Berlin; resided for several yrs. at Rome and Carrara in intimate intercourse with Thorwaldsen, Canova, and W. von Humboldt; settled subsequently at Berlin as prof. at the acad. D. in Dresden Dec. 8, 1857.

**Rauch (FREDERICK AUGUSTUS)**, D. D., b. at Kirchbracht, Hesse-Darmstadt, July 27, 1806, ed. at the univs. of Marburg, Giessen, and Heidelberg; was for some time prof. in the 2 latter insts.; came to the U. S. 1831; was ordained to the ministry of the Ger. Reformed Ch. 1833; prof. of Ger. at Lafayette Coll., Pa.; prin. of high schools and prof. of biblical lit. at York and at Mercersburg, and pres. of Marshall Coll. from 1836 until his death, Mar. 2, 1841. Wrote *Psychology*.

**Raumer**, row'mer, von (FREDERICH LUDWIG GEORG), b. at Wörlitz, duchy of Anhalt, Ger., May 14, 1781; studied law at Berlin, Halle, and Göttingen; received employment in the civil service of the Prus. govt. in 1801; was appointed prof. of history at Breslau in 1811 and at Berlin in 1819; was a member of the Ger. Parl. at Frankfurt in 1848, and afterward of the Prus. upper house. D. at Berlin June 13, 1873. Wrote *Geschichte der Hohenstaufen und ihrer Zeit*, *Geschichte Europas seit dem Ende des 15. Jahrhunderts*, *Amer. und the Amer. People*, etc.

**Ravalliac**, rah-vahl-yahk' (FRANÇOIS), b. at Angoulême,



dept. of Charente, Fr., in 1578; was first clerk to a notary, then a schoolmaster; subsequently imprisoned for debt; entered the order of the Feuillants, but was expelled as a visionary and fool, and became noted for his fanatical hatred of the Protos, which feeling by degrees concentrated itself on the person of Henry IV., their former leader. On the afternoon of May 14, 1610, the king rode out to pay a visit to Sully, who was sick in bed. R. jumped up on the hind wheel of the coach and plunged a dagger into the heart of the king, who d. immediately. Executed May 27, 1610.

**Raven** [A.-S. *hræfen*] differs from the crow chiefly by its larger size and the lanceolate feathers of its chin and throat. It is found over the greater part of the N. part of the Old World, as well as N. Amer., although it is quite rare on the Atlantic seaboard. It generally associates in pairs, but sometimes is to be seen in small flocks. It builds a rude nest, chiefly on cliffs, and deposits therein from 4 to 6 eggs of a light greenish-blue, blotched with brownish spots. It is capable to some extent of mimicking the human voice.

**Ravenna**, city of N. It., chief town of the prov. to which it gives its name, near the Adriatic, in lat. 44° 24' N., lon. 12° 10' E. It is in communication by rail with all the great towns of the Peninsula, and by water, through the canal Naviglio, with Venice, Trieste, etc. The city is about 3 m. in circumference, but nearly half the inclosed space is occupied by vineyards. The great attraction of R. is the fact that here are preserved so many monuments of the dark and stormy ages of transition from the Roman to the Teutonic. The oldest of these monuments now existing are the cathedral of St. Orso, founded toward the end of the 4th century, and the baptistry, founded a very few yrs. later. SS. Nazaro e Celso, found a magnificent mausoleum of Galla Placidia, was founded by that empress in 440. The ch. of San Francesco, first dedicated to St. Peter, is also of the 5th century; Sant' Apollonia is of about the same period; and there are several other more or less ruined chs. of the same age. The archiepiscopal palace also contains a chapel of the 5th century. Of the 6th century should be mentioned St. Apollinare in Classe, outside the town, the most striking of the anc. R. basilicas, as a specimen of the purest early Chr. art, and the basilica of St. Apollinare Nuovo, built by the Arian Theodorio. The noble basilica of San Vitale is of a somewhat later period, but still nearly as old as Santa Sophia, after which it was modelled. Outside the walls, about ½ m. to the N. E., stands the mausoleum of Theodorio, now commonly called Sta. Maria della Rotonda. R. is comparatively poor in mediæval monuments, the ch. of Santa Maria in Porto Fuori, of the 11th century, being the most interesting, but it contains one great memorial of that time—the ashes of Dante. The Biblioteca Comunale, in the old Carthusian monastery, contains upward of 50,000 vols. and 700 MSS., the most precious of which is an Aristophanes of the 10th century; there is also a MS. of Dante of the 14th century, and an inferior one a little older. The museum, beside being rich in vases, bronzes, majolicas, etc., contains a very choice collection of medals, anc. and mediæval. The Acad. of Fine Arts possesses, among other things of interest, many old Byzantine pictures and a beautiful mosaic pavement. Tradition gives R. an origin greatly anterior to Rome itself. But it was under the rule of the great Ostrogoth Theodorio that the city rose to its highest point of splendor (497-553). At present it forms a part of the kingdom of It., and has a pop. of 60,573.

**Ravenna**, R. R. June, cap. of Portage co., O., 38 m. S. E. from Cleveland. Pop. 1870, 2188; 1880, 3255.

**Ravenscroft** (JOHN STARK), D. D., b. at Blandford, Va., 1772; was carried to Scot. in infancy; returned to Va. 1788; studied at William and Mary Coll.; was admitted to the bar, but ultimately studied theology; took orders in the Epis. Ch. 1817; was a minister in Mecklenburg co., Va., 1817-23, then became bp. of N. C. and pastor of chs. successively at Raleigh and at Williamsburg, Va. D. Mar. 5, 1830.

**Ravenswood**, part of L. I. City, Queens co., N. Y., on E. River, at E. terminus of a projected bridge from 79th st., New York. Pop. 1870, 1536; 1880, included in L. I. City.

**Rawdon-Hastings** (FRANCIS), Marquis of Hastings and earl of Moira, b. in Ire. Dec. 7, 1754, ed. at Ox.; entered the army 1771; was sent to Amer. 1773; was present at the battle of Bunker Hill as capt.; participated in the battles of L. I. and White Plains and the attacks upon Fts. Washington and Clinton; was appointed adjutant-gen. with the rank of lieutenant-col. 1778; soon afterward raised in New York a corps called the "Volunteers of Ireland," of which he took command; was made general and sent to the S. States with reinforcements for Cornwallis 1780; took a prominent part at the Battle of Camden, Aug. 16; attacked and defeated Gen. Greene at Hobkirk's Hill, Apr. 25, 1781; relieved Ft. Ninety-Six; fortified himself at Orangeburg; sailed for Eng. Aug. 1781, in consequence of ill-health; was promoted to maj.-gen., and given command of a force of 10,000 men sent to the relief of the duke of York in Flanders 1794; was intrusted with the direction of the expedition to Quiberon 1795; was appointed commander-in-chief of the Brit. forces in Scot. and constable of the Tower of Lond. 1803; became master-gen. of ordnance 1806; was honored with the order of the Garter and appointed gov.-gen. of Brit. India 1813; successfully conducted the Nepal, Pandaree, and Mahratta wars; retired from the gov. of India after an administration of nearly 10 yrs. 1823, and became gov. of Malta 1824. D. Nov. 28, 1826.

**Rawle** (WILLIAM), LL.D., b. at Phila. Apr. 28, 1759; studied law at New York, Lond., and Paris; commenced practice at Phila. 1783; was distinguished for legal, classical, and scientific attainments; became in 1822 chancellor of the Phila. bar, and was the first pres. of the Pa. Historical Society 1826; sat in the State legislature; made by Washington dist. atty. 1791-99; was the chief author of the new civil code of Pa. D. Apr. 13, 1836.

**Rawlins**, Wyo. See APPENDIX.

**Rawlins** (JOHN A.), b. at E. Galena, Ill., Feb. 13, 1831.

The son of a farmer and charcoal-burner, he had but limited opportunities for obtaining an education. At 20 he began to attend school; in Nov. 1854 commenced the study of law, and in 1855 was admitted to the bar, and began practice in Galena; became a Dem. of the Douglas school. While engaged in raising a regiment Gen. Grant offered him a position on his staff as assistant adjutant-gen., with the rank of capt., and with the exception of 2 months, during illness, he was with Grant in all his battles and campaigns; in 1865 he was appointed chief of staff to the lieutenant-gen. with rank of brig.-gen. U. S. A., and later was brevetted major-gen. When Grant was elected Pres., R. was made sec. of war. D. Sept. 6, 1869.

**Rawlinson** (GEORGE), brother of Sir Henry, b. at Chadlington, Oxfordshire, Eng., in 1815, ed. at Swansea and at Ealing School; grad. first class in classics at Trinity Coll., Ox., 1838; became fellow and tutor of Exeter Coll., moderator 1852, public examiner 1854, 1856, and 1868, Bampton lecturer 1859-61; elected Camden prof. of anc. hist. at Ox. 1861, and appointed canon of Canterbury cathedral 1874. Author of several theological works; of *The Five Great Monarchies of the Anc. E. World*, *A Manual of Anc. Hist.*, *The Sixth Great Oriental Monarchy*, or the *Geog., Hist., and Antiquities of Parthia*, and of *The Seventh Great Oriental Monarchy*, treating of the Sassanians.

**Rawlinson** (Sir HENRY CRESWICK), D. C. L., b. at Chadlington, Oxfordshire, Eng., in 1810, ed. at Ealing School; entered the Bombay army 1836; became proficient in the modern Oriental languages, on which account he was sent to Per. Nov. 1839; was sent to Kandahar as political agent 1840; went as political agent to Turkish Ar. 1843; was appointed consul at Bagdad Mar. 1844; became lieutenant-col. in Tur. 1850; returned to Eng. 1855; was knighted and made a director of the E. I. Co. 1856; was M. P. 1858, member of the council of India 1858-59; envoy to Per. with the local rank of maj.-gen. 1859-60; again sat in Parl. 1865-68, after which he was reappointed a member of the council of India; pres. of the Royal Geographical Society 1871-73, and again 1875-76, and pres. of the Society of Biblical Archaeology from its foundation in 1873. He translated the Per. text of the inscriptions of Darius, and edited 5 folio vols. of cuneiform inscriptions; pub. essays on Oriental politics, entitled *Eng. and Rus. in the E.*

**Rawson** (ALBERT LEIGHTON), LL.D., b. at Chester, Vt., Oct. 15, 1829; artist and author; made a pilgrimage from Cairo to Mecca with annual pilgrim caravan in disguise of a Mohammedan student of med.; explored the mounds of the Miss. Valley, visited Central Amer. 1854-55, and wrote *The Crania of the Mound-Builders of the U. S. and of Central Amer.*; travelled in the Hudson Bay terrs. 1863; drew hundreds of sketches, which have appeared in Amer. magazines, and in books on Oriental subjects, and has made translations from the Per. Ar. and It. Author of *The Divine Origin of the Holy Bible*, *The Comprehensive Bible Dict.*, *Antiquities of the Orient*, etc.

**Ray**. See RALFE.

**Ray** (ISAAC), M. D., LL.D., b. at Beverly, Mass., Jan. 1807, grad. at Bowdoin 1827; commenced practice of med. at Portland 1827; removed to Eastport 1829; devoted his attention to the subject of insanity; wrote *The Med. Jurisprudence of Insanity*; became supt. of the State insane asylum at Augusta 1841, and of the Butler Asylum at Providence 1845-66, after which he settled at Phila. Wrote *Conversations on Animal Economy*, *Education in Relation to the Health of the Brain*, *Mental Hygiene*.

**Ray** (JOHN), F. R. S., sometimes written **Wray**, b. at Black Notley, near Braintree, Essex, Eng., Nov. 29, 1627, son of a blacksmith; grad. at Trinity Coll., Cambridge; lecturer on Gr. 1650, and mathematical instructor 1652; took orders in the Ch. of Eng. at the Restoration; devoted himself to bot. and zoology, making extensive tours with Willoughby in G. Brit. and on the Continent; pub. a *Catalogus Plantarum Angliæ* (1670), *Methodus Plantarum Novæ* (1689); edited the *Ornithologia and Historia Piscium* of his friend Willoughby, and pub. his great work, the *Historia Plantarum*. He also prepared a *Collection of Eng. Proverbs*, and valuable *Glossaries of N. and S. Country Words*. He also wrote *The Wisdom of God manifested in the Works of the Creation*, *Discourses concerning Primitive Chaos and Creation*, the *Gen. Deluge*, etc. D. Jan. 17, 1705.

**Ray** (JOSEPH), M. D., b. in Va. Nov. 25, 1807; was self-educated, but by acting as a school-teacher was enabled to study at Washington Coll., Pa., Athens Coll., O., and at the Ohio Med. Coll., where he grad.; became surgeon in the Cin. hospital, prof. of math. at Woodward Coll., Cin. 1834-51, and its prin. from its reorganization as a high school; author of a series of text-books on arith. and algebra. D. Apr. 17, 1855.

**Raymond** (HENRY JARVIS), LL.D., b. at Lima, N. Y., Jan. 24, 1820, grad. at the Univ. of Vt. 1840; gave lessons and wrote for Horace Greeley's *New Yorker* while studying law in New York 1840-41; became assistant ed. of the *New York Tribune* Apr. 1841; attained great rapidity and skill as a reporter. In 1848 he left the *Tribune* and became office-editor of the *New York Courier and Enquirer*; was literary adviser to Harper & Brothers, and the first ed. of *Harper's Magazine*. In 1849 he was elected to the N. Y. assembly; re-elected 1850, and chosen speaker. In 1850 he retired from the *Courier and Enquirer*; spent the winter of 1850-51 in Europe, and on Sept. 18, 1851, issued the first number of the *New York Times*. He took an active part in the Baltimore Whig convention of 1852; was elected lieutenant-gov. of N. Y. 1854; was prominent in the organization of the Rep. party 1856, having been the author of the *Address to the People* issued by the Pittsburg convention; declined a renomination as lieutenant-gov. 1857; visited Europe 1859, was an eyewitness of the Franco-Aus. campaign in It., and wrote a full account of the battle of Solferino; member and speaker of the N. Y. assembly 1861; presided over the Union convention at Syracuse 1862; was chairman of the N. Y. dele-



gation in the national Rep. convention 1864, in which yr. he was elected to Cong., in which body he separated from the majority of his party by giving a partial support to the policy of Pres. Johnson; took part in convoking the Phila. "Loyalists' convention" of 1866, and wrote its *Address and Declaration of Principles*; refused to be a candidate for reelection to Cong. 1866; declined the mission to Aus. offered him by Pres. Johnson 1867; made a third visit to Europe 1868, and again devoted himself to journalism. He wrote but one book, *The Life and Public Services of Abraham Lincoln*. D. June 18, 1869.

**Raymond** (JOHN H.), LL.D., b. in New York 1814, grad. at Union Coll.; prof. of rhetoric and Eng. lit. at Madison Univ., and of belles-lettres in the univ. of Rochester; was elected to organize the Collegiate and Polytechnic Inst. in Brooklyn, which he accomplished with great success; elected first pres. of Vassar Coll., N. Y., and commenced work there in 1865. D. at Poughkeepsie, N. Y., Aug. 14, 1878.

**Raymond** (ROSSITER WORTHINGTON), b. at Cin. Apr. 27, 1840, grad. at the Brooklyn Polytechnic Inst. 1858; studied mining engineering in Ger. several yrs.; became ed. of the *Amer. Journal of Mining* 1867, U. S. com. of mining statistics 1868, lecturer on economic geol. at Lafayette Coll. 1870, v.-p. of the Amer. Inst. of Mining Engineers 1871, and pres. of that body 1872.

**Raymond Lully**. See LULL (RAMON).

**Raynal**, ra-nah! (GUILLAUME THOMAS FRANÇOIS), b. at St. Geniez, dept. of Aveyron, Fr., Apr. 12, 1713; studied theol. at the coll. of the Jesuits at Toulouse; entered their order and began to preach, but went in 1747 to Paris, and, enjoying the company of Diderot, Holbach, Helvetius, etc., he entered on an entirely opposite course. Of his numerous historical works, *Histoire du Divorce de Henri VIII. avec Catharine* attracted some attention, and his *Histoire philosophique et politique des Établissements et du Commerce des Européens dans les Deux-Indes* was condemned by the Parl. of Paris, and a warrant of arrest issued against the author. He fled to Switz., lived subsequently at the court of Frederick II., but was allowed to return to Fr. in 1788. D. Mar. 6, 1796.

**Read** (GEORGE), b. in Cecil co., Md., Sept. 18, 1733; became a lawyer at Newcastle, Del., 1754; was atty.-gen. of Del. and member of the legislature for many yrs.; a member of the Continental Cong. 1774-77, and one of the signers of the Dec. of Ind.; pres. of the constitutional convention of Del. 1776; member of the convention that framed the Federal const.; was appointed judge of appeals 1783; U. S. Senator 1789-93, and chief-justice from 1793 to his death, Sept. 21, 1798.

**Read** (GEORGE CAMPBELL), b. in Ire. about 1788, came to the U. S. in childhood; entered the U. S. N. as mdpn. 1804; became lieut. in 1810; participated in several engagements during the war with Eng., especially that between the Constitution and Guerriere; became capt. 1825, and rear-admiral 1862, when he was appointed gov. of the Phila. Naval Asylum. D. Aug. 22, 1862.

**Read** (HOLLIS), b. at Newfane, Vt., Aug. 26, 1802, grad. at Williams Coll. 1826; studied theol. at Princeton; was a Presb. missionary in India 1830-35; pastor at Derby, Conn., 1838-43, and at New Preston 1845-51. Author of *God in Hist., India and its People, The Coming Crisis of the World, Negro Question Solved*, etc.

**Read** (JOHN MEREDITH), b. at Phila., Pa., July 21, 1797, grad. at the Univ. of Pa. 1812, and in 1818 was admitted to the bar; in 1823 was elected to the lower branch of the Pa. legislature, where he served 2 terms; in 1833 was appointed U. S. dist. atty. for the E. dist. of Pa., and held the office till 1841; in 1845 was nominated a judge of the supreme court of the U. S., but the Senate declined to confirm him on account of his opposition to the Southern construction of the const.; in 1846 was appointed atty.-gen. of Pa., resigning at the end of 6 months. In 1858 he was elected judge of the supreme court of Pa., of which body he became chief-justice in 1872. D. Nov. 29, 1874.

**Read** (JOHN MEREDITH, JR.), b. at Phila. in 1837, grad. at Brown Univ. 1858, and at the Albany Law School 1859; was adjutant-gen. of N. Y. during the c. war; wrote *A Historical Inquiry concerning Hendrick Hudson*; was appointed consul-gen. at Paris 1869, and minister to Gr. 1874.

**Read** (NATHAN), b. at Warren, Mass., July 2, 1759, grad. at Harvard 1781; was tutor there 1783-87; settled at Danvers 1785; formed a company which established an iron-foundry at Salem 1795; was the first petitioner to the U. S. gov't. for a patent, obtaining one for a method of cutting and heading nails by the same operation, Jan. 1798; was an early experimenter upon the steam-engine; is said to have placed upon Wenham Lake, Aug. 1791, a boat propelled by steam with paddles; invented agricultural implements and labor-saving machinery; M. C. 1880-03; subsequently a judge of common pleas; removed in 1807 to Belfast, Me. D. Jan. 20, 1849.

**Read** (THOMAS BRICHAN), b. in Chester co., Pa., Mar. 12, 1829; studied sculpture at Cin., but soon turned his attention to painting, which he practised at New York (1841), and soon afterward at Boston; removed to Phila. 1846; went to Florence in 1850, and resided there with few intermissions until 1872, when he returned to the U. S. Author of several vols. of poems. D. May 11, 1872.

**Reade** (CHARLES), D. C. L., b. at Ipsden, Oxfordshire, Eng., in 1814, grad. at Magdalen Coll., Ox., 1835; was elected to a Vinerian fellowship at Ox. 1842; was called to the bar at Lincoln's Inn 1843; pub. in 1852 *Peep Woffington*, a novel which gave him an immediate reputation, and has since issued many novels. Most of his novels have been successfully dramatized by himself or by Boucault, and he has written several independent plays.

**Reading**, red'ing, on R. R. Middlesex co., Mass., 12 m. N. of Boston. Pop. tp. 1870, 2664. 1880, 3181.

**Reading**, on R. R. Hillsdale co., Mich., 10 m. S. of Hillsdale, the county-seat, has an acad. Pop. 1880, 871.

**Reading**, city and important R. R. centre, cap. of Berks

co., Pa., on the E. bank of Schuylkill River, 58 m. N. W. of Phila. and 128 m. W. of New York, was incorporated as a borough in 1783, and as a city in 1847. Pop. 1870, 33,990; 1880, 43,278.

**Reagan**, ree'gan (JOHN H.), b. in Sevier co., Tenn., Oct. 8, 1818; studied law; settled in Tex. during its existence as an independent republic; became surveyor, judge, member of the legislature, and col. of militia; M. C. 1857-61, and P. M.-gen. in the Confed. govt. 1861-65, after which he was a prisoner in Ft. Warren. M. C. 1875-85.

**Real** [Sp. for "Royal"; Port. *real*], in Sp. and Port. countries, a coin and money of account. In Sp. the R. is now about 5 cents. In Port. 40 reis make one R., but it is never coined. In Sp. Amer. the R. has various values.

**Realgar** [Fr.], mineral protosulphide of arsenic, a resinous-looking ruby-red or orange yellow mass, transparent or translucent, and of conchoidal fracture. Its crystallization is monoclinic. It is not found in any Amer. locality. It may be prepared artificially by melting together 1 part of sulphur and 2 of arsenious acid. R. is used as a pigment.

**Realism**, as opposed to nominalism, is the doctrine that universals (notions of species and genera, such as *man*, *animal*) have real existences corresponding to them. In the Middle Ages the disputes of the schoolmen over the solution of some questions of Porphyry developed this doctrine into sharp contrast with nominalism. The dispute was not an idle one, but involved the all-important theological and metaphysical question of personal individuality. At an earlier period, Boethius and St. Augustine had been decided Realists; so were all Platonists and Neo-Platonists. In the 9th century John Scotus Erigena and Remigius of Auxerre were Realists, while Hrabanus Maurus and Eric of Auxerre indicated nominalistic proclivities. Roscellinus in the 11th century boldly announced nominalism, and applied it to the Trinity, making 3 Gods, but no unity. R. prevailed against him. The great Realists of the 11th and 12th centuries were Anselm, William of Champeaux, Gilbertus Porretanus, John of Salisbury; of the 13th century, Alexander of Hales, Bonaventura, Albertus Magnus, Thomas Aquinas, and Duns Scotus. Their doctrine was *universalia ante rem* (In God's mind), *in re* (in things), and *post rem* (in man's thought).—R., as contrasted with idealism in the school of "common sense," is the theory that we cognize external objects by direct perception instead of by means of interposed ideas.

**Real Presence**. See TRANSUBSTANTIATION.

**Real Property**. In the law of the U. S. and of Eng. the term "real property" or "real estate" is applied to all those species of property where the material objects over which the rights of ownership or of user extend are things real—that is, lands or articles regarded by the law as equivalent to land. The term "land" includes not only the soil, but also all those objects which are either actually or constructively attached or affixed to it so as to become in contemplation of the law a part thereof. It also embraces rents, franchises, and the extensive group of rights in or over the land of another person which are collectively known as "easements" or "servitudes." (See EASEMENTS.)

**Reaping and Mowing Machines**. The first account of R.-M. is given by Pliny the Elder (A. D. 23), who describes as used in Gaul a cart with a series of stationary projecting combs in front, which cut, or rather tore off, the heads of grain, only leaving the straw standing. An account of the continued use of the same kind of machine was given by Palladius (A. D. 391). This machine is similar to the modern clover-seed header. The first Eng. patent for a R.-M. was granted in 1799 to Boyce. Attempts were made to build R.-M. by the following parties in Eng.: Plucknett, 1805; Gladstone, 1806; Kerr & Smith, 1811; Dobbs, 1814; Scott, 1815; Ogle, 1822; Thomas and Joseph Brown, 1823; and in Amer. by French & Hawkins, 1803; Comfort, 1811; Ten Eyck, 1825; Cope & Hoopes, 1825; Manning, 1831. Prior to 1832 there were granted in the U. S. only 8 patents for machines for cutting grain. No inventor, however, succeeded in producing machines which possessed sufficient practical merit to be used otherwise than experimentally until we come to Bell, Hussey, and McCormick. The Hussey cutter is in universal use to this day. A modification of Bell's moving platform is still largely used in harvesters. McCormick's platform, arranged for delivery behind the horses, is also largely used with Seymour's improvement. Since the introduction of Bell, Hussey, and McCormick's machines the number of patents for harvesting-machines in the U. S. has constantly increased, and has reached 5000.

The first successful R.-M. were so organized that the cut grain should be deposited in gavels on the ground. The essential parts of a R.-M. are the gathering device, the cutting apparatus, the table or platform to receive the cut grain, and an arrangement for depositing the grain in gavels on the ground.

**Mowing-machines** employ the Hussey cutting apparatus, but have no receiving platforms or tables, the grass falling as cut. The 3 principal types of mowing-machines in use have 2 supporting wheels, and they differ as to the organization by which their cutting apparatus is conformed to inequalities in the surface of the ground. (1) Wheeler's type was invented in 1854. (2) The Buckeye type about 1854, by Aultman & Miller. (3) The Ball type. Ketchum and Kirby invented one-wheel mowers which have had much popularity. Estimated product of reapers, mowers and self-binders in U. S., 1880-85 inclusive, about 700,000. [From orig. art. in *J's Univ. Cyc.*, by GEORGE HARDING.]

**Reason**, re'zn [ratio, from *reor*, to "calculate" or think], in its first or most general signification, the conscious intelligence of man as contrasted with the instinct of brutes. Its second signification is that of ground—the "reason why anything is or is done." This includes (a) the ground as motive of action, (b) as efficient cause or "sufficient reason." The third use of the word is as an equivalent of Aristotle's *voûs*: (a) *voûs theoretikos*, active or divine R., the thinking occupied with creating and contemplating divine ideas; (b) *voûs*



παθητικός, passive R., including feeling or desire, sense-perception, imagination, and reflection. Fourth, the Kantian use of "reason" is akin to that of "active reason," and distinguishes it from "understanding." WILLIAM T. HARRIS.

**Réaumur**, râ-o-mur', de (RENÉ ANTOINE FERCHAULT), b. at La Rochelle, Fr., Feb. 28, 1688, ed. in the Jesuits' coll. at Poitiers; studied law at Bourges; settled in 1703 at Paris; devoted himself with great enthusiasm to the study of nat. hist., physics, and math.; attracted much attention by some mathematical essays; became a member of the Acad. in 1708; received a pension of 12,000 livres a yr. from the govt. for his *L'Art de convertir le Fer forgé en Acier*. Of his inventions, the thermometer, dividing temperature from the freezing to the boiling of water by a scale of 80°, is still in use. R.'s porcelain is used for many purposes. D. Oct. 18, 1757.

**Rebellion**. See CONFEDERATE STATES.

**Récamiér**, ri-kah-me-è' (JEANNE FRANÇOISE JULIE ADELAÏDE), b. at Lyons Dec. 4, 1777; married in 1793 a Paris banker, M. Récamiér, 3 times her age; bought in 1798 the Hôtel Necker, and gathered, during the time of the Directory and Consulate, a most brilliant circle around her. On account of the sudden collapse of M. Récamiér's business in 1804 she left Paris, and resided for some time at Coppet with Madame de Staël. Here she met with Prince August of Prussia, and his marriage proposals form a very curious episode in her life. In 1815 she returned to Paris, and although new pecuniary reverses compelled her to keep a rather modest establishment in the Faubourg St. Germain, her salon became nevertheless very soon the rendezvous of the most gifted and finest developed spirits of Paris, and continued so till her death, May 11, 1849.

**Recapture**, [Lat. *rs*, and *capere*, "to take"] is recovery of a captured vessel by a cruiser of the same nation or of ally before any sentence of a prize-court of the captor's sovereign has decided upon the validity of the capture. Before sentence, by which the ownership of the captured vessel is determined, if retaken, it goes to the owner; after such sentence, if retaken, it goes to the captor. The captor in the first of these two cases is entitled to a reward.

**Receipt**, re-seet' [Lat. *receptum*, "received"], a written acknowledgment of the payment of money or the delivery of chattels, executed by the creditor and given to the debtor. A simple R. may always be used as evidence against the person who gives it. It is, however, only *prima facie* evidence of the payment or delivery to which it relates, and, like any other mere admission by a party, it may be explained or contradicted by oral proof.

**Receivers**. In a large class of equitable actions brought to determine the rights of the litigants in certain specific property, it is often necessary that some indifferent person should be placed in charge thereof until the final judgment is rendered. For such purpose an agent is appointed by the court, who takes possession of the property as a trustee. Such an officer is termed a "receiver." R. may be appointed in suits brought by one partner against his copartners to obtain a dissolution of the firm and a winding up of its affairs; in the very common case of "creditor's suit," in the winding up of corporations; to take charge of the property of judgment debtors against whom an execution has been returned unsatisfied, and in various other special cases. R. are, in all their proceedings, guided by and accountable to the court, and often must and always may procure its special authority before taking any important step. JOHN NORTON POMEROY.

**Rechabites** [Heb. "horsemen"], descendants of Rechab, the father or ancestor of Jonadab, a branch of the Bedouin Kenites, who entered Pal. with the Israelites. The R. were strict abstainers from wine. They built no houses and sowed no grain, but dwelt in tents.—There is a secret society of total abstinence men and women in the U. S. and G. Brit. known as the Independent Order of the R.

**Reciprocity**. A term of international law, used to denote the character of a species of treaty or convention between two or more nations, whereby each pledges itself to act in the same manner toward the other or others in reference to a given or given subjects. Strictly speaking, the stipulations of a R. treaty should be perfectly mutual, and should contain no obligation incurred by one party toward another, not entered into by that other toward the one. Still, a wider license is permitted in the actual practice, and if the stipulations are for the most part both in quality and quantity mutual, the term is used to denote this gen. mutuality in the agreements. Furthermore, the stipulations of the treaty may be themselves of a gen. nature—as, for instance, in the use of what is termed "the most-favored-nation clause" in a treaty, whereby a treaty of R. may be constructed without containing any particular specification of the manner in which the parties to the same shall act toward each other upon the given subject or subjects, but only the gen. pledge that each will deal with the other in reference to the subjects mentioned as it does or shall with that nation which it favors, or shall favor, most upon the same point or points.

The word reciprocity is also sometimes used as a term of constitutional law to denote, in a confederate or federal state system, the mutuality upon certain subjects which the confederated or federated parts are obligated to observe. For example, in the const. of the U. S. it is provided that each State shall give full faith and credit to the acts, records, and judicial proceedings of every other, shall surrender to each other, upon proper and legal demand, fugitives from justice, etc. JOHN W. BURGESS.

**Reclus** (JEAN JACQUES ELISÉE), b. at Ste. Foy la Grande, Fr., Mar. 15, 1830, studied in Berlin under Karl Ritter; travelled from 1852 to 1857 in Eng. and Amer.; has written much upon geog. and kindred subjects, his chief works being *The Earth, The Ocean, Atmosphere and Life*, and the *New Universal Geog.*

**Recollet Friars and Nuns**, a name usually applied

to one of the congregations of Franciscans of the strict observance, but sometimes designating reformed bodies of other orders.

**Reconnaissance** [Fr. *reconnaissance*], a preliminary or rough survey of a portion of country. A R. may be geodesic, civil, or military. A geodesic R. may be undertaken for the purpose of selecting suitable points for trigonometrical stations preparatory to a geodesic survey; for ascertaining the relative advantages and disadvantages of two or more routes preparatory to locating a line of R. R., canal, or aqueduct; or for the purpose of acquiring a gen. idea of the features of an unexplored country. A military R. may be undertaken to ascertain the military resources of a tract of country; for determining the best line of march for an army; or for obtaining information in regard to the military character of a defile, of a crossing, or of a position of defence. The information obtained by a R. is usually embodied in a map and an accompanying memoir. The map is intended to show the gen. topographical features of the country examined, and the memoir is designed to supply such information as cannot be presented by the map. Both the map and the memoir vary in character according to the object to be attained. In reconnoitring for the purpose of opening or extending a geodesic survey, one of the most important objects is to make a judicious selection of points of reference, called triangulation points.

**Record** [Lat. *recordari*, "to call to mind"]. The term *record* primarily denotes the written account of the important proceedings had in an action or suit brought in some one of the higher courts. It is the highest species of evidence known to the law. It imports absolute verity, admitting no contradiction of the statements therein contained. It is therefore said to prove itself. The term is also used to designate the journals and documents kept on file by public officers, legislative bodies, and Cong. (See RECORD OF CONVEYANCES.) JOHN NORTON POMEROY.

**Recording of Deeds**. See RECORD OF CONVEYANCES.

**Record of Conveyances**. By the system of legislation adopted by all the States, an officer is appointed in every co. whose duty it is to record all conveyances brought to him, in books which are open to the public inspection. The object of the recording system is to protect the holder of the conveyance or incumbrance against other conveyances or incumbrances of the same premises made by the same owner, and to give notice to all persons whether there has been any prior deed or incumbrance of the same estate. In order to effect this purpose, the general provision of the legislation is that every conveyance or mortgage not so recorded shall be void as against any subsequent purchaser or incumbrancer in good faith and for a valuable consideration of the same real estate or any portion thereof, whose conveyance or incumbrance shall be first duly recorded. Between the immediate parties to a deed and their heirs and devisees its validity is not at all affected by a failure to record. JOHN NORTON POMEROY.

**Red**. See COLOR.

**Red Bank**, R. R. junc., Monmouth co., N. J., on Never-sink River. Pop. 1870, 2086; 1880, 2684.

**Redbird**. See CARDINAL BIRD.

**Red Bluff**, cap. of Tehama co., Cal., on R. R. and Sacramento River. Pop. 1870, 992; 1880, 2106.

**Red Cloud**, on R. R., cap. of Webster co., Neb. Pop. 1880, 677.

**Redding**, Cal. See APPENDIX.

**Reddle, or Red Chalk**, an argillaceous oxide of iron brought from Ger. and Eng., is used for carpenters' chalk, for marking sheep, for drawing on paper, and fine grades for polishing spectacle-lenses.

**Redemptionists**, called also **Mathurins, Fathers of Mercy, and Trinitarians** (*Ordo Sanctissimi Trinitatis*), a brotherhood of the R. Cath. Ch. founded by John de Matha and Felix of Valois at Cerfroi in Fr. for the deliverance of Chr. captives in Barbary. It was approved by Innocent III. in 1199.

**Redemptorist Fathers, or Liguorians** (*Congregatio Sanctissimi Redemptoris*), a congregation of missionary priests founded in 1733 by Alphonso de Liguori at Scala in It. The REDEMPTORIST NUNS were founded in 1732.

**Redfield, Dak.** See APPENDIX.

**Redfield** (ISAAC FLETCHER), LL.D., b. at Weathersfield, Vt., Apr. 10, 1804, grad. at Dartmouth 1825; practised law at Derby and at Windsor; became a justice of the State supreme court 1835; was chief-justice 1832-60; prof. of med. jurisprudence at Dartmouth 1858-61; removed to Boston in the latter yr.; resided in Europe 1867-69 as U. S. special counsel upon claims against Eng. D. Mar. 1870.

**Redfield** (WILLIAM C.), b. at S. Farms, Conn., Mar. 26, 1789; conceived the fundamental idea of his famous "law of storms" as early as 1821; soon afterward established a line of steam towboats on the Hudson; issued essays and pamphlets in favor of steamboat navigation; was subsequently an active promoter of railways; wrote 40 essays upon meteorology; promulgated his *Theory of Storms* in 1831, and his views upon hurricanes in 1833; was the first pres. of the Amer. Association for the Advancement of Science 1843.

**Redgrave** (RICHARD), R. A., b. in Pimlico, Eng., Apr. 30, 1804, studied at the Royal Acad.; became celebrated for his genre pictures and landscapes; was head-master of the govt. school of design; was one of the most efficient promoters of the S. Kensington Art Museum, inspector-gen. of art schools. Wrote *An Elementary Manual of Colors and A Century of Painters of the Eng. School*.

**Red Hook**, N. Y. See APPENDIX.

**Red Jacket**, the Eng. name of SAGoyewatha, a chief of the Seneca Indians, b. at Old Castle, near the foot of Seneca Lake, N. Y., in 1753; obtained the sachemship through his activity on the Brit. side in the war of the Revolution; derived his Eng. name from a richly embroidered scarlet jacket given him by a Brit. officer; opposed the



treaty of Ft. Stanwix 1784; visited Pres. Washington, from whom he received a silver medal; gave in 1809 valuable information upon the hostile plans of the O. Indians under Tecumseh; visited Wash. on the same subject 1810; was an ally of the U. S. during the war of 1812-14; visited New York and Wash. 1829, when his portrait was painted by R. W. Weir. His last yrs. were spent on the Seneca reservation near Buffalo; lost influence on account of intemperance, and was once degraded from the chieftainship, but soon restored. He was an opponent of Christianity, of schools, and of missionaries. D. Jan. 20, 1880.

**Red Oak**, R. R. junco, cap. of Montgomery co., Ia., on Nishnabotona River. Pop. 1870, 1315; 1880, 3755.

**Red River**, the last great tributary of the Miss., takes its rise in the great Stake Plain in Tex.; its mouth in Miss. River is almost exactly on lat. 31°. The region of its source is a rainless plain, marked only by a few isolated water-holes, which are designated by stakes to guide the traveller. The imperceptible slopes converge at about lon. 102° on the same lat., and then enter a cañon of more than 100 m. in length, and of such depth (300 or 300 to 1000 ft.) and steepness as to be inaccessible, so far as known, except at the two extremities. This chasm has a breadth of 5 to 20 m., and is held by the Comanches and Staked Plain Indians. Leaving this cañon the river has a tortuous course, running first E., then S., and finally S. E. The total length is about 1550 m., draining an area of 91,000 sq. m., the whole of which except the portion lying W. of lon. 90° is habitable, and most of it very fertile. The navigable channel of the R. River proper at high water has a length of 1246 m.; those of its various affluents, including the Washita and its tributaries, 2100 m.; so that the total navigable channels reaching the Miss. through the mouth of the R. River amount to 3346 m. Washita River, which enters the R. River near its mouth, has a basin of its own, which has been treated in the delta survey as a part of the R. River basin.

**Navigation.**—The mouth of the R. River at low water can be entered only by boats of 2 ft. draught, but during about 8 months of the yr. it may be entered by vessels of all draughts needed for this river and its tributaries. It has 18 navigable canal rivers, in addition to a number of bayous, like canals, navigable in high-water seasons. The junction of the R. River with the Miss. has been menaced with final closure for the past 35 yrs. In 1831 the bend of the great river into which it discharged was cut off by Capt. Shreve, and the Old River Lake has been filling by continual deposits from both rivers. R. River has continued, however, to cut its channel through these deposits to the Miss., and at the same time to force more and more of its waters down the Atchafalaya. The increase of the Atchafalaya, but for the toughness of its bed, would soon engulf the whole of the R. River. Such result would seriously embarrass the commerce of this great tributary, but would at the same time greatly relieve the tendency to crevasses and floods upon the Miss. hence to the Gulf of Mexico. [From *art. in J. N. C. C.*, by PROF. C. G. FORBES.]

**Red River of the North** rises in Becker co., Minn., from Elbow Lake, 1680 ft. above the sea. It flows S. and then W. as far as Breckenridge, Minn., the head of steamboat navigation, 953 ft. above the sea-level. Thence it flows N. through a wide and fertile plain, and is the boundary between Minn. and Dakota. Crossing the U. S. boundary (where its elevation is 792 ft.), it traverses Manitoba, and finally flows into Lake Winnipeg. Its length is 750 m.; total fall, 1072 ft.

**Red Sea, or Arabian Gulf**, is a long narrow inlet of the Indian Ocean, between Ar. on the E. and Abyssinia, Nubia, and Egypt on the W., separated from the Mediterranean by the Isthmus of Suez, which is only 80 m. across, and communicating with the Indian Ocean through the Gulf of Aden and the Strait of Bab-el-Mandeb, which is only 14 m. broad. The entire length of the R. S. is 1450 m.; its greatest breadth 230 m.; its depth varies from 1054 fathoms in lat. 22° 30' N. to 3 fathoms in the harbor of Suez. Near its N. extremity the sea forks into 2 branches—one, the Gulf of Akaba, length 100 m. and breadth 15, occupies a depression which is the continuation southward of the valley of the Jordan and Dead Sea; the other, the Gulf of Suez, length 200, breadth 20 m. In the Sinaïtic Isthmus, lying between these arms, is Mt. Sinaï. On account of the violence of its winds and the great number of islands, shoals, and coral reefs which lie along its shores, the navigation of the R. S. has always been considered very difficult.

**Red Snow** is real snow tinted by the presence of *Palmella nivalis* and other red protophytes, microscopic algae kindred to the plant already named.

**Red Sulphur Springs**, Monroe co., W. Va., on Indian Creek, in a valley of the Alleghany Mts., 38 m. S. W. of White Sulphur Springs, is a fashionable watering-place, the water having a mean temperature of 54°. Pop. dist. 1870, 1904; 1880, 2557.

**Reduction**, in chem., a term generally used as synonymous with deoxidation, as of a metallic oxide by heating with carbon or with hydrogen gas. It is, however, applied also generally to the conversion of any metalliferous ore to the metallic or reguline form; thus we speak of the reduction of galena, the sulphide of lead, to metallic lead, a process which is really the exact reverse of deoxidation, consisting substantially in the oxidation of the sulphur of the galena, which leaves the lead free to melt down to a regulus.

**Red-wing**, city, on R. R., cap. of Goodhue co., Minn., 40 m. S. of St. Paul, has an opera-house, music-hall, and a college inst.; much wheat is shipped from here. Pop. 1870, 4260; 1880, 5876.

**Red-wood**, the *Sequoia sempervirens*, a noble coniferous timber tree of Cal., second in size to the *S. gigantea* or big tree, alone among N. Amer. trees. It occurs in great forests upon the coast-mts. of Cal., and often attains a height of 275 ft. and a diameter of 15 ft. When fresh its wood is of a

fine red color, but it slowly fades when exposed to light. The redwood sometimes used by dyers is from *Adenanthura pavonina*, a large leguminous E. I. tree. (See *SEQUOIA*.)

**Red Wood Falls**, Minn. See APPENDIX.

**Reed** [A.-S. *hreed*], a name proper to certain tall woody grasses smaller than canes and bamboos. The common reed (*Phragmites communis*) of N. Amer., Europe, and Asia is employed on the E. continent as thatch, as a material useful in clay walls and floors, etc. The more extensively grown reed of Europe is *Arundo donax*, the woody stems of which are used especially by the horticulturist and in making musical instruments, fishing-rods, canes, etc.—**REED** is also the vibrating tongue or spring, fixed in a narrow slit, which produces musical tones in many wind instruments.

**Reed** (CALEB), b. at W. Bridgewater, Mass., Apr. 22, 1797, grad. at Harvard 1817; practised law at Yarmouth; became in 1827 a partner with Cyrus Alger in his iron-foundry at S. Boston, and was ed. of the *New Jerusalem Magazine*.

**Reed** (DAVID), b. at Easton, Mass., Feb. 6, 1790, grad. at Brown Univ. 1810; was for some yrs. prin. of the Bridge-water Acad.; was licensed to preach as a Unit. 1814, and founded at Boston (1831) the *Chr. Register*. He was one of the founders of the Amer. Anti-Slavery Society in 1828, and was at the head of the *Register* until 1866. D. June 7, 1870.

**Reed** (DAVID BOSWELL), M. D., b. at Edinburgh, Scot., in 1805, ed. at the High School of Edinburgh, and in med. at the Univ. of that city; was specially elected pres. of the Royal Med. Society and member of the Royal Coll. of Phys. and of the Royal Society of Edinburgh; became instructor in chem. in the Univ.; erected in 1833 the best class-room and laboratory in Edinburgh; superintended the improvements in ventilation made in the House of Commons 1836, in the House of Peers 1839, and had charge of the ventilation dept. in the construction of the new Houses of Parl. 1840-45; afterward applied his principles to public buildings in Liverpool and other large cities; visited Rus. for a similar purpose; settled in the U. S. 1856; was for some time prof. of applied chem. in the Univ. of Wis.; became med. inspector to the U. S. Sanitary Commission 1863. D. Apr. 5, 1863.

**Reed** (EDWARD JAMES), b. at Sheerness, Eng., Sept. 20, 1830, was ed. of *Mechanics' Magazine*, and appointed chief constructor to the navy in 1866, but resigned that position in 1870, dissatisfied with the construction of turret-ships; was elected a member of Parl. in 1874, and was again consulted by the admiralty concerning naval constructions.

**Reed** (HENRY), LL.D., grandson of Col. Joseph, b. at Phila. July 11, 1808, grad. at the Univ. of Pa. 1825; studied law, and was admitted to the bar 1829; was appointed in 1831 assistant prof. of Eng. lit. and also of moral philos. in the Univ. of Pa., and in 1835 prof. of rhetoric and Eng. lit. He wrote the *Life* of his grandfather for Sparks's *Amer. Biography*; edited with prefaces and notes Wordsworth's *Poetical Works*, Arnold's *Lectures on Modern History*, Alexander Reed's *Dict. of the Eng. Lang.*, Graham's *Eng. Synonyms*, Lord Mahon's *Hist. of Eng.*, Gray's *Poetical Works*, and C. Wordsworth's *Memoirs of William Wordsworth*. Returning from Europe, was lost in steamer Arctic, Sept. 27, 1854.

**Reed** (JOSEPH), b. at Trenton, N. J., Aug. 27, 1741, grad. at Princeton 1757; studied law under Richard Stockton, and afterward at the Temple, Lond., 1763-65; became deputy sec. of N. J. 1767; went to Eng. 1770; settled at Phila. 1771; was a member of the committee of correspondence 1774; pres. of the first provincial convention of Pa. Jan. 1775; delegate to the Continental Cong. in May; became aide-de-camp and sec. to Washington; was appointed adjutant-gen. 1776; declined the chief-justiceship of Pa. Mar. 20, 1777, and the rank of brig.-gen., with command of all the cav. forces, tendered him by Cong., but served as a volunteer at the battles of Brandywine, Germantown, and Monmouth; was elected to Cong. 1777; signed the Articles of Confederation in 1778; was elected pres. of the supreme executive council of Pa.; was an earnest opponent of slavery and of the proprietary system of govt. D. Mar. 5, 1785.

**Reed** (WILLIAM BRADFORD), LL.D., grandson of the preceding, b. at Phila. June 30, 1806, grad. at the Univ. of Pa. 1823; accompanied J. R. Poinsett as private sec. on his mission to Mex. 1825; became a lawyer; was atty.-gen. of Pa. 1838, and minister to Chl. 1857-58; negotiated with Chl. the treaty of June 18, 1858 (ratified Jan. 26, 1860). Author of essays upon historical, literary, and political subjects; was the biographer of his grandfather and of his brother, Henry Reed, and ed. of their writings. D. Feb. 18, 1876.

**Reed City**, Mich. See APPENDIX.

**Reedbird**. See BOBOLINK.

**Reed'er** (ANDREW H.), b. near Trenton, N. J., about 1808; studied law, which he practised many yrs. at Easton, Pa.; was appointed by Pres. Pierce the first gov. of Kan. Terr.; was removed from that office July 1855, for declining to exert his official influence against the Free-State movement; was elected delegate to Cong., and afterward U. S. Senator, under the Topeka const., which, however, was not ratified by Cong., and declined an appointment as brig.-gen. 1861. D. July 5, 1864.

**Reedsburg**, Sauk co., Wis., on R. R. and Baraboo River, is one of the prin. hop-markets in the U. S. Pop. 1870, 547; 1880, 1331.

**Rees** (JOHN KROM). See APPENDIX.

**Reese** (DAVID MEREDITH), M. D., LL.D., b. in Phila., Pa., 1800, grad. in med. at the Univ. of Md. 1820; became a practitioner in New York and phys.-in-chief to Bellevue Hospital, and was for some yrs. supt. of public schools in New York. He wrote for periodicals, edited the *Amer. Med. Gazette*, Chambers's *Educational Course*, Cooper's *Surgical Dict.*, Nelligan *On Medicines*, and J. Mason Good's *Book of Nature*; author of *Observations of Yellow Fever, Epidemic Cholera*, Phenology known by its Fruits, etc. D. 1861.

**Reeve** (HENRY), D. C. L., b. in Norwich, Eng., in 1813, a relative of the celebrated family of the Taylors of that city; ed. at the Norwich gram. school and at Geneva, Switz.; became registrar of the privy council 1837, and succeeded Sir



G. C. Lewis as ed. of the *Edinburgh Review* 1855. Translator of De Tocqueville's *Democracy in Amer.*, Fr. before the Revolution, of Guizot's *Washington*, and author of a series of essays reprinted from the reviews under the title of *Royal and Republican France*. He is one of the 8 foreign members of the Inst. of Fr. elected in 1865.

**Reeve** (TAPPING), LL.D., b. at Brookhaven, L. I., Oct. 1744, grad. at Princeton 1763; began to practise law at Litchfield, Conn., 1772, and commenced there in 1784 the Litchfield Law School, which he conducted alone until 1798, and with Judge James Gould until 1820. He was judge of the supreme court of Conn. 1788-1814, and originated the movement for more equitable legislation concerning the property of married women. Wrote *A Treatise on the Law of Descent in the Several U. S. of Amer.* D. Dec. 13, 1823.

**Refining of Metals.** Some metals are met with in commerce nearly pure, but none are perfectly so.

**Antimony.**—The raw antimony obtained by smelting contains more or less iron, lead, arsenic, copper, and sulphur. From these it is purified in the large way by an oxidizing and scorifying fusion with nitre or antimonious oxide, sulphide of antimony, sulphate of soda and charcoal, or carbonate of soda.

**Bismuth.**—Commercial bismuth may contain lead, copper, arsenic, iron, and sulphide of bismuth. In the large way it is refined by fusion in crucibles with nitre, and stirring, which removes sulphur and arsenic.

**Copper.**—The impurities of commercial copper are—arsenic and antimony, making it more or less brittle, even when only traces are present; lead, sulphur, tin, suboxide of copper, iron, and zinc, all of which injure its malleability and ductility. In the large way they are removed by a powerful oxidizing fusion, generally in small reverberatory furnaces, by which some, as antimony, arsenic, lead, and zinc, are removed, partly by volatilization, and some, as lead, zinc, and iron, by scorification.

**Gold.**—Gold can be separated from silver by "quartation." The alloy should contain 3 parts (according to some authorities  $2\frac{1}{2}$ ) of silver and 1 of gold. It is granulated, and heated with nitric acid, the gold being left as an insoluble powder, which is washed, dried, and fused. Gold containing palladium is alloyed with  $2\frac{1}{2}$  parts of silver, and then both the foreign metals dissolve in nitric acid.

**Lead.**—The most frequent impurities are antimony, arsenic, copper, zinc, iron, and sulphur. Moderately impure lead can be purified by stirring the melted metal with a green birch pole and skimming it.

**Mercury.**—To obtain pure mercury from quite impure metal it must be redistilled in an iron retort, which may be made of one of the wrought-iron vessels in which it is shipped. After distilling the mercury is heated to  $50^{\circ}$  C. ( $112^{\circ}$  F.) with nitric acid, diluted with 2 volumes of water, for a day, then well washed and dried with bibulous paper.

**Platinum.**—The separation of platinum by the wet way from the metals usually accompanying it is a complicated chemical process, but Deville and Debray procure a malleable, ductile alloy of platinum, rhodium, and iridium, admirably adapted for chemical apparatus, by treating it in a small reverberatory furnace, with a bottom of fire-brick lined with clay. This is heated to redness; 2 cwt. of ore and as much galena added by degrees; a little glass and as much litharge as galena are added little by little, and the melted metal left at rest. Iridosmine settles, and the platinumiferous lead is cautiously ladled off and cupelled. The platinum is then refined with the oxyhydrogen flame on a lime-bed.

**Silver.**—The impure silver from cupellation and "retorting" may contain lead, bismuth, copper, arsenic, antimony, sulphur, and nickel. It is usually refined in small reverberatory furnaces. About 1 ton is charged, melted rapidly, a moderate blast turned on, the metal skimmed from time to time, marl thrown on to absorb the foreign oxides, and the silver when fine covered with charcoal and ladled out. It is from 0.996 to 0.998 fine.

**Tin.**—Commercial tin is refined by melting it slowly on the hearth of a reverberatory furnace and collecting the melted tin in a basin, where it is stirred with poles of green wood and skimmed. After standing a while it is ladled off carefully, the upper part being purest.

**Zinc.**—Commercial zinc may contain lead, iron, tin, copper, cadmium, arsenic, and antimony. It is purified at Swansea by melting it in cast-iron pots, stirring, skimming, and ladling off the top portions; the lead collects at the bottom. [From orig. art. in *J.'s Untd. Cyc.*, by Prof. H. B. CORNWALL.]

**Reflection** [Lat. *re*, "again," and *flexere*, to "bend"] of **Light**, that bending of a light-ray from its rectilinear course in which the whole ray, both before and after bending, lies outside the deflecting body. When a light-ray falls upon an unpolished surface, it is irregularly reflected or scattered in consequence of the different inclinations of the innumerable facets of which such surfaces are composed, as may be seen under the microscope. Non-luminous bodies are made visible by the scattering of light from their surfaces. When a ray falls upon a perfectly smooth surface, it is regularly reflected, and a virtual image of the illuminating body is seen behind the reflecting surface. Most surfaces which reflect regularly also reflect irregularly to some extent. The 2 portions of a reflected light-ray, before and after bending, are called respectively the incident and reflected ray. If a perpendicular or normal be erected to the reflecting surface at the point of incidence, the angles made with this normal by the incident and reflected ray are called the angles of incidence and reflection. The law of R. is: *The angles of incidence and reflection are equal, and lie in the same plane.* This plane is perpendicular to the reflecting surface, and the illuminating and illuminated points are mutually interchangeable.

**Reformation** [Lat. *reformatio*], the name usually given to the religious revolution of the 16th century which

divided the W. Ch. into the 2 sections known as Prot. and R. Cath. Protestantism, as a religion, had 2 main principles—viz. the exclusive authority of the Bible as the rule of faith, as opposed to the normal authority of the pope or the Ch.; and the doctrine of justification by faith alone, in contradistinction to salvation by works or human merit.

I. **The Reformation in Germany.**—The movement began here by the posting of the theses of Martin Luther, who also attacked the sale of indulgences. Luther was excommunicated by Pope Leo X. in 1520, but he publicly burned the papal bull. Political opposition to the encroachments of Rome seconded his efforts. His adherents were too powerful to be suppressed. The electors of Sax. were his staunch friends. At the Diet of Augsburg in 1530, in the presence of Charles V., the Prots. presented their famous Confession, but a decree was passed condemning their cause. The menace involved in this decree led to the formation of the Prot. Schmalkaldic League. In 1546 the Schmalkaldic war broke out, which resulted disastrously for the party of reform, but their cause was restored after Maurice, duke of Sax., turned against the emp. The Peace of Augsburg (1555) was a virtual acknowledgment of defeat on the part of the emp., and secured to Protestantism a legal recognition. After the terrible Thirty Years' war in the 17th century the Treaty of Westphalia (1648) once more established the legal privileges of Protestantism as one of the religions of the Ger. empire. The final result was that N. Ger. was mostly Prot., while S. Ger., after the Catholic reaction and the labors of the Jesuits, became predominantly R. Cath.

II. **The Reformation in (German) Switzerland.**—The leader of the Prot. movement here was Ulrich Zwingli. He was chiefly instrumental in inducing the city of Zurich to abolish the old system and become a separate Prot. Ch. (1524). Bale (1529), Berne (1528), St. Gall (1528), and Schaffhausen (1529) followed the example of Zurich. The ecclesiastical revolution was also a political one; the movement for reform in the Ch. was identified with republican principles and patriotic efforts for the improvement of public morals. As the consequence of dissensions between the Prots. and Catholic cantons, war broke out, and Zwingli himself fell in battle in 1531. The Zwinglians differed from the Lutherans on the doctrine of the Lord's Supper, the former considering it a mnemonic or memorial feast, intended to call vividly to mind the Saviour's death; the latter holding that while transubstantiation is to be denied, Christ is actually received in the sacrament, even by the unbelieving.

III. **The Reformation in the Scandinavian Kingdoms.**—Protestantism spread northward, and it acquired a legal establishment in Den. under Christian III. Protestantism was introduced into Nor. in 1537 in connection with the subjection of the country to Den. The Reformed doctrine was first preached in Swe. in 1519; it was favored by Gustavus Vasa (1523-60), and adopted at the Diet of Westeras (1527).

IV. **The Reformation of Slavonic Countries.**—Lutheranism was favorably viewed by the Hussites of Bohemia. Protestantism was strongly established in that country. Lutheranism early spread into Polish Prus. and Livonia, also into Poland. In this last country dissension broke out between the Lutherans and Calvinists, and further division was occasioned by the introduction of Unitarianism, which gained many adherents among the higher classes. The various evangelical parties formed a union of Sandomir in 1572.

V. **The Reformation of Hungary.**—The new faith made rapid progress. But the c. wars that arose, coupled with the doctrinal contests between Lutherans (mostly Gers.) and Calvinists (mostly Magyars), checked its growth. It remained strong, however, until it was weakened and reduced by the measures of the Catholic reaction.

VI. **The Reformation in Geneva.**—The pioneer in the work of introducing Protestantism into Geneva was William Farel, a Frenchman, by whose influence Calvin was induced to establish himself there (1536). The bp. of Geneva had been expelled and Protestantism legally accepted in 1535. Calvin took the leading part in shaping the civil and ecclesiastical insts. of Geneva. His doctrine upon the Lord's Supper was intermediate between that of Zwingli and the theory of Luther. The 2 streams of Swiss Protestantism gradually mingled in one. Calvin asserted likewise the divine predestination and election—in terms which went beyond the view which the Lutherans were inclined to adopt. His doctrines of the Lord's Supper and of election or divine "sovereignty" became the distinguishing features of Calvinism. These tenets, associated with the Presb. polity, which Calvin also founded at Geneva, were accepted by the Prots. of Fr., Scot., Hol., and other countries. Thus Prots. were divided under 2 great classes—the Lutherans and "the Reformed."

VII. **The Reformation in France.**—A class of mystics sympathized with the doctrine of justification by faith, though they were not averse to the traditional doctrine of the sacraments. Humanism was favorable to reform, and Francis I. encouraged innovation up to a certain degree. His successor, Henry II., was inimical to the Reformed faith. Nevertheless, Protestantism in his reign made great progress. The Huguenots, as they were called, became, by the force of circumstances, a political party. The hist. of the R. in Fr. would include a full narrative of the c. wars. The edict of St. Germain in 1562 granted to the Huguenots a measure of toleration. But the massacre of Vassy shortly after opened the long and bloody struggle which went on, with intervals of peace, down to the accession of Henry IV. and the edict of Nantes (1598), which reduced them to the condition of a stationary or declining party, but one furnished as a means of defence with political privileges of an extraordinary character, which they continued to hold until the time of Richelieu.

VIII. **The Reformation of the Netherlands.**—The contiguity of the Netherlands to Ger. and Fr. facilitated the incoming of Prot. opinions; merchants and emigrants brought them



over from Eng. The persecuting edicts of Charles V. led to the destruction of a great number of Prot. Philip II., who was unpopular in this part of his dominions, set about the strict enforcement of the laws against heresy. The cruelties of the Inquisition provoked armed resistance. The hero of the great revolt was William of Orange. In the course of the protracted conflict a Prot. state grew up in the N., while the S. provs. finally submitted to Sp. and retained the old form of religion. The Calvinistic type of doctrine and polity prevailed in Hol.

**IX. The Reformation in England and Scotland.**—The R. in Eng. had 2 distinct sources. The first was the moral and religious feeling, which was enlisted in favor of the Prot. movement. The second was the quasi political opposition to the foreign rule of the papacy. The Act of Supremacy put an end to papal authority in Eng. In 1536 followed the act for abolishing the monasteries and confiscating their property. But there was still a Prot. and a Catholic party in the Ch. The Ten Articles (1536) were, however, favorable to the Prot. side. On the accession of Edward VI. (1547) the Prot. party obtained complete control. In his brief reign the Prot. Ch. of Eng. received its const. Under Mary (1553-58), the successor of Edward, the old order of things, the papal supremacy included, was restored. But during the long reign of Elizabeth (1558-1603) the Prot. religion took firm root in Eng. soil. The conservatism of the queen in matters of religion provoked into activity the Puritan sentiment, which was anxious to assimilate Eng. Protestantism to that of the Continent. The result was the division of the Ch. of Eng. into 2 great parties. In Scot. the Presb. system was fully established in 1592.

**X. The Reformation in Italy and Spain.**—The disciples of Protestantism in these countries were confined to the higher, cultivated classes, and the Reformed faith took no root among the people at large. The societies of professed Prot. were secret. In It. there was a widespread desire of Ch. reform, in which eminent Catholics participated. In Naples, Venice, Florence, and other cities there were Prot. chs. But Protestantism was extirpated in It. by the instrumentality of the Inquisition. In Sp. there were Prot. chs. at Seville and Valladolid. But in Sp. also the Inquisition, with its *autos da fé* (1559-60), did its work thoroughly. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. G. P. FISHER, D. D.]

**Reformed Church of America.** This was known prior to 1867 as the Reformed Protestant Dutch Church in North America, a name which exactly described it, as *Protestant vs. Roman*; *Reformed*—i. e. Calvinistic in doctrine and non-prelatical in order; *Dutch*, as descended from Hol. and inheriting its religious type. At the present time it numbers about 510 chs., 550 ministers, and nearly 80,000 communicants, who are organized into 34 classes, 4 particular synods, and 1 Gen. Synod. The strength of the denomination lies at the E., but classes have been formed among the Hollanders who within 35 yrs. have sought a home in Mich., Ill., and Wis. The Ch. owns 5 creeds—the Apostles', the Nicene, the so-called Athanasian, the Belgic Confession, and the Canons of Dordrecht. It requires the Heidelberg Catechism to be taught in families and schools, and also to be regularly explained from the pulpit. A compendium of this catechism is the standard of doctrine, and ministers are required to pledge themselves not to promulgate any change of views they may make without previously consulting the classis to which they belong. There is a Liturgy, which is for the most part optional, but the forms for the administration of the sacraments, of ordination, and of ch. discipline are of imperative obligation. Nor is any psalmody allowed to be used unless it has been approved by the General Synod. Rutgers Coll., founded in 1770 in N. J., and Hope Coll. (1885), Mich., are controlled by members of this Ch. It also has a theological sem. at New Brunswick, N. J. The salient characteristics of the Ch. are zeal for doctrine, for order, and for a learned ministry, unyielding attachment to its own views, and a large charity for all other Chs.

**Reformed Episcopal Church.** There have always existed in the P. E. Ch. 2 different schools of thought, popularly known as the High Ch. party and the Low Ch. or Evangelical party. On Dec. 2, 1873, a number of clergymen and laymen, under the presidency of Rt. Rev. George David Cummins, D. D., previously assistant bp. of the P. E. Ch. in Ky., assembled in the city of New York, and organized themselves "into a Church, to be known by the style and title of 'The Reformed Episcopal Church,' in conformity with the following Declaration of Principles: I. It declares its belief in the Holy Scriptures of the O. and N. T. as the word of God and the sole rule of faith and practice; in the creed 'commonly called the Apostles' Creed'; in the divine institution of the sacraments of baptism and the Lord's Supper; and in the doctrines of grace substantially as they are set forth in the Thirty-nine Articles of Religion. II. It recognizes and adheres to episcopacy, not as of divine right, but as a very anc. and desirable form of church polity. III. It accepts the Book of Common Prayer as it was revised, proposed, and recommended for use by the General Convention of the P. E. Ch. A. D. 1785, reserving full liberty to alter, abridge, enlarge, and amend the same, as may seem most conducive to the edification of the people, 'provided that the substance of the faith be kept entire.' IV. It condemns and rejects the following erroneous and strange doctrines as contrary to God's word: *First*, that the Ch. of Christ exists only in one order or form of ecclesiastical polity; *second*, that Ch. ministers are 'priests' in another sense than that in which all believers are 'a royal priesthood'; *third*, that the Lord's table is an altar on which the oblation of the body and blood of Christ is offered anew to the Father; *fourth*, that the presence of Christ in the Lord's Supper is presence in the elements of bread and wine; *fifth*, that regeneration is inseparably connected with baptism." The members of the new Ch. then completed their organization by the appointment of officers and committees, and the adoption of provisional rules. Leading men of the Ch. pro-

ceeded to revise the Book of Common Prayer, and this work was finally accomplished, and the revised book adopted at the second General Council held at New York in May 1874. At this time it also adopted its const. and canons. The third General Council was held at Chicago in May 1875, at which the articles of faith of the Ch. were adopted. The revised Book of Common Prayer allows liberty in extemporaneous prayer. The use of this book is obligatory at morning Sunday services, and optional at other times. This Ch. repudiates the doctrine of the apostolic succession, but recognizes officially the orders of other Chr. chs. as equally valid with its own, considering the test of a Ch.'s legitimacy to be the purity of its faith and the divine blessing on its work. It rejects the hierarchical system, and all that is technically known as the sacramental theory. It has no earthly altar, priest, or sacrifice. It is obligatory upon every minister, in celebrating the Lord's Supper, to extend an invitation to all who love the Divine Lord and Saviour Jesus Christ to participate. The baptismal service contains no statement of the regeneration of the recipient. Baptism is merely the means whereby children and adults become members of the visible Ch. [From orig. art. in *J.'s Univ. Cyc.*, by HERBERT B. TURNER.]

**Reformed Presbyterians,** a religious body in Scot. and the U. S., often called Covenanters or Cameronians. The first presbytery of Cameronians in Amer. was formed in 1774 by missionaries from Scot., and in 1782 they united with "Associate Reformed Church," taking latter name.

**Refraction** [Lat. *refringere*, *refractum*, from *re*, "again," "back," and *frangere*, to "break"] of **Light**, that deflection of a light-ray from its rectilinear course which is caused by its passage from one transparent medium into another of different density. When a ray of light falls obliquely upon the surface of a transparent medium, a portion of it is reflected; the remaining portion enters the medium, is bent aside at its point of entrance, but after that pursues a straight path through the transparent body. If the medium be homogeneous, the intramitted portion is single; this is also true of such crystals as have for their primitive form a cube, a regular octahedron, or a rhomboidal dodecahedron. In all other crystals the ray is divided into 2 portions. When a ray passes through a medium with parallel faces, as a pane of window-glass, its course after emergence is parallel to the original direction. All the rays which go to make up the image upon the eye of an object so viewed assume their relative positions, and the proportions are perfect, though the whole object is slightly displaced, the amount of displacement being dependent upon the thickness of the glass. An object viewed through imperfect glass, where the faces are not strictly parallel, has its proportions altered, because the emergent rays which go to form it are not parallel, but diverge or converge, or cross each other, at all sorts of angles. It will be found that the distortion becomes more striking as the eye recedes from the glass, the divergences being more noticeable at a distance. When the faces of a refractive medium are perfectly smooth, though not parallel, the displacement of the object viewed is very great, though the proportions are perfectly retained.

**Refraction, Double**, that case of R. in which the intramitted portion of the light-ray is divided, at its deflection, into 2 rays, each of which pursues a different rectilinear course through the medium. D. R. takes place in all transparent media except those bodies specified as singly refractive—viz. homogeneous bodies uniform in density, non-crystalline, or isometrically crystallized. At the point of entrance both rays into which the incident ray is divided are bent—one, the ordinary ray, being refracted in the plane of incidence; the other, the extraordinary ray, deviating from the plane of incidence more or less as the inclination of this plane to the faces of the crystal varies, and being governed by the law of extraordinary R. It is only in the crystalline mineral commonly called Iceland spar (calcite), which occurs in large and beautifully transparent rhombs, that the phenomenon in question is conspicuous enough to be detected by ordinary observation. If such a rhomb be placed so as to cover a portion of a straight black line drawn upon a sheet of white paper, 2 images of the line will in general be seen by an eye situated vertically over the crystal, of which one—that of the ordinary ray—will be continuous with the portion of the line seen outside the crystal, while the other—that of the extraordinary ray—will be discontinuous and laterally displaced. By rotating the crystal about the vertical, this second image may be made to change its place, and 2 positions will be found, differing in azimuth 180°, in which it will apparently coincide with the first, which remains motionless; but the two are nevertheless perceptibly different in distance from the eye, the ordinary image being nearest. If instead of the line there be merely a dot upon the paper, one image of the dot will appear to be in the vertical, and the other aside from the vertical; and as the crystal is rotated this one will revolve around the first, which remains at rest. This latter seems nearest.

**Refraction, Index of**, a term used to denote the abstract number expressing the constant ratio between the sine of the angle of incidence and the sine of the angle of R. in a given substance; or the numerical quotient of the former divided by the latter. The indices of R. afford a convenient means of comparing the refracting powers of different media.

**Refraction of Sound.** A beam of sound—regarded as any very small segment of an advancing spherical wave-front—moves normally in a radial line, but it is bent from its rectilinear course whenever it undergoes an unequal acceleration or retardation, necessarily turning toward the side of least velocity and from the side of greatest velocity. In other words, the direction of acoustic impulse is always perpendicular to the wave-front of sound, whether it continues as an expanding spherical surface, or, by reason of unequal velocity, becomes in any way deformed. There



are 4 ways in which sound-waves may be subjected to an unequal disturbance of velocity, and the sound-beams become thereby "refracted." First, by variation of *elasticity* in the medium; second, by variation of *density* in the medium; third, by variation of *motion* or *current* in the medium; and fourth, by variation of *temperature* in the medium. The effect of heat on a gas is to increase its elasticity if confined, and to diminish its density if unconfined; in either case equally accelerating the waves of sound.

**Refrigerators.** See APPENDIX.

**Reggio de Calabria** [Gr. *Rhegion*; Lat. *Rhegium*], one of the most ancient and distinguished cities of S. It., prov. of Reggio, situated near the right bank of the torrent Calopinace, on the seashore. It lies S. E. of Messina, and is compactly built on a gently rising hill, and one broad street runs along the shore. Everything here is comparatively modern, as the earthquake of 1783 spared not a single house. Pop. in 1881, 39,255.

**Reggio nell'Emilia**, city of It., chief town of the prov. of the same name, situated in a fertile plain. R. is a walled town; the streets are broad, and many of them flanked by porticoes; the chs. are imposing, and contain some precious objects of art, the solitary remnants of former riches. The theatre of R. belongs to the first class of It. theatres. The town has recently purchased and opened to the public a small house which was for a long time occupied by Ariosto, whose mother was born here. The Museum of Nat. Hist. is very interesting, and the acad. of Fine Arts deserves a visit. Outside the town there is a large asylum for the insane, said to be the best establishment of the kind in It. R. is the commercial centre of a rich prov., and there is considerable industry in the town itself. Sail-cloth, leather, carriages, brooms, etc. are manufactured here on a large scale. Pop. in 1881, 50,651.

**Regnault** (JEAN BAPTISTE), b. at Paris Oct. 17, 1754; entered in 1771 the studio of the painter Bardin, whom he accompanied to Rome; became a member of the Acad. in 1782, subsequently prof. in the School of Art, and stood by the side of David at the head of the Fr. school of painting. Among his pictures are *Perseus and Andromeda*, the *Education of Achilles*, and *Cupid and Psyche*. D. Oct. 29, 1829.

**Regulus** (MARCUS ATILIVS), belonging to an old plebeian family in Rome; was consul the first time in 267 B. C., and the second in 256; was taken prisoner by the Carthaginians and carried to Carthage. Here he was detained for 5 yrs., but in 250, fortune having once more turned against Carthage, he was sent to Rome with a Carthaginian embassy, in order to support the envoys in negotiating a peace. In Rome, R. set aside every regard for himself, and, considering the proposed peace disadvantageous to his country, exercised all his power to dissuade the senate and people from accepting it. He succeeded, and returned to Carthage.

**Rehobo'am** [Heb. "enlarger of the people"], son and successor of Solomon. His mother was Naamah, an Ammonite. His accession, about 975 A. C. (Usher) or 990 A. C. (Hales), was the signal for the revolt of the 10 tribes and the dismemberment of the kingdom. He d. at the age of 58, after a reign of 17 yrs.

**Reho'both** [Heb. "streets," "open places," "ample room"], the name of 3 biblical sites: (1) In Gen. x. 11, one of the 4 Assyrian cities founded either by Asshur or, as most modern interpreters understand the passage, by Nimrod. It may afterward have become a part of Nineveh. (2) In Gen. xxvi. 22, a well dug by Isaac, recently identified with an anc. well, now filled up, 12 ft. in diameter, in the wady *er-Ruhaibeh*, about 20 m. S. of Beersheba. (3) In Gen. xxxv. 37, the city of an early Edomite king named Saul, described as being "by the river"—i. e. the Euphrates.

**Reichstadt**, DUKE OF. See NAPOLEON II.

**Reid** (DAVID S.), b. in Rockingham co., N. C., Apr. 19, 1813, was admitted to the bar 1833; served in the State legislature 1835-42; M. C. 1843-47, gov. of N. C. 1851-55, U. S. Senator 1856-61, and a delegate to the "Peace Cong." of Feb. 1861.

**Reid** (JOHN MORRISON), D. D., b. May 30, 1820, in New York; grad. at the Univ. of the City of New York in 1839, and at Union Theological Sem.; was admitted to the New York M. E. conference in 1844, and has preached in W. Conn., on L. I., and in New York; in 1858 became pres. of Genesee Coll., N. Y.; in 1864 ed. of *The Western Chr. Advocate* at Cin.; in 1868 ed. of *N. W. Chr. Advocate*, and in 1872 a corresponding sec. of M. E. Missionary Society.

**Reid** (WHITELAW), b. at Xenia, O., Oct. 27, 1837, grad. at Miami Univ. in 1856; bought the *Xenia News*, editing it for 2 yrs.; his newspaper was the first one in the W., outside of Ill., to advocate the nomination of Mr. Lincoln; in the winter of 1860-61 went to Columbus as political correspondent for 3 daily newspapers; at the close of the session became city ed. of the *Cin. Gazette*; at the outbreak of the c. war went to the front as war-correspondent of that journal; served on the staff of Gen. Morris in W. Va. with the rank of capt.; at the close of the campaign returned to Cin., and wrote for the *Gazette* until the front, on the staff of Rosecrans; wrote letters under the signature of "Agate"; witnessed the entire battle of Pittsburg Landing; in the spring of 1862 was appointed librarian to the House of Reps., and acted as correspondent of the *Cin. Gazette*; was present at the battle of Gettysburg; in 1865 accompanied Chief-Justice Chase on a tour of the S., and wrote *After the War, a S. Tour*; during the next 2 yrs. engaged in cotton-planting in La. and Ala., and wrote *Ohio in the War*; in 1868 returned to the *Cin. Gazette* and became one of its leading eds. In 1869 he became managing ed. of the *New York Tribune*, and upon the nomination of Mr. Greeley for the Presidency in 1872 R. became ed.-in-chief. Pub. *The Scholar in Politics*.

**Reidville**, N. C. See APPENDIX.

**Reign of Terror**, in the first Fr. Revolution, may be said to have begun Jan. 21, 1793. It lasted till July 27 (9 Thermidor), 1794.

**Reindeer** [Icelandic *hreindyr*], **The**, is clumsier than the ordinary deer: the nose broad, covered with hair, and without a naked muffle; antlers are developed by the female as well as the male; the hoofs are spreading and adapted for progression over the snow. In the Old World, especially in Lapland and some parts of Siberia, the species has been domesticated, and is raised for the milk. In Lapland it feeds especially upon a species of lichen.

**Reindeer Moss**, the *Cladonia rangiferina*, a lichen abundant in arctic regions, where it forms the prin. winter food of the reindeer. It is of a silvery-white color, even in summer. It is also used as an article of food after having been boiled in reindeer's milk. The reindeer digs it from beneath the snow with its horns, nose, and feet.

**Relapsing** [Lat. *relabor*, *relapsus*, "to fall back"] **Fever**, also known as **Famine Fever**, and, technically, as **Febris Recurrens**. Its nature is undetermined—by some regarded as a form of typhus, by others as due to malaria. It occurs only at intervals of some yrs., and then during seasons of privation and insalubrity, attacking chiefly the lower classes, ill fed and housed. It has been so prevalent in crowded communities, as Liverpool, as to be regarded an epidemic and contagious disease, but careful study connects it with dietetic and telluric causes, prevailing in the form of a non-contagious endemic.

**Religion**, re-lid'jun [Lat. *religio*], in the widest reach of the word, comprehends all frames of feeling, all forms of faith and acts of worship, to which man is impelled by his fears or drawn by his hopes toward superhuman beings and powers or their visible representatives. For the different sects, see respective headings.

**Religious Orders.** See MONACHISM.

**Remainder** [Lat. *remanere*, to "remain back"], in law, is a technical expression to designate a future estate in land, created at the same time and by the same transaction as a prior estate, called a particular estate. R. are divided into 2 prin. classes—vested and contingent. A R. is said to be *vested* when the *right* to the future enjoyment is fixed, though the possession is postponed. It may be vested in right even though it never come into possession. A convenient test of a vested R. has been suggested. Suppose that the prior estate should instantly terminate, is the person claiming the R. entitled to immediate possession? If so, the R. is vested; otherwise, it is contingent. A contingent R., therefore, is one where the *right* itself is not yet fixed and certain. An instance is found in the case of a R. given to an unborn or unascertained person, or made to depend upon an uncertain event. The rules of law favor vested rather than contingent R., and a construction of doubtful words will be made in this spirit. Contingent R. are subject to a number of technical rules which cannot be satisfactorily explained within the compass of this article. Some of them have been abrogated in a number of the States of this country. This is particularly true in the State of N. Y. and a number of the States following its radical legislation in respect to real estate. In fact, the word "remainder" in that State has largely lost its original accurate meaning. T. W. DWIGHT.

**Rembrandt van Ryn** (PAUL HARMENS), b. at Leyden July 15, 1607; produced in 1628 his first excellent picture, a portrait of his mother; settled in 1630 at Amsterdam; was soon recognized as the first master of the Dut. school, and gathered a great number of disciples around him. Of his pictures, comprising portraits, landscapes, historical and genre pieces, etc., are still in Amsterdam and the Hague, but excellent specimens are found in all the larger galleries of Europe. D. Oct. 8, 1669.

**Remi**, SAINT. See REMIGIUS.

**Remigius**, the name of 3 eminent Fr. ecclesiastics: (1) (St. Remi) the bp. of Rheims, who in 496 baptized Clovis, the founder of the Fr. monarchy. He was b. at Laon in 437, became bp. in 459, and d. Jan. 13, 533. (2) The abp. of Lyons, who sided with Gottschalk in the great anthropological controversy of the 9th century. He became abp. in 853, and d. after 875. (3) A Benedictine monk of Auxerre, who was at the head of the bps.' school at Rheims in 882, and d. about 900. He wrote commentaries on the Psalms, the last 11 of the Minor Prophets, and the Epistles of St. Paul.

**Remittent** [Lat. *remittere*, to "send back"] **Fever**, a fever of malarial origin, but differing from intermittent fever in that it has no prolonged intermission. Although there is at no period of the 24 hours a complete cessation of fever, there is daily a perceptible or marked abatement or diminution of the elevated temperature and associated symptoms. This period is termed the remission. The characteristics of this fever vary with the country and season in which it occurs. The ordinary autumnal R., the bilious R. of Eng. and the U. S., is comparatively mild. Reversely, the R. of intensely malarial regions, as the borders of the Mediterranean, the Isthmus of Panama and of Suez, the Afr. jungles, and of Bengal, is severe and fatal. "Congestive," "pernicious," "fulminating," or lightning-like attacks may be rare in temperate climates. The duration of R. F. may be 7, 14, or 21 days, seeming to observe a law of septenary crises. Cold and effervescing draughts and saline aperients should be given at once and repeatedly, and the period of remission utilized by the free exhibition of quinine to anticipate and lessen the gravity and duration of the next period of fever. E. DARTS HUDSON, JR.

**Remonstrants** [Lat. *remonstrare*, "to show back"], the name by which the adherents of Arminius were designated when in 1610 they addressed a remonstrance to the states of the prov. of Hol. Their adversaries, the adherents of Gomarus, answered with a counter-remonstrance, and were called Contra-Remonstrants.

**Remus**. See ROMULUS.

**Rémusat**, ra-mu-zah' (JEAN PIERRE ABEL), b. at Paris Sept. 5, 1788; studied med., took his degree, and served as a phys. in the military hospitals of Paris during a typhus



epidemic in 1813, but devoted himself principally to the study of the Tartar langs., especially Chi., and was appointed prof. of Chi. at the Collège de France in 1814. D. at Paris June 4, 1832. Wrote *Recherches sur les Langues tartares, Éléments de la Grammaire chinoise, Mélanges asiatiques*, etc.

**Renaissance** [Fr.], the name of a style of arch. which originated in It. in the first half of the 15th century under the influence of the awakened enthusiasm for classical lit. and art, and which in the following centuries wholly superseded the Gothic style all over Europe. It may be characterized generally as a return to the classical principle of building and decoration, and the course of its hist. may be described as beginning with the simple adoption of classical motives in ornamentation, and ending in the mere copying of antique buildings. In It. the return from Gothic to classical ideas in arch. was easy. Three different schools of R. are distinguishable here—the Florentine, the Roman, and the Venetian. The cradle of the R. was Florence, and the dome of her cathedral is generally mentioned as the first example of the style. Still more characteristic of the new style are the palaces of Florence, for which Brunelleschi gave the model by the erection of the Palazzo Pitti. The chief monument of Roman R. is the ch. of St. Peter, commenced in 1506, and finally completed by Bernini in 1667. In this building, as in the cathedral of Florence, the dome is the most prominent feature, and the weakest point is the front façade. The most interesting examples of Venetian R. are the Palazzo Vendramin Calergi, the Scuole di San Marco and di San Rocco and the palace of the doges. Fr. also is very rich in R. arch.: she even gave the style an individual development, and it is chiefly in this its Fr. shape that it was adopted by Eng., Sp., Ger., and Rus. The Tuilleries, begun in 1564 by Philibert de l'Orme, and large parts of the palace of Fontainebleau, built during the reign of Henry IV. (1589-1610), shows signs of that exaggeration of ornamentation and that empty ostentation which afterward became the characteristic of the Fr. R., and from which it received the name of Rococo. The most striking example of this style is the château of Versailles, built under Louis XIV. by Hardouin and Mansard. Neither in Ger. nor in Eng. did the R. produce any great and interesting results. The royal palace of Dresden, the château of Heidelberg, and the ch. of St. Paul in Lond. are fine structures.

**Ren'al** [Lat. *renes*, "kidneys"] **Diseases, or Diseases of the Kidneys.** See ALBUMINURIA, BRIGHT'S DISEASE, CALCULUS, DIABETES, OXALURIA, URINARY CALCULI.

**Rennan**, reh-non' (JOSEPH ERNEST), b. Feb. 27, 1823, at Tréguier, Côtes-du-Nord; trained in the parish school of his native town, at the age of 16 he went to Paris to prepare himself for the Ch. During his course in St. Sulpice he displayed ability in the Oriental langs., and he abandoned the sem. and devoted himself to linguistic studies. In 1847 he gained the Volney prize by his *Mémoire sur les Langues sémitiques*; in 1848 was crowned by the Inst. for his *Étude de la Langue grecque au Moyen Age*; in 1849 was sent by the Académie des Inscriptions on a literary journey through It.; in 1851 was appointed to a position in the MS. dept. of the Bibliothèque Nationale; in 1856 was elected member of the Académie des Inscriptions; in 1860 was sent on a scientific mission to Syria, and on his return in 1863 was appointed prof. of Hebrew in the Collège de France. Wrote *Histoire générale et Systèmes comparés des Langues sémitiques; Origines du Christianisme: A. Life of Jesus, B. The Apostles, C. St. Paul, D. L'Antichrist*, etc.

**René**, reh-nâ' (or **Renatus**) **I.**, count of Provence, duke of Anjou, titular king of Naples, b. at Angers Jan. 16, 1409. Having married Isabelle of Lorraine, he laid claim to this country after the death of her father, Duke Charles, in 1431, but was captured and imprisoned for several yrs. In 1434 his elder brother, Louis III., who had been in actual possession of the throne of Naples, d. and left to him Provence, Anjou, Naples, Sic., and Jerusalem. In 1437 R. succeeded in buying his liberty and the acknowledgment of his right to Lorraine for 400,000 pieces of gold, and he now led an army to Naples, where his claims were disputed by the king of Aragon. He was unsuccessful, and in 1442 returned to Provence, and confined himself to the improvement of his beautiful family estates. He encouraged agriculture, manufactures, lit. and art, and was himself a successful cultivator of lit. D. July 10, 1480.

**Renl** (GUIDO). See GUIDO RENI.

**Rennet**. See CHEESE.

**Re'no**, R. R. junc., cap. of Washoe co., Nev., on Truckee River, 11 m. E. of the base of the Sierra Nevada, is an important centre of mining and manufacturing interests. Pop. 1870, 1035; 1880, 1302.

**Reno** (Jesse L.), b. in Va. in 1823, grad. at W. Pt. 1846; in the war with Mex. was engaged in the siege of Vera Cruz and in the battles of Cerro Gordo, Contreras, Churubusco, and Chapultepec, and brevetted first lieut.; subsequently served on duty in the ordnance corps, being in command of Mt. Vernon Arsenal, Ala., at the time of its capture, Jan. 1861; appointed brig.-gen. of volunteers in Nov. 1861; accompanied Burnside's expedition to N. C.; was promoted to be maj.-gen. of volunteers July 1862, and in Aug. assigned to the command of the 9th army corps, which he led in the second battle of Bull Run and at Chantilly, Aug. 29-Sept. 1. At the battle of South Mountain he was killed, Sept. 14, 1862.

**Reno'vo**, on R. R. Clinton co., Pa., 28 m. W. of Lock Haven, along W. branch of Susquehanna River, has extensive works of P. & E. R. R. Pop. 1870, 1940; 1880, 3708.

**Rensselaer**, Ind. See APPENDIX.

**Rent** [It. *rendita*; Sp. *renta*; Fr. *rente*—from Lat. *reddere*, to "give back"], money, service, or products paid for the use of land and its appendages, commonly called "real estate." For agricultural purposes the rent of land is determined mainly by 4 considerations: (1) Its *fertility*, on which the amount of products depends. (2) Its *location* with respect to a market. (3) *The growth of population*, and especially its

concentration in new centres. (4) *Improvements* put upon the land, including drainage, fertilizers applied to the soil, fences, and buildings. In cities, where pop. is crowded within narrow limits, rents for lots and buildings are determined almost entirely by *location* with respect to facilities for business, the social character of the neighborhood, and the fads of fashion. The compensation paid for the use of capital in the form of real estate is, except in the favorite locations of great cities, generally less than average rate of interest allowed for other forms of capital and the rate of profits from business. This is mainly from the security of property in real estate intrusted to others' use.

**Rent**, in law, as defined by the early common-law writers, is a certain annual profit issuing out of lands and corporeal tenements. In the great majority of the States the only rent actually known is that arising between the landlord and tenant from the ordinary letting of land, and it may be properly defined as a certain pecuniary sum agreed upon between the parties, paid at fixed intervals by the lessee to the lessor, as a compensation or hire for the use and possession of the leased land. The anc. common law divided rent into 3 classes—rent service, rent seek, and rent charge. The first was of purely feudal origin, and existed when the tenant, for the land held of his lord, owed the latter some corporeal service, at least that of fealty. The second class was granted or reserved by deed without any clause in the conveyance authorizing the holder thereof to distrain, and was called seek or dry rent, because by the law, prior to alterations made by statute, such holder had no means of enforcing his claim. A rent charge was one where the owner thereof had no reversion or future interest in the land, but was still entitled, by virtue of a clause in the deed creating it, to distrain for any arrears. In the U. S. these anc. species of rent exist only to a slight extent.

**Ren'wick** (JAMES), LL.D., b. in New York in 1793, grad. at Columbia Coll. 1807; was prof. of chem. in that inst. from 1820 to 1853; wrote *Outlines of Natural Philos.*, *Elements of Mechanics*, and other scientific text-books; prepared lives of De Witt Clinton, Jay, and Hamilton, and was U. S. com. on the N. E. boundary 1838. D. Jan. 12, 1863.

**Reph'idim** [Heb. "stays," "props"], a station in the Sinaitic peninsula, where the Israelites under Moses and Joshua gained a great victory over the Amalekites. Its identification depends upon that of Sinai, in whose immediate neighborhood it was.

**Repoussé**, re-pooos-sâ', a Fr. term for the art of producing reliefs, and even rounded forms, in metal by beating thin plates from behind (Ger. *das treiben*; Eng. *embossing*). The metals employed are those that by their malleability lend themselves most easily to the work—gold and silver, brass, copper, tin, and lead. This is a very anc. art; the Egyptians, Cypriotes, and Etruscans practised it. In the Middle Ages it was widely employed both in Europe and in the East, and it has continued in use down to our own times. Some splendid pieces of R. work were produced in It. in the 15th century. The art was in a flourishing state in Europe in the 17th and 18th centuries, but the design was artistically inferior to that of an earlier time. Until lately the art had fallen into disuse, but it has shared in the gen. revival of the arts, and is now much in fashion. In It., Fr., Eng., and Amer. much R. work is now produced, and so far as mechanical excellence is concerned, Amer. smiths are not behind the rest of the world.

**Representation and Representative System.** See GOVERNMENT AND PROPORTIONAL REPRESENTATION.

**Reprisals.** See INTERNATIONAL LAW, SUMMARY.

**Reproduction in Animals**, a term used to designate the phenomena observable in the numerical development of animals from pre-existing ones, and the immediate antecedents and sequels thereof. R. may be the result either of the concurrence of 2 dissimilar elements (the male and female sexes) or of outgrowths from or division of an already developed body. In the lowest forms of animal life (e. g. *Monera*, etc.), where there is no true organization, and where, of course, sexes are undistinguishable, under certain conditions 2 individuals come together and combine into a single one, which assumes a subglobular form, becomes segmented, and finally gives origin to a number of new and independent beings. In all the regularly organized forms (i. e. those in which various organs are differentiated) there is a development of sexes, which may be either combined in one individual or separated among two. The germs, or female elements, are specialized as eggs—the sperms, or male, as spermatozoa. The conjunction of the 2, resulting in the fertilization of the eggs by the spermatozoa, is necessary for the growth and development of the embryo. The egg is a spheroidal body whose essential constituent is the vitellus or yolk, and in the central portion of this is generally a distinct cell known as the germinative vesicle. This is either transparent or contains spots, one or more in number, designated germinal dots; the vitellus is inclosed in an envelope of various consistency called the vitelline membrane. The albumen, so prominent in birds' eggs, in which it forms the "white," is a subordinate and super-added element, and is wanting in some types. The male elements consist of a liquor (the seminal liquor), in which are innumerable filiform or worm-like corpuscles, generally inflated at one end and attenuated at the other, and which move about with great rapidity in the liquor; these are the so called spermatozoa.

When the eggs have been fecundated by the conjunction or penetration into their substance of the spermatozoa, a course of development commences which finally results in the production of an organism like the parent; but this development may be either consecutive and gradual, as in mammals, birds, etc., or distributed into several stages of more or less persistency. In the latter case the adult form may be ultimately either (1) evolved by a modification of all the parts of the preceding state, as in amphibians, insects, etc.; or (2) developed by a peculiar growth, analogous



to birth, as in most aculephs, etc. The future course of the egg is various. In the lowest forms frequently an amebiform body is a first result—i. e. a creature like a mass of jelly, but with an interior vesicle; in the higher, the egg becomes segmented, and successively divided and subdivided into "blastomeres" or cells, and forms a mulberry-like mass (hence called *morula*). Often these cells become differentiated into 2 kinds, of which a few retain their spheroidal form, but most become elongate and prismatic, and furnished each with a cilium, thus resembling the planula of an aculeph. Generally, the cells become differentiated into the roundish ones and the prismatic ones, and an involution of the mass takes place by which a cavity is formed, the inner roundish cells remaining unfurnished and forming an endoderm, and the outer prismatic ones becoming ciliated and forming an ectoderm: this stage has been named *gastrula*, and is by some supposed to recall the ancestral condition of most or all of the higher animals. The terms thus indicated—*ameba*, *morula*, and *gastrula*—are employed for the brief characterization of the correspondent stages through which the embryos of different types manifesting them pass.

**ASEXUAL REPRODUCTION.**—The higher forms of animal life are reproduced solely in course of generation, but in many of the lower forms R. is effected by peculiar processes—i. e. either (1) by the subdivision of a given organism into distinct entities (scissiparity or fissiparity), or (2) by an outgrowth of buds from the surface of an organism, and the subsequent development thereof into animals similar to the primitive form, which may either remain connected with it or become liberated and assume an entirely independent existence.

THEODORE GILL.

**Reptiles** [Lat. *reptare*, to "creep"] may be briefly defined as vertebrates with a trilobular heart, incomplete circulation; and cold blood, the lower jaw connected with the skull through the intervention of a quadrate bone, the skull with a single occipital condyle, and the tegumentary appendages developed as scales or plates.

**Tegumentary System.**—The tegumentary appendages forming the exoskeleton are developed in the form of thin horny scales or bony plates. In the rhynchocephalians, saurians (lacertilians), and ophidians the scales are generally imbricated on the back and sides, and often developed as transverse scutellæ on the abdomen; in the crocodilians, bony plates are developed; in the tortoises, the vertebral column and ribs are peculiarly modified, forming a shield which becomes superficial and covered, generally, by a number of angular contiguous plates.

**Osseous System.**—The skeleton is always completely developed and ossified. The vertebral column in the quadrupedal forms is divided into 4 or 5 regions. In the apodal forms there is no definite differentiation of the vertebral column into regions. No epiphyses are developed. The vertebrae are generally concave in front and convex behind, but not infrequently biconcave, like those of fishes, and sometimes they are concave behind. The ribs differ considerably in the mode of attachment to the vertebrae. The skull is quite diversiform in the several orders. The sternal apparatus is wanting or atrophied in the apodal and composite in the quadrupedal ones. The members are very diversiform in development. They are primarily fitted for running or walking in the limbed saurians, rhynchocephalians, crocodilians, and tortoises, as well as the extinct dinosaurs and dicynodonts; modified for swimming in the normally limbed sauropterygians and fish-limbed ichthyopterygians; the anterior members are modified for flight in the ornithosaurs or pterodactyles; and limbs are completely wanting or atrophied in the ophidians and many saurians; sometimes the anterior and sometimes the posterior limbs are developed, and not the others.

**Nervous System.**—The brain is small compared with the size of the skull, but mostly fills the cranial cavity. The cerebrum is moderately developed. The hemispheres are not connected by a corpus callosum, but a small anterior commissure is developed. The optic lobes are generally contiguous, and imposed over the mesencephalon; they have ventricles. The olfactory lobes are generally elongated, and are excavated by ventricles which are continuous with those of the hemispheres of the cerebrum. The cerebellum is moderately developed.

**Dental System.**—The teeth are extremely diversiform, and their modifications are characteristic of various groups. They often become ankylosed with the jaws in the old; and in many forms, beside being present on the jaws, they exist also on the palatine and pterygoid bones.

**Alimentary System.**—The intestinal tract is generally differentiated into an oesophagus, a stomach, a small intestine, and a large intestine. The terminal portion is a cloacal cavity.

**Circulatory System.**—The heart in the saurians, ophidians, rhynchocephalians, and tortoises is trilobular; in the crocodilians imperfectly quadrilobular. Venous blood is in all, however, more or less commingled with arterial, and the temperature is low.

**Respiratory System.**—Respiration is always performed by lungs, which are highly organized.

**Reproductive System.**—The organs of generation differ according to the orders. There is always a cloaca. In the saurians and ophidians the copulatory organs are paired; in the crocodilians and tortoises there is a simple organ, and in the rhynchocephalians there are no copulatory organs. The ova are large, and are in some hatched in the body, but in most expelled and left to the heat of the sun.

**Republic** [Lat. *res publica*, "public concern," "commonwealth"], a political community in which the sovereign power is lodged in the whole body of the people or in a portion of them, and exercised through representatives or agents directly or indirectly elected by them for that purpose. It is called an *aristocratic R.* when the exercise of the sovereign power is confined to a privileged class of what-

ever description, to the exclusion of all others; a *democratic R.* when all classes of the people participate in the exercise of that power alike.

Of the R. of anc. Gr., Sparta had a strictly aristocratic govt., while Athens might have been called a democratic R. but for the circumstance that a majority of its pop. were slaves. The R. of Rome was, during the first centuries of its existence, aristocratic in its political organization, but in the course of time the patrician aristocracy found itself compelled to yield to the lower orders of the people, the *plebs*, access to the high offices of the govt. The R. were strictly aristocratic. The first important R. of the modern era, the United Netherlands, was of a more democratic tendency, as was also the R. or "Commonwealth" sprung from the Eng. revolution. Of a similar character were most of the free cities and Hanse towns of Ger. At present there are only 2 R. of importance in Europe—Switz. and Fr. Since 1830 the federal as well as the cantonal const. of Switz. have undergone very important reforms, making them more and more democratic. Several cantons have introduced in their const. the provision that certain classes of bills passed by their legislatures shall be submitted to a vote of the people to acquire the force of law; and another provision, making it the duty of the legislatures to take into consideration and pass upon propositions submitted to them by a number of citizens fixed by the const. The Swiss cantons here referred to may be called the most democratic republican states now in existence. In Fr. the R. was proclaimed in Paris for the third time, Sept. 4, 1870. The National Assembly has since passed a number of constitutional laws for the permanent organization of republican govt. resting upon universal suffrage. In Amer. all states except Brazil and the colonial possessions of European powers have republican govts. with democratic insts. The largest and most powerful of them, the republic of the U. S., presents the realization of the democratic republican idea on the greatest scale.

In our days, while all R. with a uniform tendency, have drifted toward democracy as far as the equality of political rights among citizens is concerned, we find an essential difference between them as to the character of their political insts. In another respect. (1) The const. of a R. may be such as to make the gen. govt. the depository of the whole sovereignty of the people, so as to give it control not only of national affairs, but also of local administration; or (2) the gen. govt. of a R. may be one of strictly limited powers, being confined in its constitutional sphere of action to a certain class of things which concern the nation as a whole, while the administration of affairs of a local nature is left to the "self-government" of the people in their local organizations respectively, with entire independence of the central authority; or (3) these 2 systems may be so mixed as to leave to the local self-govt. of the people only a limited range, subject to supervision and interference by the central govt. A govt. of the first description would be called a *centralized*, of the second a *decentralized* govt., and of the third either one or the other as it more nearly approaches the first or the second standard. The Fr. R. presents an illustration of the centralized system in a but slightly modified sense, while the so called *federal R.*—and among them most conspicuously and on the greatest scale the R. of the U. S.—exemplify that which combines the independent administration of local interests by the people in their local organizations with a central govt. controlling affairs of national concern.

In the so called *federal R.* the *decentralized system* of govt. has been a thing of natural growth. They were formed by uniting in common political organizations a number of already existing communities, and these pre-existing communities, after their union, remained self-governing bodies, while within them the smaller units of local organization continued to stand in a similar relation. Of the nature, as well as of the practical working of this complex system the R. of the U. S. furnishes the most instructive illustration. There local self-govt. exists as the original condition of society, while the national idea, politically embodied in the gen. govt., although a thing of later growth, has also developed itself to great moral potency. The national govt. is restricted by the const. to a limited sphere of action, covering matters of national concern. The several States are left free to manage their own local affairs, being restrained, however, from doing anything that would encroach upon the constitutional sphere of the national govt., and from depriving any class of citizens of the equal protection of the laws or of the right of suffrage on account of race or color; while the national authority, on its part, is bound to guarantee to every State a republican form of govt. and to protect it against invasion, and, upon its own application, against domestic violence. Republican govt. on this plan has been carried on in the U. S. for nearly a century. A republican govt. so organized is unquestionably less subject to certain dangers, to which centralized R. are apt to succumb. A *coup d'état* would in a country like the U. S. be a mere blow in the air. Neither will a political party in possession of the national govt. be able to oppress opposition by an arbitrary stretch of power. If there is any real danger threatening the political insts. of the U. S., it is their deterioration by the influence of corrupt practices and habits. In this respect nothing can be more deplorable than the usage which has developed itself in the U. S. in the last 40 yrs.—to treat the offices of the govt. as the mere "spoils" of party victory, so that whenever the control of govt. passes from the hands of one party into those of another, all the officers belonging to the outgoing party are removed, and their places are distributed among those members of the victorious party who have gained a title to reward by partisan zeal or service. Persons being appointed to office not on account of their ability and character fitting them for the discharge of official duty, but on account of their usefulness in party warfare, the civil service of the govt. gradually



sinks down to the level of a partisan agency. But, on the whole, it will be admitted, even by those not partial to the republican theory, that in spite of temporary abuses and occasional jarrings the decentralized system of republican govt. with its "checks and balances" of power has not only proved itself entirely practicable, and very successful even in holding together in one national organization a very numerous pop. spread over a vast extent of terr., but that the people living under it, in Switz. as well as in the U. S., have attained a social condition remarkably prosperous, progressive, and happy. [From orig. art. in *J.'s Univ. Cyc.*, by Hon. CARL SCHURZ, LL.D.]

**Republican Party.** See PARTIES, POLITICAL, IN U. S.  
**Requisitions** [Lat. *requirere*, to "seek again"], in war, do not differ essentially from contributions. The latter Calvo regards as that which a dist. is called on to pay to besecure from pillage, and the former as what it places at the disposal of military invaders. Contributions are especially payments in money; requisitions, in some substance needed for the uses of an army, as wagons, horses, or flour. They are not payments for exemption from pillage, but what a commander requires for the necessities of the situation. No precise rules can be laid down for their amount, and their indefinite nature gives rise to savage demands. But while the property of the citizen is to be respected, govt. must be supported by taxes as before military occupation, special services exacted from the inhabs. must be paid for. The rule is a bad one that war must pay for war, and penalties in the way of fines have seldom sufficient justification. It is a good rule that the enemy can demand in kind or money all that which the armies of the invaded terr. would have a right to call for. Gen. Scott in Mex. paid for provisions, refrained from requisitions, and took nothing by force without indemnifying those who held the property, except in extreme and rare occasions. Dr. Lieber's instructions for the armies of the U. S. limit the rightfulness of seizing private property to cases of necessity, and require receipts to be given to owners from whom things are taken. Nap. admitted that the harsh requisitions of the Fr. in Sp. contributed not a little to Fr. reverses in the peninsula.

T. D. WOOLSEY.

**Resaca de la Palma**, a ravine which crosses the road about 3 m. N. of Matamoras, Mex., the position taken by the Mex. gen. Arista to resist the advance of Gen. Taylor's army. Although the latter was outnumbered 3 to 1, the Mex. were routed after a short conflict (May 9, 1846), and driven across the Rio Grande.

**Reservoir**, rez-er-vwôr' [Fr.], an artificial basin for storing water. Natural R. consist of (1) accumulations of snow, and, in elevated regions, of ice, which by gradually melting tend to equalize the flow of streams; (2) natural lakes and ponds, which during violent rains receive more water than they discharge; (3) swamps and extensive level areas, which by reason of their flatness retain the water falling on them or flowing from higher ground, allowing it to escape very slowly; (4) the vast layers of porous gravel and sand forming so large a portion of the earth's exterior, into which rain-water sinks and slowly reappears at lower levels in the form of springs. Notwithstanding these equalizing agencies, the flow of streams varies between very wide limits, never remaining uniform for any considerable time. The greater part of the water of heavy rains finds its way directly into the water-courses, causing a useless and often destructive increase of their volume. During intervals of dry weather the natural R., except the first named, furnish a constantly diminishing supply. These facts exhibit the utility of storage R.

R. are usually formed by constructing a dam across the valley or channel of a stream; the outlet of a natural lake often presents a favorable locality. When not founded upon rock, such dams are usually made of earth with a wasteway of stone for discharging superfluous water. The best construction consists in cutting a trench across the valley down to rock, and filling it with clay or impervious material called puddle, which is clay mixed with suitable gravel. The body of the dam is composed of binding gravel, or gravel containing some mixture of clay. It has a central wall or else an inner facing of puddle carefully mixed and compacted. The water is drawn from the R. generally through iron pipes. They are sometimes laid in the earthwork of the dam, but preferably in a gallery excavated in the natural earth. They are sometimes laid over the top of the embankment and operate as siphons. The wasteway is arranged to let the water escape before it rises high enough to run over the earthwork. It is usually constructed of heavy stones, so as to conduct the water by a series of low falls down to the level of the stream. [From orig. art. in *J.'s Univ. Cyc.*, by J. P. FRIZELL.]

**Reshid** (reh-sheed') **Pa'sha** (MUSTAFA MEHEMET). b. at Constantinople in 1802; entered the civil service of the Tur. govt., in which he subsequently held the highest positions; allied himself with Fr. and Eng. against the old Tur. party and the influence of Rus. At the death of Mahmood II., in 1839, and the brilliant victory of Ibrahim Pasha at Nisib over the Turks, he was placed in charge of the ministry of foreign affairs. By the hatt-i-sherif of Gulhane (Nov. 3, 1839), a sort of constitutional charter, he created sympathy in Europe for the cause of the sultan; succeeded in forming the quadruple alliance which compelled Mehemet Ali to give up all his conquests outside of Egypt. Nevertheless, he had to resign his office in 1841, baffled by the machinations of the old Tur. party. He was grand vizier from 1846 to 1852, and was recalled to power in 1853, but toward the close of the Crimean war he was superseded by some of his own party; by English influence he came into power a fifth and a sixth time, but his influence was gone. D. Jan. 7, 1858.

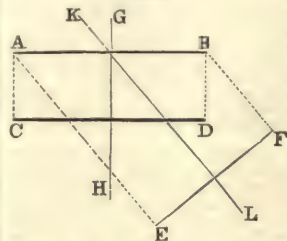
**Resins.** See GUM-RESINS and ROSIN.

**Resistance** [Lat. *resistere*, to "withstand"] of **Fluids.** When a solid body floats or is immersed in a fluid, both being at rest as regards one another, the lateral

pressure upon each side of the body is balanced by an equal pressure upon the opposite side. As soon as the body commences to move, this equality of pressures no longer exists. The pressure on the forward side becomes greater than before, that on the rear becomes less. The particles of fluid in front of the body must be put in motion, and flow right and left to allow the body to pass. On the other hand, the movement tends to leave a void in rear of the body. The R. is proportional to the square of the velocity.

Numerous experiments have been made to determine the R. to the motion of bodies of different forms in water. The

FIG. 1.



R. is given for a velocity of 1 ft. per second. For any other velocity the R. must be multiplied by the square of the velocity. It is expressed in lbs. per square foot on the projection of the body upon a plane perpendicular to the direction of its motion. This phrase will be understood by reference to Fig. 1. Suppose the body to be a flat plate A moving in the direction G H. Thus, its projection on the plane perpendicular to the direction of its motion is C D. If it be moving in the direction K L, its projection is E F.

The R. of air follows practically the same law as that of water, the only difference being that which results from its elasticity. The movement of a body in air has the effect to condense the air, to some extent, in front, and to rarefy it in the rear. When, therefore, a body moving in air changes its velocity, the R. changes in 3 ways: (1) By changing the quantity of air put in motion; (2) by changing the velocity with which it is put in motion; and (3) by momentarily changing in some slight degree its density or weight. Nevertheless, except for very rapid movement, as in the case of war projectiles, it is for common purposes sufficiently accurate to say that the R. is proportional to the square of the velocity. The R. on a convex surface is less than that on a plane surface, and that on a concave surface is greater than on a plane. For a hemispherical dish the R. is  $2\frac{1}{2}$  times as great with its concavity in front as with its convexity. A parachute is a very large and strong umbrella designed to enable a man to descend from a great height. It meets with the same R. as the cup moving with its rim in front. As its velocity increases by the action of gravity, the R. increases until it becomes equal to the weight, after which the descent is uniform. [From orig. art. in *J.'s Univ. Cyc.*, by J. P. FRIZELL.]

**Respirators**, mouth-pieces of fine gauze and cloth, to be worn by patients with diseased or weak lungs to prevent the ingress of cold and damp air or foreign matter, as smoke, dust, or the grit of stone. But little used in this country, they are employed in Eng. and in many vocations, as by grinders, stone-carvers, and wherever the air is permeated by impalpable particles.

**Restigouche**, res-te-goo-shâ' [an Indian word, indicating its division into 5 head-streams, like the fingers of a hand], a river which separates N. B. from the province of Que. It is 200 m. long, drains 4000 sq. m., is navigable for large ships 16 m. to Campbellton, and reaches the Bay of Chaleurs at Dalhousie.

**Restorationists** [Lat. *restauratio*], a name applied to those Chrs. of whatever sect who entertain the belief that the wicked who die in an impenitent state will, after suitable punishment and repentance, be restored to divine favor, and that all the human race will at last become forever holy and blessed.

**Resurrection** [Lat. *resurrectio*, "rising again"]. The resurrection is the future general raising by the power of God of the bodies of the dead. It was clearly revealed in the N. T. by Christ and the apostles, and has been accepted by all parts and ages of the Ch. As held now, this doctrine rests on the historical fact of the R. of Christ. He rose on the third day after his death in the body, which, though changed as to its mode of being, was the identical body which was crucified. The N. T. teaches that all the dead which was crucified. The N. T. teaches that all the dead, are to rise at the last day to judgment—the good to bliss, the bad to punishment. It speaks of the R. of the dead, or from the dead, or of the body, not of the flesh. The creeds and symbols of the Ch. have generally used the grosser form, the R. of the flesh.

The R. implies the continued identity of the body—that the future body is in essence identical with the present body, one being the veiled germ, the other the glorious development. Concerning identity, it has been taught that (1) all the particles of matter that have ever been in the body are brought together again; (2) only the particles present at death; (3) certain more enduring parts are preserved as an indestructible corporeal germ from which is made by divine power an organ of the soul adapted to its higher condition; (4) some of the particles remain, however few; (5) there is a "vital germ"; (6) a spiritual, "ethereal, luminous" body is evolved at the moment of death; (7) that the plastic formative principle of life (*anima, psyche*) is continually gathering and casting off the matter it needs for a body wherever it may be. (8) That identity is in the spirit, the rational, immortal principle which shows itself in the body which it occupies and stamps with its own personality. The R. body is (1) spiritual, as opposed to the "natural"; (2) like Christ's body; (3) is glorious, powerful, incorruptible, immortal. [From orig. art. in *J.'s Univ. Cyc.*, by REV. ISAAC RILEY.]

**Resurrection, Congregation of the**, a society of R. Cath. priests founded in 1836 at Rome by Rev. J. Kajsiewicz, who d. in 1873. They have a few missions in the U. S.



**Resuscitation** [Lat. *resuscitatio*], or **Artificial Respiration**, consists in motion of the ribs and exchange of air produced by external instead of internal and vital force.

**Rule 1 (Fig. 1).** To drain off Water from Chest and Stomach.—Instantly strip the patient to the waist. Place him face downward, the pit of the stomach being raised above the level of the mouth by a large, hard roll of clothing placed beneath it (c). Throw your weight forcibly 2 or 3 times, for a moment or two, upon the patient's back, over roll of clothing (b), so as to press all fluids in the stomach out of the mouth.

FIG. 1.



**Rule 2 (Fig. 2).** To perform Artificial Breathing.—Quickly turn the patient upon his back, the roll of clothing being so placed beneath as to make the breast bone the highest point of the body (b). Kneel beside or astride patient's hips. Grasp front part of the chest on either side of the pit of the stomach, resting your fingers along the spaces between the short ribs (d). Brace your elbows against your sides, and, steadily grasping and pressing forward and upward, throw your whole weight upon chest c and b, gradually increasing the pressure while you can count one—two—three. Then suddenly let go with a final push, which springs you back to your first position. Rest erect upon your knee while you

FIG. 2.



can count one—two; then make pressure again as before, repeating the entire motions at first about 4 or 5 times a minute, gradually increasing to about 10 or 12 times. Use the same regularity as in blowing bellows and as is seen in natural breathing, which you are imitating. If another person be present, let him with one hand (d), by means of a dry piece of linen, hold the tip of the tongue out of one corner of the mouth, and with the other hand grasp both wrists and pin them to the ground above the patient's head.

**After-treatment.**—After breathing has become natural, dry the patient briskly. Wrap him in blankets only, and let him be kept perfectly quiet. Provide free circulation of air. Give brandy and water—a teaspoonful every 5 minutes the first half hour, and afterward occasionally as may seem expedient. [From orig. art. in *J.'s Univ. Cyc.*, by B. HOWARD.]

**Retention** [Lat. *retentio*] of **Urine**, a condition in which the urine cannot be evacuated from the bladder at all, or only with great difficulty, the former being known as complete, the latter as incomplete. R. It should not be confounded with *suppression*, in which the urine has not been excreted by the kidneys, and consequently the bladder is empty. The treatment in all cases should be by opium, the warm bath, and the catheter. Hysterical R. is a disease of the mind, and depends wholly upon the volition of the patient. (See **HYSTERIA**.)

E. DARWIN HUDSON, JR.

**Retrogradation** [Lat. *retro*, "back," *gradati*, to "step"], in astron., an apparent or real motion of a celestial object from E. to W., or contrary to the order of the signs in the heavens. Motion from W. to E. is called direct. The motion of all the bodies of the solar system is direct, but that of some of the comets is retrograde. The planets, however, seem at times to have a retrograde motion, which is a consequence of the fact that their velocities in their orbits differ from that of the earth. The inferior planets move more rapidly than the earth, and the superior less rapidly. It happens, therefore, that the inferior planets have a motion apparently retrograde for some time before and some time after their inferior conjunctions. The ap-

parent motion of the superior planets is retrograde for some time before and some time after their oppositions. Between the periods of direct and retrograde motion there are times when these bodies are apparently stationary, but the stations are of brief duration.

**Retz, de** (JEAN FRANÇOIS PAUL DE GONDÉ), CARDINAL, b. at Montmirail, Fr., in 1614, ed. for the Ch. In 1643 he took the degree of D. D. at the Sorbonne, and was appointed coadjutor to the abp. of Paris. He began to preach, and soon became popular among the Parisians. In the embroilments of the Fronde he appeared as one of the leaders of the revolution against Mazarin and the queen. But in 1650 he allied himself with the court, gained a cardinal's hat, and commenced to intrigue against the opposite camp. He had forfeited all confidence, however, and in 1652 Mazarin ordered his arrest. He was imprisoned, but escaped and fled to Sp., afterward to It. After the death of Mazarin he was permitted to return to Fr. in 1661. He received the abbacy of St. Denis, and here he lived in great splendor and gayety. D. at Paris Aug. 24, 1679. His *Mémoires* were pub. at Nancy in 1717.

**Reuchlin**, roik-leen' (Hellenized CAPNIO), (JOHANN), b. at Pforzheim, Baden, Ger., Dec. 28, 1455; educated in the chapel of the margrave of Baden, and followed in 1473 the young margrave to the Univ. of Paris, where he commenced his studies in Gr. During 2 yrs.' residence at Bâle he wrote and pub. his Latin dict., and during a second visit to Fr. in 1478 he studied law at Orleans. In 1481 he lectured on jurisprudence and belles-lettres at the Univ. of Tübingen, received the title of imperial councillor from the emp., and lived for several yrs. at the court of the elector palatine, Philip, at Heidelberg. To this period belong his first studies of the Heb. lang. and his satirical comedy, *Serghus, sive Capitis Caput*. In 1498 he went to Rome, his patron, the elector palatine, having fallen under the papal ban, and he succeeded in procuring his absolution. After his return he was appointed pres. of the Swabian confederate tribunal, and continued his studies of Heb., the results of which were his *Rudimenta Hebraica*, *De Arte Cabalistica Libri III.*, and *De Accentibus et Orthographia Hebraeorum Libri III.* (1518). By these works he actually initiated the study of the Heb. lang. But he was too liberal to escape clashing against the prejudices of his age. A converted Jew, Johann Pfefferkorn, proposed in 1510 that all Heb. books, with the exception of the Bible, should be burned. The Dominicans were in raptures over the proposition; the Inquisition immediately recognized it as a new weapon of persecution; the emp. acquiesced. Meanwhile R. remonstrated, the emp. withdrew his consent, and the Inquisition and the monks flew into a fury. R. pub. *Speculum Oculare* (*Augenspiegel*) (1512) and *Defensio contra Calumniatores* (1513), while Ulrich von Hutten and Franz von Sickingen kept guard over his personal safety. With Luther R. felt a deep sympathy, but he declined an invitation to come to Wittenberg, sending in his stead Melancthon, and maintained his connection with the R. Cath. Ch. to the last. In 1520 he was appointed prof. at Ingolstadt. D. June 30, 1522.

**Reuling** (GEORGE), M. D., b. in Darmstadt, Ger., Nov. 11, 1819, studied med. in the Univ. of Giessen, where he grad. with the highest honors; devoted himself as a specialist to diseases of the eye and ear; became in 1867 first assistant to the eye hospital at Wiesbaden, which after 1 yr. he resigned to take charge of the eye and ear infirmary of Baltimore, Md. In 1869 he was elected prof. of ophthalmology in the Univ. of Baltimore.

**Reuss**, ruce, 2 small principalities of Ger., belonging to an elder and younger line of the family of Reuss, and consisting of several separate terrs. situated between Prus., Sax., and Bavaria. The dominions of the elder line. Reuss-Greiz, comprise an area of 148 sq. m., with 50,782 inhabs.; and those of the younger line, Reuss-Schleitz, 297 sq. m., with 101,330 inhabs.

**Reuter**, roiter (FRITZ), b. at Stavenhagen, Mecklenburg-Schwerin, Nov. 7, 1810; studied law at Weimar and Jena, but was arrested in Prus. in 1834 for political agitation and sentenced to death. The sentence was commuted to imprisonment for 30 yrs., but in 1840 he was pardoned and restored to liberty. He then wrote poems and novels in the Low Ger. dialect. D. July 12, 1874.

**Revalen'ta Arab'ica**, a name for a dietetic preparation highly vaunted for the use of invalids. It is simply the meal of lentils, and its name *revalenta* is an imperfect anagram of *Ervum lens*, the botanical name of the lentil-plant. In reality it is very nutritious, but much more suitable food for a well person than an invalid.

**Revela'tion, Book of.** The word "revelation" signifies properly the removal of a veil. To know the present man has his senses; to know the past, he has the study of history; but the future is hidden from him by a thick curtain; and if the future is to be disclosed to man like the present and the past, it is necessary that an inner sense should be created through which he can enter into contact with the new sphere. Thus God placed before the inner eye of John, in a picture comprising a series of scenes and forming a complete drama, the future of the Ch. viewed under a certain aspect. In the fourth Gospel John describes



the first appearance of his Master, the apparition in the weakness and poverty of the flesh: in the book of Revelation he describes the second appearance of his Master, the apparition in the divine power and glory.

I. In the picture of the appearance of the Lord in chap. i. he is surrounded with seven candlesticks, representing the various chs. which have succeeded the one candlestick of the anc. people of God, now rejected. The seven chs. are chosen to represent the totality of the Ch. In the first, Ephesus, good and evil balance each other. In the third, Pergamos, evil excels. In the fifth, Sardis, death reigns in spite of the noise of her life. In the seventh, Laodicea, her state is such that the Lord is about to vomit her out of his mouth. In Smyrna, the second, faithfulness reigns; at Thyatira, the fourth, it progresses. At Philadelphia, the sixth, her state is such that she seems ready to be crowned. There is not, and there never will be, in Christendom, a Ch. which does not conform to one of these divisions.

II. The opening of the second part is given in chaps. iv. and v. in 2 pictures—that of the glory of God and that of the glory of the Lamb. In the first may be noticed the 4 animals or living beings which support the throne of God, and the 24 elders who surround it. The former represent the forces of nature under the emblem of the 4 beings which are at the head of the living world. The 24 elders represent the Ch. already triumphant—12 for the faithful among the Jews, and 12 for the faithful among the pagans. "In the right hand of Him that sits on the throne is a book written within and on the back side, sealed with seven seals." It is the symbol of the decree of God which must be understood and executed by some one. But no one is able to accomplish this act until the Lamb itself seizes the book and commences to break the seals. Then the execution of the divine plan shall begin. In chap. vi. the seals are finally opened. At the opening of the first, a white horse comes forth, mounted by the angel of victory. At the second, a red horse appears, bearing the angel of war. At the third, a black horse comes forth, and the angel whom it carries holds in his hand a scale for measuring food: it is the symbol of famine. From the fourth, a pale horse issues, and on him sits the angel of Death, and hell follows with him. On the opening of the fifth seal the departed souls of the martyrs raise a loud cry, calling for judgment. With the sixth seal an earthquake wakes the world, and gives to all human beings a presentiment of the approach of the judgment. The meaning of this picture of the 6 seals seems to be clear. After the establishment of Christianity in the whole empire the earth shall be visited by plagues destined to break the stubbornness of the pagans and dispose them to receive the promises of grace. To this sombre picture of the plagues of God corresponds in chap. vii. a bright picture of assistance and grace. It comprises 2 scenes. The one relates to the Jewish people. Twelve thousand persons of each tribe are marked with the seal of God. In the second part of chap. vii. the prophet witnesses the arrival at the celestial glory of an innumerable multitude of faithful from among the Gentiles. They have traversed the furnace of persecution victoriously by their faith. In chap. viii. the seventh seal of the book containing the decrees of God is broken, but it does not contain any particular event. It incloses the whole subsequent vision of the 7 trumpets. There is an apparent gradation from the image of the seal to that of the trumpet, and from the image of the trumpet to that of the vial. The seal represents simply the divine decree as inevitable. The trumpet announces the execution as very near; it is a signal. The vial introduces the decree as identical with its execution. The 6 trumpets which are heard in the 8th and 9th chaps. call down on the inhabs. of the earth a second series of plagues still more frightful than the first one. The sounding of the 7th trumpet, which shall call up the last and most terrible plague, Antichrist, is preceded, as was the opening of the 7th seal, by a bright and joyful picture.

This introductory picture is presented under the image of a small book. John is commanded to eat this book—that is, to appropriate wholly its contents. He sees Jerusalem occupied by the Gentiles; even the fore-court of the temple is in their power. But the temple, properly speaking, is withheld from them, and here are kneeling the true worshippers of Jehovah. In the city itself 2 prophets preach repentance to Israel. But the Pharaoh of the last times is also here, and this master of the world kills them, but in the lapse of 3 days they are resuscitated and raised to heaven. This vision relates to the final conversion of the people of Israel. Jerusalem crowded with Gentiles represents the Jewish people in its present state of dispersion and subjection. But the temple is guarded by God himself. It is the faithful portion of Israel which remains attached to the faith of their ancestors and shall continue so until this Jewish piety shall be transformed into faith in Christ. Among the infidel Israel powerful agents of God shall fill the ministry of prophecy. They shall succumb to the hatred of Antichrist, but their defeat and their glorification shall be the signal of the conversion of the whole people. The sounding of the 7th trumpet calls forth Antichrist. But this supreme apparition of evil is still preceded by a picture relating to the Ch. during this great crisis (chap. xii.). One Ch. is here represented under the image of a woman travelling in childbirth. A dragon is waiting for the child in order to devour it, but the child is taken away into heaven and the woman flees to the desert, where she is miraculously fed for three yrs. and a half. Then the archangel Michael precipitates the dragon from the heavens to earth, where he causes to issue forth from the womb of the ocean the beast with the seven heads, which represents Antichrist. This beast is followed by another, of a less terrible form, having the horns of a lamb: it is the false prophet. The Son about to be borne by the Ch. is the Lord himself. His removal to heaven signifies that his reign is still deferred for a time, in order to make room for that of his rival,

Anti-Messiah. The Ch. itself shall be externally suppressed during the reign of this adversary, but shall be miraculously preserved. This external destruction of the Ch. shall take place simultaneously with the fall of idolatry, represented by the victory of the archangel Michael over Satan. And this very fact shall be the occasion of the arrival of Antichrist, whose theological system may be summed up in the 3 following theses: (1) there is no personal God without and above the universe; (2) man is himself his own god—he is the god of this world; (3) "I am the true representative of humanity; by worshipping me mankind worships itself." He is evidently the personification of worldly wisdom, natural inspiration.

After this dark picture in chap. xiii. the Lord encourages the Ch. by a bright picture in chap. xiv. It is the aspect of the one hundred and forty-four thousand Israelites who were sealed in chap. vii., and who now have been won over to the faith, and surround the Lamb as a picked guard just as the battle draws near. Then an angel, flying across the heavens with the gospel in his hand, announces the extension of the mission to all the nations of the earth; and finally, the promise and the threat of the near judgment. As the 7th seal inclosed the 7 trumpets, thus the 7th trumpet, which occasions the appearance of Antichrist, incloses the 7 vials, or the last plagues reserved for the ruin of the empire of the false Messiah. They are announced in chap. xv. and enumerated in chap. xvi. In chap. xvii. Babylon appears personified. It is a queen arrayed in purple and gold, the great whore. She is sitting on the beast. This beast has 7 heads, of which 5 have fallen, the 6th is still alive, and the 7th shall come, but only for a short time, after which the beast itself, which "was" and "is not," and who "is of the 7, and goeth into perdition," shall appear as the 8th head. The 7 heads of the beast are 7 hills, on which Babylon, considered as a city, is built. Then suddenly the beast turns against Babylon with the kings, his allies, pillages her, and burns her; chap. xviii. is a song of triumph chanted over her ruins. The beast represents the political power, as far as it is hostile to God, through the whole course of hist., from its first appearance in Egypt to Antichrist. What are the 7 heads which preceded Antichrist? The first state which came in hostile contact with the reign of God, manifesting itself through his chosen people, was Egypt. The second was the Assyro-Babylonian empire, which suppressed it for a time. The third was the Per. empire, which held the restored Israel under its authority; and the fourth the Gr. monarchy, or more especially the kingdom of Syria. The fifth is the Jewish state, degenerating under the sceptre of the Herods and the pontificates of Annas and Caiaphas. The sixth is the Rom. empire, which in the moment when John wrote stood in its full power. The seventh, which shall last only for a short time, is the political power which is called to put an end to the Rom. dominion, to destroy the whole political system of Europe and prepare it for the arrival of Antichrist. And who shall be Antichrist himself, the 8th head? Is it not the people of Israel? In xvii. 10 it is said of the beast that it "was," that it "is no more," and that it shall return, but only to disappear. Israel was once an independent political power; it is no more a nation organized as a power, but it shall reappear as the last monarchy, and after so many powers have succeeded each other the astonished world shall see the Jewish empire unite once more. Any one who knows Europe knows also what a peculiar aspect matters have there begun to assume. The Jews are not only the bankers of the kings and the directors of the commerce of the whole world, but they have become the governors of the ideas of the century. "The distinctive feature of the Jews is their indefatigable tendency to place themselves at the head of modern life."

III. We approach the moment when Christ shall arrive and free his Ch. from the hand of the enemy, described in chap. xix. This act is accompanied with the resurrection of those among the faithful who have died, and the glorification of those who are still alive; and it is followed by a state of affairs in which the reign of God can be perfectly realized among mankind. It is the reign of a thousand years. At the end of this period Satan, who as yet is only bound, shall try once more to destroy the work of God, but he shall only give the signal of his own final punishment, which is accompanied by universal judgment (chap. xx.). The terrestrial state founded on the day of creation (Gen. i.) now gives place to the new heavens and a new earth (Rev. xxi.), in which God is all in all. The question is now, Who is the man to whose eyes the whole plan of God has been thus unveiled and the book with the 7 seals unfolded? He calls himself simply John. But could any other than the apostle of this name designate himself in this manner, especially in Asia Minor, where the apostle had ended his life? The Fathers tell us that toward the close of his life, during his residence in Asia Minor, the apostle John was exiled to the isolated rock of Patmos by Domitian. Here, alone, on a Sunday, the inner veil was removed from before his soul, and the second coming of Him whose first apparition he had seen with the eyes of his body was revealed to him. [From orig. art. in *J's Univ. Cyc.*, by Prof. FREDÉRIC GODET, D. D.]

**Revere** (PAUL), b. at Boston Jan. 1, 1735; became a goldsmith, and afterward a copperplate engraver; was a member of the "tea-party," and at the instance of Gen. Warren secretly left Boston on the night of Apr. 18, 1775, and rode to Concord to announce the Brit. expedition of the following day, which was resisted at Lexington and Concord. In the same yr. he engraved the plates and printed the bills of the paper-money of Mass.; afterward set up a powder-mill; became lieut.-col. of State artil.; participated in the Penobscot expedition of 1779; established a foundry of cannon and ch.-bells; erected extensive works for rolling copper at Canton, Mass., and became grand master of the Masonic order, in which capacity he assisted in laying the cornerstone of the Boston State-house 1795. Longfellow's poem has immortalized him. D. May 10, 1818.



**Revision of the Bible.** On May 6, 1870, the Convocation of Canterbury appointed a committee of eminent biblical scholars and dignitaries of the Ch. of Eng. to revise the authorized Eng. version of 1611, and to associate with them representative biblical scholars of other Chr. denominations using that version. This committee was divided into 3 companies—one for the O. T. and one for the N.—which hold regular meetings in the Jerusalem Chamber in the deanery of Westminster, Lond. On the invitation of the Brit. committee an Amer. committee was organized in 1871, and began active work in Oct. 1872. This is likewise selected from different denominations, and divided into 2 companies, which meet once a month for several days in their own rooms in the Bible House at New York. Virtually, these 2 committees form one organization, with the same principles and objects, and in constant correspondence with each other. The intention is simply to adapt King James's version to the present state of the Eng. lang., without changing the idiom and vocabulary, and to the present standard of biblical scholarship. The two committees consist of 79 members—52 in Eng. and 27 in Amer. The revised N. T. was pub. in 1881 and the revised O. T. in 1885. The pres. of the Amer. Revision Committee is Philip Schaff, D.D., LL.D.; its sec., George E. Day, D.D.

**Revolvers** [Lat. *revolvere*, to "return"], breech-loading small-arms, usually pistols. R. rifles of Colt's pattern have been in service in the U. S., and the Gatling gun is also a R. Samples of R. made in the early part of the 17th century are known, but the Colt's R. was the first of practical value.

**Reward** [Lat. *recompensum*], a recompense or compensation offered for the performance of some act, and payable to the one who does the prescribed act. If a private individual offers in a public manner to pay a certain sum upon the performance of a certain act, any person who complies with the terms of the offer becomes entitled to payment, and can enforce it by action.

**Reykjavik**, rík-yáv-ik, the cap. of Iceland, on the S. W. coast of the island, at the head of Faxafljörð, is the seat of the govt., has a coll. with a library of 10,000 vols., an important annual fair, and regular steam communication with Leith and Copenhagen. Founded 874. Pop. 1816.

**Reynard the Fox**, a satirical epic pub. in the Low Ger. dialect at the close of the 15th century. It gives in rhymed verses a humorous account of the adventures of the Fox at the court of the Lion, and became very popular in Ger. and the adjacent countries.

**Reynolds** (IGNATIUS ALOYSIUS), D. D., b. near Bardstown, Ky., Aug. 22, 1798, ed. at St. Mary's Coll., Baltimore; became a Catholic priest; was successively vicar-gen. of Ky., rector of St. Joseph's Coll., and pres. of the Nazareth Female Inst. of Ky., and was consecrated bp. of Charleston Mar. 18, 1844. D. Mar. 6, 1855.

**Reynolds, or Rainolds** (JOHN), D. D., b. at Pinhoe, Devonshire, Eng., in 1549; studied at Merton Coll., Ox., 1562; was admitted to Corpus Christi Coll. 1563; became fellow 1566; lectured on Aristotle; was dean of Lincoln 1593; refused a bishopric in order to accept the presidency of Corpus Christi Coll. 1598; was eminently distinguished as a Hebraist, regarded as the leader of the Puritan party, and was said to have been "the most eminently learned man of Queen Elizabeth's reign;" took a prominent part in the Hampton Court Conferences of 1603, where he maintained the necessity of a new version of the Bible; executed a small portion of King James's version, and revised much more in the weekly meetings of the translators held at his chambers. D. at Ox. May 21, 1607.—His brother, WILLIAM REYNOLDS, b. at Pinhoe about 1540, was ed. at Ox.; became a Catholic; was prof. of divinity and Heb. at Douay and Rheims; took an important part in the translation of the Rheims Testament; chaplain to the Beguin nunnery at Antwerp. D. Aug. 24, 1594.

**Reynolds** (JOHN), b. in Montgomery co., Pa., Feb. 26, 1789; removed in childhood to Kaskaskia, Ill.; served in campaigns against the Indians 1812-13; became a lawyer at Cahokia; was appointed a justice of the supreme court of Ill. 1818; gov. of the State 1830-34; commanded the Ill. volunteers during the Black Hawk war 1832; M. C. 1835-37 and 1839-43; was speaker of the Ill. house of representatives 1852-54; wrote *The Pioneer Hist. of Ill. and My Life and Times*. D. May 8, 1865.

**Reynolds** (JOHN F.), b. in Pa. 1820, grad. at W. Pt. 1841; in the Mex. war served at Monterey and Buena Vista, winning the brevets of capt. and major; in garrison and on frontier duty until Sept. 1860, when he was selected as commandant of cadets at W. Pt.; lieut.-col. of inf. 1861, col. June 1863, brig.-gen. of volunteers Aug. 1863, and assigned to command of a brigade of the Pa. Reserve Corps, which he commanded in the Virginia peninsular campaign of 1862 at Mechanicsville, Cold Harbor, and Frazier's Farm, where taken prisoner; being exchanged, commanded a division in the second battle of Bull Run; in Md. campaign of Sept. 1862, was selected to command the Pa. militia for the defence of the State. In Nov. 1862 was promoted to be maj.-gen. of volunteers, and placed in command of the 1st corps of the Army of the Potomac, which was engaged in the battle of Fredericksburg, Dec. 13, 1862. At the battle of Gettysburg, on the opening day (July 1, 1863), he was struck with a rifle-shot that caused almost instant death.

**Reynolds** (JOSEPH J.), b. in Ky. 1822, grad. at W. Pt. 1843. After serving in garrison and in Tex., he was in 1846 selected as assistant prof. of geog., hist., and ethics at W. Pt., and the following yr. became assistant prof. of natural and experimental philos., and from 1849 to 1855 was prof. In 1857 became prof. of mechs. and engineering in Washington Univ., St. Louis, Mo., which he held until 1860. In 1861 he was appointed col. and brig.-gen. of Ind. volunteers, and June 1861 brig.-gen. of U. S. volunteers, serving in V. Va.; resigned in Jan. 1862, reappointed Nov. 10, and Feb. 2, 1863, was promoted to be maj.-gen. of volunteers, serving with the Army of the Cumberland at the battle of Chickamauga.

At the battle of Chattanooga he was chief of staff; subsequently held commands in the S. W., and from Nov. 1864 to Apr. 1866 commanded the dept. of Ark.; appointed col. of the 26th U. S. Inf. July 1866; transferred to 35th Inf. Jan. 1870, and to 3d Cav. Dec. 15, 1870; brevet brig.-gen. and maj.-gen. for gallantry in the field. Ret'd, 1877.

**Reynolds** (SIR JOSHUA), D. C. L., b. at Plympton, Devonshire, Eng., July 16, 1723, ed. at the free gram. school of his native place; settled at Plymouth as a portrait-painter 1743, and at Lond. 1746; obtained the patronage of Capt. (afterward Lord) Keppel, who gave him a passage to the Mediterranean in his vessel 1749; returned to Lond. 1753; soon took the first rank among Brit. artists; was chosen pres. of the Royal Acad. at its creation 1768, at which time he was knighted; delivered at the Royal Acad. discourses on the fine arts, which were pub., and was appointed prin. portrait-painter to the king 1784. D. Feb. 23, 1792.

**Reynolds** (WILLIAM MORTON), D. D., b. in Fayette co., Pa., in 1812, grad. at Jefferson Coll. 1832; became a clergyman of the Lutheran Ch.; was prof. in Pa. Coll. 1833-50; pres. of Capital Univ., O., 1850-57, and of Ill. State Univ. 1857; ordained in the P. E. Ch. 1864. Author of *Discourse on the Sinc. Chs.*; founded and conducted the *Evangelical Magazine*, the *Literary Record*, and the *Evangelical Review*.

**Reynoldsville**, Pa. See APPENDIX.

**Re'zin** [Heb. "firm," "stable," or "prince"], the 8th and last of a line of kings of Damascus, beginning with Hladad, contemporary with David. He began to reign about 745 B. C., and was slain by Tiglath-Pileser of Assyria (732 B. C.).

**Rhadamanthus**, in Gr. mythology, son of Zeus and Europa, and brother of Minos, king of Crete, settled in Boeotia, where he married Alemena, and became after his death, on account of his supreme justice, one of the 3 judges of the lower world.

**Rhapsodists** [Gr. *ῥαψῳδοί*, from *ῥάπτειν*, to "stitch," to "string together," and *ὄδῳ*, "song"], a class of wandering minstrels in anc. Gr. whose occupation was the recital of the Homeric and other poetry.

**Rhatany** (Peruvian, *añaña*), a drug, being the root of *Krameria triandra*, a small woody shrub growing in the Bolivian and Peruvian Cordilleras. R.-root is in pieces of various sizes, composed of a dark, reddish-brown bark and a central lighter-colored, woody portion. It has no smell, but a bitter, somewhat sweetish, and very astringent taste. The medicinal principle is a form of tannin, called rhatannic acid. This is found only in the cortical part of the root, where it exists in the proportion of about 30 per cent. Preparations of the root are used in med. almost exclusively as astringents in diarrhical affections.

**Rhea**, in Gr. mythology. See CYBELE.

**Rhea**, in ornithology. See RHEIDE.

**Rhea Silvia**. See ROMULUS.

**Rheidae** [from *Rhea*, "Pea," a mythological name], a family of birds of the order or sub-order Ratitae, containing the S. Amer. ostriches, and differing externally from the Afr. ostriches chiefly by the 3-toed feet, the more slender bill, and the want of caudal plumes. The species of this group are confined to S. Amer., where they inhabit the open plains and exhibit habits analogous to those of the ostriches of Afr. They are generally seen alone; they run with considerable fleetness, and generally against the wind, expanding their wings in starting to assist in making headway. They feed chiefly upon grass and roots. The females lay their eggs in combination, sometimes depositing together as many as 80 eggs; these are collected together by the male bird, who hatches them and attends for a short time to the young.

**Rheims**, reemz [Lat. *Durocortorum*, afterward called *Remi*, the name of the people], a large old city of Fr., dept. of Marne, on the Vesle, is surrounded with walls and ramparts planted with trees and affording beautiful promenades; it is generally well built, and has many fine streets, squares, and public buildings. The cathedral, built in the first part of the 13th century, is one of the finest Gothic edifices of Europe. R. has extensive manufactures of woollens and a large trade in champagne wines. Pop. 93,823.

**Rhenish Confederation**. By the Peace of Presburg (Dec. 26, 1805) Bavaria and Württemberg were erected into kingdoms, and their princes received sovereignty independent of the Ger. emp. Thus, the dissolution of the Ger. empire was prepared, and on Aug. 1, 1806, 16 princes of S. and W. Ger. threw off their allegiance to the emp. and formed a confederacy, the *Rheinbund*, under the protectorate of Nap. Aug. 6 the emp. Francis II., abdicated the title imperial dignity and crown of Ger., and assumed the title of emp. of Aus., and after the war between Fr. and Prus. most of the princes of Central and N. Ger. entered the confederacy, which continued valid to the downfall of Nap.

**Rhenish Prussia**, the westernmost prov. of Prus., bounded W. by Belg. and the Netherlands, comprises an bounded W. by Belg. and the Netherlands, comprises an area of 10,289 sq. m. The surface is mountainous; the N. part, however, is flat, and produces much grain and cattle. The mts. are covered with fine forests and are rich in lead, copper, iron, and coal; the valleys belong to the richest and most beautiful regions of Europe, famous for their excellent wine and for their enormous manufacturing industry. Pop. 4,074,100.

**Rhenish Wine**, or **Rhine Wine**, a name for the wines of Ger., produced chiefly in the Palatinate and the Moselle valley, but especially in the Rheingau. The white Rhine wines are better than the red Rhine wines, have a peculiar, delicate bouquet and fragrance, and are dry, clear, and very durable.

**Rhetoric**, ret'-o-rik [Gr. *ῥητορικὴ*, sc. *τέχνη*], is the art of discourse, and recognizes 3 forms:

1. *Representative discourse*, in which the matter is presented for its own sake, without especial purpose or especial regard to form. Under this head we treat of—(1) things—description; (2) facts—narration; (3) truths—exposition.



Clearness, accuracy, and completeness are the prime essentials of this form.

2. *Poetry*, in which the matter and the purpose are subordinate to the form. Under poetry the following classification may be recognized: (1) the poetry of thought—didactic poetry; (2) the poetry of feeling—lyric poetry; (3) the poetry of action—epic poetry.

3. *Oratory*, which proposes an end to be attained, to which the matter and form of discourse are merely ancillary. The anc. recognized 3 kinds of oratory—the demonstrative, the judicial, and the deliberative. Blair proposes to recognize, instead, the eloquence of popular assemblies, the eloquence of the bar, and the eloquence of the pulpit.

*Inventive R.* has to do with the choice of themes, the accumulation of material, and the disposition of material.

*Ethical R.* has especial reference to the purpose contemplated in discourse. This purpose may be either—(1) enlightenment, (2) conviction, (3) excitation, or (4) persuasion.

*Aesthetic R.* has reference to "style," or the art of expressing, clearly, energetically, and elegantly, the products of inventive R. in adaptation to the ends of ethical R.

*Figurative language* (or lang. which deviates from the plain and ordinary method of describing an object or stating a fact) may be included under the head of "style." Under the head of "figurative language" we recognize *figures of speech*, which consist in a mere modification of the form of expression; and *figures of thought*, which involve an essential modification of our conception. Under the head of "figures of speech" we recognize—(1) alliteration, or the repetition of similar sounds at the beginning of successive words; (2) paronomasia, or the use of words in the same connection which are similar in sound but dissimilar in sense; (3) meiosis or litotes, which consists in the representation of an object as less than it really is; (4) pleonasm, which consists in the use of more words to express one's meaning than are strictly necessary; (5) hyperbole, which consists in representing an object as larger than it really is, or stating a fact more strongly than is consistent with literal truth; (6) climax, which consists in gradually rising, by more and more emphatic statements, to the fullest and most expressive utterance of our thought.

Under the head of "figures of thought" that are founded on the principle of similarity we have—(1) the simile, which is an expressed comparison; (2) the metaphor, which is an implied comparison; (3) the allegory, which is an extended metaphor; (4) the fable; (5) the parable; (6) personification, which regards things inanimate as if they were animate. Under the head of "figures of thought" that are founded upon the principle of dissimilarity we have contrast, antithesis, irony.

*Founded on the principle of association* we have metonymy, or a transference of names, under which we recognize the substitution of—(1) the cause for the effect, and vice versa; (2) the container for the thing contained; (3) the sign for the thing signified; (4) the instrument for the agent; (5) the author for his works. We must class under the combined heads of similarity and dissimilarity, synecdoche, which includes objects that are similar in kind but dissimilar in extent or degree. By synecdoche we put a part for the whole, as a "sail" for a ship, or a "blade" for a sword, etc.

The great masters of R. among the Grs. were Aristotle and Longinus. Among the Roms. the most eminent names are those of Cicero, Quintilian, and Horace. Volckmar, *Die Rhetorik der Griechen und Römer*, is a valuable compend of the results attained by the anc. rhetoricians. Of Eng. authors, mention should be made of Whately (best on conviction and persuasion), Blair (best on style), Kames (best on figurative lang.), and Campbell (best on the grammatical properties of style). [From orig. art. in *J.'s Univ. Cyc.*, by Prof. J. H. Gilmore.]

**Rhett** (ROBERT BARNWELL), b. at Beaufort, S. C., Dec. 24, 1800, was originally named SMITH; adopted in 1837, with the other members of his family, the name of RHETT, in memory of an ancestor; studied law; was elected to the State legislature 1826; became atty.-gen. of S. C. 1832; was one of the most pronounced advocates of State rights, nullification, and secession; M. C. 1838-49, and U. S. Senator 1850-51; expressed himself in favor of a dissolution of the Union, both in Cong. and in the Charleston *Mercury*, which he owned and conducted; was a leader in the State convention of S. C. which passed the ordinance of secession Dec. 20, 1860; was chairman of the committee which reported the const. of the Confed. States to the Montgomery convention Feb. 1861, and subsequently a member of the Confed. cong. D. Sept. 14, 1876.

**Rheum.** See RHUBARB.

**Rheumatism**, *ru'ma-tizm* [Gr. *ρευματισμός*], a specific inflammation of certain anatomical tissues or organs. There are 2 varieties of this disease—*articular* and *muscular*.

*Articular R.* is a specific inflammation of the fibrous tissues about the joints, not tending to suppuration, attended with high fever, and of very uncertain duration. It commences with a chill, followed by high fever and pain in one of the larger joints, which soon becomes almost unendurable. The joint is swollen, often reddened, and sensitive to the slightest touch. A number of joints may be affected at once, or inflammation may begin in one just as another is becoming relieved. Under no especial treatment, its usual duration is from 2 to 4 weeks, but no two cases are absolutely alike in point of continuance, as one may be cured spontaneously in 5 or 6 days, while another may last for 2 months. *Articular R.* may be complicated by inflammation of any of the serous membranes, but more especially of the endocardium and pericardium. *Treatment.*—The joints should be kept at an equable temperature by warm applications, and some salt of salicylic acid should be taken internally. Immediate pain should be relieved by opiates.

*Muscular R.* is a painful affection of the voluntary muscles, unattended with any other symptoms of acute inflamma-

tion. It is called *lumbago* when it affects the large muscles on either side of the spine in the lumbar region; *torticollis*, or *wry-neck*, when it is confined to the muscles on one side of the neck; and *intercostal R.* when the intercostal muscles are the seat of pain. The prominent symptoms are severe pain in the affected part and impaired motion. *Treatment.*—This consists in the use of diuretics, iodide of potassium, alkalies, baths, etc. It may be necessary to ring the changes, and sometimes all treatment is unavailing.

JOHN R. HOBBIÉ.

**Rhind** (A. C.), b. Oct. 31, 1821, in New York; entered the navy as a mdpn. Sept. 3, 1838; became a passed mdpn. in 1845, a lieutenant in 1854, a commander in 1863, a capt. in 1870; served with heroic gallantry in the waters of Va. and the Carolinas during our c. war, and was highly commended by Rear-Admirals Du Pont, Porter and Lee in their official despatches.

**Rhine** [Lat. *Rhenus*; Ger. *Rhein*], an important river of Europe, rises in Switz. in the Alps, where it is formed at Reichenau, in the canton of Grisons, at an elevation of 1922 ft., by the union of 2 streams, the Vorder and Hinter Rhein, the former of which, rising on the N. E. side of the mt.-group of St. Gothard, at an elevation of 7600 ft., is generally considered as the principal source of the river. During its whole upper course from Reichenau to Bâle, through Switz., the Lake of Constance, and along the frontier between Switz., Bavaria, and Baden, its navigation is difficult, and in many places entirely interrupted by rapids and cataracts, of which that of Schaffhausen is the most remarkable. During its middle course, from Bâle to Cologne, it winds through a broad and fertile valley between the Vosges and the Schwartzwald—the Rheintal, often called the "garden of Germany"; thence it forces its way, by a narrow gorge, through the plateau of the lower Rhine. In this latter part the Rhine is not only an important route of traffic, but it also presents some of the loveliest scenery in the world, flowing along between vine-clad hills, which now rise into towering rocks crowned with old castles, and then again open into long, beautiful cross-valleys through which come rushing smaller streams. Its lower course, from Cologne to the N. Sea, leads through low and level ground; it branches off into the Waal, Yssel, Leek, and Vecht, and reaches the ocean as a small stream, almost disappearing among the sand-banks of the shore. The entire length of the R. is 960 m.; its breadth at Bâle is 750 ft.; at Mentz, 1500 ft.; at its entrance into the Netherlands, 2150 ft.; its depth varies from 5 to 28 ft.; its elevation is 814 ft. at Bâle, 121 ft. at Cologne. Its prin. affluents are the Aar in Switz., the Neckar and Main in the Rheintal, the Lahn and Moselle in the highlands of the lower Rhine.

**Rhinebeck**, Dutchess co., N. Y., on R. R. and Hudson River, opposite Kingston. Pop. 1870, 1322; 1880, 1569.

**Rhinobatidae** [from *rhinobatus*; Gr. *ῥινόβατος*, the ancient name of a fish—*ῥίς*, *ῥύς*, "nose," and *βάτος*, "ray"], a family of selachians intermediate between the sawfishes (Pristidae) and the typical rays. The body in front is a subcordate disk pointed forward, and ends behind in an elongated caudal portion resembling that of the Pristidae; the skin is armed with spines, especially in a median dorsal row; the head is produced into a pointed snout; the mouth is rather small and transverse; the teeth small and obtuse; dorsals 2, on the middle or posterior portion of the tail; the caudal fin is a heterocercal fold at the extremity of the tail. The family, chiefly distinguished by the form, is composed of species inhabiting the tropical and sub-tropical seas.

**Rhinoceros.** See RHINOCEROTIDÆ.

**Rhinocerotidae** [from *rhinoceros*, *ῥινόκερος*, of the Grs., from *ῥίς*, *ῥύς*, "nose," and *κέρας*, "horn"], a family of ungulate mammals embracing the various species combined under the popular name rhinoceros. They are distinguished by their massive form, short neck, long head, the presence in all the living forms of 1 or 2 horns on the middle of the nasal region, and the broad, clavate feet, each of which has 3 toes. The family embraces but few recent species, which have been variously grouped, but appears to represent but 3 genera—(1) *Rhinoceros*, including the Asiatic species, and (2) *Rhinaster*, embracing the African species. In former geological epochs other forms flourished, and one of these survived long after the appearance of man on the globe. The existing species of the family are peculiar to Asia and Africa, but formerly the range of the family extended far northward into Europe and Siberia, and at a still earlier period the group was represented in N. Amer.

**Rhinoplastic** (Gr. *ῥίς*, *ῥύς*, "nose," and *πλαστικός*, to "mould") *Operations* are performed with the view to re-establish a lost nose or a part thereof, or to bring to a normal shape a deformation of this organ. The methods applied are very different. The flap for the new formation in the majority of cases is taken from the forehead, and is cut out so that a pedicle of it remains in connection until it is healed into the new place, thereby allowing the access of blood without interruption. In other cases the flap is taken from the cheeks and from the lip, transplanted in the same manner. Even from more remote parts of the body, especially the arm, the material has been taken successfully to replace the defect of the nose. This last method, as well as the employment of a second individual to supply the wanted flap for new formation, is not much in favor with the surgeons of the day, and is only made use of in very exceptional cases, where the material cannot be obtained otherwise.

**Rhizogens** (Gr. *ρίζα*, "root," and *γενέω*, to "produce"), a proposed class of plants, comprising the Rafflesiaceæ, Balanophoraceæ, and Cytinaceæ, all parasitic, all fungus-like in growth, all phanerogamous, and nearly all having obscure and spore-like seeds. The better opinion seems to be that the two orders first mentioned are exogenous and the last endogenous. They seem to share in the qualities of cryptogamous and phanerogamous plants.



**Rhode Island**, one of the original 13 States of the

Union, belonging to N. Eng., lies between 41° 18' and 42° 3' N. lat., and 71° 8' and 71° 53' W. lon. It is bounded on the N. and E. by Mass., on the S. by the Atlantic, and on the W. by Conn. Its extreme length from N. to S. is 47.5 m., and its extreme breadth from E. to W., 40 m. Its land and water surface is 1250 sq. m. or 800,000 acres. It is the smallest State in the Union.



Seal of Rhode Island.

**Face of the Country.**—The surface of R. I. is considerably diversified, portions of it being hilly and broken, while other portions are level and sandy or marshy. Narragansett Bay, extending inland about 30 m. from the ocean, divides the State into 2 unequal parts. Providence River and Bay are merely continuations of Narragansett Bay to the N., as Mt. Hope Bay and Taunton River are to the E. The S. coast of the State has extensive salt marshes and ponds of salt water. There are numerous islands belonging to the State, of which the best known are Rhode Island, with its 3 towns of Newport, Middletown, and Portsmouth; Canonicut, Prudence, Block Island, Patience, Perry, Hope, Dyer's, Dutch, and Goat Islands. The State has 3 considerable rivers—viz. the Pawtucket, called above the town of that name the Blackstone, the Pawtuxet, which flows S. E. and forms the boundary between Kent and Providence cos., and the Pawcatuck, which flows through the W. portion of the State and forms a part of the boundary between R. I. and Conn.

**Mineralogy.**—A tract covering all the islands of Narragansett Bay and part of its W. shore, and extending N. E. into Bristol co., Mass., belongs to the Carboniferous era, and forms the easternmost bed of anthracite in the U. S. The coal is not equal to the Pa. anthracite in quality, but it improves as lower strata are reached. About 10,000 to 15,000 tons are annually mined. Excellent iron ore is found in various parts of the State, and lime of the best quality is burned from the limestones at Lime-Rock, which belong to the coal-measures and abound in fossil plants. Sandstone, serpentine, and marble abound in several parts of the State, and excellent brick are made from the clay of Providence co.

**Soil and Vegetation.**—The soil of the State is for the most part moderately fertile. The islands of Narragansett Bay and the region drained by Pawtucket and Pawtuxet rivers is the most arable. The vegetation does not differ materially from that of Mass. and Conn. The flora and fauna also of the State are almost without exception those of Mass. and Conn. Narragansett Bay is a favorite resort for the duck, brant, and teal families, and the swamps and marshes adjacent for snipe, woodcock, and grouse.

**Climate.**—The mean annual temperature of the State ranges from 47° to 51°. The average mean of Providence for 43 yrs was 47.94°, and the average annual range seldom exceeds 100°. The rainfall in the E. part of the State averages about 40 inches, and in the W. part sometimes reaches 44 inches. The average of Providence for 43 yrs. was 44.81 inches.

**Agricultural Productions.**—These are not extensive, the soil being neither abundant nor fruitful. The census of 1880 returned 372,967 bushels of corn, 150,339 bushels of oats, 17,783 bushels of barley, 12,997 bushels of rye, and 240 bushels of wheat. The tobacco crop was only 785 lbs.

**Farm Animals.**—The census of 1880 reported in R. I. 9661 horses, 35,584 cattle, 17,211 sheep, and 14,121 swine.

**Fisheries.**—The yield of the R. I. fisheries for 1880 was \$880,915, being wholly salt-water fish.

**Manufactures.**—R. I. manufactures largely, especially in textile fabrics and iron and steel products. Of the latter there were produced, in 1880, manufactures to the value of \$488,040. In cotton goods the State stands second, having 30,274 looms, with 1,649,295 spindles, employing 22,228 persons, and consuming 161,694 bales of cotton. Coal mined in 1881, 15,000 tons.

**Railroads.**—There were in operation in R. I., Jan. 1, 1882, 211 m. of railway, costing \$6,736,799, with net earnings of \$526,151, and paying in interest and dividends \$401,564. The prin. roads are the Old Colony, the N. Y., Providence and Boston, and the N. Y. and N. Eng.; the longest track of any R. R. within the State is only 55 m.

**Finances.**—The assessed valuation of property in 1881 was—real estate, \$243,658,190; personal, \$64,872,369; total, \$298,530,559. Rate of State tax, 15 cents on \$100, producing \$883,489; total taxation, municipal and State, \$2,692,715; amount of State debt, less sinking fund, \$1,832,463; aggregate State and local indebtedness, \$13,102,790.

**Commerce.**—The direct foreign commerce of R. I. is not large, showing imports in 1881 to the value of \$128,927, and exports, \$15,961. The internal trade is active. The shipping in 1881 included 241 sailing vessels and 59 steam vessels, measuring 41,106 tons.

**Banks, Etc.**—There were in operation, Oct. 1881, 62 national banks, with capital of \$20,065,050; circulation, \$14,718,956;

U. S. bonds to secure circulation, \$16,503,300; aggregate deposits, \$11,411,411. There were also 15 State banks and trust cos., with \$3,361,608 capital and \$4,212,867 deposits; 7 private bankers, with \$368,181 capital and \$462,398 deposits; and 33 savings banks, with aggregate deposits of \$28,364,066. The insurance cos., numbering 32, wrote risks to the amount of \$56,174,696 in 1880, receiving in premiums \$536,036, and paying \$512,500 for losses.

**Education, Etc.**—The number of children of school age (5-15 yrs.) in R. I. in 1880 was 52,273, of whom 42,489 were enrolled in public schools, with average daily attendance of 27,453. Total expenditure for public schools, 1880, \$530,167, of which \$401,738 was for teachers' salaries. R. I. has one coll., Brown Univ. at Providence, founded in 1764, and having 17 instructors and 247 students, paying in tuition \$30,869 in 1880. Number of newspapers and other periodicals in 1882, 42, of which 7 were daily.

**Churches.**—The Bap. denomination has the largest membership, numbering 10,839, with 65 ministers and 60 chs.; Prot. Epis., 6396 members, 45 ministers, 44 chs.; M. E., 5561 members, 48 ministers, 30 chs.; Congl., 5214 members, 35 ministers, 25 chs.; R. Cath., 54 priests and 44 chs., claiming about 100,000 Catholic pop. Twelve other sects have from 3000 to 75 members each.

**Population.**—In 1860, 174,630; 1870, 217,353; 1880, 276,331 (white 269,939, colored 6592, including 27 Chl. and 77 Indians).

**Principal Cities and Towns, Pop. 1880.**—Providence (one of the caps.), 104,857; Pawtucket tp. 19,030; Woonsocket tp. 16,050; Newport (one of the caps.), 15,693; Bristol, 6028.

COUNTIES.	*Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
Bristol.....	5-H	9,421	11,394	Bristol.....	tp. 6,028
Kent.....	5-G	18,595	20,588	E. Greenwich.....	tp. 2,887
Newport.....	5-H	20,100	24,180	Newport.....	15,693
Providence.....	4-G	149,190	197,854	Providence.....	104,857
Washington.....	6-G	20,097	22,495	Kingston.....	329
Total.....		217,353	276,331		

**History.**—There seems to be convincing evidence that the Northmen who visited the N. Amer. coast in the 10th and 11th centuries and planted their colonies there, explored the waters of Narragansett Bay and established one of these colonies on Aquetneck (or Rhode) Island, near the present site of Newport, and that the Vinland, of which they speak so often, was that island. In 1524 Verazano visited Narragansett Bay, and remained there about 2 weeks trading with the Indians, who were then very numerous. The founder of the present State of R. I. was Roger Williams, an eminent Eng. clergyman and scholar, who emigrated to the Mass. Bay Colony, and became pastor of the ch. at Salem. A vigorous and original thinker, of logical mind and great moral courage, he soon startled the leading ministers, by the avowal of his doubts of the propriety of infant baptism, and of his doctrine that the civil power had no authority to bind men to the belief or maintenance of any religious doctrine; that the human conscience in all these matters was responsible to God alone. In the winter of 1635-36 the clergymen and civil magistrates notified him to leave the colony within 6 weeks, under penalty of being sent to Eng. by the first vessel. He left Salem, Mass., and came in the early spring of 1636, in a canoe, to the present site of Providence. He founded the town of Providence, giving it that name in acknowledgment of "God's good providence in directing him thither;" and when, 2 yrs. later, his friend, William Coddington, followed him into the wilderness, he advised him to purchase from the Indians the island of Aquetneck or Rhode Island and start another colony there. The towns of Providence, Newport, Portsmouth, and Warwick remained independent of each other until 1647, when the 4 towns united under a patent or charter granted by Parl. in 1643. In 1663 John Clarke, aided by Roger Williams, obtained from Charles II. a remarkably liberal charter, under which the colony and State were governed for 179 yrs. The great Indian war of 1675, from which R. I. suffered severely, might have been averted had the counsels of the R. I. leaders been heeded. It cost the colony largely in blood and treasure, and terminated only by the death of Philip of Pokanoket on R. I. soil. In the great battle in the "Narragansett country," Dec. 1675, 1000 Indians perished or were captured. In Jan. 1686-87 Sir Edmund Andros suspended the charter of the colony and made R. I. a co. of his extensive domain; but in Feb. 1689-90, Andros having been deposed, the colony was reorganized under the charter. In the wars between G. Brit. and Fr. the little colony was very active. In 1766 she had 50 privateers at sea, manned by about 1500 men. In the war of the Revolution her citizens were active on sea and land. Newport was occupied by the Brit. forces from Dec. 1776 to near the close of 1779. In 1780 the count de Rochambeau of our Fr. allies made it his headquarters. After the war Newport for some yrs. contended successfully with Boston and New York for the commercial supremacy of the new republic. The State was the last of the 13 to ratify the const. of the U. S., and delayed her admission to the Union till May 29, 1790. Repeated efforts had been made for a number of yrs. to replace the charter by a State const. One was framed in 1824 and rejected by the people. In 1841 a convention called the "People's convention" met and framed a const., which was submitted to the people. The general assembly took no notice of their proceedings. The friends of the new const. claimed that it was ratified by the people, and proceeded to organize a govt. under it, electing Thomas Wilson Dorr gov. The general assembly ordered a convention to be held in Nov. 1841, and this convention prepared a const. which was rejected by the people in Mar. 1842. The general assembly and the regular State

\* Reference for location of counties. See map of Mass., R. I., and Conn., in article CONNECTICUT.



govt. were, however, elected, and a collision seemed inevitable. Mr. Dorr led his forces, but they were overpowered without bloodshed, and Dorr was compelled to flee. After his flight a new convention was called, and the const. under which the State is now governed was prepared in Nov. 1842, ratified by the people, and went into operation in May 1843. At the commencement of the c. war the State sent a body of troops for the defence of Wash., and the gov. of the State accompanied and commanded one of her regiments.

#### Governors.

COLONIAL.		William Greene*..... 1757-58
<i>Presidents under the Patent.</i>		Stephen Hopkins..... 1758-62, 1763-65, and 1767-68
John Coggeshall.....	1647-48	Samuel Ward..... 1762-63 and 1765-67
William Coddington.....	1648-49	Josias Lyndon..... 1768-69
John Smith.....	1649-50	Joseph Wanton..... 1769-75
Nicholas Easton.....	1650-51	

#### The Division (1651-54).

(a) <i>Providence and Warwick.</i>	
President John Smith.....	1652-53
President Gregory Dexter.....	1653-54

(b) <i>Portsmouth and Newport</i>	
(1651-54).	

Pres. John Sanford, Sen.....	1652-54
<i>Reunion of Towns (1654-63),</i>	
<i>Presidents.</i>	

Nicholas Easton.....	1654
Roger Williams.....	1654-57
Benedict Arnold.....	1657-60
William Brenton.....	1660-62
Benedict Arnold.....	1662-63

<i>Royal Charter Governors.</i>	
Benedict Arnold.....	1663-66
William Brenton.....	1666-69
Benedict Arnold.....	1669-72
Nicholas Easton.....	1672-74
William Coddington.....	1674-76
Walter Clarke.....	1676-77
Benedict Arnold.....	1677-78
William Coddington.....	*

<i>Aug. to Nov. 1678</i>	
John Cranston,* Nov. 1678-Mar. '80	
Peleg Sanford.....	1680-83
William Coddington.....	1683-85
Henry Bull.....	1685-86
Walter Clarke.....	May to June 1686
Henry Bull.....	Feb. to May 1690
John Easton.....	1690-95
Caleb Carr.....	1695
Walter Clarke.....	1695-98
John Cranston.....	1698-1727
Joseph Jencks.....	1727-32
William Wanton.....	1732-33
John Wanton.....	1734-40
Richard Ward.....	1740-43
William Greene.....	1743-45
Gideon Wanton.....	1745-46
William Greene.....	1746-47
Gideon Wanton.....	1747-48
William Greene.....	1748-55
Stephen Hopkins.....	1755-57

William Greene*.....	1757-58
Stephen Hopkins.....	1758-62, 1763-65, and 1767-68
Samuel Ward.....	1762-63 and 1765-67
Josias Lyndon.....	1768-69
Joseph Wanton.....	1769-75

STATE ORGANIZATION, BUT UNDER	
THE CHARTER.	

Nicholas Cooke.....	1775-78
William Greene, Jr.....	1778-86
John Collins.....	1786-90
Arthur Fenner.....	1790-1805
Paul Mumford (acting)*.....	1805
Henry Smith (acting).....	1805-06
Isaac Wilbur (acting).....	1806-07
James Fenner.....	1807-11
William Jones.....	1811-17
Nehemiah R. Knight.....	1817-21
William C. Gibbs.....	1821-24
James Fenner.....	1824-31
Lemuel H. Arnold.....	1831-33
John B. Francis.....	1833-38
William Sprague.....	1838-39
Samuel W. King.....	1839-43

GOVERNORS UNDER THE CONSTITUTION	
OF 1843.	

James Fenner.....	1843-45
Charles Jackson.....	1845-46
Byron Diman.....	1846-47
Elisha Harris.....	1847-49
Henry B. Anthony.....	1849-51
Philip Allen.....	1851-52
Wm. B. Lawrence (acting).....	1852
Philip Allen.....	1852-53
Francis M. Dimond (acting).....	1853-54
William W. Hoppin.....	1854-57
Elisha Dyer.....	1857-59
Thomas G. Turner.....	1859-60
William Sprague.....	1860-61
John R. Bartlett (acting).....	1861-62
Wm. C. Cozens (acting).....	1863
James Y. Smith.....	1863-66
Amrose E. Burnside.....	1866-69
Seth Padelford.....	1869-73
Henry Howard.....	1873-75
Henry Lippitt.....	1875-77
Chas. C. Van Zandt.....	1877-78
H. Littlefield.....	1878-83
A. O. Bourn.....	1883-85
George P. Wetmore.....	1885-86

#### REVISED BY A. R. SPOFFORD.

**Rhodes** [Lat. *Rhodus*], an island in the Mediterranean, belonging to Tur., 10 miles off the coast of Asia Minor. Area, 420 sq. m. Pop. 35,000. It is mountainous, but the soil is fertile and the climate beautiful. Forests of fir cover the mts.; in the valleys figs, oranges, grapes, and olives ripen perfectly. Its coral fisheries are important.

**Rhodes**, the cap. of the island of Rhodes, on the N. E. extremity of the island, was founded in 408 B. C., and rose very soon to eminence among the Gr. cities, both as a commercial port and as a seat of learning. At the entrance of one of its harbors stood the so called Colossus of Rhodes, and 300 other statues adorned the city. This splendor was to some extent destroyed by Cassius in 42 B. C., but the island and the city rose once more into importance and prosperity while in the possession of the Knights of St. John (1309-1522). After its conquest in 1522 by the Turks, it greatly declined, and having suffered by earthquakes and by a fearful powder-explosion, large parts of it are now only heaps of ruins. Its commerce is carried on by Grs., but its harbors are nearly spoiled. Pop. about 20,000.

**Rhodium**, a metal found in 1804 by Wollaston associated in small quantity with native platinum. It is whitish-gray and very hard; highest density when fused, 12.1; equivalent, about 104. It is one of the most infusible metals. Pure, it is not acted on by the most powerful acids, but in alloy with some of the other metals may be dissolved in *aqua regia*. Fusion with saltpetre oxidizes it easily, and even fusion with sulphate of potash converts it into a soluble double salt. Chlorine combines with it at a red heat, forming a soluble chloride.

**Rhodum**, oil of, a balsamic volatile oil obtained from Canary Island rosewood, the woody root of *Rhodoriza scoparia* and *florida*, convolvulaceous plants. The oil is employed as a perfume, and to attract fishes and game to traps of various kinds. Horses are very fond of the odor.

**Rhododendron** [Gr. *rhododendron*, "rose tree"], a large genus of plants of the natural order Ericaceae, comprising trees, shrubs, and rootlet-climbing epiphytes, with entire, alternate evergreen, or rarely deciduous leaves, and showy flowers in terminal clusters. Passing S. of the equator throughout the mountainous dists. of the N. hemisphere. The greatest number of species occurs in the high mt. regions extending from Java and Borneo on the S. to the Sikkim Himalayas in the N. Several are found in Chi. and Japan. 2 reach Kamchatka, and 1 of them Alaska. The contrast in the size attained by the different species of this genus is as remarkable as its geographical range is extensive. The useful properties of this genus are few and unimportant. Horticulturally, R. play a more important part. A moisture-loving plant and unable to withstand the severe

summer droughts so common in many parts of the U. S., and not thriving in soils strongly impregnated with lime, the R. as a garden-plant can only be successfully cultivated in the Atlantic States from Mass. to Va.

**Rhone**, the anc. *Rhodanus*, a river of Fr., rises in Switz., in the Alps, on the W. side of St. Gothard, flows through the Lake of Geneva, crosses the Jura Mts., turns at Lyons, where it receives the Saone, to the S., and falls, 644 m. distant, into the Mediterranean, through 2 branches which form the island of Camargue.

**Rhu'barb** [Fr. *rhubarbe*]. A well-known and valuable drug, being the root of some species of *Rheum* growing in Chi., Chi. Tartary, and Thibet. R. has been known as a drug from a remote period. It was first brought to Europe by land from Chi. to the Levant ports, whence the name "Turkey" R., or was shipped directly from Chi. or by way of India, whence the variety called "China," "Canton" or "East India" R. Later, a direct trade between Rus. and Chi. was established, and under supervision of the Rus. govt. R. was transported overland through Central Asia to Rus. With the establishment of this commerce the trade by way of the Levant disappeared, and the name *Turkey* R. came to be applied to that imported direct to Rus. This *Turkey* R. was highly esteemed for its unvarying good quality. But in 1863, from the depressing influence on trade caused by the opening of a number of ports in the N. of Chi., the Rus. R. office was abolished, and the fine old quality of Tur. R. no longer exists. Chi. R. is now shipped direct from Chi. R. has a peculiar smell, and a disagreeable, bitter, and astringent taste. A bit of the root if chewed feels gritty, from the presence of crystals of calcium oxalate. In small dose R. behaves as a stomachic bitter, but in larger quantities is an active purge, producing liquid mucous evacuations. By reason of the tannin it contains it is also secondarily astringent. It is used in med. as a stomachic and a laxative or purge, and is especially useful in summer diarrheas from relaxation of the bowels or improper diet.

**Rhumb** [Fr. *rumb*]. In navigation, the track of a ship sailing on a given course is called a *rhumb*. A R.-line cuts all the meridians at the same angle, and when this angle is acute the R. is a species of spherical spiral, continually approaching the pole, but reaching it only after an infinite number of turns. The angle under which a R.-line cuts any meridian is called the *angle of the R.*, and the angle that it makes with the prime vertical at any point is called the *complement of the R.* The projection of a R. on the plane of the equator is a logarithmic spiral.

**Rhus**, the botanic name of the sumach, a genus of the Anacardiaceae or cashew family, includes not only the common sumach of the U. S. (4 species), but the dogwood (*R. venenata*) and the poison-ivy (*R. toxicodendron*).

**Rhyme** [properly *Rime*; A.-S. *rim*, "number"] is a certain agreement in the sound of strong syllables, which, next to accent, is the most important regulator of Eng. verse, and without it it would be difficult to indicate the metre in some of the best specimens of versification, except in an inferior degree by the use of non-metric expedients, such as punctuation and the restriction of an idea to each line. R. enables the audience to distribute rhythmic discourse into lines and stanzas. In relation to R. alliteration is a consonant identity with a vowel difference, the latter in a strong syllable. R. are strong syllables which are unlike before the vowel and alike in the vowel, and in any consonants or weak syllables which may follow it.

**Rhymer** (THOMAS), The, the name by which the earliest poet of Scot. is usually mentioned. There is reason to believe that his real name was Thomas Learmount, of Erildoune, Berwick co., who flourished under the reign of Alexander III. (circa 1283), whose death he is said to have foretold. The ballads of Thomas the Rhymer were long preserved by memory, the earliest edition being 1603.

**Riad**, or **Riyad**, city of Ar., cap. of the dominion of the Wahabees, in lat. 24° 38' N., lon. 46° 41' E., in a large plain, is surrounded by well-cultivated fields and gardens. The most prominent buildings are the palace of the sultan and the great mosque, forming the 2 sides of the prin. public square, the market-place occupying the centre of the city. R. is important as a station on the route of pilgrims from Per. to Mecca and Medina. Pop. estimated at 40,000.

**Ribaut**, re-bô' (JEAN), b. probably at Dieppe, Fr., about 1520; sailed from Havre Feb. 18, 1562, in 2 vessels, with a band of veteran soldiers and several young nobles; landed May 1 at the mouth of St. John's River, Fla., called by him "river of May;" entered Pt. Royal harbor May 27; built there a block-house, which he called Ft. Charles; left 26 colonists, and returned to Fr. to send reinforcements, but the distracted state of affairs in Fr. prevented aid being sent, and the survivors of the colony, after nearly perishing by starvation, were picked up at sea by an Eng. vessel. A new expedition under René de Laudonnière having founded a settlement called Ft. Caroline on the river of May in 1564, R. was commissioned gov. of the colony, and sailed from Dieppe May 22, 1565, with 7 vessels and 300 men; landed at Ft. Caroline Aug. 28; had to flee with his vessels Sept. 4 from a Sp. fleet under Menendez de Avila; sailed to attack the Spaniards, but had his squadron wrecked; set out by land with 500 men to return to the fort, but was intercepted by Menendez, induced to surrender under false pretences, and put to death with most of his men in Oct. 1565.

**Ribbon-Fish**, a name given to various fishes, chiefly belonging to the family Trachypteridae. They are so called on account of their much compressed, elongated, and band-like bodies.

**Ribbon-Worms**, an Eng. name sometimes given to the species of the family Nemertidae, belonging to the order Turbellaria.

**Ricardo** (DAVID), an Eng. writer on political economy, b. of Jewish parentage in Lond. Apr. 19, 1772; as a member of the stock exchange he secured an independent fortune, and then devoted himself to scientific and philosophical

\* Died in office. † Charter suspended till 1689. ‡ Displaced.



study. In 1817 he pub. his most important work, entitled *The Principles of Political Economy and Taxation*. Its leading feature was a theory of rent, which has attracted much attention, especially in connection with the theory of Malthus on pop. He became a M. P. D. Sept. 11, 1823.

**Ricasoli**, re-kah'so-lee (BETTINO), BARON, b. in Florence Mar. 9, 1809; promoted liberal reforms in Tuscany in 1847 by signing an address to the grand duke; was sent as minister to the court of Carlo Alberto, and there urged the union of Piedmont, Tuscany, and the pope against the Aus.; in Dec. 1847 was chosen gonfaloniere of Florence; was then elected to the Tuscan Parl. After the defeat of Novara, hoping to prevent the entrance of the Aus. into Tuscany, he took the initiative in recalling the grand duke, but when the latter withdrew the const. R. retired from the court. In 1859 he aided essentially in the expulsion of the grand duke. The union of Tuscany with Piedmont being accomplished, he was appointed gov.-gen. of Tuscany, an office which he held till Mar. 1861. The city of Florence elected him deputy to the It. Parl. and after the death of Cavour he became pres. of the council in the new ministry which was afterward overthrown by the opposition of Rattazzi. In 1866, when Gen. La Marmora was about to take the field, R. returned to power and resumed the direction of public affairs, which position he maintained until again overthrown by the Rattazzi party. D. Oct. 23, 1880.

**Ricci**, ré-chee (MATTEO), b. at Macerata, It., Oct. 6, 1552; entered the Society of Jesus 1571; went to India and to Chi.; studied Chi. several yrs. at Macao; obtained permission to settle with his companions at Tchao-king-fu 1583; pub. a *Map of the World* in Chi., and a small *Catechism* containing only the elementary principles of Christianity; gained a high position among the Chi. *literati*, whose distinctive dress he was permitted to assume; composed an *Art of Memory* and a *Dialogue of Friendship*, and was permitted to visit Peking, but, being unable to gain an interview with the emp., settled at Nanking. In 1600 he again went to Peking; was allowed to remain; built a ch., acquired great influence over the emp., and caused the establishment of missions in the prin. cities of Chi. D. at Peking May 11, 1610. Wrote *Mémoires*.

**Riccio** (DAVID). See Rizzio.

**Rice**, *Oryza sativa*, the common rice, has the culm or stem from 1 to 6 ft. in length, annual, erect, simple, round, jointed; leaves subulate linear, reflex, embracing, not fleshy; flowers in a terminal panicle, calycine; leaflets lanceolate; awnless. This is one of the two grand species of rice, and is known as the *lowland* rice. It grows on natural wet lands or is cultivated with excessive irrigation. The *Oryza mutica* is the dry or mountain rice, cultivated in Ceylon and Java, and lately in Hungary. It has the culm or stem 3 ft. high, and more slender than the former; fruits longish; awns longest of all. It is sown on mts. and in dry soil, rots with long inundation, and perishes in sea-water. Of each of these 2 species there are almost numberless varieties, the result, in great part, as in other grains, of the difference in soil and peculiarities of cultivation.

*Introduction into America.*—We have accounts of it as early as 1604. At that date a vessel from Madagascar which put into the port of Charleston in distress had on board a little sack of the rough rice. It was given to one Landgrave Thomas Smith, who planted it first in a low place in his garden. It yielded admirably, and by him was disseminated as seed among the neighboring planters, and by them to others along the rivers farther in the interior, till it became after a few yrs. of careful culture the staple commodity of the colony. From this it has extended through all the S. States of Amer., and has found quite a successful cultivation far up into the interior and W. States of Tenn., Ill., and Mo. The Carolina is the lowland rice, and the method of culture is by extreme irrigation. At first the swamp-lands were considered best adapted, but the greater ease of irrigating on tide-lands subsequently gave them the preference, and its cultivation is now chiefly confined to the coast and lands subject to tidal overflow, while the interior swamps have been gradually abandoned.

**Rice** (ALEXANDER HAMILTON), LL.D., b. at Newton Lower Falls, Mass., Aug. 13, 1818, grad. at Union Coll. 1844; became partner in a paper-manufacturing firm at Boston; pres. of the common council, mayor of Boston 1856-57. M. C. 1859-67; during the c. war chairman of the naval committee; gov. of Mass. 1876-79.

**Rice** (HARVEY), b. at Conway, Mass., June 11, 1800, grad. at Williams Coll. 1820; settled in 1824 at Cleveland, O., where he was at first a teacher; was admitted to the bar 1826; established the Cleveland *Plain-Dealer* 1829; a State senator 1852-53, and drew up the school legislation then enacted. Author of *Mt. Vernon and other Poems*.

**Rice** (JAMES CLAY), b. at Worthington, Mass., Dec. 27, 1820, grad. at Yale 1834; taught school, edited a paper and studied law at Natchez, Miss., 1835-50; settled in New York 1856; enlisted as a private in a N. Y. regiment 1861; became col. of the 44th N. Y. Volunteers; commanded a brigade at Gettysburg; brig.-gen. Aug. 17, 1863. D. from wounds received at the battle of Spotsylvania C.-H., May 11, 1864.

**Rice** (JOHN HOLY), D. D., b. at New London, Va., Nov. 28, 1777, grad. at Washington Coll., Va.; was a tutor at Hampden-Sidney Coll. 1796-99; became a Presb. clergyman and a pastor in Richmond, Va.; labored much among the slaves; was eminent as a pulpit-orator; founded in 1824 the Union Theological Sem., Prince Edward co., Va., and presided over it until his death. D. Sept. 3, 1891.

**Rice** (LUTHER), b. at Northborough, Mass., Mar. 25, 1783, grad. at Williams Coll. 1810; entered Andover Theological Sem.; was one of the 5 students who addressed themselves to the general association of Mass. announcing their desire to become foreign missionaries; was ordained Feb. 6, 1812, along with Judson, Newell, Hall, and Nott; sailed for Calcutta with the 2 latter; became a Bap. on the voyage, as did also Judson, who sailed in another vessel; was baptized

at Calcutta according to the Bap. ritual; returned to the U. S., and succeeded in effecting the organization of a Bap. missionary society 1814, for which he undertook the financial agency; projected Columbian Coll. at Wash., D. C., becoming its agent and business manager. D. Oct. 25, 1836.

**Rice-Bird**. See ROBIN.

**Rice-Bunting**. See ROBIN.

**Rice, Indian, or Water Rice** [Lat. *Zizania aquatica*], an annual aquatic grass, from 5 to 10 ft. high, which abounds in marshy regions of the U. S., especially in Minn. Its grain forms an important portion of the food of the game-birds of the N. W. Its stem is now employed as a paper-stock.

**Rich** (CLAUDIOUS JAMES), b. of Eng. parents near Dijon, Fr., Mar. 28, 1787, ed. at Bristol, Eng.; devoted himself from childhood to Oriental langs.; obtained at the age of 17 a cadetship in the service of the E. I. Co.; resided for a time at Bombay; became sec. to the Brit. consul-gen. in Egypt; travelled through Pal. Syria and Mesopotamia disguised as a Mameluke; was appointed by the E. I. Co. resident at Bagdad 1808; explored the site of Babylon 1811, and again 1816; pub. a *Memoir on the Ruins of Babylon* and a *Second Memoir on Babylon*; travelled in Koordistan 1820. D. at Sheeraz, Per., Oct. 5, 1821.

**Rich** (EDMUND), SAINT, b. at Abingdon, Berkshire, Eng., about 1195; was sent to school at Ox.; where he made a vow of celibacy; studied theol. at Paris; became an instructor at Ox.; was the first who taught there the Aristotelian logic and the scholastic philos.; was prebendary and treas. of Salisbury cathedral 1219-22; distributed its revenues to the poor; was appointed in 1223 abp. of Canterbury; presided over 2 councils 1234, which by threats of excommunication induced King Henry III. to dismiss his foreign favorites; negotiated a peace with Llewellyn, prince of Wales, 1234; officiated at the marriage of Henry III. to Eleanor of Provence, and at the coronation of the latter Jan. 1236; had his authority superseded by that of the legate, Cardinal Otho, who held a council Nov. 1237; went to Rome to negotiate a settlement of the controversy about the appointment of Eng. bps. 1238, but, being unsuccessful, retired to Fr. 1240, where, the fame of his sanctity being general, the queen-mother came to meet him and solicit his blessing; took up his residence in the abbey of Pontigny, and afterward went for his health to the priory of Soissy, where he d. Nov. 16, 1642. He wrote a vol. of *Constitutions* in 36 canons (1236), *Speculum Ecclesie*, and left MS. treatises, now in the Bodleian Library.

**Richard**, re-shar' (GABRIEL), b. at Saintes, Fr., Oct. 15, 1764, ed. at the Coll. of Angers; became a R. Cath. priest; came to the U. S. 1792 as teacher of math. in the coll. at Baltimore; soon went as a missionary to Kaskaskia, Ill.; settled at Detroit, Mich., 1798; acted there as vicar-gen. of the bp. of O.; was taken prisoner by the Eng. in 1813, and was delegate to Cong. 1823. D. Sept. 13, 1882.

**Richard I.** (PLANTAGENET), surnamed 'ŒUR DE LION' ('lion-hearted'), king of Eng., b. at Ox. Sept. 13, 1157; received the duchy of Aquitaine by the treaty of Montmirail (Jan. 6, 1169), under the feudal supremacy of King Louis VII. of Fr., to whose youngest daughter, Adelaide, he was at the same time betrothed; went to the court of Fr., where he was knighted by King Louis; joined his mother and his 2 brothers in rebellion against his father 1173; was reconciled to him Sept. 1174, relinquishing Aquitaine, but acquiring a terr. in Poitou, for which he did homage to the Fr. king; made different wars upon his brothers and his father, and did homage to Philip Augustus, king of Fr., for all his continental terrs.; succeeded to the throne by the death of his father July 6, 1189; immediately liberated his mother from the prison where she had remained several yrs. and appointed her regent of Eng.; received possession of the duchy of Normandy July 30; arrived in Eng. Aug. 15; was crowned at Westminster Sept. 3; appointed William de Longchamp guardian of the realm, and returned to Normandy Dec. 11; joined his forces at Vezelay with those of the king of Fr. for the third crusade, July 1190; embarked at Marseilles Aug. 7; touched at Naples and at Messina; captured the latter city Oct. 4; remained there 6 months while he built the castle of Mategriffon; quarrelled there with Philip; released himself by treaty from his engagement to the Fr. princess, influenced by a passion for Berengaria, daughter of King Sancho of Navarre; embarked for the E. Apr. 7, 1191; married Berengaria at Limesol, Cyprus, May 13; arrived before Acre June 8; took part in the siege, but soon quarrelled again with the Fr. king; was attacked by the plague; was present at the surrender of Acre July 12, after which Philip returned to Fr.; defeated the Saracens at Arsuf Sept. 6; took and fortified Jaffa; advanced on Ascalon, which he took Jan. 1192; set out twice for Jerusalem, but was called back each time by hostilities in his rear; being obliged by the state of affairs in Eng. to return, made a truce with Sultan Saladin, and sailed from Acre Oct. 9; was shipwrecked at the head of the Adriatic; endeavored to make his way by land through Aus.; was seized and imprisoned Dec. 30 by Leopold, duke of Aus., with whom he had quarrelled in the Holy Land; was handed over to the emp. of Ger., by whom he was detained more than a yr.; was liberated on pledge of a heavy ransom Feb. 4, 1194; landed at Sandwich Mar. 13; engaged in a war with Philip Augustus of Fr., whom he defeated and forced to sign a disadvantageous truce, and renewed the war 3 years later with a similar result, but was mortally wounded by an arrow shot from a petty castle Mar. 26 and d. Apr. 6, 1199.

**Richard II.**, king of Eng., b. at Bordeaux, Fr., Apr. 3, 1366; succeeded to the throne on the death of his grandfather, Edward III., June 22, 1377; was under the tutelage of a council of 12 nobles, from which his 3 uncles were excluded, the govt. being, however, really controlled by one of them, John of Gaunt, duke of Lancaster; encountered opposition from Parl. and from the common people in



the imposition of a capitation-tax, which gave rise to the insurrection of Wat Tyler, June, 1381; married Anne of Bohemia, daughter of the emp. Charles IV., Jan. 14, 1382; maintained war with Fr.; invaded Scot. with slight result beyond the burning of Edinburgh, Aug. 1385; attempted to emancipate himself from the council of regency, which was reorganized under the duke of Gloucester Nov. 19, 1386, but without success; succeeded by a sudden display of vigor in assuming the gov't. May 3, 1389; concluded a truce with Fr. May 27, 1394; lost his queen the same yr., and held a Parl. in Ire.; married Isabella of Fr. Oct. 1396; summoned a new Parl. 1397, by whose aid he caused the arrest of Gloucester; quarrelled with his cousin, Henry of Bolingbroke, duke of Hereford, whom, along with Mowbray, duke of Norfolk, he banished for 10 yrs. 1398; seized the estates of his uncle, John of Gaunt, on the death of that prince Mar. 18, 1399; sailed for Ire. in May, but, being deserted by his troops, returned to Conway, Wales, Aug. 6; found the country in rebellion, Henry of Bolingbroke having landed at Ravenspur, Yorkshire, in July and gathered a formidable army; was taken prisoner Aug. 20 by Bolingbroke, and sent to the Tower Sept. 2; was compelled to abdicate Sept. 29; was declared by Parl. Sept. 30 to be deposed in favor of Bolingbroke (Henry IV.); was kept a prisoner at Pontefract Castle, but soon disappeared, about 1400. The reign of R. is a remarkable period in religion and lit., from the names of Wycliffe, Chaucer, and Gower, and from it dates the Eng. lang. in its modern form. PORTER C. BLISS.

**Richard III.**, last king of Eng. of the Plantagenet line, b. at Fotheringay Castle Oct. 2, 1452, was the youngest son of Richard, duke of York, who, having renewed the struggle for the crown against Henry VI., was defeated, captured, and executed near Wakefield, Yorkshire, Dec. 31, 1460. R., then 8 yrs. of age, was taken prisoner on this occasion, and shortly afterward sent by his mother to Utrecht, Hol.; returned the following yr. (his eldest brother having become king under the title of Edward IV.); was created duke of Gloucester, and endowed with large estates from the spoils of war; fled with King Edward to Flanders Sept. 1470, during the rebellion which for a time restored Henry VI. to the throne; was attained and outlawed by Parl.; accompanied Edward on his return to Eng. early in 1471; commanded the van of the Yorkist army at the battles of Barnet (Apr. 14) and Tewkesbury (May 4); was created lord high chamberlain of Eng., earl of Dorset and of Somerset, and placed in possession of numerous forfeited estates; was made a second time lord high constable Feb. 1472; accompanied his brother in the invasion of Fr. 1475; inherited the offices and estates of his brother, the duke of Clarence (executed for treason Feb. 1478); was made lieutenant of the kingdom upon the breaking out of war with Scot. 1480; penetrated to Edinburgh, and dictated terms of peace July 1482; was made warden of the W. marches of Eng. and lord of Carlisle early in 1483; learned of the death of Edward IV. while still in Scot. Apr. 1483; took an oath of allegiance to his nephew, Edward V.; met the duke of Buckingham at Northampton Apr. 20; forcibly assumed the guardianship of the young king the following day; proceeded to Lond.; was appointed by the council of state and confirmed by Parl. "protector and defender of the realm" early in May; asserted his own title to the throne on the ground of illegitimacy of his nephews June 22-24; obtained from Parl. a favorable decision, and assumed the throne June 26; was soon suspected of having caused the princes to be murdered in the Tower (see EDWARD V.); repressed a conspiracy in behalf of the earl of Richmond as head of the Lancastrian party, putting to death the duke of Buckingham (his own former partisan); became unpopular on account of forced loans; marched with a large army to encounter the earl of Richmond, who had landed at Milford Haven, Aug. 7; was defeated at Bosworth through the desertion of the Stanleys; killed while fighting, Aug. 22, 1485. PORTER C. BLISS.

**Richard of Cirencester** (sis'eter) [Lat. *Ricardus Coroniensis*], b. at Cirencester, Gloucestershire, Eng.; entered the Benedictine monastery of St. Peter at Westminster; resided there during remainder of his life; visited Rome about 1391; d. about 1402. Author of Lat. hist. of Eng. to 1348.

**Richard of St. Victor**, a Scotch mystical schoolman. At an early age he appears to have entered the Augustinian abbey of St. Victor in Paris, where he was a pupil of Hugo of St. Victor (d. 1141). In 1159 became subprior, and in 1162 prior of the abbey. D. Mar. 10, 1173.

**Richard Plantagenet**, earl of Cornwall and titular emp. of Ger., b. at Winchester, Eng., Jan. 5, 1209, was a younger son of King John; took the cross 1226; set out for Pal. 1240; returned to Eng. Jan. 1242; was chosen emp. of Ger. by a faction 1256, and crowned king of the Romans at Aix-la-Chapelle May 17, 1257, but was unable to obtain general recognition; was taken prisoner by Simon de Montfort at the battle of Lewes, May 13, 1264; held a diet at Worms 1269; returned to Eng. in that yr. D. Apr. 2, 1272.

**Richards** (T. Addison). See APPENDIX.

**Richards** (WILLIAM), b. at Plainfield, Mass., Aug. 22, 1792, grad. at Williams Coll. 1819, at Andover 1822; went in that yr. as a missionary to the S. I., where he became interpreter and chaplain to the king; was sent as minister to Eng. and other countries, and was appointed in 1845 minister of public instruction. D. Dec. 7, 1847.

**Richardson** (BENJAMIN WARD), M. D., F. R. S., b. at Somerby, Leicestershire, Eng., Oct. 31, 1828, grad. in med. at St. Andrew's 1854; became an eminent phys. at Lond.; was chosen a member of the Royal Coll. of Phys. and Surgeons 1856; founded and edited the *Journal of Health and Sanitary Review*; wrote *On the Cause of the Coagulation of the Blood* and *On the Diseases of the Fetus*; was pres. of the Med. Society of Lond.; contributed to the *Social Science Review*, pub. several med. works, and gained a high position by original experiment.

**Richardson** (CHARLES), LL.D., b. in Eng. in July 1775;

studied but never practised law; devoted himself to lit. at Lond.; pub. *Illustrations of Eng. Philology* (1815); prepared his great work, a Dict. of the Eng. Lang., which appeared in 1837, and still maintains high rank as an authority in Eng. etymology; also pub. a *Supplement* to his dict., a work *On the Study of Lange*, and an *Historical Essay on Eng. Gram.* and *Eng. Grammarians*. D. Oct. 6, 1865.

**Richardson** (Sir JOHN), M. D., F. R. S., LL.D., b. at Dumfriess, Scot., Nov. 5, 1787, was surgeon and naturalist to Sir John Franklin in his Arctic expeditions of 1819-22 and 1825-27; explored on the latter occasion the shore of the Arctic Ocean between the mouths of Mackenzie and Coppermine rivers; pub. *Geognostical Observations*, etc. as an appendix to the narrative of Franklin's first voyage (1823); edited the *Fauna Boreali-Americana*; was phys. to Melville Hospital, Chatham, 1828-38, phys. to the fleet 1838-48; was knighted 1846; commanded an expedition in search of Sir John Franklin 1848-49; pub. *The Arctic Searching Expedition* and *The Polar Regions*; retired from public service 1855. D. June 5, 1865.

**Richardson** (RICHARD), b. near Jamestown, Va., in 1704, was a land-surveyor in Va.; became a planter in S. C.; member of the S. C. council of safety 1775; suppressed a Tory revolt on the frontier; member of the legislature 1776; aided in forming the const. of S. C.; was imprisoned at St. Augustine, Fla., after the capture of Charleston. D. Sept. 1781.—His son, JAMES B. RICHARDSON, was gov. of S. C. 1802-04; and his grandson, JOHN PETER RICHARDSON, b. Apr. 14, 1801, grad. at S. C. Coll. 1819, was M. C., gov. of S. C. 1840-42, and a leader of the Union party.

**Richardson** (SAMUEL), b. in Eng. about 1689, learned the printing trade; became a publisher at Lond., printer of the journals of the House of Commons, master of the Stationers' Co., and purchased in 1760 a half-interest in the office of king's printer. Author of several novels, which were among the earliest of the modern school: *Pamela*, *Hist. of Clarissa Harlowe*, and *Hist. of Sir Charles Grandison*. D. July 4, 1761.

**Richardson** (WILLIAM A.), b. in Fayette co., Ky., about 1810, grad. at Transylvania Univ.; was admitted to the bar at 19; settled soon after in Ill., where he became State atty. 1835, member of the legislature 1836, 1838, and 1844, being chosen speaker in the latter yr.; served in the Mex. war as capt.; was promoted to be major by vote of the regiment on the battle-field of Buena Vista, Feb. 1847; M. C. 1847-55, gov. of Neb. 1858; again elected to Cong. 1860, and chosen U. S. Senator on the death of Stephen A. Douglas, 1861. D. Dec. 27, 1875.

**Richardson** (WILLIAM A.), LL.D., b. at Tyngsborough, Mass., Nov. 2, 1821, grad. at Harvard 1843; admitted to bar at Boston 1846; practised law at Lowell; was one of the revisers of the *Gen. Statutes of Mass.* and of the *Supplement* to the same; became judge of probate 1856, assistant sec. of the treas. 1872, and sec. 1873-74. Judge of U. S. court of claims since 1874; pub. *National Banking Laws*.

**Richardson** (WILLIAM MERCHANT), LL.D., b. at Pelham, N. H., Jan. 4, 1774, grad. at Harvard 1797; practised law at Groton, Mass.; M. C. 1811-14; removed to Portsmouth, N. H., 1814; was chief-justice of the State from 1816 to his death; author of *The N. H. Justice of the Peace*; co-reporter of vols. I. and II. of the *N. H. Superior Court Cases*, and sole reporter of vols. III.-V. D. Mar. 23, 1838.

**Richborough**, N. Y. See APPENDIX.

**Richelieu**, rêsh-le-uh', de (ARMAND JEAN DUPLESSIS), DUKE and CARDINAL, b. at Paris Sept. 5, 1585, was consecrated bp. Apr. 16, 1607. Elected a deputy of the clergy to the States-General in 1614, he allied himself with the queen-mother and regent, Maria de' Medici, and became a member of the council of state. When dissensions broke out between the king (Louis XIII.) and his mother, R. succeeded in bringing about a reconciliation between mother and son; was rewarded with the cardinal's hat in 1622; re-entered the council of state, and was soon after made prime minister, which office he filled, exercising a most decisive influence on the hist. of Fr. His foreign policy centred in the idea of humiliating Aus. For this purpose he encouraged the rising of the Prot. princes in Ger., the revolution of the provs. in the Netherlands, and even the revolt in Catalonia. He subsidized Gustavus Adolphus, and after his death in 1632 he took the duke of Saxe-Weimar and his army into the Fr. service, and carried on the war against the emp. with great vigor. He also declared war against Sp., and succeeded in separating Port. from Sp. in 1640, and conquered Perpignan in 1642. The final results of these wars he did not live to see, but by the Peace of Westphalia (1648) the progress of the house of Aus. was effectually checked and its dream of establishing a world-empire was destroyed. By his internal policy he finished the establishment of the absolute authority of the royal power. His gov't. was marked by conspiracies among the feudal nobility of the realm, headed by the queen-mother (whose favor had turned into a deadly hatred), by the queen herself, Anne of Aus., by Gaston of Orleans, the brother of the king, and by the royal princess. But he always punished the conspirators with merciless severity. D. in Paris Dec. 4, 1642.

**Richfield Springs**, on R. R., Otsego co., N. Y., near the head of Schuyler Lake, has a sulphur spring celebrated for the cure of cutaneous disorders, and is a fashionable summer resort. Pop. 1870, 696; 1880, 1307.

**Rich Hill**, Mo. See APPENDIX.

**Richland Centre**, Wis. See APPENDIX.

**Richmond**, city and R. R. centre, cap. of Wayne co., Ind., 4 m. from the E. border of the State, 68 m. E. of Indianapolis, is the seat of Earlham Coll., under the control of the Society of Friends (Orthodox); has schools of the Hicksite Friends, R. Catholics, and Lutherans, and a business coll. Pop. 1870, 9445; 1880, 12,742.

**Richmond**, on R. R., cap. of Madison co., Ky., 20 m. W. of Lexington, is the seat of Central Univ. and of Madison Female Acad. Pop. 1870, 1629; 1880, 2909.

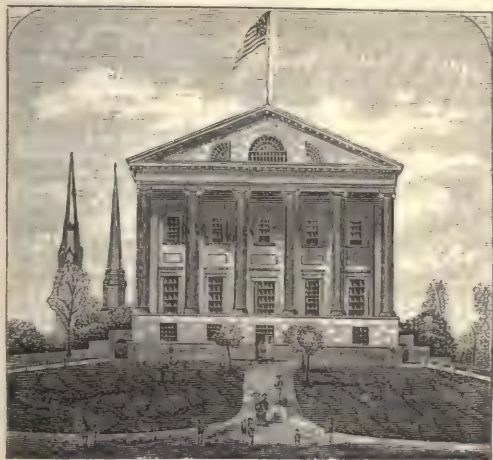


**Richmond**, on R. R. and Kennebec River, Sagadahoc co., Mo. Pop. tp. 1870, 2442; 1880, 2658.

**Richmond**, on R. R., cap. of Ray co., Mo. Pop. 1870, 1218; 1880, 1424.

**Richmond**, city, important R. R. and commercial centre, cap. of Va. and Henrico co., is on N. side of James River, 151 m. from its mouth and at the head of tide water. It has immense water-power and extensive manufactures, principally of tobacco, flour, and iron. Near the city are inexhaustible quarries of fine granite.

**Public Buildings**.—The prin. are the Capitol, situated in a beautiful square of 12 acres, the U. S. Custom House, P. O., and the State Penitentiary.



State Capitol (Richmond, Va.).

**Education**.—R. has good public free schools, including a high school. It has also Richmond Coll., Richmond Female Inst., and Richmond Med. Coll. For the colored people there are the Richmond Normal School and the Colver Theological Inst. At Ashland, 17 m. N., is Randolph-Macon Coll.

**History**.—A settlement was made here as early as 1609: it was known as "Byrd's Warehouse" from 1679 till 1742, when it was made a town by act of Assembly; in 1779 it became cap. of the State; in 1781 it was captured and burned by the traitor Benedict Arnold; in June 1861 it became cap. of the Confed. States, and there the Confed. Cong. met July 20, 1861. During the c. war of 1861-65 it was the prin. point of Federal invasion and attack. It was evacuated by the Confed. govt. Apr. 3, 1865. Pop. 1800, 5737; 1880, 63,600; 1883, 70,945.

**Richmond** (MARGARET BEAUFORT), COUNTESS OF, daughter of Edmund Beaufort, duke of Somerset, and granddaughter of John of Gaunt, duke of Lancaster, b. at Bletsoe, Bedfordshire, Eng., about 1438; married Edmund Tudor, earl of Richmond, in 1455; lost her husband the following yr. shortly after the birth of her son, Henry Tudor (Henry VII.); married Sir Henry Stafford 1459; was again left a widow 1481; married Thomas, Lord Stanley, 1482, and assisted at the coronation of Richard III. July 1483; was known as countess of Derby during the reign of her son, her husband having been created earl of Derby as a reward for his defection from Richard III. on Bosworth Field; was noted for charity and devotion, and also for her patronage of letters and her own literary taste. D. June 29, 1509.

**Richmond College**, Richmond, Va., began its existence in 1830 as a sem. organized by the Bap. gen. association for the education of candidates for the ministry. In 1844 the sem. expanded into a coll. In 1866 the coll. was reorganized on a new basis. The univ. system is adopted and studies are elective. There are 7 independent academic schools, a school of law, and a commercial dept. The faculty of instruction and govt. consists of coequal profs., one of whom is annually chosen to be chairman and chief executive officer. Each prof. is responsible for the efficient conduct of his own school. Attendance on religious exercises is voluntary. A free course of weekly lectures on the Bible is given every session.

**Richmond, Dukes of** (1675), dukes of Lennox (Scot. 1675) and of D'Aubigny (Fr. 1683), earls of March and of Darnley (1675), barons of Settrington and of Methuen (1675) a family of the Eng. nobility descended from CHARLES LENOX, natural son of King Charles II. by a Fr. woman, Louise Querouaille, made duchess of Portsmouth, b. May 29, 1672, and d. at Goodwood May 27, 1723.—His son, CHARLES LENOX, second duke, b. in Lond. May 29, 1701, became lieutenant, and col. of the horse guards Feb. 1750. D. Aug. 8, 1750.—CHARLES LENOX, third duke, b. Feb. 29, 1735, a man of talent and of liberal principles, entered the army; headed the Reform party in the House of Lords 1781, and was master-gen. of the ordnance 1782-95. D. Dec. 29, 1806.—His sister, SARAH LENOX, married Col. George Napier, and was mother of the Napiers of Peninsular fame.—His nephew, CHARLES LENOX, fourth duke, b. in 1764, served in the army; was appointed gov.-gen. of Brit. N. Amer. 1819. D. in Canada of hydrophobia, Aug. 28, 1820.—His son, CHARLES GORDON LENOX, b. in Lond. in 1791, became a member of the privy council and of the Reform ministry of Earl Grey 1831. D. Oct. 21, 1860.—His son, CHARLES HENRY GORDON LENOX, b. Feb. 27, 1818, ed. at Christ Ch., Ox., sat in Parl. for W. Sussex 1841-60; was pres. of the board of trade in the Disraeli cabinet 1867-68; became the leader of the Conservative party in the House of Peers Feb. 26, 1870, and lord

pres. of the council on the accession to power of the second Disraeli ministry in Feb. 1874. The dukedom of Gordon was conferred upon him in 1876.

**Richter**, rik'ter (JEAN PAUL FRIEDRICH), generally called JEAN PAUL, b. at Wunsiedel, in Bavaria, Mar. 21, 1763, went to Leipsic in 1781 to study, but had to flee from the city in 1784, in order to escape imprisonment for debt. From 1787 to 1789 he was private tutor in a family at Töpen, and from 1790 to 1794 a schoolmaster at Schwarzenbach. His *Lawsuits in Greenland* and *Selections from the Papers of the Devil* were not read; their satire is narrow, their humor forced, their form unripe. But in 1793 his romance, *The Invisible Lodge*, turned the scales of fortune, and now followed in rapid succession, and with decided success, *Hesperus* (1794), *Biographical Recreations under the Cranium of a Giantess*, *Leben des Quintus Fixlein* (1796), *Flower, Fruit, and Thorn Pieces, or Marriage, Death, and Wedding of Langer Siebenkiss* (1797), *Der Jubelsator* (1797), *Das Kampaner Thal* (1797). These writings made Jean Paul the literary fashion of Ger. In 1794 he began a life of visits to the different literary centres—Leipsic, Weimar, Dresden, and Berlin. In 1801 he married in Berlin the beautiful and spirited Caroline Mayer, and removed first to Meiningen, then to Bayreuth. The king of Bavaria gave him an annual pension of 1000 florins, and the Univ. of Heidelberg made him a doctor. In 1803 he pub. his *Titan*, and in 1804 *Wild Oats*, which 2 romances, together with his first philosophical attempt, *Introduction to Aesthetics*, may be considered as indicating the culmination of his talent. He afterward wrote many political and satirical pamphlets, etc. D. Nov. 14, 1825.

**Richwood**, O. See APPENDIX.

**Rick'ets**, a term applied to a distortion of the bones, especially those of the extremities, which is the result of a diseased condition arising from malassimilation of the ingredients which properly form the bone-substance, and by which they are deprived of the proper supply of earthy materials. It is a disease of early life, occurring as a rule in infants from 12 to 18 months of age. The predisposing causes are the influence of an impure or poisonous atmosphere, improper food and clothing, and poorly ventilated, damp apartments, especially if they be deprived of sunlight. The gen. health fails; emaciation takes place to a marked degree, the muscles becoming soft and flabby; the teeth are very late in making their appearance, and decay rapidly after doing so. As the disease advances the bones grow softer and softer, and become distorted by the superincumbent weight and muscular contraction. The bones of the extremities are bent, shortened, and twisted, and the ends enlarged. The ribs become flattened by atmospheric pressure, and drawn inward by the contraction of the diaphragm, and as a consequence we have the sternum pushed forward in front, and the deformity known as pigeon or chicken breast. The treatment can be summed up in a few words—fresh air, sunlight, good food, bathing, and cod-liver oil.

**Rico**, Col. See APPENDIX.

**Ricord'** (PHILIPPE), M. D., b. at Baltimore, Md., of Fr. parentage, Dec. 10, 1800; went to Paris 1820; received his med. degree 1826; was surgeon-in-chief of the Hôpital du Midi at Paris; acquired a wide reputation by his treatment of venereal diseases; was appointed consulting surgeon to the emp. Nap. III. Oct. 1869. Author of numerous works.

**Ridge'ly** (JAMES LOR), b. at Baltimore Jan. 27, 1807, ed. at St. Mary's Coll., Baltimore, and at Mt. St. Mary's Coll., Emmitsburg; was admitted to the bar 1828; member of the city council of Baltimore 1824-35; of the house of delegates 1838, and of the constitutional conventions of 1849 and 1864; was 12 yrs. register of state of education. He was initiated into Odd Fellowship in 1829; became a member of the grand lodge of the U. S. 1831, was elected in 1836 grand sire, and from 1842 was grand corresponding and recording sec.; chief author of the various rituals now in use; edited the *Covenant*, the official magazine of the order; wrote *Odd Fellowship—What is it?* etc. D. Nov. 16, 1881.

**Ridgeway** (ROBERT). See APPENDIX.

**Ridge'way**, on R. R., cap. of Elk co., Pa., 118 m. from Erie and about 120 m. from Williamsport. Pop. 1880, 1100.

**Rid'ley** (NICHOLAS), D. D., b. at Untham, Northumberland, Eng., about 1500, ed. in the gram. school at Newcastle-upon-Tyne; grad. at Pembroke Hall, Cambridge, 1522; studied theol. at the Sorbonne, Paris, and at the Univ. of Louvain, 1527-29; became on his return to Cambridge under-treas. to the univ., and soon afterward senior proctor (1533) and public orator; was appointed domestic chaplain to Abp. Cranmer 1537, vicar of Herne, Kent, 1538, master of Pembroke Hall and chaplain to the king 1540; was accused of heresy at the instigation of Bp. Gardiner, but acquitted by Cranmer 1541; became prebendary of Westminster 1545, bp. of Rochester Aug. 14, 1547; assisted Cranmer in compiling the Liturgy (1549), and framing the 41 "Articles of Religion;" was instrumental in founding Christ's, St. Thomas's, and Bethlehem hospitals; was a member of the commission which deposed Bonner, and was his successor as bp. of Lond. Apr. 1550; concurred in the proclamation of Lady Jane Grey as queen, and was induced by the duke of Northumberland to preach a sermon at Paul's Cross in defence of her title July 16, 1553; was committed to the Tower on the accession of Mary a few days later; was taken to Ox. Apr. 1554, to participate in a discussion with the court theologians on the Real Presence; was formally tried for heresy with Cranmer and Latimer by a commission named by Cardinal Pole, and condemned to death as an obstinate heretic Oct. 1, 1555, and was burned at the stake with Latimer, Oct. 16, 1555.

**Rienzi**, re-en'ze, dl (COLA), b. about 1312 at Rome; put an end to the anarchy which prevailed in Rome during the pope's residence at Avignon, by assuming dictatorial power and the title of tribune, May 20, 1347, but was compelled to flee in disguise Dec. 15, same yr. In Aug. 1354 he returned, and resumed power, but on Oct. 8 he was killed in a riot.



**Rifling of Ordnance.** Rifling is the device by which a cannon is made to give its projectile a movement of rotation about an axis coinciding with the axis of the gun. It is in consequence of this rotation that the elongated projectile moves in the direction of its longer axis, and hence is far less resisted by the atmosphere than a spherical shot of equal weight. The rifling is, in fact, making the gun a nut or female screw, while the projectile has upon it, or is made by force of the explosion to take, projections which cause it to turn in the gun according to the pitch of the screw cut therein.

**Riga,** ree'gah, cap. of Livonia, next to St. Petersburg and Odessa the most important port of Rus., on the right bank of the Dvina, about 8 m. from its mouth in the Gulf of Riga, where is situated the fort of Dünabünde, erected for the protection of the harbor. Among the public buildings the most notable are St. Peter's ch., built in 1406; the palace of the gov.-gen., built 1494-1515; the city hall, the new exchange, etc. The city has a polytechnic inst., a school of navigation, several other schools for special purposes, and numerous charitable insts. It contains about 100 manufacturing of cotton, woollen, linen, and iron goods, and its ship-building industry is very flourishing; it owns over 100 vessels, of which  $\frac{1}{4}$  are steamers. But it derives its greatest importance from its commerce. Pop. 168,844.

**Riga, Gulf of,** an inlet of the Baltic, 100 m. long, 80 m. broad, and bounded by the Rus. govts. of Courland, Livonia, and Esthonia. It receives the Dvina. Oesel is a large island at its entrance.

**Rigdon** (SIDNEY), b. in Allegheny co., Pa., Feb. 19, 1793; was working as a printer at Pittsburgh when about 1812 a MS. entitled *The Manuscript Found, or the Book of Mormon*, was offered for publication by Solomon Spaulding. R. made a copy before it was returned to Spaulding, who d. soon after. About 1817 R. became a preacher, and soon began to propagate singular doctrines. In 1829 he became acquainted with Joseph Smith, and with him devised the publication of the *Book of Mormon* as the basis of a new sect. He accompanied Smith to Kirtland, O., to Mo., and to Nauvoo, where he was one of the pres. of the Ch.; was one of the originators of the "new revelation" permitting polygamy; was twice tarred and feathered, several times imprisoned, and was a candidate for the succession to the leadership on the death of Smith. On the election of Brigham Young, R. refused to acknowledge his authority, and was excommunicated. D. July 14, 1876.

**Riggs** (ELIAS), D. D., LL.D., b. in New Providence, N. J., Nov. 10, 1810; grad. at Amherst Coll. 1829, at Andover Theological Sem. 1832, and went immediately to his work abroad. He was in Athens, Gr., 1832-34, in Argos 1834-38, in Smyrna 1838-53, and since 1853 has been in Constantinople, except in 1857-58, when he taught Heb. and the cognate langs. in Union Theological Sem., New York, while he superintended the electrotyping of his own Armenian translation of the Bible. He also translated the Bible into Bulgarian, and revised a translation into Tur. Most of his work has been done in the modern Gr., Armenian, Bulgarian, and Tur. langs., but he is acquainted with upward of 20 more. He received the title of D. D. from Dartmouth Coll. in 1853, and of LL.D. from his alma mater in 1871. R. D. HITCHCOCK.

**Riggs** (STEPHEN R.), D. D., many yrs. a missionary of the A. B. C. F. M. to the Dakota Indians; author of several books for his Indian pupils, and of a *Gram. and Dict. of the Dakota Lang.*, pub. by the Smithsonian Inst., one of the most valuable contributions to Amer. philology. Aided by Dr. Williamson, he has given the Dakotas a translation of almost the entire Bible.

**Rights** [A.-S. *riht*], in law and political science, denote powers of free action, or exemption from disturbance of free action, with which others are bound not to interfere. R. are such *subjectively* when an individual is the *subject* of R., or one to whom when an individual is the *subject* of R., or one to whom these powers of free action belong. They belong to him as being necessary for fulfilling the end pointed at by his bodily, mental, and moral powers, and by his positions, needs, and relations in a society of similar beings. Thus the general nature and destination of man in the world is the foundation of R. *Undeveloped* human beings have not the full exercise of their R. because they have not yet the nature of man fully expanded, but they have R. which must in some way be secured. Law, again, for the protection of society, strips criminals of R. for a time or forever, that the R. of others may be preserved.

If man's nature altered, his R. would cease or alter. If men grew out of the ground, there would be no family R.; if they drew food and shelter directly from nature, R. of labor, property, and association would disappear. R. point to society; they are conceptions of right by means of which men can live together in peace and without violence, either from inward sense of right or the aid of society repelling wrong. (1) They may be divided into the *moral* and the *jurid.* of which the former comprehend the other. If I have R., it does not follow that *my freedom to act* in one way releases me from the *duty* of acting in another. Duty is universal, absolute, personal. I have a right to property, but it does not follow that I ought not to give it away. I must decide what I ought to do with it, but may decide wrong. If I wrong another by using it wrongfully, others have no right to keep me by force from sin; but I may be kept from wronging others by it. (2) R. and (civil) obligations pertain only to the act; morals have to do as much with dispositions and state of will as with the act. Yet even unintended wrong caused by *culpa levis* may need reparation. (3) R. may be waived. I may forgive a violation of right, remit a debt, forbear to prosecute an injury. But this seems to extend to *particular cases only*, not to all possible cases. A man has no right to surrender his right of free action in society, or surrender all his R., for his free action is necessary for even his virtuous action. A nation can only accept the inevitable when it is enslaved. (4) The *negative* side in the sphere of R. is the most important, but not necessarily so in

the moral sphere. Most laws, as the decalogue, say *thou shalt not* (kill, steal, commit adultery), but morals say also *thou shalt love*, etc. (5) R. and morals, as a class, can be sharply defined; moral claims and duties may be uncertain and questionable. How much I ought to spend, just how in all respects I ought to treat my neighbor, it is hard to decide. And thus virtue consists chiefly in those very actions which only good purposes and an unbiased mind can make clear. (6) R. and obligations are the principal subjects of private law. Immoral acts are injuries especially to the state, but may be injuries to persons also. (7) *Natural R.* are deducible from our *nature*, not from an imagined condition or a compact. They are called also *original R.* Acquired R. are gifts or political privileges. T. D. WOOLSEY.

**Riley** (CHARLES VALENTINE), M. D., Ph. D., b. in Lond. Sept. 18, 1843, came to the U. S. 1860; became ed. of the entomological dept. of the *Prairie Farmer* at Chicago 1863-68; State entomologist of Mo. 1868, in which yr. he began, with Benjamin D. Walsh, State entomologist of Ill., the publication of a monthly magazine, *The American Entomologist*. He has made annual reports on the entomology of Mo., and has rendered valuable services to science and to agriculture by tracing the hist. of the Col. potato-beetle, the discovery of a 13-yr. brood of the "17-yr. locust" or periodical cicada, of the phylloxera insects on Amer. grape-vines, and establishing their identity with the Fr. species; by his recommendation to use diluted Paris green against the Col. potato-beetle and the cotton-worm, and the discovery of the yucca-moth (*Pronuba yuccasella*) by which the yuccas are fertilized. The Fr. govt. awarded him in 1873 a gold medal "for services rendered to Fr. grape-culture." Received gold medal at International Forestry Exhibition, Edinburgh, 1884.

**Rimini** [anc. *Ariminum*], town of It., prov. of Forlì, lying near the Adriatic, in lat. 43° 4' N., 12° 34' E. It is a walled and well-built town, but there is everywhere an air of decay. The structures of interest still remaining from the Rom. period are the bridge of Augustus over the Marecchia, the arch of Augustus, the Fontana Publica. The great medieval attraction is the cathedral, founded in the 14th century. Several other chs. and the Palazzo Comunale contain admirable pictures. The Gambalunga Library (17th century) consists of about 25,000 vols. The chief industry of R. is connected with the fisheries, which are abundant, and the old harbor serves for little else than a shelter for fishing-smacks. The Porto Canale receives vessels of 120 tons. R. is a favorite resort for sea-bathing. Pop. 37,078.

**Rinderpest** [Ger.], or **Steppe Murrain**, a contagious eruptive fever among cattle, endemic or nearly so in Rus., and occasionally sweeping as a most destructive epizootic throughout Europe. It considerably resembles smallpox in its symptoms and progress. The best treatment is the prompt destruction of all diseased animals.

**Rinehart** (WILLIAM H.), b. Sept. 25, 1825, in Frederick co., Md., where he spent his childhood and youth in labor on his father's farm. A quarry opened here led to a shop for rustic gravestones. Shortly afterward, R., 21 yrs. old, came to Baltimore, where he apprenticed himself to a marble-worker, and within 2 yrs. was made chief of the ornamental work. In 1850 he began modelling in clay the human figure, or parts of it. In 1855 he sailed for It., determined to be an artist. He remained in Florence 2 yrs., with means so narrow as to verge on absolute privation, but brought back to Baltimore in 1857 two bas-reliefs (*Night and Morning*), which won attention. For a year he occupied a studio in Baltimore, modelled several busts, a fountain figure for the U. S. gen. P. O., and 2 supporting figures (*Indian and Back-woodsman*) for the clock in the new House of Reps., Wash. In 1858 he went to Rome, where his success was immediate. At the instance of Crawford's widow he completed the modelling of the bronze doors of the U. S. Capitol, which Crawford had left unfinished at his death; produced his life-size *Angel of the Resurrection and Jesus*, also his *Woman of Samaria* listening to Jesus, and a lovely group of 2 *Sleeping Children*. One of his highest works was of this period—*Love Reconciled with Death*—bronze, life-size, for the tomb of Mrs. Walters. His portrait-busts became so widely recognized that he had usually 2 or 3 yrs. of such work ahead. He made upward of 100 of them. The State of Md. having commissioned him to make an heroic statue in bronze of Chief Justice Taney, R. unveiled this work in the State-house grounds, Annapolis, Dec. 10, 1872. On this visit to Amer. he brought his statue of *Chytle* when just forsaken by Apollo. This was bought by a gentleman of Baltimore, who gave it to the Peabody Inst. of that city in perpetual trust as a free exhibition. Beside the works already named, R.'s early yrs. in Rome produced *Lander, Hero, Indian Girl, and St. Cecilia*; his later yrs., the group of *Latona and her Children, Antigone, Atalanta*, an ornament worn on the finger, frequently invested with a symbolical meaning. From the remotest antiquity the finger-ring was an emblem of an authority which could be delegated by the simple process of delivering it to an agent. They have long been in almost universal use in Christendom as tokens of marriage or betrothal, and are often engraved with mottoes. The "fisherman's ring" is an indispensable article of the papal chancery. Magical virtues have often been ascribed to rings both by pagan and Chr. nations, and traditions of poison concealed in rings have played a large part in the criminal annals of the Middle Ages.

**Ring-bone**, an exostosis or bony tumor on the coronet of the horse, most common on overworked horses, but sometimes seen on colts, or even newly dropped foals. R. may stiffen and spoil a horse for the road, although not unfrequently there is no practical trouble from it; but it injures a horse's value, and is practically incurable.

**Ring-money.** In rude and low stages of civilization the use of rings of the precious and other metals for personal adornment is very much more prevalent than in en-



**Ringworm.** See HERPES.

C. F. CHANDLER.

**Rio de la Plata.** See PLATA, RIO DE LA.

**Rittenhouse** (DAVID), F. R. S., LL. D., b. near Germantown, Pa., Apr. 8, 1732; worked in boyhood on his father's farm; came into possession of a set of tools and some mathematical books; made himself master of Newton's *Principia*; discovered for himself the method of fluxion in his 16th yr.; made a clock at a still earlier age, and undertook clockmaking as a profession 1751; soon afterward made an orrery, which was purchased by Princeton Coll. 1768; and subsequently a larger one for the Univ. of Pa.; was employed with Mason and Dixon, in 1763, to determine the initial point of their survey, which he did with instruments of his own construction; fixed the boundaries of Pa. with N. Y. and N. J., and performed similar tasks for other States; was appointed by the Amer. Philosophical Society to observe the transit of Venus June 3, 1769, which he did successfully in his private observatory, though he fainted from excitement at the moment of apparent contact; calculated correctly the elements of the future transit of Dec. 8, 1874; settled at Phila. 1770, continued there the manufacture of clocks and mathematical instruments; was elected to the provincial legislature 1775, in which yr. he delivered an *Oratio* on *Astron.* before the Amer. Philosophical



Society, of which he was an active member, and became pres. on the death of Franklin 1791; was a member of the convention which formed the State const. of Pa.; State treas. 1777-89, director of the U. S. mint 1792-95, and was chosen F. R. S. 1795. His papers on astronomical, phys., and mathematical subjects are found in the first 4 vols. of the *Philosophical Transactions*. D. June 26, 1796.

**Ritter** (FREDERIC LOUIS). See APPENDIX.

**Ritter** (KARL), b. at Quedlinburg, Prus. prov. of Sax., Aug. 7, 1779; studied at Halle; travelled much, and was appointed prof. of geog. at the Univ. of Berlin in 1820. He had great influence on the study of geog., remodelling the whole science. Wrote *Die Erdkunde im Verhältnisse zur Natur und Geschichte des Menschen*, *Geschichte der Erdkunde*, *Allgemeine Erdkunde*, and *Europa*. D. Sept. 23, 1859.

**River Falls**, on R. R., Pierce co., Wis., 12 m. N. E. of Prescott and 12 m. S. E. of Hudson, contains a State normal school and the River Falls Inst.; has good water-power. Pop. 1870, 741; 1880, 1499.

**River Head**, cap. of Suffolk co., L. I., N. Y., on R. R., at the head of navigation, has direct water-communication with New York. Pop. 1870, 1296; 1880, 1757.

**Rivers**. The first source of all the streams which flow on the surface of the earth is the ocean. The water of the sea, transformed into vapor, journeys through the atmosphere, and falls again in the form of snow and rain. However trifling these precipitations of moisture may seem, when compared with the "moving seas" of the Miss. and the Amazon, they suffice to account for the formation of all the R. But not all the water which is precipitated finds its way to the beds of the R. A considerable part returns to the air, while another enters into the circulatory current of vegetable and animal life. In all seasons, but especially in spring, when the foliage is formed, the plants absorb a great quantity of the water poured down by the sky. In the summer, during the great heats, the evaporation is very rapid, and the whole superficial layer of lakes and R. escapes into the air. No less active than the sun are the great winds in reducing the rains to the form of vapors. In the eyes of a physicist there is no essential difference between a pool and a brook, a lake and a river. The pool without efflux is formed, like the brook, by rains which do not escape immediately after their fall, but gather together in a common cavity. But when the waters of the rain are sufficiently abundant, and the geological strata easy to break through, and when the gen. slope of the ground aids the work of erosion, the lake bursts open at some weak point the reservoir which incloses it, and changes into a stream.

In moist regions and on surfaces of marked inclination, where one stream can join another, the river always terminates by reaching the sea. But there are other countries where the streams evaporate during their course, until at last the small balance of water which remains is sucked in by the sands, and the river ends in a marsh. The length of a river increases and decreases by the abundance of rain and the heat of the sun. Many a stream reaches the main river or the sea only during a few days or weeks or months; then it ceases to flow, partly or perhaps completely; it is a temporary apparition only, changing its appearances according to the course of the seasons. But such locked basins are exceptional; the open basins whence streams descend with a continuous flow to the R. are the rule.

What is, in each river-basin, the proportion between the water drained off and the water precipitated? The valuation which seems most plausible is that according to which the average rainfall on the whole surface of the continents amounts to about half a metre, and the average drainage to about  $\frac{1}{2}$  of the rain received; in this case the sea would receive 1,000,000 cubic metres a second. By adding together the masses of water poured into the ocean by R. which have already been gauged by engineers and geographers in the different parts of the world, the total average drainage of the whole of these river-basins, comprising an area of about 29,000,000 quadrate kilometres, is found to be approximately 265,000 cubic metres a second; which is very near the proportion presumed with respect to the whole earth. Considering what good or evil man may expect from the running waters, the action of the R. on their shores interests us more than the amount of water which they pour into the immense abyss of the ocean. Continual changes take place in the river-basins in accordance with the ever-varying phenomena of climate and soil. Everywhere the geological strata bear traces of R. which have had a different course from that of those which now traverse the country, or which have carried a different amount of water, either greater or less. Thus, in the Sahara, in Toorkistan, large river-beds are seen, with their shoals, meanderings, accretions, battures, banks, and islands; only the running water is wanting. In Westphalia traces are seen of an anc. delta formed by a powerful river whose basin occupied a large part of the basin of the present Ger. Ocean, and whose sources were situated in the present G. Brit.

The great hydrological changes are the work of centuries. In our short lives, however, mere moments though they are in comparison with the life of the globe, we see very considerable modifications taking place. Thus, the R. of Ger., from the Rhine to the Vistula, have all decreased regularly since the commencement of the century. In It. all the streams which enter the N. extremity of the Gulf of Venice change their outlet with every new flood. And who has forgotten the wonderful changes which the Yellow River or Hoang-Ho in Chi. has undergone? This stream has continued for at least 2500 yrs. to change its outlet in the sea from the right side of the peninsula of Shantoong to the left, and back again from the left to the right, a distance of 550 kilometres. It is sufficient simply to look at any great river with a rapid current and earthy banks in order to notice the incessant mobility of the bed under the action of the running water. Along the hollow of the creeks where the current sets with force, the sandy molecules become

loose, detach themselves, sometimes in large masses, and spreading in the muddy water, pass on to deposit themselves down-stream, especially at the mouth, where the current, retarded at the bottom, has not sufficient rapidity to hold the sand or clay suspended. Islands, pitched at their front point and elongated at their base-line, are formed, and then carried away to be formed again further down: they are incessantly displaced, changing form and aspect according to the size of the river and the power of the current.

Beside the continual displacements of the bed caused by the sinuosities of the current, which undermines on the one side, sanding up on the other, there is the normal displacement caused by the rotation of the earth from W. to E. In the plains of Rus. and Siberia, where the uniformity of the ground both in topographical and geological respects allows the running water full liberty in choosing its course, there is not one river which does not, from yr. to yr., encroach on its right bank, generally known as the "high bank," because the current incessantly saps the cliffs; and there is not one river which does not at the same time retreat from its left bank, its "basis," which has been levelled by the waters and made straight by the regular deposition of alluvions. Even when traversing regions which he has never seen before, the Siberian knows what aspect the R. which he is to cross must have. Nevertheless, several R. present a striking exception to this law, and the N. Amers. may quote as an instance the Miss. This stream should, according to theory, gradually deviate in a W. direction—that is, retreat incessantly to the W.—on account of the movement of the earth. But it does not. On the contrary, it abandons its old beds in the W. plains, which are transformed into annual lakes, and throws itself to the E. against the cliffs on which stand the cities of Memphis, Natchez, and Pt. Hudson. Farther on, when issuing from its middle course into a region where it is not restrained by the rising E. ground, but can choose what direction it likes toward the sea, it flows to the S. E., instead of taking the shortest way directly S. or deviating to the W. But all natural phenomena are complex, and controlled at the same moment by several laws. While the Miss. is pressed to the W. by the movement of the rotation of the earth, it may be thrown back to the E. by another power; and, indeed, it seems that the whole N. Amer. continent slopes from W. to E., toward the Atlantic coast. The geographers who quote the Miss. as an exception to the law of normal deviation may, on the other hand, characterize it as the greatest artifice among the R. In the present geological period no stream has thrown out into the sea a peninsula of a more extraordinary form. The long channel inclosed by narrow banks, which are bathed on the one side by the waters of the river and beaten on the other by the waves of the sea, resembles an arm thrust far out into the sea, and the beds of the various passages spread like the fingers of a hand.

This crossaction of laws manifests itself in the most curious manner in the annual history of the R.—that is, in the changes of their level and discharge according to the seasons. The R. of the temperate zone, which descend from high mts., offer a striking instance. At the time of the great autumn rains which fall in the river-basins of W. Europe, only one part of the moisture swells the current and finds its way to the sea; another is carried away by the winds to the slopes of the mts., and remains there bound up under the form of snow and ice. A similar contrast between the different affluents of the same river is produced in other basins by the alternation of the rains in the different parts of the surface drained. The Amazon is the most remarkable instance of this hydrological phenomenon. When the sun, on its annual round, is N. of the terrestrial equator, a belt of rain-clouds cover the lands below with their shade and inundate them daily by their showers. The R. which receive the surplus of these rains, the Pastaza, Tapura, Rio Negro, etc., become filled to the very brim, and soon after flood the adjacent fields. The Amazon is thus sustained in its course by its great N. affluents. But when the sun again crosses the equator, and journeys toward the boundary of the S. tropical zone, the rains fall in the other part of the basin, and it is the Huallaga, Ucayali, Purus, Madura, Tapajoz, and all the other great S. tributaries which flow with full current and bring to the Amazon that liquid mass which the N. affluents have ceased to offer.

The geological difference of the regions produces also a difference in the management of the water-courses which traverse them. The impermeable strata, solid rocks, stiff clays, etc. do not allow the rain-water to penetrate into the depths of the soil; it hurries immediately to the beds of the rivulets, and thence to the common river. The permeable strata, on the contrary, such as the cracked layers of limestone, permit the water to penetrate into hidden grottoes: its course is retarded by a thousand obstacles; it wanders through long subterraneous galleries; and when at last it reappears in abundant springs, the superficial waters have been drained off days and weeks before. The overflowing river tends itself to regulate and moderate its course. While the exceeding rapidity of the current hurries the billows of the flood down-stream, the waters which expand laterally over the regions inundated slacken little by little on account of the innumerable obstacles which they meet. In regions not yet under cultivation or defended by levees the river generally finds natural reservoirs—lakes, swamps, etc.—in which it can store up a large part of the surplus of the flood, which then afterward flows back to the prin. river when this has lowered its level. Any great river presents instances of such reservoirs, in which the surplus of the inundated liquid mass is temporarily gathered up, and which, in their turn, supply the fluvial volume in times of drought.

The intervention of man may aid in regulating the management of water-courses, but it may also contribute to spoil; and the latter has frequently been the case. The best means which can be employed to reduce the floods is



that used by the agriculturists in the hot regions, where abundance of water is indispensable for the cultivation of plants. They divide the current into secondary canals, and these again into other threads, which finally branch off into innumerable trenches. The water, thus divided into a multitude of beds, each of which is regulated with embankments and locks, is retarded in its course, and the loss by evaporation is increased. The R. does not gush forth afterward with that frightful suddenness which characterizes streams not yet brought under control. Along the great R. the prin. occupation of man, while yet only half civilized, is not to utilize its waters, but to secure himself against its wrath. He then often happens to act with imprudence, and in many cases the very means of safety which he chooses become causes of disaster to him. It seems at first glance a very simple matter to heighten the river-banks by means of a levee in order thereby to protect the adjacent fields and restrain the waters to their bed; but in the construction of these artificial banks what obstacles are to be overcome, what constant care is to be taken, what foresight is to be exercised! They must be sufficiently large in order to resist the most violent pressure of the water, and sufficiently high in order to command the most exceptional level of the floods; at the most exposed points they must be strengthened by transverse supporters, which again lean against secondary dams; the maintenance of these levees must constantly be watched; their slopes must be consolidated; any subsidence of the ground must be repaired; all burrowing animals must be hunted out. If wars, lack of money, rivalry between states or proprietors, cause any neglect in the maintenance of the dams at any point of their immense length, one day, one hour, will suffice, and a disaster may occur: the fluvial current will make a breach, and carve for itself a new bed in the fields.

Avarice creates dangers of another kind by narrowing the river-bed for the profit of cultivation. Almost all the levéed R. occupy a part only of their original bed of inundation, and consequently the flood must gain in height what it loses in width; it rises instead of spreading; reaches the level of the levees, overflows them if it has not broken them, and expands far away across cities and fields. In all the countries in which cultivation does not profit directly from the waters of the inundation, as is the case in the valley of the Nile, the system which ought to be followed is evidently that applied by the inhabs. along the Po. The original bed of inundation is here carefully maintained in its whole width, and the prin. dam, the levée which is called *insubmergibile*, is raised along this line. The space between this dam and the low-water marks of the current can be cultivated, but the levees which protect it should be 2 ft. lower than the prin. dam. They do not arrest the flood; the inundation spreads over this whole terr., depositing its fertilizing mud, but retarded by a thousand obstacles.

[From orig. art. in *J.'s Univ. Cyc.* by ELISÉE RECLUS.]

**Rivers** (ANTHONY WYDEVILLE, or WOODVILLE), EARL or, son of Sir Richard Wydeville, b. in Eng. about 1442; accompanied his father on an expedition against the earl of Warwick at Calais, and was there taken prisoner 1459; married the heiress of Lord Scales and assumed that title 1467; succeeded his father as Earl Rivers 1469; was made a knight of the Garter, chief butler, and capt.-gen. by King Edward IV., who had married his sister Elizabeth; attended him to Hol. 1470; became gov. of Calais about 1471, gov. of Prince Edward, the heir to the throne, 1482; translated from the Fr. *The Dictes and Sayings of Philos.*, *The Morale Proverbs of Crystyne of Pise*, and *The Booke named Cordyale, or Memorare Notissima*. On the death of Edward IV. Lord R. assembled a body of troops for the purpose of proclaiming his nephew, but was seized by the duke of Gloucester (Richard III.), and beheaded about June 13, 1483.

**Rivers** (RICHARD H.), D. D., b. in Tenn. Sept. 1814, grad. at La Grange Coll., Ala., 1835; elected assistant prof., and in 1836 prof. of langs. in that inst.; was pres. of the conference school at Athens, Ala., 1843; v.-p. and prof. of moral science in Centenary Coll., La., 1848, and pres. 1849; pres. of La Grange Coll. 1854, and remained in that position after the removal of the inst. to Florence, Ala., and the change of the name to Wesleyan Univ., until it was broken up by the c. war; was subsequently pres. of Centenary Inst., Summerfield, Ala., Somerville Female College, Tenn., and

Logan Female Coll., Ky.; pastor of Broadway ch., Louisville, Ky.; pres. of Martin Female Coll., Pulaski, Tenn.; member of Tenn. conference of the M. E. Ch. South; author of a vol. on mental and another on moral science.

**Riverside**, Cal. See APPENDIX.

**Rives** (WILLIAM CABELL), b. in Nelson co., Va., May 4, 1793, ed. at Hampden-Sidney and William and Mary colls.; studied law under Jefferson; served as a volunteer in the war with Eng. 1812-15; became prominent in Va. politics; M. C. 1823-27; minister to Fr. 1829-32, and again 1849-53; U. S. Senator from 1832 to 1845, with a brief interruption; a member of the peace conference of 1861, and of the Confed. cong. at Montgomery. Author of *The Life and Times of James Madison* and other works. D. Apr. 26, 1868.

**Rivoli**, ree'-vo-le, town of It., prov. of Turin, on a hillside about  $\frac{3}{4}$  m. W. of the city of Turin. On the top of the hill stand 2 castles—one anc., the other modern. The old collegiate ch. (founded 1304) and the present collegiate ch., still older (1287), are remarkable. R. is a favorite country retreat for the Turinese aristocracy. Pop. 6000.

**Rizzio**, rit'-se-o, or **Riccio** (DAVID), b. at Turin, It., in 1540, his father being a dancing-master; was brought up in Fr.; became an accomplished musician, excelling especially on the lute; accompanied an embassy sent by the court of Savoy to Scotland about 1563. Having attracted the attention of Mary queen of Scots by his musical talent, she appointed him one of the pages of her chamber. He acquired great influence over her, and was accordingly hated by less fortunate courtiers; was an advocate of the marriage to Darnley, after which he was appointed keeper of the privy purse to the king and queen. Several of the most powerful nobles, especially Morton, Ruthven, Lindsay, and Maitland, formed a conspiracy to assassinate him, and obtained the written concurrence of the weak Darnley by working upon his jealousy. Introduced by Darnley into the queen's chamber, Ruthven and George Douglas struck down R. in her presence. Killed Mar. 9, 1566.

**Roach** [A. S. *Aræce*], a species of fish of the family Cyprinidae; and the type of the genus *Leuciscus*; the body is silvery, and the lower fins tinged with red. The species generally attains a length of about 7 to 9 inches, and sometimes reaches as much as 10 or 12. It is distributed throughout Europe N. of the Alps. In Amer. the same name is applied to several species belonging to the same or related genera, and even in some places, to the sunfish.

**Road** [A. S. *ráð*, Law of the. In Eng. the L. of the R. consists of 3 well-settled rules—viz. (1) when 2 vehicles meet, each must bear to the left; (2) when one vehicle overtakes another, the foremost gives way to the left, and the other passes by on the off side; (3) a vehicle crossing the direction of another keeps to the left and crosses in its rear. In the U. S. 2 vehicles meeting turn to the right instead of to the left, but with this modification the L. of the R. is the same as in Eng. All persons traversing a highway, whether walking, riding, or driving, must use reasonable care and diligence to avoid collision.

The method of avoiding collisions at sea is now a matter of international concern. Different rules have hitherto been prescribed by different states, but at the present day the tendency is toward the adoption of a single system by all maritime countries. To this end the U. S. Cong. and the Brit. Parl. have enacted the same code of regulations for the govt. of all steam or sailing vessels at sea, which are contained in Rev. Stat. of U. S. title "Commerce and Navigation," chap. v.; and 25 and 26 Vict., chap. 63 (1862), schedule C. JOHN NORTON POMEROY.

**Roads and Pavements.** A road [A. S. *ráð*, *rade*, "a ride," "a passing on horseback"] is an open way or public passage appropriated for travel, and generically includes highway, street, and lane. A pavement (Lat. *pavimentum*) is a covering of stone, bricks, or other hard and solid material laid firmly on a road or street in order to give a smooth and convenient surface for travel and traffic. The grade of a road or street is the angle which the axis makes with a horizontal line. It should never, except for very short distances, be steeper than the angle of repose, or that angle upon which a loaded wheeled vehicle of the kind in common use would not be set in motion by its own weight, but would slowly descend if a slight motion be imparted to it. The *tractive force* is the power required to move a vehi-

FIG. 1.

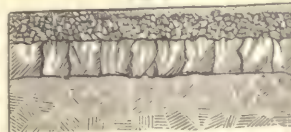


cle and load on a horizontal road. At the angle of repose the force acting parallel to the grade to sustain the vehicle in its position on the incline is equal to the tractive force. The width of R. will depend largely on local circumstances. A width of 27 to 30 ft. prepared for vehicles will amply suffice for the prin. route between cities. For branch R., or R. connecting small towns, the width may be much less. In order to carry off the rainfall the surface slopes from the centre toward the side-ditches or gutters. The best transverse form is secured by 2 planes sloping gently toward the side-gutters, and connected in the middle of the roadway by a short convex surface, as shown in Fig. 1, where the road is 30 ft. wide, metalled in the middle for a width of 16 ft., with a footpath on one side, and side-ditches.

Road-coverings have for their object the reduction of the tractive force to the lowest possible limit at the least cost

for construction, maintenance, and repairs, and they should be composed of tough and durable materials, such as the basaltic, the doleritic, and other trap-rocks, the sienitic granites, and some of the limestones, laid up on a firm bed suitably drained. A Telford road (Fig. 2) is made with layers of broken stone, aggregating 6 to 7 inches in thickness, resting on

FIG. 2.



6 to 7 inches in thickness, set on their broadest edges in contact in courses across the roadway. All the irregularities in the upper surface of the sub-pave-



ment are broken off, and the joints are filled by wedging in small pieces of stone with a hammer. In soft soils a layer of rubble-stones is sometimes first laid as a foundation for the Telford sub-pavement. Such a foundation should be constructed with great care, the larger stones being laid down first, side by side, upon the road-bed, and firmly set to their places by rammers. When the soil is quite soft, it is well to set the rubble-stones in contact on their edges in lines across the road, although they may vary greatly in shapes and sizes, as shown in plan in Fig. 4, and in vertical section across the road in Fig. 3. In very soft clayey soils, especially where constantly saturated with water, cases have occurred where it was necessary to resort to a concrete foundation about 6 inches thick to prevent the road-material from sinking into and mixing with the clay. Rubble-stones on edge, but not in contact, with the interstices filled in with concrete, as shown in Fig. 5, would be equally good.

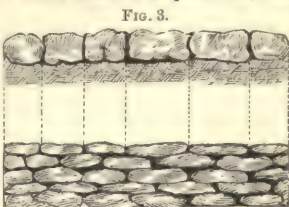


FIG. 3.

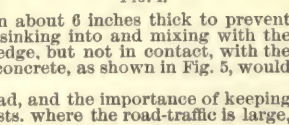


FIG. 4.



FIG. 5.

The value of a good road, and the importance of keeping it in good condition in dists. where the road-traffic is large, cannot well be over-stated. In Fr. 2 methods of maintaining broken-stone R. are practised. The first method is one of minute daily repairs, by which the road-covering is preserved at a constant thickness by filling in the ruts and depressions as fast as they begin to appear, and thus systematically restoring fresh material in the place of that removed as dust or mud by sweeping and scraping. The other method is one of partial repairs, accompanied by periodical additions of fresh material, by which the diminished thickness of the covering is restored at stated intervals.

A street-pavement ought to be smooth and hard in order to give a secure foothold for animals; not become slippery from use; be as noiseless and as free from dust and mud as possible; be easily and cheaply cleansed; and be of such material and construction that it can be readily taken up and relaid in places at all seasons of the year. Economy of maintenance also requires that the material at the surface shall be durable. A good foundation is as necessary for the stability of a pavement as for that of any other structure, and a street-surface which satisfies all the foregoing conditions will inevitably fail as a pavement if it rests upon a yielding foundation. The best stone pavement is one of rectangular blocks set in contact on their longest edges, in lines across the street, and resting on a foundation of concrete, or rubble-stone filled in with concrete. The most valuable wooden pavement is composed of rectangular blocks set on their longest edges close together in courses across the street, with an open joint about 3/4 inch wide between the courses. A good asphalt pavement requires a solid foundation. The asphalt covering may be the natural asphalt rock derived from the Jurassic region on the confines of Switz., or it may be composed of asphaltic cement suitably prepared by refining natural bitumen, to which is added a calcareous powder to take the place of the amorphous carbonate of lime contained in the natural asphalt rock. The advantages of a good monolithic asphalt pavement are—(1) that it produces no dust, and therefore no mud; (2) it is comparatively noiseless; (3) it does not absorb and retain noxious liquids; (4) it is impermeable to moisture, and neither emits nor allows the emission from the subsoil of unwholesome and poisonous vapors; (5) it reduces the force of traction, and consequently the wear and tear upon animals and vehicles, to a minimum; and (6), although furnishing a somewhat less secure foothold for animals than blocks of stone or wood, it does not become polished and slippery from continued wear.

1. *Durability*.—Stone possesses the longest life, and wood very much the shortest, while asphalt lies between the two, and very near to the stone.

2. *First Cost*.—At present prices a good asphalt pavement on a concrete foundation can be laid for \$3.50 per square yard, with 30 per cent. profit to contractor. This somewhat exceeds the first cost of a wooden pavement, but is less by at least \$1 per square yard than one of stone set on a concrete foundation. In economy of first cost, wood, therefore, stands first, asphalt second, and stone third.

3. *Cost of Maintenance and Repair*.—The order of merit will be—first stone, second asphalt, and third wood, and the stone must be both hard and tough in order to maintain the first place.

4. *Facility of Cleansing*.—The order of merit under this head will be asphalt first, stone second, and wood third.

5. *Convenience*.—With regard to the safety of the animals and the convenience and comfort of those using the street, as well as those living upon it, the weight of opinion places asphalt first, wood second, and stone third for all except very crowded business-streets, in which case stone rises to the first place and asphalt sinks to the third.

6. *Hygienic Considerations*.—Upon hygienic grounds asphalt conspicuously stands first, stone second, and wood third in order of merit.

The most suitable pavement for the busiest streets of a city, where the traffic is dense, heavy, and crowded, is one of rectangular stone blocks set on a concrete foundation, while for streets of ample width, or those largely devoted to light traffic or pleasure-driving, or lined on either side with residences, asphalt is the best for all grades not steeper

than 1 in 48 or 50. [From orig. art. in *J.'s Univ. Cyc.*, by GEN. Q. A. GILLMORE.]

**Roanoke**, a river formed by the union of the Dan and Staunton rivers at Clarksville, Va. It flows 250 m. in an E. S. E. course, and finally falls into Albemarle Sound near Plymouth, N. C. It is a tidal stream to Halifax Falls, N. C., 75 m. from its mouth, is navigable 75 m. farther to Weldon by steamboats, and throughout its course by bateaux.

**Roanoke, Va.** See APPENDIX.

**Roanoke College**, a Lutheran educational inst. at Salem, Roanoke co., Va., chartered as a coll. 1853. The curriculum of studies is peculiar—(1) in the embodiment of Christianity in the course, the connection of religion and the sciences in the depts. of ethnology, geol., natural theol., and the evidences of Christianity; and (2) in the extension of the dept. of metaphysics.

**Roaring** [A.-S. *rārian*], in the horse, is the noise made by some horses while drawing in the breath, especially while travelling fast. It depends upon a kind of wasting disease of the muscles of the larynx, and is incurable.

**Robbery** [O. Fr. *robberie*]. At the common law R. is the felonious taking of money or goods from the person of another, or in his presence and against his will, by violence or by putting him in fear. To constitute the crime the property must be of some value. The taking must be from the peaceable possession of the individual robbed, but if the goods are taken from his immediate presence and under his eye they are regarded as abstracted from his person. There must also be actual violence, or a reasonable putting in fear before or at the time of the taking. Finally, the fear, which is the alternative of violence, may be either of injury to the owner's own person or to the person of his wife or child, or of injury to his property. The statutes of the various States defining and regulating the crime are closely modelled after the common law.

JOHN NORTON POMEROY.

**Robbins** (ASHUR), LL.D., b. at Wethersfield, Conn., 1757, grad. at Yale 1782; was tutor in R. I. Coll. (now Brown Univ.) 1783-90; became a lawyer at Newport; in the State legislature 1818-25; U. S. dist. atty. 1812, and U. S. Senator 1825-39. D. Feb. 25, 1845.

**Robbins** (CHANDLER), D. D., b. at Lynn, Mass., Feb. 14, 1810, grad. at Harvard 1829, and became pastor of the Second ch. (Unit.) at Boston 1833. Author of memoirs, and a *Hist. of the Second Ch.*; one of the eds. of the *Proceedings of the Mass. Historical Society*. D. Sept. 11, 1882.

**Robbins** (THOMAS), D. D., b. at Norfolk, Conn., Aug. 11, 1777, grad. at Yale 1796; was pastor of a Congl. ch. at E. Windsor 1809-27, at Stratford 1830-31, and at Rochester, Mass., 1832-42; afterward resided at Hartford, Conn.; was one of the founders of the Conn. Historical Society, and its sec. and librarian from 1844, and bequeathed to it his valuable library. Author of *An Historical View of the First Planters of N. Eng.*, a *View of all Religions*, and ed. of Tyler's *Elements of Gen. Hist.*, revised and continued to 1815. D. Sept. 13, 1856.

**Robert II.**, surnamed THE DEVIL, succeeded his brother as duke of Normandy in 1027. He was the very image of medieval energy, audacity, unscrupulousness, and cruelty. From the height of his success he suddenly fell into melancholy. He repaired to Rome; thence he went next yr. to Constantinople, and from Constantinople he journeyed on foot to Jerusalem. At the Holy Sepulchre he found consolation, but on his return d. suddenly at Nicæa July 2, 1085. His only child was William the Conqueror.

**Robert I.**, king of Scot. See BRUCE (ROBERT).

**Robert II.**, king of Scot., founder of the Stuart dynasty, b. in Scot. Mar. 2, 1316; succeeded his father in 1326 as 7th high steward of Scot. (whence the family surname); became regent 1388-41, during the minority and absence in Fr. of his nephew, King David II.; was again regent from the capture of the king at the battle of Nevill's Cross, Oct. 1346-57; opposed a successful resistance to the project of imposing Lionel, duke of Clarence, upon Scot. as king, and renewed his oath of fealty to David II. 1363; was imprisoned 1363-69; declared king after the death of David, Feb. 1371; conducted 2 wars with Richard II. of Eng.; suffered much from the disorders of his turbulent barons and the border wars with Eng. D. at Dundonald Castle May 13, 1390.

**Robert III.**, king of Scot., b. in Scot. about 1340; succeeded to the throne May 13, 1390; renewed the war with Eng. 1399; was an imbecile ruler, and left the administration in the hands of his unscrupulous brother, Robert Stuart, by whom the heir to the throne, David, duke of Rothesay, was imprisoned and starved to death in Falkland Castle 1402; suffered the invasion of Henry IV. of Eng. 1400, and the terrible defeat of Homildon Hill 1402; sent his surviving son, Prince James, to Fr. for safety, and became the victim of incurable melancholy on learning the imprisonment of his son by the Eng. May 1405. D. Apr. 4, 1406.

**Robert Guiscard**. See GUISCARD.

**Roberts** (DAVID), R. A., b. at Stockbridge, near Edinburgh, Scot., Oct. 24, 1796; was in early life a house-painter, afterward a scene-painter for the Lond. theatres; visited Sp. 1832-33, painting many pictures from which he prepared a lithographic collection of *Picturesque Sketches in Sp.*; travelled in the E. 1838-39; pub. a splendid series of drawings under the title *The Holy Land, Syria, Idumæa, Arabia, Egypt, and Nubia*. D. at Lond. Nov. 25, 1864.

**Roberts** (ELLIS H.), LL.D., b. at Utica, N. Y., Sept. 30, 1827, learned the printing trade with his brother; grad. at Yale, 1850; became in 1851 ed. and proprietor of the *Utica Morning Herald*, a newspaper of Whig and subsequently of Rep. principles; was a member of the Presidential conventions of 1864, 1868, and 1876, of the State legislature 1867; M. C. 1871-75.

**Roberts** (FREDERICK SLEIGH). See APPENDIX.

**Roberts** (ORAN M.), a native of S. C., settled in 1841 in the practice of law in San Augustine, Tex.; was appointed dist. atty. in 1844, and dist. judge in 1846. In 1857 he was elected to the supreme bench as associate justice. When



the c. war began he was elected pres. of the convention of secession, and commanded a regiment in the Confed. army 1862-64, when he assumed the chair of chief-justice of the supreme court. In 1866 he was elected to the U. S. Senate, but denied his seat.

**Robertson** (CHARLES FRANKLIN), S. T. D., b. in New York Mar. 2, 1835, grad. at Yale 1859, at the General Theological Sem. of the P. E. Ch. 1863; took orders in that Ch.; officiated as rector of several chs., and was consecrated bp. of Mo. Oct. 25, 1868.

**Robertson** (FREDERICK WILLIAM), b. in Lond. Feb. 3, 1816; abandoned the plan he had formed of entering the army; entered Brasenose Coll., Ox., 1837, and grad. 1840; was settled in Winchester 1840-42, in Cheltenham 1842-47, in Ox. 1847, going that yr. to Brighton, where he d. Aug. 15, 1853. His *Sermons* have had a wide circulation.

**Robertson** (GEORGE), LL.D., b. in Mercer co., Ky., Nov. 18, 1790; studied at Transylvania Coll. and at a classical school at Lancaster; was admitted to the bar 1809; M. C. 1817-21; speaker of State legislature 1823 and 1825-27; sec. of state 1828; judge of the court of appeals 1829; chief-justice of Ky. 1829-43, and prof. of law in Transylvania Univ. 23 yrs.; wrote a *Biographical Sketch of Hon. John Boyle*. D. May 17, 1874.

**Robertson** (JAMES), b. in Fifeshire, Scot., about 1725; was appointed lieut.-col.; was stationed at New York 1763-75; went to Boston July 1775; was appointed maj.-gen. Jan. 1, 1776; commanded a brigade in the battle of L. I.; went to Eng. 1777; returned with a commission as royal gov. of New York 1779; took the oath of office Mar. 23, 1780; exerted himself with Gen. Greene to procure the exchange of Major André; became lieut.-gen. Nov. 30, 1782; returned to Eng. Apr. 1783, and d. Mar. 4, 1788.

**Robertson** (WILLIAM), D. D., b. at Borthwick, Scot., Sept. 19, 1721, grad. at the Univ. of Edinburgh 1741; became a minister of the Scot. Ch. at Gladsmuir 1743, prin. of the Univ. of Edinburgh and minister of Greyfriars ch. 1762, and was appointed historiographer of Scot. 1764. Author of a *Hist. of Scot. during the Reigns of Mary and James VI. Hist. of the Reign of the Emp. Charles V., Hist. of Amer., and an Historical Disquisition concerning the Knowledge which the Anc. had of India*. D. June 11, 1793.

**Robeson** (GEORGE M.), b. in N. J. 1827, grad. at Princeton Coll. 1847; was admitted to the bar 1850; practised at Newark, and afterward at Camden; was appointed a brig.-gen. by the gov. of N. J. early in 1861; was atty.-gen. of N. J. from 1867 to June 22, 1869, when he became sec. of navy in cabinet of Pres. Grant; elected to 46th Cong.; re-elected to the 47th and 48th (1881-85).

**Robespierre**, rob'es-peer; Fr. ro-bes-pe-air' (MAXIMILIEN JOSEPH FRANÇOIS ISIDORE), b. at Arras May 6, 1758. His father, who was a lawyer in poor circumstances, abandoned the family and went to the U. S. His mother died early, and Maximilien was ed. by the grandfather in hopeless poverty. He distinguished himself at the coll. of Arras, so that the bp. sent him to the coll. of Louis le Grand at Paris, where he went through the preliminary course with great honor. He then studied law, and after finishing his studies he returned to his native city and began to practise law. He wrote verses, and became a member of the acad. of Arras. In the Constituent Assembly, to which he was returned by Artois, R. did not play any very conspicuous part. It was outside the assembly he first made himself noticed as a revolutionary leader. In the Jacobin Club he soon acquired a predominant influence, and he grew in importance with the club. Mirabeau noticed him, and after the death of that leader he began to make himself felt even in the assembly. Some time before its dissolution, in May 1791, he proposed that no member of the Constituent Assembly should be eligible to the first Legislative Assembly, and for this decree R. was greatly applauded. He did not lose anything by it himself. It prevented him from being elected to the Legislative Assembly, but it did not prevent him from being the head of the Jacobin Club, and by composing the Legislative Assembly merely of political novices it weakened this body to such a degree as to deliver it up wholly to the guardianship of the club. What part R. really took in the insurrections of June 30 and Aug. 12, and in the Sept. massacres of 1792, is doubtful, but from his entrance into the National Convention (Sept. 21, 1792), in which he took his seat as the head of the radical party, the so called Mountain, his career was unmistakable. It was he who brought first the king, then the Girondists, then the opponents of the radical party, Camille Desmoulins and Danton, and at last his own tools, Hébert and Chaumette, to the scaffold, and it was he who was the leader in establishing the Reign of Terror. After the execution of Danton (Apr. 5, 1794), R. actually stood alone, without a rival or adversary, the dictator of Fr. The last days of R. are very interesting to study. He was accused, and not allowed to defend himself. The decree of his arrest was carried in the Convention in the midst of a complete uproar. After being arrested he was rescued by his friends, and a gen. insurrection was proposed in order to save him. He was guillotined the day after his arrest, July 28, 1794.

**Rob'in**, the name applied in Eng. to several well-known singing birds of the family Erythracinæ, and improperly given in the U. S. to a species of thrush, the *Turdus migratorius*. There are 15 genera of robins in Europe, W. Asia, and N. Africa. They all feed on worms, insects, and fruits, generally living on cultivated grounds, and having but slight fear of man. The best-known species is the R. redbreast.

**Robin Hood**. See HOOD (ROBIN).

**Robinson**, ill. See APPENDIX.

**Robinson** (BEVERLEY), b. in Va. 1723; was major under Wolfe at Que. 1759; married a daughter of Frederick Phillips, thereby coming into possession of immense tracts of land on the Hudson; was opposed to the despotic measures of the Brit. ministry, but was loyal to the gov.; removed into New York at the outbreak of the Revolution; recruited

and commanded the Loyal Amer. regiment, of which he was col.; lost his property by confiscation; at the conclusion of the war went to Eng. D. 1792.

**Robinson** (REV. CHAS. S.). See APPENDIX.

**Robinson** (EDWARD, D. D., LL.D., b. in Southington, Conn., Apr. 30, 1794, grad. at Hamilton Coll. 1816; was tutor there 1817-18; pub. an edition of 11 books of the *Heb.*; was instructor in Heb. in Andover Sem. under Prof. Stuart, whom he assisted in preparing the 3d ed. of his *Heb. Gram.*, publishing meanwhile (1825) his translation of Wahl's *Chrus Philologien Novi Testamenti*; studied in Europe, mostly at Halle and Berlin, 1826-30; returned to the U. S., and was prof. extraordinary at Andover 1830-33; broke down in health, and resided in Boston 1833-37, and in 1837 accepted a professorship in Union Theological Sem., New York, which he held till his death, Jan. 27, 1863. In 1838 and again in 1852 he travelled in Pal., doing more for biblical geog. than any other one man that has ever lived. Beside the works already mentioned, he pub. Gesenius's *Heb. Lexicon*, *Gr. and Eng. Lexicon of the N. T.*, *Gr. Harmony of the Gospels*, *Eng. Harmony of the Gospels*, etc. In 1831 he founded the *Biblical Repository*, and in 1843 the *Bibliotheca Sacra*. The great work of his life was the *Biblical Researches*. His *Phys. Geog. of the Holy Land* was pub. in 1855.

**Robinson** (EZEKIEL GILMAN), D. D., LL.D., b. at Attleborough, Mass., Mar. 23, 1815, grad. at Brown Univ. 1838, at Newton Theological Sem. 1842; was pastor of Bap. chs. at Norfolk, Va., 1842-45, and at Cin., O., 1849-52; prof. of Heb. in the theological sem. at Covington, Ky., 1846-52; prof. of biblical theol. in the sem. at Rochester, N. Y., 1852, and pres. of that inst. 1860, remaining until 1872, when he was chosen pres. of Brown Univ.; was ed. of the *Chr. Review* 1859-64; prepared a revision of Hyland's translation of Neander's *Planting and Training of the Chr. Ch. and The Relation of the Ch. to the Bible*.

**Robinson** (SIR FREDERICK PHILLIPS), son of Col. Beverley, b. on the Phillips Manor, N. Y., in Sept. 1763; became an ensign in his father's Loyal Amer. regiment Feb. 1777; was wounded and taken prisoner at Stony Point; served in the W. I., and under Wellington in the Peninsular war, rising to be gen.; was commander-in-chief of the Brit. forces in Canada 1812; participated in the campaign on Lake Champlain Sept. 1814; was knighted 1815, and made gov. of Upper Canada, and became full gen. 1841. D. Jan. 1, 1852.

**Robinson** (GEORGE D.), LL.D. See APPENDIX.

**Robinson** (HORATIO NELSON), LL.D., b. at Hartwick, N. Y., Jan. 1, 1806; received an ordinary common-school education until the age of 16, when his mathematical talent led a wealthy gentleman to assist him in entering Princeton Coll.; was prof. of math. in the U. S. N. 1825-35; afterward prin. of acads. at Canandaigua and Genesee. Author of *Univ. Algebra*, *Differential and Integral Calculus*, and other mathematical text-books. D. Jan. 19, 1867.

**Robinson** (JOHN), b. in Eng. 1575; entered Cambridge Univ. 1592; became attached to Puritan doctrines; took preliminary orders in the Ch. of Eng.; was suspended by the bp. for nonconformity in ecclesiastical ceremonials 1602; formally separated from the Ch. of Eng. 1604; resigned his fellowship at Cambridge; became assistant, and soon after sole pastor of a dissenting congregation (1604) gathered at Scrooby, Nottinghamshire; suffered a persecution which led many of his congregation to emigrate with him to Amsterdam, Hol. 1608; removed to Leyden 1609; gathered there a numerous ch.; attended lectures at the univ., of which he afterward became a member; held a notable public discussion with the Dut. prof. Episcopius, the successor of Arminius, upon the Calvinistic doctrine of free-will, 1615; was active in promoting the negotiations with the Plymouth Co. of capitalists; dismissed a portion of his congregation with a memorable farewell sermon on their embarkation for Amer. July 22, 1620, intending to follow them the next yr., but before the negotiations were completed he d. at Leyden Mar. 1, 1625. The remainder of his ch. emigrated to Mass. soon afterward, with his sons, John and Isaac. Wrote *A Justification of Separation*, *Of Religious Communion*, *Apologia Juda et Necessaria*, etc.

**Robinson** (SIR JOHN BEVERLEY), BART., D. C. L., b. at Berthier, Lower Canada, July 26, 1791; studied law; was clerk of the assembly 1811; atty.-gen. 1812; served as a volunteer under Gen. Brock at Detroit; was solicitor-gen. 1815-18; again atty.-gen. 1818-29; was chief-justice of Upper Canada from July 15, 1829, until his death, Jan. 30, 1863. He was created a baronet 1854; was 18 yrs. a member of the legislature of Upper Canada, chancellor of Trinity Coll., Toronto, and author of several miscellaneous publications on Canada.

**Robinson** (JOHN CLEVELAND), b. in Binghamton, N. Y., Apr. 10, 1817; entered the U. S. Military Acad. 1835, but without graduating commenced the study of law in 1838, and in 1839 he accepted a second lieutenancy in the 5th Inf., and served in the war with Mex. and in Fla. In Sept. 1861 he was appointed col. of the 1st Mich. Volunteers, and in Apr. 1862 brig.-gen. of volunteers, serving in the Va. peninsular campaign of 1862, at the second battle of Bull Run, Chantilly, and Fredericksburg. At Gettysburg and in the Richmond campaign of 1864 he commanded a division, losing a leg on the fourth day of fighting in the latter campaign. Brevet brig.- and maj.-gen. for gallantry. In 1866 he attained the colonelcy of the 43d Inf., and in 1869 was retired from active service on the full rank of maj.-gen. In 1872 he was elected lieut.-gov. of N. Y.

**Robinson** (LEWIS), LL.D., b. at Windham, Greene co., N. Y., Nov. 4, 1810, ed. at Del. Acad., Delhi; studied law, admitted to the bar in 1829; appointed master in chancery in 1843; elected to legislature in 1859; appointed comptroller of the State in 1861; was a member of constitutional commission 1871-72; elected comptroller of the State on the Dem. ticket in 1875, and gov. in 1876; nominated for gov. of N. Y. by the Dems. in 1879.



**Robinson** (Solon), b. at Tolland, Conn., Oct. 21, 1803, was for many yrs. agricultural ed. of the *New York Tribune*; author of *Hot Corn, or Life-Scenes in New York Illustrated*; *How to Live, or Domestic Economy Illustrated*; *Facts for Farmers*, and *Me-won-i-toe*. In 1870 he settled on a farm in Fla. D. Nov. 3, 1880.

**Robinson** (Stuart), D. D., b. at Strabane, Ire., Nov. 26, 1816, grad. at Amherst Coll. 1836; studied theol. at Union Theological Sem., Prince Edward, Va.; taught 2 yrs., and then spent part of a yr. (1840) at Princeton, N. J.; was settled at Kanawha Salines, W. Va., 1841-47, at Frankfort, Ky., 1847-52, at Baltimore, Md., 1852-56; was prof. of ecclesiology at Danville, Ky., 1856-58, and in 1858 became pastor of the Second Presb. ch. in Louisville, Ky. He has pub. *The Ch. of God an Essential Element of the Gospel and Discourses of Redemption*, reprinted in Edinburgh. He established and edited in Baltimore the *Presbyterian Critic* (1855-56), and in Louisville *The True Presb.*, suppressed during the war, and then revived under the name of *The Free Chr. Commonwealth* (1861-68). He has also put forth many pamphlets on various issues between N. and S. Presbs. In 1873 he visited Egypt and the Holy Land. D. Oct. 5, 1881. R. D. HITCHCOCK.

**Robinson** (Thérèse Albertine Louise von Jakob), daughter of Prof. L. H. von Jakob, b. at Halle, Ger., Jan. 26, 1797; resided with her father in Rus. 1807-16, becoming acquainted with the Slavic langs.; returned to Halle 1816; became known as a poetess; pub. *Psyche, Original Tales*, under the nom de plume of "Talvi" (the initials of her name), and *Servian Songs*; married Prof. Edward Robinson 1828; contributed largely to the *Biblical Repository*; pub. *Characteristics of the Popular Songs of the Ger. Nations* and a treatise on *The Authenticity of the Poems of Ossian*; wrote in New York 2 small works on Amer. hist. for circulation in Ger., and several novels which were translated into Eng. by her daughter. In 1850 appeared her chief work (in Eng.), *An Historical View of the Langs. and Lit. of the Slavic Nations*. D. at Hamburg Apr. 13, 1869.

**Robinson** (William E.), b. in Ire. May 6, 1814; came to the U. S. 1836; studied for a time at Yale Coll., and grad. at the Yale Law School; was well known by his writings in the *New York Tribune* over the signature "Richelieu"; edited a weekly paper, *The People*, 1848-49; practised law in New York 1853-62; was appointed U. S. assessor of internal revenue 1862; M. C. 1867-69; elected to the 47th Cong., and re-elected to the 48th (1883-85).

**Rob Roy**, the popular name of a Scotch outlaw (*Roy* meaning "red" in Scotch), whose true name was ROBERT MACGREGOR, b. in Scot. about 1660; changed his name to CAMPELL on the outlawry of the clan MacGregor 1683. Became a partisan of the Pretender in 1715. D. about 1738.

**Roc'ambol** [Fr.], the *Allium Scorodoprasum*, a plant of the garlic family, much resembling garlic, but larger and milder. It is cultivated in European kitchen-gardens, and is a native of N. regions.

**Rochambeau**, ro-shon-bô', de (JEAN BAPTISTE DONATIEN de Vimeur), COUNT, marshal of Fr., b. at Vendôme, Fr., July 1, 1725; entered the Fr. army 1742; was distinguished in the campaigns of the Seven Years' war; became field-marshal 1761; was made lieut.-gen. Mar. 1, 1780; commanded the Fr. forces in the U. S. during the war of independence 1780-83; took a prominent part in the campaign of Yorktown 1781; became gov. of Picardy 1782; was a member of the second "Assembly of Notables" 1788; became marshal 1791; commanded the Army of the North Mar. to June 1792; was imprisoned during the Reign of Terror; was appointed by Nap., when First Consul, grand officer of the Legion of Honor (1804). D. at Thoré May 10, 1807. Wrote *Mémoires*.—His son, DONATIEU MARIE JOSEPH, b. in 1750, served in the U. S. 1780-82; took part in the wars of the Fr. Revolution, Consulate and Empire; became lieut.-gen. 1792; was gov. of Santo Domingo 1796; was taken prisoner there by the Eng. 1803; distinguished himself at the battle of Bautzen, and was killed at that of Leipzig, Oct. 18, 1813.

**Rochdale**, roch'del, town of Eng. in Lancashire, built on both sides of the Roch, has large manufactures of woollen goods, such as balze, flannels, blankets, and kerseys; cotton goods, especially calicoes, and iron and steel ware. Pop. 68,865.

**Rochefort**, rosh-for' (VICTOR HENRI DE ROCHEFORT-LUCAY), COUNT, b. in Paris, Fr., Jan. 30, 1830, ed. at the coll. of St. Louis; became one of the eds. of *Figaro*. In June 1868 he founded *La Lanterne*, in which he bitterly attacked the Empire; the journal was suppressed and its ed. condemned to one yr.'s imprisonment and \$2000 fine. He fled to Belg. before the sentence was pronounced, and there resumed the publication of *La Lanterne*. In Nov. 1869 he was elected a member of the Corps Législatif. Later in the same yr. he founded a radical journal, *La Marseillaise*, and was sentenced to 6 months' imprisonment. He remained in prison until the fall of the Empire at Sedan, when he became a member of the gov't. of national defence. In Feb. 1871 he founded another journal, *Le Mot d'Ordre*, devoted to sustaining the official policy of Gambetta. At the same time he was chosen a member of the National Assembly, when he voted against the proposed basis of peace, and then resigned. On the entrance of the national troops into Paris he fled toward Belg., but was arrested, tried for complicity in the acts of the Commune, sentenced to imprisonment for life in a fortress, and sent to the penal settlement of New Caledonia, whence he escaped in the spring of 1874, and returned to Europe by way of the U. S.

**Rochefoucauld**. See LA ROCHEFOUCAULD.

**Rochelle**, ro-shel', city and R. R. junc., Ogle co., Ill. Pop. 1880, 1893.

**Rochelle, La**, town of Fr., on an inlet of the Atlantic formed by the islands Ré and Oléron. It is fortified, has a commodious harbor, and was very conspicuous in the religious wars as a stronghold of the Huguenots. Pop. 27,854.

**Rochelle Salt** [first prepared at La Rochelle in 1672],

the double tartrate of soda and potassa, an efficient cathartic, considered more palatable than most preparations of the kind. It is chiefly used in preparing sedilitt powders.

**Rochester**, on R. R., cap. of Fulton co., Ind., 97 m. N. of Indianapolis. Pop. 1870, 1528; 1880, 1869.

**Rochester**, city and R. R. junc., cap. of Olmsted co., Minn., 50 m. from Miss. River. Zumbro River flows through the city, affording fine water-power. It has a large trade in grain. Pop. 1870, 3593; 1880, 5103.

**Rochester**, R. R. junc., one of the caps. of Stafford co., N. H., on Salmon and Cochecho rivers, has fine water-power and extensive woollen-factories. Pop. tp. 1870, 4103; 1880, 5784.

**Rochester**, city, port of entry, and important R. R. centre, 7 m. from and 263 ft. above Lake Ontario, is on Genesee River and Erie canal, 229 m. W. of Albany, and is cap. of Monroe co. The Erie canal crosses Genesee River here on a fine stone aqueduct 848 ft. long. R. is divided into 16 wards, and its assessed valuation is over \$16,000,000.

**Public Buildings**.—Among these are the City Hall, c. h., and the Free Acad. The State House of Refuge for juvenile delinquents is situated in the N. part of the city in an enclosure of 42 acres. Other penal and reformatory insts. are the Monroe co. penitentiary, almshouse, and insane asylum located S. of the city.

**Education**.—R. is the seat of Rochester Univ. established in 1850 and situated in grounds of 23 acres, and of the Bap. Theological Sem. The public school system is excellent, and includes the Free Acad. and a public library.

**Benevolent Insts.**—Among these are the City Hospital, St. Mary's Hospital, and 4 Orphan Asylums.

**Cemeteries**.—The prin. are that of Mount Hope (200 acres), laid out in a picturesque manner, and one of the oldest of the kind in the U. S., having been established in 1838, and the R. Cath. Cemetery of the Holy Sepulchre (140 acres).

**Manufactures, Etc.**—The Genesee River has 3 falls in the city, 96 ft., 26 ft. and 83 ft. respectively, below the last of which the river is navigable for all lake vessels. These falls furnish immense water-power, which is the foundation of the prosperity of the city. Among the prin. manufactures are those of clothing, boots and shoes, flour, furniture and carriages. The nursery business is extensively carried on here, there being in and near the city 3500 acres under cultivation for this purpose, yielding an average yearly product of \$1,000,000. R. is also a great distributing centre for coal. It has excellent waterworks, and is the business centre of the Genesee valley.

**History, Etc.**—The first house was erected in 1812; incorporated as Rochesterville 1817, and as a city 1834. Pop. 1870, 62,386; 1880, 89,966; 1885, about 100,000. [From orig. art. in *J's Univ. Cyc.*, by FRED A. WHITTELEY.]

**Rochester**, R. R. junc., Beaver co., Pa., at the confluence of Beaver with Ohio River, here crossed by a bridge. Pop. 1870, 3091; 1880, 2552.

**Rochester** (LAWRENCE HYDE), EARL OF, b. in Eng. about 1635; entered Parl. for Ox. Univ. 1661; was plenipotentiary at the Cong. of Nymwegen 1666; became first lord of the treas. and privy councillor 1679, lord pres. of the council 1684, lord treas. and prime minister on the accession of James II., 1685; was deprived of his offices from unwillingness to become a R. Cath. 1686; took part in revolution of 1688; was leader of High Ch. party in reign of Anne, and became pres. of the council 1710. D. May 2, 1711.

**Rochester, University of**, established in 1850 by the Baps. of W. N. Y. in co-operation with their brethren in other parts of the State. Though under the effective control of the Bap. denomination, both the faculty and the board of trustees embrace members of other religious denominations. The univ. opens to students 3 courses of study—the classical, the scientific, and the eclectic. The geological cabinets are among the best in the country.

**Rock** [Fr. *roche*, "a rock"], in technical lang., any considerable aggregation of mineral matter, whether hard and massive like granite, marble, sandstone, etc., or unconsolidated like clay, sand, and gravel. Incoherent mineral aggregates, as sand, clay, etc., only receive this name when they form some definite portion of a geological series. The science which has been formed by the combination of facts observed in regard to R. is called *lithology*, or sometimes *petrology*. R. may be divided into 3 classes—*igneous*, *sedimentary*, and *metamorphic*. Of these the *igneous* R. are such as have derived their distinguishing characters from the action of fire. The *sedimentary* R. are such as have been deposited from water. They form 3 groups—viz. *mechanical*, *chemical*, and *organic* R. The *mechanical* sediments are those which are composed of fragments of agency. This group includes gravel, sand, and clay, or the same materials consolidated into conglomerate, sandstone, and shale. Organic stratified R. are such as have been formed through the agency of animal or vegetable life. They are limestones, which are mostly derived from the hard parts of marine animals, diatomaceous earths, shell-marl, coal, peat, etc. Chemical R. are those which have been precipitated from chemical solutions, and among these are to be enumerated rock-salt, gypsum, the ores of iron and other metals, vein-stones, trass, etc. Metamorphic R. are aqueous sediments which have been changed from their original condition and made more compact and crystalline by heat—which has baked or vitrified them—by steam, or hot or cold chemical solutions. By these agents shale is converted into slate, sandstone into quartzite, limestone into marble.

**Rock-cry's-tal**, a name for the purest and most transparent forms of quartz. Some of these are of great beauty, and the crystalline forms are often very fine.

**Rock-dale**, on R. R., Milam co., Tex., 324 m. from Galveston. Pop. 1880, 1185.

**Rock'et** [It. *rochetta*], a projectile known from remote antiquity in Chi. and India, but first introduced into Europe about A. D. 900, the distinguishing characteristic of which is



that it is set in motion by a force within itself, and therefore combines the functions of gun and projectile. R. were employed at first chiefly in fireworks for popular amusement, were subsequently utilized in war for igniting an enemy's citadel, and were also used for signals.

**Rock Falls**, on R. R., Whiteside co., Ill., on S. bank of Rock River, 110 m. W. from Chicago, has good water-power. Pop. 1870, 471; 1880, 894.

**Rockfish**, a name under which the *Roccus lineatus*, or striped bass of N. J., is known along the Atlantic seaboard from S. N. J. southward to Va. (See Bass.)

**Rockford**, city and R. R. centre, cap. of Winnebago co., Ill., on both sides of Rock River, 92 m. W. of Chicago, has extensive water-power, and is adorned by rows of natural trees, whence it has received the name of "Forest City." It is the seat of Rockford Female Sem., and has a museum, containing collections of stuffed birds, rare old coins, precious stones, geological specimens, shells, etc. Pop. 1870, 11,049; 1880, 13,129.

**Rockford**, Iowa. See APPENDIX.

**Rockingham** (CHARLES WATSON Wentworth, MARQUIS OF, b. in Eng. May 13, 1730; became earl of Malton 1750, and succeeded to the marquise in Dec. of the same yr.; became premier 1765, acquiring popularity in the Amer. colonies on account of the repeal of the Stamp Act Mar. 1766; retired July 12, 1766, and again became premier on resignation of Lord North, Mar. 22, 1782. D. July 1, 1782.

**Rocking Stones**, or **Logan Stones**, large rocks which are so balanced upon other stones that they can be rocked by the hand. They abound in many parts of the world, and in not a few cases are evidently boulders which have been dropped by glaciers or icebergs.

**Rock Hill**, S. C. See APPENDIX.

**Rock Island**, city and R. R. centre, cap. of Rock Island co., Ill., on Miss. River, 180 m. W. of Chicago, is the seat of St. Augustana Coll., founded by the Swe. Lutheran denomination. The railway and river shipping facilities afford direct communication with all points N., W., and S., while the water-power at Moline, 2 m., and at Milan, 3 m. distant, makes it the centre of an extensive manufacturing region. Connected with the city is Rock Island, from which the municipal name was derived. The national govt. has here one of the most extensive armories and arsenals in the country. R. I. is connected with Davenport, Ia., by an iron bridge. Pop. 1870, 7890; 1880, 11,659.

**Rockland**, city, seaport, and cap. of Knox co., Me., on R. R. and the W. shore of Owl's Head Bay, which forms its harbor, 60 m. E. N. E. from Portland and about the same distance S. S. W. from Bangor. It is largely engaged in manufacture of lime. Pop. 1870, 7074; 1880, 7599.

**Rockland**, on R. R., Plymouth co., Mass., 19 m. S. of Boston. The manufacture of boots and shoes forms an extensive industry. Pop. 1880, 4553.

**Rockland Lake**, 4 m. in circumference, in Clarks-town tp., Rockland co., N. Y., opposite Sing Sing, 36 m. N. of New York, 1 m. W. of Hudson River, and 160 ft. above its surface. It produces for market large quantities of ice.

**Rockport**, cap. of Spencer co., Ind., on R. R. and Ohio River. Pop. 1870, 1730; 1880, 2382.

**Rock Rapids**, Iowa. See APPENDIX.

**Rock River** rises in Fond du Lac co., Wis., flows through Horicon Lake, receives its W. fork, and traverses Lake Koshkonong; passing S. into Ill., its course becomes S. W. After a course of 350 m., it reaches the Miss. 2 m. below Rock Island. It is not navigable except at high water, but affords much water-power.

**Rock-Salt**. See SALT.

**Rockville**, on R. R., Tolland co., Conn., 15 m. E. of Hartford. Water-power is supplied by Hockanum River, which has a fall of 266 ft. Pop. 1880, 5902.

**Rockville**, on R. R., cap. of Parke co., Ind. Pop. 1870, 1187; 1880, 1684.

**Rockwell** (JULIUS), b. at Colebrook, Conn., Apr. 26, 1805, grad. at Yale 1826; studied law at the New Haven Law School; was admitted to the bar 1829; settled at Pittsfield, Mass., 1830; was a member of the Mass. legislature 1834-38, being speaker 1835 and 1838; was bank com. 1838-41, M. C. 1847-51, member of the Mass. constitutional convention 1853, U. S. Senator 1854-55, and was a judge of the Mass. superior court 1859-71.

**Rocky Mountain Locust**, the *Culex femur-rubrum*. See LOCUST, by PROF. A. S. PACKARD, JR., M. D.

**Rocky Mountains**, all the mts. of N. Amer. between the great plains and the Pacific Ocean. They are composed of crags and peaks of naked rock, and the mt.-streams run at the feet of towering cliffs in deep gorges beset with rocks. The hills, unprotected by vegetation, are swept clean of sands and soil by the winds. The water-courses rarely have flood-plains, and the steep sides of the valleys are strewn with fragments of rock. In the plateau region the streams run in deep cañons, whose walls rise hundreds or even thousands of ft. above the waters, and the channels below are choked with rocks which tumble from the cliffs. By reason of unequal erosion of the gen. surface, long lines of cliffs or towering escarpments of rock stand athwart the plateaux. These are often for scores or even hundreds of miles almost or quite impassable barriers to travel.

This great mt.-system extends through the U. S. from its S. border, through Brit. Amer. and Alaska to the Arctic Ocean, or from the 30th to the 70th parallel of N. lat. Its greatest development in lon. is between the 38th and 42d degrees of N. lat.; here the grand system has a breadth of about 1000 m. Its highest peak is Mt. St. Elias, lat. 60° 20' 45', lon. 141°, which rises to an altitude of 19,500 ft. above the sea. Within the U. S. these mts. may be grouped as follows: the Desert Ranges, the Park Ranges, the Plateaux, the Basin Ranges, the Sierra Nevada, the Coast Ranges, the Cascade Mts., and, provisionally, the Geyser Ranges.

The *Desert Ranges* extend through S. Cal., S. Ari., and S. W. N. M., S. into Mex.; the limits of the group in this di-

rection are unknown. Usually, these mts. rise as island ridges from a desert sea of sand, the most inhospitable region of N. Amer., but near their N. E. limits in Ari. and N. M., the gen. altitude being greater, there is more precipitation of moisture. The Col. River divides the system. The highest summits in this range are Ingo Peak, 11,337 ft.; Hahn Peak, 11,298; Wancobe Peak, 11,267; Telescope Peak, 10,938; New York Peak, 10,594.

The *Park System* extends from S. Wyo. through Central Col. into N. M., bounded on the N. by the Laramie Plains, on the E. by the Great Plains, and on the W. by the Plateaux; the S. limits cannot yet be defined. These mts. are drained by the Platte and Ark., which flow into the Miss.; by the Rio Grande del Norte, which flows into the Gulf of Mex.; and by the Col. River of the W., which flows into the Gulf of Cal. The system is composed of ranges and irregular groups which stand as walls about the great parks—the N., the Middle, and the S. These parks are broken valleys nearly or completely surrounded by mts. Beside the larger parks, there are many of smaller extent, mt.-valleys of great beauty in midsummer, but mantled with snow during many months of the yr. In this range there are 24 peaks whose height has been ascertained to be more than 14,000 ft., and about as many more which are over 12,000. The highest appears to be Mt. Harvard, 14,375 ft.; Gray's Peak is 14,841; Torrey's Peak, 14,336; Mt. Lincoln, 14,297.

The *Plateaux*.—The great plateaux stretch from S. Wyo. through W. Col. and E. Ut. far down into N. M. and Ari. The region is chiefly drained by the Col. River of the W. The gen. elevation is about 7000 ft. above the sea. The ascent from the low desert plains on the S. is very abrupt, in many places by a steep and almost impassable escarpment. There are 29 summits more than 10,000 ft. high, the loftiest being Emmons's Peak, 13,694 ft. On these plateaux stand buttes, lone mts., and groups of mts. The buttes are of cameo structure—i. e. mts. of circumdenudation, with horizontal strata and escarped sides. The Plateaux have been continuously above the sea since the close of the Cretaceous period, but during earlier Tertiary times the region was an area of lacustrine sedimentation, and during late Mesozoic and early Tertiary time the Basin Prov. was the dry land that fed the sea and the lakes of the Plateau Prov.

*Basin Ranges*.—These ranges (about 100 in number) occupy S. E. Or., S. Id., W. Ut., Nev., and the N. E. corner of Cal. The region is bounded on the E. by the great plateaux, on the W. by the Sierra Nevada, and on the S. by the region of the Desert Ranges; their extent to the N. is unknown. One of the characteristics of these ranges is, that they usually rise abruptly from the desert plain without intervening foothills, and rarely do the ranges coalesce. The region occupied by these mts. has no drainage to the sea except to a limited extent on the N. side, and on the S. E. corner, where a few of the ranges are drained by the Virgin River, a tributary of the Col. River of the W. Some of the streams that head on the mts. find their way into salt lakes, and others disappear in sinks—i. e. they are lost in the desert sands, where their waters are evaporated. There are 18 peaks of these ranges more than 10,000 ft. high, the loftiest being Mt. Delano, 12,159 ft.

The *Sierra Nevada* is one great range stretching from the 35th parallel of N. lat. to about 41° 35', where the range topographically terminates at Mt. Shasta, or perhaps S. of this, at Lassen's Peak. These mts. are carved from a great plateau more than 400 m. in length and 100 m. in breadth. The axis of the range is near the E. side. Here the streams head, the greater number running W. into the Pacific, the less number running E. and rapidly descending into desert valleys, where they are lost in the desert plains. On the E. side a bold front rises abruptly from the desert plains. On the W. side, though the descent is greater, the gen. slope is more gentle, but is broken by many profound gorges or deep cañons. On the W. flank of the range there are many table-mts. covered with sheets of lava. This broad massive range is crowned with peaks which rise to higher altitudes than any other in the U. S. There are 10 peaks more than 10,000 ft. high, the loftiest being Mt. Whitney, 14,867 ft.

The *Coast System* is composed of the low, narrow ranges near the Pacific, and separated from the Sierra Nevada by the valleys of the Sacramento and San Joaquin rivers, which, often uniting, burst through the ranges, dividing them into 2 sub-systems, the N. and S. Coast Ranges. The highest summit is San Carlos Peak, 4977 ft.

The *Cascade Mountains* stretch from S. Or. N. far into Brit. Amer. On the E. they are bounded by the great valley of the Columbia River, and on the W. by the Pacific. The Columbia River where it bursts through this zone of mts. plunges to the level of the sea in a series of great cascades, and from these mts. take their name. Little is known of their general topography and geol., except that the group is characterized by many lofty volcanoes now extinct. The loftiest summit is Mt. St. Elias, 19,500 ft.; the next highest Mt. Jefferson, 15,500.

To the N. of the Park Mts. and great plateaux beyond the Laramie Plains and the head-waters of the Shoshone River, are many mts. drained on the S. by tributaries of the N. Platte, on the E. by the Mo. River and its tributaries, and on the W. by the Columbia River and its tributaries. No accurate geographic or geological surveys have been made of these mts., and they may constitute one or more systems, but at present it is proposed to call them provisionally the *Geyser Mountains*. Too little is known of the R. M. of Brit. Amer. and Alaska to warrant any description.

In the U. S. the R. M., together with the Great Plains that stretch W., constitute the great arid region where irrigation is necessary to agriculture. The arid region is nearly 1/4 of the area embraced in the U. S., excluding Alaska. From actual surveys and careful estimates it is shown that it will not be possible to redeem more than 2 per cent. of the entire region by irrigation when every brook, creek, and river is utilized. About 3 per cent. of the region is forest-



clad. Some portion of this forest-region may eventually be cultivated without irrigation, but only such crops can be raised as may mature in the short summers of a sub-arctic climate. The land to be cultivated lies along the streams, and is principally confined to the little valleys nestling among the mts., but altogether the agricultural resources of the region are very limited. Gold, silver, iron, copper, salt, coal, and many other minerals are found in great abundance, and the region will be chiefly valuable for its great mines. [From orig. art. in *J. S. C. C.*, by M. F. W. J. W. POWELL.]

**Roden** (*Lat. rodere*, to "gnaw"), or **Glires** (plural of *glis*, a kind of gnawing animal), an order of mammals of the sub-class Monodelphia or Placentalia, comprising the gnawing animals, such as the rats, mice, squirrels, rabbits, etc. These may be briefly defined as ineducabilian placenteriferous mammals, with the incisors in pairs in the upper and lower jaws, rootless, and ever-growing, and in their growth describing the segment of a circle or open spiral. The order thus defined is the most numerous in species of the class of mammals, and between 800 and 900 species are known. Two well-defined sub-orders are recognizable: (1) the Simplicidentati, and (2) the Duplicidentati.

**Roderic**, the last king of the Visigoths in Sp., ascended the throne in 709 in consequence of a revolution by which King Witiza was overthrown, and fell in the battle of Xeres de la Frontera (July 711) against the Arabs under Tarik, who then took possession of the S. and central parts of Sp.

**Rodgers** (C. RAYMOND P.), b. in New York Nov. 14, 1819; entered the navy as mdpn. 1833; became lieut. 1844, commander 1861, capt. 1866, com. 1870, rear-admiral 1874; served on the E. coast during the Mex. war; commanded the Wabash at the battle of Ft. Royal, and Battery Sigel at the reduction of Ft. Pulaski, and acted as Rear-Admiral Du Pont's fleet-capt. in the attack on Ft. Sumter of Apr. 7, 1863; chief of the bureau of yards and docks 1871-74, when he became supt. of the Naval Acad., which position he held till July 1878, when he was placed in command of the Pacific station.

**Rodgers** (JOHN), b. in Harford co., Md., 1771, entered the U. S. N. as a lieut. Mar. 1798; was executive officer of the frigate Constellation when she captured the Fr. frigate *L'Insurgente*, Feb. 9, 1799; was made capt. Mar. 5; succeeded Com. Barron in command of the squadron operating against Tripoli and Tunis 1805; commanded the President when that vessel had an encounter with the Brit. man-of-war *Little Belt*, May 16, 1811; rendered various services during the war of 1812-15, especially in the defense of Baltimore; was pres. of the board of navy coms. 1815-24, acting sec. of the navy 1823, and commanded the Mediterranean squadron 1824-27, after which he was again on the board of navy coms. until 1837. D. Aug. 1, 1838.

**Rodgers** (JOHN), son of the preceding, b. in Md. Aug. 8, 1812, entered the navy as mdpn. 1828; served in the Mediterranean squadron 1829-32; passed midpn. 1834; served in the Brazilian squadron 1836-38; lieut. 1840; on the home squadron 1841-43, on special service 1844-45, on the Mediterranean squadron 1846-47, on the Coast Survey 1848-52, in surveying expeditions to the N. Pacific and China seas 1853-56; commander 1855; on special duty or waiting orders 1857-60. In 1861 he was sent to the W. to superintend the construction of iron-clads; was in command of the iron-clad *Galena* in the attack upon Ft. Darling, near Richmond, May 15, 1862; made capt. July 1862, and placed in command of the monitor *Weehawken*, on the S. Atlantic blockading squadron; participated in the first Ft. Sumter fight; captured the Confed. iron-clad *Atlanta* June 17, 1863; was made com.; commanded the iron-clad *Dictator* 1864-65, the monitor *Monadnock* 1866-67, making a voyage in her around Cape Horn to San Francisco; in command of the Boston navy-yard 1867-69; rear-admiral Dec. 31, 1869; commanded the Asiatic fleet 1870-72; commandant of the navy-yard at Mare Island, Cal., 1873-77; supt. of the naval observatory, Wash., May 1, 1877, and chairman of the light-house board. D. May 5, 1882.

**Rodman** (THOMAS J.), b. in Ind. in 1818, grad. at W. Pt. 1841; devoted himself to experimenting upon iron, gunpowder, and cannon; invented the 15-inch and 20-inch smooth-bore guns, and the method of hollow casting, by which their manufacture became practicable, with their projectiles, adopted for our military and naval service; also the improvements made in the mode of manufacture of gunpowder for large cannon. The "mammoth powder" and "perforated cake" were made by him, since adopted by foreign nations for use in their heavy rifle guns. Author of a *Report of Experiments on Metals for Cannon and Cannon Powder*. D. June 7, 1871.

**Rodney** (CESAR), b. at Dover, Del., about 1730; inherited a large landed property; was sheriff of Kent co. 1758; member of the legislature many yrs., its speaker 1769-74; delegate to the Stamp Act cong. at New York 1765; chairman of the Del. popular convention 1774; elected to the Continental Cong. Mar. 1775; was soon afterward elected brig.-gen.; signed the Dec. of Ind.; served under Washington in the N. J. campaign 1776-77; defended Del. from Brit. invasion; was maj.-gen. of Del. militia; pres. or executive officer of Del. 1778-82, and twice elected to Cong., but did not again take a seat in that body. D. 1784.

**Rodney** (CESAR AUGUSTUS), nephew of the preceding, b. at Dover, Del., Jan. 4, 1772, grad. at the Univ. of Pa.; studied law; M. C. 1808-07, atty.-gen. of the U. S. 1807-11; commanded an artill. co. 1813; went to S. Amer. 1817 as member of a commission to report upon the insurrection against Sp.; M. C. 1821-22, U. S. Senator 1822-23, and in the latter year appointed minister to the Argentine provs. Author, with J. Graham, of *Reports on the Present State of the United Provs. of S. Amer.* D. June 10, 1834.

**Rodney** (GEORGE BRIDGES), BARON, b. at Walton-upon-Thames, Surrey, Eng., Feb. 19, 1718; entered the Brit. navy in childhood; was gov. of Newfoundland 1748, M. P. 1752, rear-admiral 1761, in which yr. he captured the Fr. W. I.

Islands; vice-admiral 1762, baronet 1764, master of Greenwich Hospital 1765, commander-in-chief in Jamaica 1771, admiral and commander-in-chief at Barbadoes in Dec. 1770; defeated a Sp. squadron off Cape St. Vincent Jan. 16, 1780, and broke through the Fr. fleet near Martinique Apr. 17, 1780. In the war against Hol. (1781) he captured Dut. Guiana; was made vice-admiral of Eng., and commander-in-chief of the W. I. squadron; engaged the Fr. fleet under Count de Grasse Apr. 9, and again Apr. 12, 1782, capturing 7 ships of the line and 2 frigates. D. in London May 23, 1792.

**Roe** (Sir THOMAS), b. at Low Layton, Essex, Eng., about 1580, ed. at Magdalen Coll., Ox.; was knighted 1604; explored the river Amazonas in Brazil 1600; sent as envoy to the Great Mogul, Shah Jehan, and penetrated to Delhi 1614-18; entered Parl. for Cirencester 1620; was ambassador to Constantinople 1621-28, to Poland and Swe., charged with negotiating a peace between those kingdoms, 1629; sat in Parl. for Ox. Univ. 1640; was ambassador to the Diet of Ratisbon 1641, and made chancellor of the order of the Garter and privy councillor the same yr. It was by his advice that Gustavus Adolphus intervened in the Thirty Years' war in Ger. Wrote *A True and Faithful Relation of what hath lately happened in Constantinople and a Journal of Voyages to the E. I., Tur., Egypt, Pal., and Per.* D. Nov. 1644.

**Roebling** (JOHN A.), b. at Mulhausen, Prus., June 12, 1806; received the degree of C. E. from the Royal Polytechnic School at Berlin, the subject of his thesis being suspension bridges. In 1831 he emigrated to Amer., locating near Pittsburg, Pa., and commenced the practice of his profession, his first employment being on the slackwater improvement of the Beaver River, followed by similar engagements in other localities, until called into the service of the State of Pa. to make surveys for a R. R. route across the Allegheny Mts. from Harrisburg to Pittsburg. One of the routes located by him is that now followed by the Pa. R. R. In 1844, having previously commenced the manufacture of wire rope, he obtained the contract for replacing the wooden aqueduct of the Pa. Canal across Allegheny River by a suspension aqueduct, which was opened in May 1845. The construction of the Monongahela suspension bridge next followed, and in 1848-50, 4 suspension aqueducts were completed on the line of Del. and Hudson Canal. In the mean time he had established his works at Trenton, N. J., where he took up his residence. In 1851 the great suspension bridge at Niagara River was commenced, and in Mar. 1855 the first locomotive crossed. The bridge over the Allegheny at Pittsburg and that over the Ohio at Cin. were his next works. But his grandest undertaking was the bridge across E. River, connecting Brooklyn and New York. The reports, plans, and specifications for this work were all completed and operations begun when he d. July 22, 1869.—His son, WASHINGTON A. ROEBLING, succeeded him.

**Roebling** [A.-S. *roh*], a small species of the deer family (Cervide), representing the genus *Capeolus* (*C. caprea*), found in Europe. It is characteristic in the antlers being destitute of an anterior basal snag, the first branch arising considerably above the burr, and the tail being very rudimentary or wanting; the muffle is broad and naked; the color in summer is reddish-brown, and in winter olive; the height is about 2½ to 2½ ft., the length about 4 ft.

**Roebuck** (JOHN ARTHUR), b. at Madras, India, Dec. 1802; resided in Canada during his youth and early manhood 1815-24; was called to the bar in Lond. 1832; entered Parl. the same yr. as a radical reformer; was Lond. agent for the assembly of Lower Canada 1835; lost his seat 1837, and again in 1847, but was returned in 1841, and for Sheffield in 1849, continuing to represent that borough until 1868, and being once more elected there Feb. 1874. Wrote *Plan for the Govt. of our Eng. Colonies and Hist. of the Whig Ministry of 1830*; was a leader of the parliamentary opposition during the Crimean war, and was the prime mover in the Administrative Reform Association, organized in 1856. D. Nov. 30, 1879.

**Roemer** (OLE). See RÖMER.

**Rogation Days** [Lat. *rogare*, to "implore"], a fast of 3 days before the festival of the Ascension, introduced about the middle of the 5th century.

**Roger**, the name of the first 2 rulers of the Norman dynasty in Sic. ROGER I., the 12th son of Tancred of Hauteville, b. in Normandy about 1031, participated in the conquest of Calabria, and received a part of the country; took Messina in 1060, Palermo in 1072; expelled the Saracens from Sic. in 1089, and established himself as sovereign under the title of count of Sic. He abolished the Gr. Ch. in Sic. and introduced the Roman, for which pope Urban II. rewarded him by making him apostolic legate, with permission to appoint bps., etc. D. at Mileto, Calabria, in 1101.—During the minority of his son, ROGER II., b. about 1095, his widow, Adelaide of Montferrat, carried on the govt. In 1127, on the extinction of the elder line, Roger II. became duke of Apulia and Calabria, and in 1130 received the title of king of Sic., and was crowned at Palermo by his brother-in-law, Anacletus, whom he established in Rome as antipope and sustained against Innocent II. Roger II. made war successfully on the Gr. emp., and on the Saracens in Afr. His internal administration was also successful. D. Feb. 26, 1154.

**Rogers** (FAIRMAN), b. at Phila. Nov. 15, 1833, grad. at the Univ. of Pa. 1853; was lecturer on mechanics in the Franklin Inst. of Pa. 1854-65, and prof. of civil engineering in the Univ. of Pa. 1855-70; served as a volunteer in the cav. and as an officer of engineers 1861; completed for the U. S. Coast Survey in 1862 the survey of the portion of Potomac River northward from Blakiston Island, and was one of the original members of the National Acad. of Sciences 1863. He resigned his professorship in the Univ. of Pa., and was chosen a trustee of that inst. in 1870.

**Rogers** (HENRY DARWIN), LL.D., F. R. S. E., b. at Phila. 1809; became prof. of phys. sciences in Dickinson Coll. 1830; many yrs. prof. of geol. in the Univ. of Pa.; was employed on the geological survey of N. J., of which he pub. a report



and geological map 1836, and the final report 1840: was occupied from 1836 to 1855 as director of the geological survey of Pa., and issued his final report under the title *The Geol. of Pa., a Govt. Survey, etc.* In 1858, after residing some yrs. at Boston, he was appointed regius prof. of nat. hist. in the Univ. of Glasgow, and was chosen a F. R. S. of Edinburgh. He was one of the eds. of the Edinburgh *New Philosophical Journal*. D. May 29, 1866.

**Rogers (JOHN)**, b. at Deritend, a suburb of Birmingham, Eng., about 1505, grad. at Pembroke Hall, Cambridge, 1525; was rector of the ch. of the Holy Trinity, Lond., 1532-34; embraced Prot. opinions; was the real editor of the so called Matthew's Bible of 1537; was presented to the rectory of St. Margaret Moyses and the vicarage of St. Sepulchre's, Lond., May 10, 1550; was made by Bp. Ridley prebendary of St. Paul's, St. Pancras, and rector of Chigwell, Aug. 24, 1551; preached a sermon at St. Paul's Cross on the Sunday after the entry of Queen Mary into Lond. (Aug. 3, 1553), in which he denounced Romanism and exhorted the people to adhere to the doctrines promulgated under Edward VI.; was cited before the privy council, tried for heresy before Gardiner, bp. of Winchester, condemned to death Jan. 1555, and burned at the stake at Smithfield, the first of the "Marian martyrs," Feb. 4, 1555.—**DANIEL ROGERS**, eldest son of the martyr (b. at Wittenberg about 1538, d. 1591), became a learned scholar and an elegant Lat. poet.

**Rogers (JOHN)**, b. in Eng. about 1505, became a Puritan; was vicar of Hemmingham 1592, minister of Haverhill 1603, and minister of Dedham. D. 1630. Wrote *Sixty Memorials of a Godly Life, A Treatise of Love, The Doctrine of Faith, and A Godly and Fruitful Exposition upon all the First Epistle of Peter*.—His son **NATHANIEL**, b. at Haverhill, Eng., in 1598, ed. at Emanuel Coll., Cambridge, preached at Bocking, Essex, and at Assington, Suffolk; was driven by persecution to N. Eng., where he arrived Nov. 16, 1639; was a member of the synod of 1637, and was settled Feb. 30, 1639, as colleague with Mr. Norton over the ch. at Ipswich, Mass., where he d. July 3, 1655. Wrote *Letter discovering the Cause of God's Wrath against the Nation*.

**Rogers (JOHN)**, son of Rev. Nathaniel, b. at Coggeshall, Eng., Jan. 1631; came in childhood to Mass.; grad. at Harvard 1649; studied divinity, and aided his father in his pastoral duties at Ipswich; afterward became a phys., and was pres. of Harvard Coll. from Apr. 10, 1682, to his death, July 2, 1684.

**Rogers (JOHN)**, b. at Salem, Mass., Oct. 30, 1829; left school at 16; went into a machine-shop at Manchester, N. H., 1848, as an apprentice, and was ultimately put in charge of a R. R. repair-shop at Hannibal, Mo., 1856. Having amused himself with modelling in clay, he made a tour in Europe in 1857. On his return he became draughtsman in a surveyor's office at Chicago, and soon afterward, learning of a peculiar mode of casting intricate figures, he modelled the groups of the *Checker-Player* and the *Slave Auction*, with which, in Dec. 1859, he came to New York, where they attracted notice. Learning the art of casting, he produced in 1861 his *Picket Guard*, followed by a succession of groups, which brought him decided success. Among them were *The Country Post-Office* and *The Town Pump*. Among his later works is a series illustrative of *Legends of Sleepy Hollow* and *Zip Van Winkle*.

**Rogers (RANDOLPH)**, b. in N. Y. about 1825, was in early life engaged in mercantile pursuits; became a sculptor at Rome; returned to New York with the statues of *Nydia*, *A Boy and Dog*, and others, which procured him reputation; designed and modelled the bronze doors for the E. entrance to the Capitol extension at Wash.; was several yrs. engaged in finishing the designs for the Washington monument at Richmond, Va.; executed a statue of John Adams, now in Mt. Auburn Cemetery; *The Angel of the Resurrection*, for Col. Colt's monument at Hartford, Conn.; a colossal memorial monument, 50 ft. high, for the State of R. I., erected at Providence 1871, and one still larger for Mich., erected at Detroit 1873. He executed the colossal bronze statue of Lincoln unveiled at Phila. 1871; has made many busts and ideal figures.

**Rogers (RICHARD)**, b. in Eng. about 1550; became a Puritan minister 1575, and preached at different towns of the E. counties 43 yrs., frequently undergoing molestation from the authorities, but acquiescing by his pastoral labors and his theological writings a very prominent position among the dissenting divines of Eng. Wrote *Seven Treatises*. D. at Weathersfield, Essex, Apr. 21, 1618.

**Rogers (ROBERT)**, b. at Dunbarton, N. H., about 1730; commanded during the "old Fr. war" (1755-63) a corps of frontiersmen known as "Rogers' Rangers," distinguishing himself in the campaigns on Lake George, and taking a prominent part in the defence of Detroit against Pontiac; wrote *A Concise Account of N. Amer., Journals of Major Robert Rogers, etc.*; was appointed gov. of Michilimackinac; was accused of plotting to deliver that post to the Fr.; was sent in irons to Montreal and tried by court-martial; went to Eng. 1769; went to N. Afr., where he "fought 2 battles in Algiers under the dey;" was in Phila. 1775, and imprisoned by order of Cong.; was paroled, but again arrested by Washington Jan. 1776; was sent to N. H., where he took sides for the Crown, and raised a company of loyalists known as "The Queen's Rangers," of which he became col.; went to Eng. about 1777, and his subsequent hist. is unknown.

**Rogers (ROBERT EMPIE)**, M. D., LL.D., b. at Baltimore 1814, grad. in med. at Univ. of Pa.; prof. of chem. in the Univ. of Va. 1844-52; aided his brother, J. B. Rogers, in preparing his edition of *Turner's Chemistry*, and on his death became his successor as prof. in the Univ. of Pa. He edited the American reprint of Lehmann's *Physiological Chemistry*, contributed to the *Journal of the Franklin Inst.*; took part with his brothers in geological surveys of Va. and Pa., and was dean of faculty of Univ. of Pa.

**Rogers (SAMUEL)**, b. at Newington Green, near Lond.,

July 30, 1763, son of a Lond. banker, whose counting-house he entered in boyhood: pub. some poetical trifles in the *Gentleman's Magazine*, but attracted no attention until the appearance of his best poem, *The Pleasures of Memory*, in 1792. Succeeding to his father's large estate 1793, he soon retired from active business, remaining, however, a partner. Wrote *The Voyage of Columbus, Jacqueline, Human Life, and Italy*. D. at Lond. Dec. 18, 1855.

**Rogers (WILLIAM BARTON)**, brother of R. E. and H. D. Rogers, b. at Phila. 1805; gave scientific lectures at the Md. Inst. 1827; succeeded his father as prof. of natural philos. and chem. at William and Mary Coll., Va., 1829; filled a similar post in the Univ. of Va. 1835-53; organized the Va. geological survey 1835, and conducted it until its discontinuance in 1842; removed to Boston 1853; lectured before the Lowell Inst.; aided in founding the Mass. Inst. of Technology, and was its first pres. 1862-70, and 1878-81; pres. of the Amer. Association for the Advancement of Science 1875-76. Author of *Strength of Materials, Elements of Mechanical Philos.*, and of many scientific papers. D. May 30, 1882.

**Rohan—Guéméné, de** (LOUIS RENÉ EDOUARD), PRINCE, CARDINAL, b. Sept. 25, 1734, was ed. for the Church, and sent in 1772 to Vienna as ambassador, but recalled in 1774 on account of the scandalous life he led; was made grand almoner to Louis XV., bishop of Strasbourg in 1779, and cardinal. One of the prin. figures in the necklake intrigue, he was arrested in 1785 and arraigned before the tribunal of the Parl., which acquitted him. He was a member of the States-General in 1789; refused in 1791 to carry out the new ecclesiastical const. in his diocese, and resigned his bishopric in 1801. D. Feb. 17, 1803.

**Roland**, the name of one of the prin. representatives of mediæval chivalry was one of Charlemagne's paladins, and fell at Roncesvalles in 778. His life and exploits form the subject of numerous rhymed and unrhymed chronicles.

**Roland de la Platière** (JEAN MARIE), b. at Villefrance, dept. of Rhone, Fr., Feb. 18, 1734; became an author on subjects relating to manufactures and the useful arts (see *Letters from Seitz*, *Dictionnaire des Manufactures et des Arts*), and was inspector-gen. of Lyons at the outbreak of the Revolution. In 1780 he married Maon Jeanne Philpon (b. at Paris Mar. 17, 1754). She became the partner of all her husband's studies and plans. In 1791 he removed to Paris, having been elected a member of the National Assembly, and the salon of Madame R. soon became one of the prin. centres of the fermentation of the cap. On Mar. 23, 1792, R. became minister of the interior in the cabinet of Dumouriez, but was dismissed in June. After the fall of the throne (Aug. 10) he re-entered the ministry, but his connection with the Girondists made him obnoxious to the Jacobins, and on May 31, 1793, he was arrested. Meanwhile the fantastical ideas of Madame R. had caused her to be arraigned before the Convention. She appeared Dec. 7, 1792, and was acquitted. But after the arrest and escape of her husband she was accused of maintaining treasonous correspondence with the Girondists; was arrested, and gillotined Nov. 9, 1793. When R., who had escaped to Rouen, heard of her execution, he stabbed himself, Nov. 15, 1793. She wrote *Mémoires et Lettres*.

**Rol'a**, on R. R. cap. of Phelps co., Mo., 113 m. from St. Louis. Pop. 1870, 1354; 1880, 1582.

**Rolleston** (GEORGE), M. D., F. R. S., b. at Maltby, Yorkshire, Eng., July 30, 1829, studied med. at St. Bartholomew's Hospital, Lond.; was assistant phys. to the Brit. Civil Hospital at Smyrna during the Crimean war 1855-56, and to the Children's Hospital, Lond., 1857; became phys. to the Radcliffe Infirmary and Lee's reader in anat. at Christ Ch., Ox., 1857; Linnean prof. of anat. and physiology in Ox. Univ. 1860, and fellow of Merton Coll. 1862. Wrote *Forms of Animal Life*. D. June 9, 1881.

**Rollin** (LEDRU). See LEDRU-ROLLIN.

**Roll'ing-Mill**. The R.-M. has, to a greater extent than any other mechanical combination, enlarged the uses and cheapened the production of wrought iron and steel. All the iron bars of commerce, with few exceptions, and a large proportion of the steel bars, are rolled. Nearly all the members of machines and structures for which these materials are suitable—of ships, roofs, boilers, bridges, railways and their rolling-stock, and for the purposes of general engineering—are so designed that they may be rolled or compounded of rolled forms, for this method of manufacture is essential to their uniformity and cheapness, and this condition does not seriously embarrass designers, because the great majority of desirable forms can be rolled.

**Roma'na, de la** (PEDRO CARO Y SUREDA), MARQUESS, b. in Palma, island of Majorca, Sp., in 1761; served in the Sp. navy; participated in the defence of Gibraltar 1782; entered the army during the war with Fr. 1792; became lieutenant-gen. of Catalonia 1800, member of the supreme council of war; was sent in 1807 to Pomerania in command of the force of 15,000 Sp. auxiliaries furnished to Nap., and withdrew these troops on learning the treacherous imprisonment of his sovereign by Nap. In the Peninsular war he rendered service as commander-in-chief in N. Sp. 1809-10 by organizing the guerilla warfare. D. Jan. 23, 1811.

**Roman Archaeology**. THE DEVELOPMENT OF ART IN ROME.—I. Before the establishment of the Gr. colonies in S. It. the site of Rome was occupied by a Lat. settlement in a very low state of culture.

II. Rom. culture first received a higher impulse when the colonies from Magna Græcia began to extend their civilizing influence toward Latium and Etruria. This was felt by Rome, through the coast-towns of S. Etruria, where in early times a rich industrial art, inspired by Gr. models, had been developed. It was also the Hellenic form of temple, modified by Etruscan influence, that was adopted by the Romans. The Etruscan temple, the *templum Tuscanicum*, followed, as far as our knowledge extends, the Doric type. The oldest temple in Rome, the temple of Jupiter under the Capitol, built by Tarquinius Priscus, was in the Tuscan style. Also, the



clay image of the god placed in the temple, and the *quadriga* of the same material over the pediment, were works by an Etruscan artist. Only a few examples of building in stone remain to us from this anc. period. First among these is the Servian city-wall, built of colossal blocks of tufa, without cement; then the reservoir (*Tullianum*), at the foot of the Capitol, the covering of which is formed with layers of stone placed over each other, gradually projecting inward as they rise—a mode of construction that precedes the development of the true arch; and finally the Cloaca Maxima. Of the first centuries of the republic several evidences remain, showing an increase of the direct Gr. influence. When it was decided to decorate the temple of Ceres (dedicated 485 b. c.) near the Circus Maximus, 2 Grs., Damophilus and Gorgasus, distinguished both as modellers in clay (*plastæ*) and as painters, were called to Rome. The manner of ornamentation employed by these artists was that of a polychrome, terra-cotta style. The walls, whether of brick or of timber, were incrustated with plates of terra-cotta, upon which were painted ornamental, and sometimes also figurative representations. At the eaves of the roofs were *antefixæ* of terra-cotta, in the field of which was introduced in high relief the head of a Silenus, a satyr, or of a woman, and around it ornaments in low relief, the whole painted in brilliant colors.

III. *The Hellenic Period.*—The extension of the Rom. dominion over Magna Græci, Sic., and finally over Gr. itself, was productive of most important results. By this means the Romans were brought into intimate relation with Gr. culture, and there began an extensive immigration of Gr. artists to Rome. Rome became gradually the centre of activity for Greek art.

*Architecture and Architectural Ornamentation.*—In arch. the Romans seem to have preserved their originality against Gr. influence, and we have strong evidence that even in Gr. the merit of Rom. archs. was acknowledged, in the fact that when the Syrian king, Antiochus Epiphanes (a. c. 176-169), determined to finish the temple of the Olympian Jupiter at Athens, he intrusted the direction of this undertaking to the Rom. knight Cassutius. The arch became a conspicuous feature in the construction of gigantic aqueducts. These were not, as in former times, wholly subterranean, but by a succession of arches the water was carried above ground wherever the character of the surface required it. Thus, the Marchian aqueduct (built a. c. 142) was a subterranean structure for a distance of 528 Rom. paces, while 6935 paces of its length rested on arches. The double purpose of use and ornament was served by the arch and vaulted roof in the construction of the *forniceæ*, or covered archways, which stood at certain important points as monuments to mark the direction of the main avenues of intercourse. Out of the *forniceæ* grew the triumphal arches of the imperial age. The Tabularium, a building used for the state archives (finished b. c. 78), is a most majestic combination of the vaulted roof and the arch. This building was situated on the W. side of the Forum. It rested on a five-fold row of vaults, the outermost of which, still visible, faced the Forum as an open corridor with half columns of the Doric order. The main feature in the construction of the theatre and amphitheatre was likewise the arch and vault. Of this style of building the grandest structure is the Colosseum, built a. d. 80 under the reign of Titus, and capable of holding 87,000 spectators. The building is 4 stories in height. The 3 lower stories are composed of arcades, the piers of which are ornamented with engaged columns—on the first story of the Doric, on the second of the Ionic, and on the third of the Corinthian order. In the 4th story the wall is pierced by windows, between which are Corinthian pilasters. Variety was secured by means of statues within the arches of the second and third stories. Among the buildings with domes, the Pantheon (erected b. c. 27) stands foremost. It is a circular building surmounted by a dome, and has a height equal to its diameter. A portico, with 16 granite columns crowned by splendid Corinthian capitals, adorns the front. The domed roof was also especially employed in the construction of the vast swimming-halls in the baths of anc. Rome. It is impossible to form an adequate conception of the innumerable public edifices, vying with one another in magnificence, which sprang, as it were, out of the ground, from the time of the first Cæsar down to that of Hadrian.

From the time that Rome became the metropolis of the world it was evident that the old Forum was not adequate to the demands of public intercourse. The older Cato, in order to attract the public to the N. side, erected there the Basilica of Portia (a. c. 184); the Basilicas of Emilia (a. c. 179) and that of Sempronia (b. c. 169) soon followed. Cæsar erected on the S. side of the Forum the Basilica Julia, consisting of 5 aisles. On the N. side the Forum Julium was erected. Adjoining this stood the Forum of Augustus. A vast deal was done under Augustus to supply the city with water, and that in a most sumptuous manner. The Aqua Virgo and the Aqua Alsietina were led into the city, and the volume of the Aqua Marcia was increased. Agrippa during his ædileship constructed in a single yr. (a. c. 33) 700 basins, 500 fountains, 180 reservoirs, and employed in the decoration of these works 400 marble columns and 300 bronze and marble statues. Meanwhile the terrible conflagration under Nero (a. d. 64) had occurred. Of the 14 city precincts, 3 were entirely and 7 wellnigh entirely destroyed. A countless number of monuments were sacrificed. In consequence of the destruction of entire quarters of the city, room was obtained for the erection of large public buildings. Nero's Golden House requires only a passing notice as an illustration of the vicissitudes of earthly grandeur; for immediately after the emp.'s death (a. d. 68) the whole establishment fell into decay. On the site of the artificial lake within the gardens of the Golden House, Vespasian began to build the Colosseum.

Arch. received a new impulse under Trajan, who em-

ployed an excellent Gr. arch., Apollodorus of Damascus. Under the direction of this artist the Forum of Trajan was erected. The prin. building of this Forum was the Basilica Ulpia, having 5 aisles, the central one being uncovered. Trajan's Column, with its gilded reliefs on a colored ground, was embraced within this gigantic structure. The constructive activity of the emp. Hadrian is exemplified in the double temple of Venus and Roma on the Velia, the plan of which the emp. designed with his own hand (a. d. 135). It was composed of 2 temples, having a single roof covered with tiles of gilded bronze. The cellæ of the 2 temples adjoined each other, and the whole was surrounded by a double portico of granite columns. The Mausoleum of Hadrian, begun by that emp. and completed (a. d. 140) by Antoninus Pius, consisted of a square substruction, upon which stood a terrace-like superstructure covered with marble and adorned with statues. From the time of the Antonines, beside the column in honor of M. Aurelius, we have only the temple of the elder Faustina (erected a. d. 141). After the Antonines, even at the time when the downfall of the empire was becoming more and more evident, many sumptuous buildings were erected in Rome. Caracalla strove to surpass all his predecessors in the colossal baths, capable of holding 1600 bathers, which he commenced on the S. E. side of the Aventine Hill, near the Via Appia, but which were not completed until the time of Alexander Severus. These were incrustated with costly stones and peopled with an army of statues. The Baths of Diocletian, on the Viminal, were still more extensive than those of Caracalla, and, it is said, were capable of accommodating 3000 bathers. The basilica on the Velian, with its 3 aisles, was built by Maxentius, and remodelled by his successful rival, Constantine. A close inspection of the above series of buildings proves that arch., down to a very late period, preserved the indications of a strong feeling for grandeur in plan and in the arrangement of the interior, as well as of masterly mechanical skill. On the other hand, the decline in art showed itself especially in 2 directions. The first of these was the loss of a feeling for the significance of the component parts of the architectural whole. The other was in the treatment of the ornamentation. The passion for costly material worked most disastrously in this respect. In the earlier stages of the period under consideration the decoration of interiors was chiefly fresco. Fresco-decoration, however, in the houses of the wealthy, soon found a rival in the practice of incrusting the walls with costly stone. Marble facings for walls were first introduced by Mamurra in his house on the Cælian Hill in the time of Cæsar. Under Claudius and Nero the practice of adorning walls with facings of parti-colored stones had become not unrequented in Rome. Costly marbles finely cut and polished, varying in color in the different architectural divisions, shone in the state apartments of the emps. and of the Rom. aristocracy. The ceiling as well, in order to harmonize with the walls, was made brilliant with gold and enamel, and the floors with mosaics.

IV. *Sculpture and Mural Decoration.*—In the Rom. sculpture of this period 2 tendencies, the idealistic and the realistic, may be distinguished. The first occupies itself specially with the mythological deity, but also sometimes takes to the portrait and to the representation of scenes from daily life. Through a series of works that have been preserved we are made acquainted with a group of Athenian artists who lived in the last century before Christ. The most distinguished among these are Apollonius, son of Nestor, the sculptor of the Hercules torso in the Vatican; Cleomenes, son of Apollodorus, the artist of the Medicean Venus; Cleomenes, son of Cleomenes, author of the fine portrait-statue in the Louvre mistakenly called Germanicus; Glykon, one of the latest artists of the group referred to, in the execution of his statue of Heracles (Farnesian Hercules, Naples) followed a type probably designed by the second Attic school in the 4th century b. c. A peculiar direction was taken by the school of Pasiteles, himself a versatile and also literary artist of the last century b. c. We know the statue of an Ephebus, with an inscription (Villa Albani), executed by a scholar of Pasiteles, Stephanus; also a marble group (Villa Ludovisi) generally considered to represent the meeting of Orestes and Electra, and shown by the inscription to be the work of Menelaus, a pupil of Stephanus. Both sculptures are eclectic works, in which the artists aimed to unite the excellences of different epochs of style. The same is true of Arcesilaus, who wrought the statue of the goddess for the temple of Venus Genetrix, dedicated by Cæsar, in 46 b. c. In other works of art also, belonging to the epoch under consideration, the authors of which are unknown, recent investigations have shown the same dependence upon anc. models. The well-known group representing Venus and Mars, and probably connected with a work placed in the temple consecrated by Augustus to Mars Ultor (2 b. c.), is strictly derived from 2 types of the earlier development. One is the well-known figure of Aphrodite holding a shield. The celebrated statue of the Nile (Vatican) is the reproduction of an original from the Ptolemaic period. We come to a similar conclusion from the investigation of the portrait-statues, of which the early imperial period presents several very prominent examples, as, for instance, that of Augustus from the Villa ad Gallinas (Vatican), that of the older Agrippina (Capitol), etc.

In view of these facts we are justified in saying that the plastic art of this period was rather reproductive than original—that when called to poetic creation in the higher sense, it found itself incapable, and fell back upon older productions. On the other hand, it possessed to the fullest extent the power of delicately seizing and reproducing with artistic correctness the forms presented by nature. A considerable decline in this power is first perceptible in the time of Hadrian. To this early stage of decline belongs the last important type in the hist. of classic art, the type of the favorite of the emp. Hadrian, the Bithynian Antinous.



After the age of the Antonines the decline in plastic art was most precipitous, at least in so far as it dealt with ideal themes. An eloquent proof of this is the anonymousness which covers with silence almost the whole art of the 3d and 4th centuries. So far as our positive knowledge of the monuments extends, there exists of this period no representation of any god from the classic Olympus worthy of mention. On the other hand, the statues of Mithras, of the shocking Æone, the repulsive figures of the Ephesian Artemis, are everywhere prevalent. The most pleasing, comparatively, and certainly for the hist. of art the most interesting, productions of this age of decline are the sarcophagi, adorned with figures in relief, which came into vogue from Hadrian's time. The reliefs, mostly mythological subjects, scenes from the story of Bacchus, the myths of Meleager, Hippolytus, etc., repeat motives from the older Gr. art, especially from that development of painting which began in the time of Alexander. The realistic tendency, which was fostered together with the ideal one of which we have spoken, does not appear at all in the foreground during the last century before and the first after Christ, but remains secondary and limited to a lower sphere. The realistic portrait of this period is distinguishable from the ideal by certain mechanical methods of producing expression. In the latter the eyelids are elaborated with a strong feeling for style, and there is no intimation of the eyebrows; the realistic school makes the edges of the lids rest upon the eye, as is the case in nature, and marks the form of the brow. Sometimes the pupils are indicated by grooved outlines, a practice which first became general in the 3d century after Christ.

Unlimited is the sway of the realistic tendency in the historical representations with which triumphal arches and other similar monuments were adorned in the imperial ages. The historical reliefs appear as a development of works from the period of Alexander the Great and of the Diadochi—a development in which the endeavor to be true to the real emancipates itself more and more from artistic fetters. The band of figures winding up the triumphal columns narrates, chronicle-wise, the prin. events of the campaign according to the imperial bulletins, and can be compared to nothing more analogous than to a parchment roll upon which is inscribed an abridgment from the Rom. general-staff records. By the multiplication of the planes of relief an attempt was made to obtain an effect corresponding to perspective in painting. Bold foreshortenings, intimations of landscape detail, and other means of expression properly belonging to the pictorial art, became, with the advance of this development, more and more frequent, and more prejudicial to the plastic clearness of the representation. After the age of Trajan there is a rapid decline even in this form of art. The pictorial art shows, in every respect, a development analogous to that of the plastic. We are told that in the last century of the republic the portrait-workers of Sopolis, Dionysius, and of a female painter named Ia or Lala, were esteemed; that in the same period a certain Avellus painted goddesses with the features of his mistresses. In the Augustan age we hear of the decorator Ludius or S. Tadius. Under Vespasian, Cornelius Pinus and Attius Priscus decorated with paintings the temple of Honor and of Virtue, the restoration of which was then completed. A series of frescoes representing Io guarded by Argos (Rome, Palatine—Pompel), and another series showing Perseus leading the released Andromeda down the rock to which she had been chained (Pompel), are probably reproductions of 2 celebrated paintings by Nikias, a master who flourished in the time of Alexander the Great and of the first Ptolemy. The wall-paintings representing Danaë with the boy Perseus upon the shore of Seriphos (Pompel) seem to be traceable to an original by Artemon, a contemporary of Demetrius Poliorcetes. And, finally, those representing Medea about to kill her children, yet still restrained by the conflict between the passions of maternal love and jealousy (Herculaneum, Pompel), repeat a grand composition by Timomachus, an artist probably of the Diadochi period. In Rom. fresco-painting an important place is occupied by the landscape, a province of art which also came into independent development during the age of the successors of Alexander. The most beautiful extant paintings of this kind are the landscapes discovered on the Esquiline, with scenes from the *Odysey* (Vatican Library).

An exclusively realistic tendency manifests itself only in the mural paintings of a very inferior kind. In Pompel this class of pictures are almost entirely confined to houses of a very poor, or even of a decidedly questionable character. They depict the manners and habits of artisans and wagoners, who are drinking or making merry with dissolute women, and other scenes from the daily life of the provincial towns of Campania, always represented with a low feeling, and almost without exception of very coarse execution. After the yr. 79 A. D. we can no longer follow with any certainty the hist. of this art. The rise of Christianity did not tend to arrest its decline, but rather hastened its downward course.

**RESULTS OF RECENT EXCAVATIONS.**—The works for the extension and embellishment of the city of Rome have been the occasion of a great number of archaeological discoveries.

(a) *Fortifications.*—Rome has been defended at 3 different periods by 3 different walls—that attributed to Romulus, which surrounds the Palatine; that of Servius Tullius, which encircles the Seven Hills; that of Aurelian, which forms the inclosure of the city at the present day. Four fragments of the wall of the Palatine have been discovered. As to the wall of Servius Tullius, it may be traced to-day at 43 different points, the most considerable remains being those discovered in the Villa Torlonia, upon the Aventine, near the railway-station. In Dec. 1875 were discovered some vestiges of the citadel, or *arx*, which occupied the N. E. summit of the Capitoline.

(b) *Temples.*—The number of temples, either standing or

uncovered, which in 1870 was 21, has now risen to 30. Among those recently discovered we should mention the temple of Cybele, discovered in 1870 on the Palatine, with the statue of the goddess; the temple of the Flavians, discovered 1872 with a colossal head of Titus; the temple of the Dea Dia (Ceres), discovered in 1868; the temple of the Fortuna Primigenia, discovered in 1873; the temple of Julius Cæsar, discovered in 1873; the temple of Jupiter Capitolinus (1865-76); the temple of the Palmyrene Sun (1857); and, finally, the temples of Bellona and of Honor and Virtue, discovered in 1873.

(c) *Basilicas.*—The whole of the surface covered by the Basilica Julia, which occupied the entire W. side of the Forum, has been completely laid open.

(d) *Theatres.*—In Jan. 1876 there was discovered a considerable portion of the lower portico of the theatre of Marcellus.

(e) *Amphitheatres.*—During the whole of 1874 excavations were making in the interior of the Colosseum. Thus, we have been able to study all the details of the service of the amphitheatre.

(f) *Circuses, Stadia.*—The palace of Augustus on the Palatine was separated from the palace and the Septizonium of Septimius Severus by a stadium built by Domitian and restored by Hadrian. This was mostly uncovered in 1872.

(g) *Therma.*—Rome in the period of her splendor counted 11 large thermae, some of which could receive as many as 2000 bathers at a time, and 556 baths of an inferior order, for the use of the lower classes. These last have almost totally disappeared, but many of the thermae still exist, and several of them have been explored since 1870.

(h) *Forums.*—The exploration of the Rom. Forum may now be considered as complete. It has the form of the trapezium, and is bounded on the E. W. and S. by streets, on the N. by the Rostra. The pavement is composed of blocks of travertine. Along the W. side—that is, in front of the Basilica Julia—may be seen 7 pedestals of honorary columns; the S. side, facing the temple of Cæsar, was shut in by a line of shops. In the centre of the Forum may still be seen the pedestal of the equestrian statue of Domitian described by Statius; and farther to the N. the two *putei*, or parapets, discovered in Jan. 1873. These *putei* indicated the place where all the citizens on their way to the elections were to go and present their *testera*, or tickets of admission. The excavations consequent upon the building of the new quarters upon the Esquiline have led to the discovery of the Forum Esquilinum, and of the public markets (Macellum Livie) which surround it. Some of the market-shops preserved traces of their original destination; as, for example, in one was found a collection of mineral colors; in another, a number of small bottles for perfumery; in a third, some wine-measures, and amphoræ once containing the produce of the vines of Chios.

(i) *Honorary Monuments—Triumphal Arches.*—Some very important remains of a triumphal arch erected in honor of Gordian the Pious were discovered in 1872 in digging a drain in the Via Gaeta. *Columns.*—We have already mentioned the 7 pedestals of honorary columns found on the W. side of the Rom. Forum. We should add that 3 of these columns have also been discovered. *Obelisks.*—Among the ruins of the temples of Isis and Serapis, which we know stood near the ch. della Minerva, had already been found the obelisks erected afterward in the open squares of the Pantheon, of the Minerva, and in the grounds of the Villa Mattel. Recent excavations in the same place have given us fragments of a fourth obelisk, entirely covered with hieroglyphics.

(k) *Military Establishments.*—The military garrison of Rome comprised the corps of the *prætorians* and of the *urbani*; the 7 battalions of the *vigiles*, who exercised the police of the city; also several battalions of less importance, such as the marine infantry (*misenates*, *ravenarates*), the imperial guard of honor (*equites singulares*), etc. Of the barracks of the prætorians it was already known that 3 sides were incorporated into the city-walls by Aurelian. The 4th—that is, the W. side—has just been discovered in consequence of the works in the new quarter of the Viminal (*Castrum Prætorio*). The site of the *Castra Equitum Singularem*—that is, of the barracks of the imperial horse-guards—has been made known by the discovery of a monument erected to Sylvanus at the expense of certain soldiers. The 7 battalions of the *vigiles*, or policemen, were distributed through the city in such a way that each one occupied the boundary-line between 2 regions. Recent discoveries established the fact that the barrack of the first cohort (or battalion) was situated below the Palace Savorelli on the boundary between the VII. (Via Lata) and IX. (Circus Flaminius) regions. That of the second has been found on the Esquiline, very near the Arch of Gallienus; that of the third at the S. E. angle of the Baths of Diocletian; that of the fifth in the Villa Mattel, by the ch. of the Navicella; that of the seventh in the Piazza Monte de' Fiori, in the Transtevere.

(l) *Palaces and Houses.*—In a *résumé* so limited as ours it would be impossible to describe the topography of the Palace of the Cæsars on the Palatine as it has been determined by the latest excavations. The imperial palace has no unity of plan or of decoration, but is composed of a suit of palaces, the one differing from the other, built at different epochs, and separated by streets and squares always accessible to the public. Although the condition of their remains is in general very ruinous, yet every room, so to say, preserves sufficient traces to enable us to decide or to divine what was its decoration and its primitive destination. Among the palaces and private houses of which the position or new details have been discovered should be mentioned the Palace of the Laterans, the House of Germanicus, the House of Asinius Pollio, the House of Q. Fabius Cilo, the house of the Cornelli, etc.

(m) *Villas and Gardens.*—The gardens of Mæcenas, on the Esquiline, have been in a great measure excavated. The most interesting monument as yet found is a magnificent



conservatory in the form of a small oblong theatre, the walls of which are decorated with beautiful landscapes. Still more important are the discoveries made on the site of the Horti Lamiani, which adjoined those of Mæcenas. In the very centre of these gardens the remains of a palace have been found, the E. and W. sides of which were adorned by porticoes with columns of *giallo antico*. On the 2 other sides were found bath-rooms of extraordinary splendor. Almost the whole surface of the Esquiline was occupied by gardens, opened by the emps. to the public.

(n) *Tombs*.—The burial-place of the anc. inhabs. of Rome was not confined to the borders of the great consular highways, but outside every gate were found vast necropolises called *campi*, named from the nearest gate. The most anc. of the tombs contemporary with the first centuries of R. are excavated in the rock according to Etruscan usage. The second system of burial, which dates from the beginning of the 4th century, is that of sarcophagi and cinerary urns in volcanic stone. The third method is that of sepulchral chambers.

In conclusion, we may announce the discovery of a Rome anterior to the Rome of hist. Her existence has been revealed to us by objects in stone, such as arrow-heads of silex, axes of bluish jadéite, knife-handles of deer-horn, necklaces of burnt clay, pottery made by hand, etc. All these objects belong to the Neolithic period, or the age of polished stone. [From *Orig. art. in J.'s Univ. Cyc.*, by PROF. W. HELBIG and R. LANCIANI.]

**Roman Architecture.** See ARCHITECTURE and ROMAN ARCHEOLOGY.

**Roman Catholic Church.** *Definition.*—This Ch. is composed of that body of Chrs. who are united in the profession of the same faith and in the communion of the same sacraments, under the government of lawful pastors, especially of Christ's vicar on earth, the Roman pontiff (*Bellarmin*, lib. iv. c. 2).

*Divine Institution of the Church.*—The reality of the Ch. as a collective body of believers in the fulness of the revelation of truth and grace from God through Christ is apparent from scriptural utterances both *figurative and obvious*, wherein the *origin, nature, and tendency* of that Ch. are pointed out. To establish, to spread, and to preserve this *kingdom of God* upon earth, this *fold under one Shepherd*, Christ taught certain doctrines, performed wonderful works, chose 72 disciples to prepare the way, and 12 apostles, among whom *one* as his *visible representative*; moreover, he instituted baptism, Eucharist, absolution, and the other sacraments; he sent the Holy Spirit, and invested the apostles with certain prerogatives, and commissioned them to bring all nations, by their preaching them *his* doctrines and dispensing unto them *his* sacraments, into *his* Ch.

*Constitution of the Church.*—The organization of the Ch. as a divinely established *factum* was invested with such prerogatives, as essential conditions to her *continuity and perpetuity* as a living visible body—that in her very formation, no less than in the days of her world-wide extension and development, she presents the same attributes in her constitution given her by Christ and vindicated for her in the apostolic age. In the apostolic Ch. we find the well-defined character of an *Ecclesia docens, a teaching body* in the Ch., and an *Ecclesia audiens or discens*, another body that *hears* and receives the doctrines taught. Hence also the distinctive division of *clergy and laity*.

2. All power and authority resided originally in the apostolate, and all the apostles joined in the care of all the chs., whose members, as children born anew through Christ, looked upon them as spiritual fathers. Among the apostles Peter beyond doubt ranked *first, ὁ πρῶτος*, receiving from Christ the power of the keys, the duty to strengthen his brethren, to feed the flock; upon all occasions of importance he appears at the head of the apostolic college.

3. *Apostolate and Episcopate.*—From the apostolic office is derived—nay, connected therewith—the episcopal, or the office of *bps.* in the Ch.

*Pre-eminence of Bishops.*—The apostolic Father Ignatius bears testimony to this pre-eminence of bps. over presbyters (priests) when he asks the faithful to obey the bp. who presides as Jesus Christ obeyed his Father, to honor the presbyters and deacons.

*Diocese.*—As a third and last degree the office of *deacon* appears as a constituent part of orders in the apostolic Church.

*Hierarchy of the Ch.*—*ἐνὰ ἀρχήν*—signifies the collective body of bps., presbyters, and deacons, and by divine right the govt. centres in this hierarchy, and its const. may be termed *hierarchical*; the power to "rule the Church of God" rests in this hierarchy, which culminates in the

*Primacy of the Church of Rome.*—The primacy is inherited by the successors of St. Peter in the Rom. Ch., as the apostolate descended to the episcopacy, not because the primacy is merely the product of the unity in the Ch., but typifies and truly represents Christ the Head.

*Orders of the Hierarchy.*—*Major and minor orders* as a distinctive classification is handed down from the earliest ages of the Ch. To the former belong 3, respectively, the *presbyterate*, the *diaconate*, and *subdiaconship*; to the latter 4, *lectors*, *acolythes*, *ostiarii*, and *exorcists*. A further development of this hierarchy in the early Ch. derived from the episcopate and intimately connected therewith, consists in the several titles of *patriarch*, *exarch*, *primate*, *metropolitan*, *archbishop*.

*Diocese* is the ancient *parochia*, subject to the bp., whose relation thereto is compared to an indissoluble bond; and the several congregations, as parishes, were governed by a presbyter as *parochus*—parish priest—appointed by the bp.

*Councils of the Church* were the assemblies of the hierarchy. After the precedent of the apostolic council of Jerusalem (Acts xv.) we find such councils of frequent occurrence since the 2d century.

*The character of these councils* depended mainly on their

composition as they represented a *lesser or larger*, or the *entire* body of the hierarchy.

*Ecumenical councils* were convened, where all the bps., assembled and the universal Ch. was represented; 19 in all.

*Marks of the Church.*—In the words of the Niceno-Constantinopolitan Creed, the *true, visible, indefectible* Ch. of Christ is recognized by these 4 characteristic marks—viz. *unity, sanctity, catholicity, apostolicity*.

*Rules of Faith.*—"Deposit of faith" means the sum of Divine revelation committed to the Ch. The rule of faith for and in the Ch. is essentially one—namely, the complete body of revealed doctrines and code of laws given by Christ to his apostles, and by them to his Ch.—written Scriptures and unwritten Tradition.

*Canon of the Scriptures.*—*Holy Scriptures* accepted by the Ch. is the collection (*canon*) of those books of the O. and N. T. called *proto- and deutero-canonical*, regarded as inspired writings.

*Historical Periods in the Church.*—As to the *history* of the Ch. proper, we may divide it into 3 great periods—I. *Ancient*; II. *Middle*; and III. *Modern*.

*Total Estimate.*—In the entire Ch. there are 12 *patriarchates*, 7 of Lat., 5 of Oriental rite; 149 *archbishops* of Lat., and 27 of Oriental rite; 714 *dioceses*. Throughout the world the Ch. numbers about 230,000,000. (See a more complete article on this subject by the same author in *J.'s Univ. Cyc.*)

—PETER J. SMITH. (See also ROMAN CATHOLIC CHURCH, by PROF. PHILIP SCHAFF, D. D., LL.D.)

**Roman Catholic Church**, that body of Chrs. which acknowledges the authority of the pope of Rome. It styles itself the "Holy, Catholic, Apostolic, and Roman Church." It is the largest and most powerful denomination of Chrs., numbering nearly 200,000,000 souls, or more than  $\frac{1}{5}$  the Chr. pop. of the globe. The R. Ch. is scattered all over the world, but has its chief hold on the Lat. races in the S. of Europe and Amer. and on the Celtic portion of the Irish. It stretches in unbroken succession back to the days of heathen Rome, and has outlived all the govt.s of Europe.

*Doctrines.*—The doctrines of the R. C. Ch. are laid down in the ecumenical creeds, the acts of 19 or 20 ecumenical councils, the bulls of the popes, and especially the Tridentine and Vatican standards. The prin. authorities are the canons and decrees of the Council of Trent (1563), the Profession of the Tridentine Faith, commonly called the Creed of Pius IV. (1564), the Rom. Catechism (1566), the decree of the Immaculate Conception (1854), and the Vatican decrees on the Catholic faith and the infallibility of the Pope (1870). The best summary of the leading articles of the R. Cath. faith is contained in the Creed of Pope Pius IV., which is binding upon all priests and public teachers, and which must be confessed by all converts. It consists of the Nicene Creed and 11 articles.

*Government and Discipline.*—The Rom. Ch. is an absolute monarchy, which culminates in the pope. The people are excluded from all participation even in temporal matters; they must obey the priests, as the priests must obey their bps., and the bps. the pope, who claims to be the universal bp., the successor of Peter, the vicar of Christ, and the visible representative of Almighty God on earth. This system is the growth of ages, and has only reached its maturity in the Vatican Council of 1870, which decreed the pope to be the infallible bishop of bishops.

*Worship and Ceremonies.*—They are embodied in the Rom. Missal, the Rom. Breviary, and other liturgical books for public and private devotion. The R. C. Ch. accompanies its members from the cradle to the grave, receiving them into life by baptism, dismissing them into the other world by extreme unction, and consecrating all their important acts by the sacramental mysteries and blessings. Its worship is the most elaborate system of ritualism, unless we except the Gr. and Rus. service. It is chiefly addressed to the eye and the ear. It draws all the fine arts into its service. Gothic cathedrals, altars, crucifixes, Madonnas, pictures, statues, and relics of saints, rich decorations, solemn processions, operatic music, combine to lend their great attractions for the common people and for cultured persons of prevailing æsthetic tastes, especially among the Lat. races. But while the external splendor dazzles the senses and pleases the imagination, the mind and heart, which crave for more substantial spiritual food, are often left to starve. Converts from Rome usually swing to the opposite extreme of utmost simplicity. Catholic worship is the same all over the world, even in lang., the Lat. being its sacred organ, and the vernacular being only used for sermons, which are subordinate. Its throne is the altar, not the pulpit (which usually stands away off in a corner). It centres in the mass, and this is regarded as a real though unbloody repetition or continuation of the atoning sacrifice of Christ on the cross. At the moment when the officiating priest pronounces the words, "This is my body," the elements of bread and wine are believed to be changed into the very substance of the body and blood of our Saviour, and these are offered to God the Father for the sins of the living and the dead in purgatory. There are, however, eminent Rom. divines who so spiritualize and refine the doctrine of the mass as to make it only a dramatic commemoration and renewed application of the one and ever-living sacrifice of Christ.

**Roma'nia, or Rouma'nia**, a kingdom of S. Europe, comprising the principalities of Moldavia and Wallachia, has an area of 48,272 sq. m. It is bounded N. and W. by Austro-Hungary, E. by Rus. and the Black Sea, and S. by the Danube, which divides it from Bulgaria. R. is drained wholly by affluents of the Danube. The prin. rivers are the Olto, the Sereth, the Dumbavitz, and the Pruth. Fresh-water lakes are numerous in the interior. The largest towns are Bucharest, pop. 221,805; Plovesti, 38,170; Braila, 28,272; Giurgevo, 20,866; Craiova, 22,764; Jassy, 90,236; Botoschani, 39,941; Galatz, 80,763; Ismail, 21,000. The total pop. is 5,300,000, who profess the orthodox Oriental faith.



The prin. agricultural products are wheat, maize, rye, barley, oats, millet, colza, flax, hemp, and tobacco. The grapes and some of the wines are of excellent quality. Grain, cattle, swine, sheep, and the products of these animals, horses, and vegetable and mineral raw material, including lumber, are exported. The imports consist almost entirely of manufactured articles, sugar, coffee, spices, and objects of luxury. In 1882 there were 775 m. of railways in operation, and about 140 in course of construction. The union of the principalities of Wallachia and Moldavia was proclaimed Dec. 23, 1861, the present name being given to the united provs. The first ruler of R. was Col. Couza, who had been elected hospodar or lord of Wallachia and Moldavia in 1859, and who assumed the govt. under the title of Prince Alexander John I. A revolution in 1866 forced Prince Alexander John to abdicate, and led to the election of Prince Karl I., who was proclaimed king of R. Mar. 27, 1881. The constitution is liberal. Legislative power is exercised by a senate and chamber of deputies, both elective.

The Romanian lang., now spoken with great uniformity of dialect throughout R., and by a nearly equally numerous pop. in the adjacent provs., belongs substantially to the Italic stock, though its vocabulary embraces a large proportion of foreign words. The Rom. character incumbered by inconvenient diacritical points and accents is now almost universally employed. The Cyrillic alphabet was introduced with the liturgy, and continued in general use until very lately. The only literary productions of much interest to foreigners are the popular ballads and the native chronicles edited by Michael Cogolnician. The *Dictionariu Limbei Romane*, compiled under the patronage of the Romanian Acad., is an important contribution to the lexicography of the langs. of Lat. stock.

**Romanic Languages, or Romance Languages**, the common name of those langs. which developed from the anc. Lat. tongue. They comprise the It., Sp., Port., Fr., Provençal, Romansh, and Wallachian.

**Romansch, Romansch, Romansch, or Rheto-Romansch**, is the lang. of about half the pop. of the Swiss canton of the Grisons, and is spoken in some other Alpine valleys comprised, like that canton, in the anc. Rom. prov. of Rhetia. The most important dialect of the R. lang. is the *Ladino*, which appellation has been restricted to the 2 vernaculars of the Upper and Lower Engadine.

As a whole, the R. in all its dialects very decidedly belongs, both by its vocabulary and by its grammatical structure, to the Italic stock; and is a valuable source of illustration of the etymological processes by which what are called the modern Romance langs. have been formed. Its most anc. written memorials are from the 15th century. Its lit. is almost exclusively ecclesiastical, and consists chiefly of translations of the Scripts, and works of religious instruction and edification.

**Romans, Epistle of St. Paul to the**, was probably written from Corinth. It is one of the most important of the Pauline books. Its contents are largely doctrinal, but it contains fine hortatory passages and directions for practical conduct. The epistle contains a thorough and comprehensive statement of the theology of Paul. He wrote the epistle, about the year 58, to the ch. at Rome, in order to prepare the way for a visit to them.

**Rome** [Lat. *Roma*; Gr. *Ῥώμη*]. *Heathen Rome, History of*.—According to legends, Romulus, the son of Mars and of Rhea Silvia, the daughter of the king of Alba, founded the city and the kingdom of Rome. Several kings seem to have ruled the young state some 600 yrs. b. c. The people consisted of 3 tribes, representing the Latin, Sabine, and Tyrrhenian elements, which constituted the *patricians*. The *plebeians* were also free, but had originally no political rights, and for centuries the struggle between the conservative patricians and the republican plebeians was the cause of endless strife. The kings had by their side a senate, while the priests, forming a coll. of *pontifices*, and the *augurs* controlled the will of the people through their religious influence. Regal R. ruled the whole Lat. coast, and enjoyed great respect abroad, but with Tarquin the Proud ended the monarchy, and R. was conquered by the Etruscan Porsenna. When the latter was slain at Aricia, R. recovered her independence, and became a republic, ruled by 2 consuls, chosen annually from the patricians. Inner dissensions long retarded the growth of the commonwealth. In 494 the plebeians obtained the right to choose tribunes and *ediles* to protect their liberties. The tribunes were sacred and inviolable in their person, and possessed the veto power annulling any law or decree of the senate. An agrarian law, which was to secure to plebeians also a share in the public lands, became a source of long-continued strife at home, while wars with neighboring tribes prevented the growth of the state. In 457 the supreme power was vested in 10 men, the *decemviri*, but 2 yrs. later lost by the latter, whereupon the old const. was restored, and the Twelve Tables, the basis of all subsequent Rom. law, were publicly acknowledged. An appeal to the people was secured to every citizen, plebeians and patricians were allowed to intermarry, the tribes obtained legislative power, and military tribunes as well as censors were appointed. These offices, as well as the *quæstorship*, were thrown open to the plebs, and soon they were admitted to the senate also.

But (395) a formidable enemy, the Gauls, appeared, defeated the army, and burned R. The barbarians were driven out, but for 10 yrs. R. was once more the scene of a struggle between the plebs and the patricians. The latter succumbed, and by the Licinian Rogations (376) debtors were relieved, the public domain was partly thrown open to the plebs, and one of the 2 consuls left to be chosen by them. Step by step they obtained access to all the higher offices of state, and in 300 even the colls. of priests and *augurs* became accessible to them. The end of civil contests enabled R. gradually to conquer the whole of It. R. treated the vanquished with kindness, incorporated them into the state,

and admitted them to citizenship. The Samnites were subdued 290. The various tribes of Gauls had been previously subjugated; now Tarentum also was conquered (272), and with this conquest the subjugation of the whole of It. from Cisalpine Gaul to Sic. was accomplished (264).

Sic., however, was still in the power of Carthage, but the first Punic war (264-242) resulted in the conquest of the larger part of Sic. and the formation of the first Rom. fleet. But soon the second Punic war threatened the very existence of R. Carthaginian gens. had conquered portions of Sp., and soon after, Hannibal marched through Sp. and Gaul, reaching It. with a small but enthusiastic army. R. was in imminent danger, but her dictator, Fabius Cunctator, with great skill husbanded his forces while exhausting those of his adversary. The Roms. gradually recovered ground, and finally Hannibal himself was defeated by Scipio on his native soil at Zama (202). Peace was made, and the power of Carthage forever destroyed. These victories only increased the desire of R. to become the mistress of the world. The alliance of Philipp of Macedonia with Carthage gave a pretext to R. for turning her weapons next against the East. Philipp's army was routed at Cynoscephalæ (197). Antiochus the Great, king of Syria, who had invaded Gr., was driven out, and at Magnesia in Phrygia defeated by the younger Scipio (190). Almost at the same time Cisalpine Gaul was created a prov. A second Macedonian war ended with the brilliant victory of L. Æmilius Paulus at Pydna (168). Antiochus IV. of Syria was compelled to admit the supremacy of R., and Gr., with the exception of Sparta and Athens, became a Rom. prov. under the name of *Achaia*. The same fate befell Macedonia and Illyria, and R. was now virtually mistress of the E. and the W.; for in the same yr. the third Punic war led to the conquest of Carthage and its organization as a Rom. prov. (146). Numantia, a Sp. city, was taken (133), reducing Sp. also to a dependency—a fate which the Asiatic kingdom of Pergamum shared (133).

In the mean time R. had undergone great changes at home. The constant wars, the vast booty flowing from all sides into the cap., and the large admixture of foreign elements produced boundless corruption. New vices were imported, mainly from Gr. and Asia; new creeds from all parts of the world. The stern simplicity and strict morality of former times disappeared. The influence of Gr. first felt in the development of a Rom. lit., and then in the almost universal adoption of Gr. philos. and Gr. manners, exercised a baneful influence. The new aristocracy, almost exclusively in possession of the higher offices, and hence immensely rich, developed a hostile antagonism to both the old aristocracy of the patricians and the people at large. The poor congregated in vast numbers in R., where food had to be distributed in incredible quantities—first for a small price, and after 50 n. c. gratuitously. To remedy this evil, the tribune T. Gracchus proposed new agrarian legislation (133). He succeeded, but both he and his brother Calvus paid with their lives for their noble efforts to benefit the people (121). A revolution could clearly be foreseen. At last C. Marius was elected consul—a triumph of the people over the optimates—and he opened the ranks of the legions to a lower class of men, thus making the army a readier instrument in the hands of great political leaders. Marius gained great victories, but a social war in It. between the Roms. and the various allies led to the great rivalry between Marius and Sulla and the breaking out of a bloody c. war. Marius d. in 86, and after a number of victorious battles Sulla remained sole master of It. (82). He became dictator, avenged himself by merciless proscriptions on his adversaries, bestowed on his vast army rich gifts in land and money, and increased his party by granting citizenship to large numbers of freedmen. In 79 he abdicated, and d. in retirement. In the mean time Lucullus and Pompey had conquered Judea. Pompey found Syria a Rom. prov., and subjugated Judea. Pompey found himself on his return from Asia (61) the most powerful man in Rome, with no rival but Julius Cæsar, and no danger but the conspiracy of Catiline. The latter was defeated by the eloquence of M. T. Cicero. The rivalry with Cæsar and the enmity of that stern republican, the younger Cato, he cunningly anticipated by forming with Cæsar and Crassus the triumvirate. Crassus fell soon in a war against Parthia. Cæsar went into Cisalpine Gaul, completed the conquest of that prov., and invaded Gr. and Britain. Strong in the great renown which he had acquired, he returned to It.; and when Pompey took hostile measures, he defeated his rival and gained victory after victory. R. was forced to make him dictator, and at Pharsalus (48) he defeated Pompey, who was soon after killed in Egypt. In 45 he was made imperator, and the senate ordered divine honors to be paid to him. The desire to add to royal power the name of king led to a conspiracy which resulted in his assassination through M. Brutus (44). This murder caused a fearful c. war between the republican party and Cæsar's nephew, Octavianus, who, united with Lepidus and Antony, triumphed at last. The battle of Philippi made an end to the republic. Antony, by preferring Cleopatra, the queen of Egypt, to his wife, the sister of Octavianus, offended the latter, and open war broke out between the 2 triumvirs. Antony was defeated in the great naval battle of Actium (31), whereupon Octavianus, under the title of Augustus, became master of the Rom. empire (30).

For a time the emps. maintained the legal fiction of a lifelong magistracy, causing all military and civil offices to be conferred upon them in the prescribed legal way. In the days of Diocletian and Constantine, however, this ap. parent respect for the anc. liberties of R. also passed away, and the emps. became absolute monarchs. Augustus was succeeded by Tiberius (14-37), who at once and forever deprived the people of certain rights, and established his body-guard, the prætorians, in the city of Rome. After him followed Caligula, Claudius, and Nero. Tyranny and fearful moral corruption increased steadily. Under Nero the first persecution of Chrs. took place. The emps. Galba, Otho, and



Vitellius followed each other in rapid succession; then came Vespasianus, proclaimed Caesar by his victorious legions, and the founder of the Flavian family, who for nearly a century gave peace and prosperity to R. They were succeeded by the humane Nerva, by Trajan (98-117), and by Hadrian. With Marcus Aurelius (161-180) ended the better times of the empire. Under his cruel and dissolute successor, Commodus, began the period of decline. Rival emps. contended for the supreme power, provs. rose in rebellion, and at the frontiers appeared new races of barbarians. Already in 286 the empire had been divided in 2, and soon after in 4 parts; then Constantius took the W. and Galerius the E. as separate empires. Constantine the Great, the son of the former, and the first Chr. emp., formally transferred the seat of govt. to Byzantium, now called Constantinople, and completely changed the const. of the empire (330). From that time R. ceased to be the mistress of the world, and sank till it became the cap. of a mere province. Finally, in the 5th century the barbarians began to press closer and closer upon the crumbling empire. Alaric laid it waste and took R. (410); Vandals and Suevi conquered Sp. (409); Franks, Alemanni, and Burgundians took possession of Gaul, while in the S. the Visigoths established a kingdom which extended into Sp. The widow of the emp. Valentinian, Eudoxia, to avenge personal injuries, called in the Vandals under Genseric, who plundered R. The unfortunate emps. were either mere puppets in the hands of ambitious gens., or paid promptly with their lives for their efforts to be independent, till Romulus Augustulus (as he was contemptuously called) abdicated in 476 at Ravenna. (See GIBBON, *Decline and Fall of the Rom. Empire*; NIEBUHR, *Hist. of Rome*; MOMMSEN, *Hist. of Rome*.) [From orig. art. in *J.'s Univ. Cyc.*, by PROF. SCHELE DE VERE.]

**Rome (CHRISTIAN).** Upon the ruins of the anc. Rom. empire there arose gradually a new empire, which soon became all the more powerful as it claimed control over the souls of men as well as over their bodies, and extended its dominion beyond this life into eternity. It owed this supremacy to the gradual development of Christianity. At first the new Ch. consisted simply of priests and laymen. Among the former, however, external circumstances soon produced a certain hierarchy. The bp. of R. assumed, as viceregent of Christ on earth, supreme power in this world over all Christendom and the keys of heaven and hell for the world to come. In 1054 a great schism divided Christendom into a R. Cath. and a Gr. Ch. independent of the pope of R. The full supremacy of R. as the cap. of the new Ch.-empire may be referred to the time of Pope Gregory I. (500-604).

R. itself—and with R. the whole of It.—had in the mean time been the easy prey of the new races which at that time broke forth from their unknown home in the E., overran the whole of Europe, and gradually obtained the supreme power in Europe. Large portions of It. were laid waste, cities were sacked and razed to the ground, and whole pops. butchered or carried into captivity. The surviving inhabs. remained in possession of the land, which they were forced to cultivate for the benefit of the conquerors. The influence of the Longobards gave a new Ger. character to the whole peninsula. Repeated efforts, made by the Rom. emps. at Constantinople, to recover possession of It. remained unsuccessful. A greater danger threatened Rome when the Ch. was violently agitated by a great schism between the followers of Arius, who denied the divinity of Christ, and the R. Caths., who condemned Arianism. Thanks to the management of Gregory the Great and his influence over Theodelinda, the queen of the Longobards, the latter were won over to his side, R. was saved from destruction, and R. Catholicism became supreme in It. The influence of R. grew with the power of the popes. The Gers. and the E. nations of the Slavonic race began to acknowledge the authority of the Ch., but the appeal of the Frankish king, Pepin, first established the claim of the popes to judge in secular matters as well as in matters of faith. Pepin rewarded the pope's assistance by a grant of land in It., and thus the foundation of the secular power of the popes was firmly laid. Pepin's successor, Charlemagne, accepted at the hands of Pope Leo III. the dignity of emp. of R. and protector of Christendom (800).

It was, however, not long to enjoy this newly won greatness in peace. New enemies arose on all sides, and already in 846 the Saracens invaded the country and threatened R. After a period of turbulent warfare an appeal was made by John XII. to Otho, the Ger. emp., who was, like Charlemagne, crowned in R., and confirmed and enlarged the donations made by his predecessors, but reserved to himself and his successors the sovereignty of R. Unfortunately, this divided authority led to the commission of atrocious political crimes by the popes and the 3 Othos. The papal party and the imperial party—later known as the Guelphs and the Ghibellines—were in constant conflict, and It. was the blood-stained battle-field on which the war was waged. At times the pope triumphed; then again he saw himself deposed, R. devastated, the city burned, the inhabs. slaughtered or sold into slavery. The popes were confined to their castle, and yet their power abroad was greater than ever. When, however, by a turn of fortune, they were compelled to abandon R. and to reside in Fr. at Avignon (1309-77), the city became a prey to complete anarchy. For a time peace was restored, order secured, and law resumed by the marvellous success of Cola di Rienzi, a man of the people, who by the rare power of genuine enthusiasm made himself master of R., and even of most of the It. states (1347). But this last "tribune of the people" was murdered, and when he fell R. had been so depopulated by wars and tumults that it counted less than 20,000 inhabs. The record of this period is one of unbroken violence, murder, and battle. Fortunately, the return of Gregory IX. after the termination of the great schism (1378-1417) had begun a new era, during which all It. bloomed forth in the so called renaissance of

anc. art and science. Popes like Julius II. and Leo X., one of the Medici, encouraged these efforts by their liberality, and thus R. was enabled to recover from a terrible calamity—the pillage of the city by the infuriated troops of the constable of Bourbon (1527). But still the popes were either unable to restore peace and order or were held in subjection by foreign powers. The increasing power of Protestantism absorbed all the energies of the popes. At last the papal sceptre fell into the hands of a born ruler. This was Sixtus V., whose restless energy and stern administration of justice once more restored peace to R. From this time law and justice reigned again where tumult and violence had so long been supreme. Unfortunately, the next epoch in the hist. of R., the 17th century, is a period of political death in It. At last the Fr. Revolution broke out. A Fr. army entered It. (1796), conquered the N. provs., and took possession of R. The pope, Pius VI., became a prisoner. It was not until 1814 that the city became free once more and saw the pope return to his palace. In 1848, however, the people rose in rebellion, drove out Pius IX., and established a republic. An appeal to Fr. brought once more a Fr. army to the gates of the city. R. was taken and the pope brought back to R. For 20 yrs. Fr. troops garrisoned the Eternal City, and when they were at last withdrawn (1870) It. had become one great nation. Soon afterward R., having been made the cap. of the new kingdom, saw the temporal power of the Holy See abolished and Victor Emmanuel enter as its new master. (See GREGOROVIVS, *Hist. of Rome in the Middle Ages*.) [From orig. art. in *J.'s Univ. Cyc.*, by PROF. SCHELE DE VERE.]

**Rome (THE CAPITAL OF THE KINGDOM OF ITALY).** On Feb. 23, 1861, the Parl. of the kingdom of Sard. unanimously resolved to confer on King Victor Emmanuel II. and his successors the title of king of It., and on the 27th of the same month the Chamber of Deputies resolved that R., proclaimed as cap. by the national opinion, should be annexed to It. The continued occupation of R. by Fr. prevented the carrying out of this resolution, but the events of the Franco-Ger. war induced that power to withdraw her troops from the city, and on Aug. 19, 1870, the last detachment of the French garrison evacuated R. On Sept. 11 a corps of the It. army entered the pontifical terr. and marched directly upon R., which capitulated to the royal army on Sept. 20, and on July 2 King Victor Emmanuel, accompanied by the great officers of state and the members of the foreign diplomatic corps, made his solemn entry into the new cap. of It. The work of material improvement was immediately commenced and prosecuted with alacrity. The most urgent need was that of suitable buildings for the accommodation of the royal household, the ministries, and other public officers. For the former purpose the Quirinal Palace was selected, while several of the depts. of the national govt. were established in old official buildings of the papal administration, some in suppressed convents fitted up for the reception of different bureaux. The only important new public construction which it has yet been found indispensable to undertake is an office for the ministry of finance, which is now finished on a scale commensurate with the extent of the functions of that dept. In the mean time private enterprise and the municipal administration of the new capital, encouraged and aided by the national govt., have vied with each other in the material improvement and embellishment of the city. But public authority and private patriotism have not confined themselves to mere material improvements. The univ. has been reorganized on a wise and liberal basis; the number of schools has been vastly augmented; numerous insts. for the increase and diffusion of knowledge in all its branches have been opened, and it may fairly be said that few cities now surpass emancipated R. in opportunities for the acquirement of the widest and soundest culture. The pop. of R. in 1881 was 300,467.

The modern city occupies the same site as the anc., on both sides of the Tiber, 14 m. from its entrance into the Mediterranean. It is surrounded by a wall 12 m. in length, constructed of brick, 50 ft. high on the outside, generally less than 30 ft. on the inside, surmounted with 300 towers and pierced by 12 gates, several having been walled up; but by far the largest part of the area inclosed by this wall is covered with gardens, vineyards, and ruins. The Tiber traverses the city from N. to S., and is spanned by 5 bridges. By the river the city is divided into 2 unequal parts. The smaller and more modern part, situated on the right bank, consists of a N. and S. portion. The former contains the Vatican Palace, the ch. of St. Peter, and the castle of Sant' Angelo. The S. portion, Trastevere, occupies the anc. Mons Janiculus. The most remarkable points here are the ch. of St. Pietro in Montorio, erected in 1500, and the magnificent fountain Acqua Paola, built in 1611. These 2 portions of the W. part of the city are connected by the Via della Lungara,  $\frac{3}{4}$  m. long, containing the Villa Farnesina, built in 1506.

The larger E. part of the city, situated on the left bank of the Tiber, occupies the far-famed 7 hills. Farthest to the N., near the Porta del Popolo, rises Monte Pincio, 175 ft. Separated from Monte Pincio by the Piazza Barberini extends the Esquiline Hill in a long curve, forming 3 buttresses toward the plain—the Quirinal, 157 ft., the Viminal, 170 ft., and the Esquiline proper, 188 ft. Farther to the S. rises the Caelias, 160 ft., and between this and the river the Aventine, 155 ft. In the S. part of the plain, between this range of hills and the Tiber, rise, insulated, 2 other hills—the Palatine, 170 ft., and the Capitoline, 161 ft. These dists. are covered with the grandest ruins, and the Capitoline Hill forms the boundary-line between anc. and modern Rome. It contains the ch. of Santa Maria in Araceli, erected before the 10th century; the Piazza del Campidoglio, begun in 1596; the Palace of the Senators, erected by Boniface IX.; the Palace of the Conservatory, and the Capitoline Museum. From the Capitoline, toward the Palatine, extends the anc. Forum Romanum. The Palatine contains the ruins of the anc. imperial palaces. Between the Palatine and the Aven-



tine lay the Circus Maximus; to the S. E. of the Aventine the Baths of Caracalla. In the depression between the Palatine Esquiline, and Caelius stands the Coliseum. The Thermæ Antoniniane were begun by Caracalla in 212, extended by Heliogabalus, and finished by Alexander Severus. Between the Caelius and the Esquiline stand the ch. of San Giovanni in Laterano and the Museum Gregorianum Lateranense; and beyond the S. slope of the Esquiline are the ch. of Santa Maria Maggiore, also called the Basilica Liberiana, erected 352-366, and restored in 1575; the Palazzo Rospigliosi, founded in 1603; the Palazzo Apostolico al Quirinale; the Palazzo Barberini; the Villa Albani, built in 1760; the railway depot, and the Porta Pia. Through the Porta Pia the It. army entered Rome Sept. 20, 1870.

The modern city, occupying the space between the river and the hills, is by the Corso divided into 2 parts, of which that situated between the Corso and the hills is elegant and mostly inhabited by foreigners visiting R., while that situated between the Corso and the Tiber forms a bewildering maze of narrow and crooked streets and alleys inhabited by the lower classes. The Corso is the finest and gayest street of the city. Among the many elegant buildings which line it on both sides are the Palazzo Doria, the Palazzo Colonna, and the Palazzo di Venezia. The portion of the city situated between the river and the Corso, although mostly inhabited by the lower classes, contains, nevertheless, many admirable monuments, among which are the Mausoleum of Augustus, the Palazzo Borghese, and the ch. of Santa Maria Rotonda, or the Pantheon. Here is also the Palazzo Farnese.

The commerce and industry of R. are not very important. Woolens, silks, and velvets, leather, glass, mosaics, jewelry, and articles connected with the fine arts, hats, gloves, stockings, and artificial flowers are manufactured but not on an extensive scale; progress has been made, however, in this respect since the city came under the It. govt.

F. A. P. BARNARD.

**Rome**, city and R. R. junc., cap. of Floyd co., Ga., on Coosa River. Pop. 1870, 2748; 1880, 3877.

**Rome**, city and R. R. centre, Oneida co., N. Y., at junction of Erie and Black River canals, and on Mohawk River, which furnishes water-power, 110 m. W. of Albany; contains the Central N. Y. Inst. for deaf mutes, and is a great centre of the dairy interest. The city is built upon a level plot of ground at the head of Mohawk Valley, at the former site of old Ft. Stanwix. Pop. 1870, 11,000; 1880, 12,194.

**Römer**, on R. R., Macomb co., Mich. Pop. 1880, 1629.  
**Rømer** (OLE), b. at Aarhus, Jutland, Sept. 25, 1644, studied math. and astron. at the Univ. of Copenhagen; was invited to Paris in 1672; appointed teacher in math. to the dauphin, and made a member of the Acad. of Sciences; invented the transit instrument, and determined the velocity of light by observations of the eclipses of the satellites of Jupiter; was appointed prof. of math. and astron. at the Univ. of Copenhagen in 1681. D. in 1710.

**Romeyn**, to'min (JOHN BROADHEAD), D. D., b. at Marbletown, N. Y., Nov. 8, 1778, grad. at Columbia Coll. 1795; was pastor of Dut. Reformed chs. at Rhinebeck (1799-1800) and Schenectady (1800-04), of the Presb. ch. at Albany, N. Y., 1804-08, and from 1808 to his death, of the ch. in Cedar st., New York. D. Feb. 22, 1825.

**Romany (Gypsy) Language**. Great interest has of late yrs. been taken in the Romany lang., as gypsies themselves call their tongue, owing (1) to the extraordinary number of curious words, both anc. and modern, from different langs., which abound in it; (2) because it is possible that even if it be in the main a new Indian tongue formed with Urduo, its germ may still have existed originally as an obscure but very anc. Aryan lang.; (3) because, while the origin of every word in R. is known, and with it the gram. of the langs. from which it comes, that of the R. gram. itself is as yet a mystery, nor is it ascertained whether it was formed in India previous to the great migration between the tenth and thirteenth centuries, or during the early travels of the race. Thirteen dialects have been given as characteristic of the prin. European tribes, but several of these are so corrupt that those speaking them would not comprehend the others, although a great number of isolated words are common to them. With little effort or practice Tur., Hungarian, and Ger. gypsies could talk together, and the few Romanies in Eng. who have still preserved the gram. of their tongue could join them in mutual intelligence. But the majority of Eng. gypsies, with all the Sp. and their Scandinavian and Egyptian brothers, would find themselves no nearer than a Spaniard and an Italian.

There is as yet wanting a gram. which shall reduce R. to its original simple elements. Pott and Ascoli have collected the material and cleared it, but no one has distinctly set forth in paradigms this curious tongue, which with the simplest elements is capable of as much expression as Eng. All R. dialects are extremely corrupt, and even in Tur. and Romania it has been almost impossible to determine their gram., simple as it is. In Ger. the lang. is spoken with very little admixture of Ger. words, and with a great exercise of ingenuity Eng. gypsies often contrive to do this. No lang. in the world is so easy as R.; most persons can learn it in 3 months, and when learned it is of incredible assistance in acquiring Hindostani and Per.

**Romney** (GEORGE), b. at Furness, Lancashire, Eng., Dec. 15, 1734; displayed such genius in drawing likenesses that he was apprenticed to a portrait-painter at Kendal; acquired a simple and natural style of portraiture, which procured him favor among the gentry of the North; set out for Lond. 1762; obtained a prize of 50 guineas from the Society of Arts for a picture of the *Death of Wolfe* (1763), and a yr. or two later a similar premium for his *Death of King Edmund*; began his metropolitan career by painting heads for 4 guineas; met with rapid success, and soon raised his price; was efficiently patronized by the duke of Richmond

and many of the nobility, becoming a formidable rival to Sir Joshua Reynolds; attained a professional income of £4000 per annum; painted a number of striking scenes from Shakespeare's plays; at a later period devoted his best energies to a fine series of works of fancy, among which the best were *Millon and his Daughters* and *Newton making Experiments with the Prism*. He obtained from Rome, through Flaxman, a magnificent collection of casts from antique statuary; built a house and gallery at Hampstead after his own plans, and settled there 1797. D. Nov. 5, 1802.

**Romulus**, in Rom. mythology, the founder of the city of Rome, was the twin-brother of Remus and a son of Mars by Rhea Silvia, a priestess of Vesta. Her father, Numitor, king of Alba Longa, was dethroned by his brother, Amulius, and her 2 sons were thrown into the Tiber by the order of her uncle. But the river landed them safely at the foot of the Palatine Hill; a she-wolf carried them to her den and suckled them, and a shepherd afterward found them and ed. them together with his own children. The legend goes on narrating how the 2 brethren determined to build a city on the Palatine Hill; how Romulus killed Remus, built the city, procured wives for the citizens, established all the fundamental insts. of the Rom. state, and finally was removed to Olympus, where he took a seat among the gods as the god Quirinus.

**Roncesvalles**, ron-se-vahl'les [Fr. *Roncesvaux*], a small Sp. v., prov. of Navarre, in a narrow valley inclosed by lofty mts., through which one of the prin. roads leads from Fr. across the Pyrenees into Sp. Here Charlemagne was attacked in 778 by the Basques, and his whole rear-guard destroyed. In the modern Fr.-Sp. wars several bloody encounters (1703, 1794, and 1813) occurred in the same valley, and in 1833 Don Carlos was first proclaimed king here.

**Rondout**, ron-dow't, R. R. junc., Ulster co., N. Y., on Rondout Creek, 1 m. above its confluence with Hudson River, is the E. terminus of Del. and Hudson Canal, by which it receives immense quantities of coal from the anthracite region of Pa. Pop. 1870, 10,114. Since 1872 it has formed the central portion of the city of Kingston.

**Ronsard**, de (PIERRE), b. at the château de la Poissonnière, Vendôme, Fr., Sept. 11, 1524, was ed. at the Fr. court as page to the duke of Orleans; lived for nearly 3 yrs. at the court of James V. of Scot. (1538-41), but having become almost entirely deaf, he retired to Fr. to the Collège de Coqueret. Among his companions here were Baif, Remi Belleau, Muret, Jodelle, and Du Bellay, and among them sprang up that new literary ideal whose first representative R. became, and which for centuries reigned not only in the Fr., but in all European lts. It broke at once and absolutely with the romantic ideals of the Middle Ages, and substituted the classical models of the Gr. and Lat. lts. R. was not a prolific writer himself. In 1550 appeared his *Amours* and *Quatre Livres d'Odes*, in 1555 his *Hymnes*, in 1572 the 4 first books of his grand epic, *La Franciade*. But his influence was decisive, and the enthusiasm he awakened extraordinary. D. Dec. 27, 1555.

**Rood** (ODDEN N.), LL.D., b. Feb. 3, 1831, in Danbury, Conn., grad. at Princeton 1852; studied at Sheffield Scientific School of Yale Coll. and in the univs. of Munich and Berlin; was elected prof. of physics and chem. in Troy Univ. 1858; prof. of physics in Columbia Coll., New York, 1863; member of the National Acad. of Sciences 1864; v.-p. of the Amer. Association for the Advancement of Science 1868; has contributed largely to scientific journals. His original investigations embrace many interesting questions in mechanics, optics, acoustics, and electricity.

**Roodhouse**, III. See APPENDIX.  
**Rook** [A.-S. *hrōc*, (*Corvus frugilegus*)], a species of the family Corvidæ closely related to the common crow, which it also resembles nearly in size as well as black color. It lives in considerable communities, and their nesting and gathering places are known as rookeries; these sometimes are very populous, occasionally containing as many as 2000 to 3000 nests. In Eng. by many they are considered as an attractive feature in the landscape, and are protected. It is capable of mimicking the sounds of other animals.

**Rooke** (Sir GEORGE), b. near Canterbury, Eng., in 1650; became post-capt. in the navy 1680, and vice-admiral 1692; headed a daring and successful night-attack in boats upon the Fr. squadron off Cape Lattogue, burning 13 Fr. vessels, May 19, 1692; entered Parl. 1697; was appointed commander-in-chief of the navy at the commencement of the war of succession in Sp. 1702; destroyed the Sp. "plate fleet" of 17 vessels in the harbor of Vigo 1702; participated in the capture of Gibraltar Aug. 3, 1704; was dismissed the service Feb. 1705. D. near Canterbury Jan. 24, 1709.

**Roon, von** (ALBRECHT THEODOR EMIL), COUNT, b. Apr. 30, 1803, entered the Prussian army in 1821. In 1842 he was made a major, and subsequently took charge of the military instruction of Prince Frederick Charles. During the campaign in Baden he was chief of the staff of the 8th army corps; was made a col. in 1851, commander-in-chief of the 20th brigade of inf. in 1856, and commander-in-chief of the 14th division at Düsseldorf in 1858. On Dec. 3, 1859, the prince-regent called him to take charge of the ministry of war, and (Apr. 16, 1861) also of the ministry of the marine. After the war of 1866 he received the cross of the Black Eagle and a donation, and after the war with Fr. (1870-71) he was made a count and received a new donation. The office of minister of the marine he resigned Dec. 31, 1871. Dec. 21, 1872, he was made pres. of the cabinet, and a few days afterward field-marshal; resigned in 1873. D. Feb. 23, 1879.

**Roosevelt** (JAMES I.), LL.D., b. in New York Dec. 14, 1796, grad. at Columbia Coll. 1815; studied law, and practised many yrs.; in 1835 and 1840 was a member of the State many yrs.; in 1835 and 1840 was elected M. C. Declining a re-election, he travelled several yrs., and on his return devoted himself to the care of his large estates, but in 1851 accepted the appointment of judge of the supreme court, which he held 8 yrs. D. Apr. 5, 1875.



**Roosevelt** (ROBERT B.), b. in New York in 1859; studied law, and was engaged in active practice for many yrs., but finally devoted himself to lit., rural sports, and politics, and in 1871 was elected M. C. He is pres. of the N. Y. Sportsmen's Club; one of the State coms. of fisheries; for several yrs. edited the *Citizen*, a journal devoted to lit. and politics; has written *The Game Fish of N. Amer.*, *Lake Superior Fishing*, *The Game Birds of the Coasts and Lakes of the N. States*; member of the N. Y. legislature 1882.

**Roosevelt** (THEODORE). See APPENDIX.

**Root** [allied to Lat. *radix*]. In algebra, a *root* of an equation is any quantity, whether real or imaginary, which being substituted for the unknown quantity will satisfy it; that is, make the 2 members equal.

**Root of a Quantity**, a quantity which, taken a certain number of times as a factor, will produce the given quantity. A R. of a Q. is one of its equal factors. If a quantity is resolved into 2 equal factors, one of these is the *square root*; if into 3 equal factors, one of these is its *cube root*; and so on. Every quantity has 2 square roots, 3 cube roots, 4 fourth roots, and so on. If the quantity is positive, both of its square roots are real; if it is negative, both of its square roots are imaginary. In like manner, if a quantity is positive and the index of its root is even, 2 of the roots will be real and the rest imaginary; but if the quantity is negative and the index even, all of its roots will be imaginary. If a quantity is either positive or negative and the index of its root is odd, one of the roots will be real and have the same sign as the quantity, and all the rest will be imaginary.

**Roots**, the organs of plants, by which absorption from the soil mainly takes place, are outgrowths covered at their tip by a cap of peculiar tissue. From the lower end of the rudimentary stem in the embryo the *primary R.* strikes down. The advancing tip, made up of a cluster of multiplying cells protected by the R-cap, can work its way past obstructions and through interstices in the soil. The parts of the plant above the radicle may give rise to *secondary R.* These in some cases never reach the ground, and are therefore *aerial*. The secondary R. of the banyan swing free in the air for a time, but ultimately reach the soil. R. which strike into the tissues of other plants and therefrom abstract nourishment are *parasitic*. The smaller R., or R.-branches, are in most cases clothed near the tip with elongated cells, or R.-hairs, by means of which liquids are absorbed.

**Rookfort**. See APPENDIX.

**Roric Figures** [Lat. *ros*, "dew"], the name by which are designated the curious images seen upon polished solid surfaces after breathing upon them, and also applied to a class of related phenomena produced under very various conditions, but agreeing in being considered as the effect of either light, heat, or electricity. Dr. John W. Draper of New York called attention to the fact that a R. F. may be preserved intact for an indefinite period, and again brought out by the breath; suggesting that an insensible molecular change had been effected by the first breathing.

**Rosa** (EUPHROSINE PAREPA), b. in Edinburgh, Scot., in 1836, made her debut on the operatic stage at Malta as a soprano singer; appeared with success at Lond. 1857; came to the U. S. 1865, and again 1866-67; obtained great popularity; married the violinist Carl Rosa 1867; organized with her husband an Eng. opera troupe, with which they sang in the prin. cities of the U. S. 1869-73; was at the Khedive's court in Egypt during the winter of 1872-73, and made another tour (1873) in the U. S. D. Jan. 21, 1874.

**Rosa** (SALVATOR), b. at Renella, near Naples, June 20, 1615, was designed for the Ch., but preferred art; studied music; was led to painting by his brother-in-law, who was an artist; became a pupil of Spagnoletto; went to Rome in 1635, and with occasional interruptions resided there. His best pictures are landscapes, which are remarkable for wildness, loneliness, and gloom. He painted swiftly, and his works are numerous. His portrait of himself is in the ch. of S. Maria dei Angeli, at Rome, where he is buried. D. in 1673.

**Rosa/cæ** [from the typical genus, *Rose*; Lat. *rosa*], an important natural order of polypetalous exogenous trees, shrubs, and herbs, comprising over 1000 species, mostly belonging to N. temperate regions. The rose, apple, pear, quince, cherry, plum, peach, apricot, almond, blackberry, raspberry, strawberry, etc. belong here. In gen., the rose family is distinguished by having alternate leaves with stipules, along with regular flowers, generally numerous perigynous stamens and definite seeds without albumen. It divides into marked sub-orders, of which the 3 following are the prin.: (1) Amygdaleæ, or the almond family, with a single simple and free pistil, becoming a stone fruit, such as that of peach, plum, and cherry. (2) R. proper, with dry or berry-like fruits, from numerous or few (seldom single) free pistils, and stipules joined with the petiole. To this belong the small fruits above mentioned, and a great variety of useful and ornamental plants, both herbs and shrubs. (3) Pomæ, the apple family, with 2 or more pistils combined with each other and with a fleshy calyx-tube, which forms the edible fruit. The fruits of the order are all innocent, except that of the cherry-laurel, but the kernels of the stone fruits contain a poisonous principle identical with or analogous to prussic acid, along with a bitter essential oil; and these qualities extend more or less to the bark and foliage. The most active article of the materia medica furnished by this order is from *Hagenia Abyssinica* (or *Brayera anthelmintica*), the koso tree of Abyssinia, the flowers of which are a powerful vermifuge. ASA GRAY.

**Rosa** (SAINT) of Lima, b. at Lima, Peru, in 1586, of wealthy Sp. parents, but they having lost their property she supported them by her labor while living as a recluse in the habit of the third order of St. Dominic. She was canonized in 1671, being the only saint of Amer. birth in the Rom. calendar. D. Aug. 24, 1617.

**Rosa Rio**, city of the Argentine Republic, prov. of Santa Fé, on the W. bank of Paraná River, at E. terminus of Cen-

tral Argentine and Rio Cuarto R. Rs., and chief port of entry for all the interior provs.; is a new city, having acquired nearly all its pop. and importance since the commencement of the R. R. in 1863; is well laid out, paved, lighted with gas, has street-cars, docks, wharves, several hotels, banks, chs., theatres, etc. Pop. about 40,000.

**Rosary** [Lat. *rosarium*, a "garden of roses," probably referring to the Virgin Mary as the mystical rose]. (1) A series of prayers prescribed by the R. Cath. Ch. The Greater R. is a synonym for the whole series, and is made up of 3 lesser R. Each of the 3 lesser R. contains 5 decades or mysteries. (2) The name rosary also designates the chaplet or string of beads used in the repetition of the R. The Pater Nosters are marked by large beads, and the Ave Marias by smaller ones. The beads serve as counters during the recitation. They are also in use among Arabs and Hindoos.

**Rosás, de** (JUAN MANUEL ORTIZ), b. at Buenos Ayres about 1793, was the son of a wealthy landowner; spent his youth among the "Gauchos" of the Pampas, receiving little education, but acquiring great influence by his skill in horsemanship and his daring exploits on the Indian frontier; in 1822 he headed the movement which overthrew Lavalle and the "Unitarian" party, proclaiming "Federal" principles; became gov. and capt.-gen. of Buenos Ayres Dec. 8, 1829; displayed great severity against political opponents; negotiated with the gov. of the interior provs. the establishment of the "Argentine Confederation" Jan. 1831, on the basis of local independence, the direction of foreign affairs being entrusted to the gov. of Buenos Ayres; retired from office Jan. 24, 1833; was again chosen gov. with nearly absolute authority Mar. 7, 1835, and maintained himself in power by successive re-elections for 18 yrs., which period was passed in constant civil and foreign wars, in which he displayed great energy and ability, but stained his name with acts of savage cruelty. Defeated at the great battle of Monte Caseros, near Buenos Ayres, Feb. 3, 1852, R. escaped in disguise on board an Eng. vessel, proceeded to Eng., and with his celebrated daughter, Manuella, resided at Southampton. D. about 1871.

**Roscius**, rosh'-e-us (QUINTUS), a celebrated Rom. comic actor, a contemporary of Cicero. He carried his art to the highest degree of perfection which the Rom. stage ever witnessed. D. 62 B. C.

**Roscommon** (WENTWORTH DILLON), EARL OF, nephew of Wentworth, earl of Strafford, b. in Ire. about 1633; ed. at Caen under Bochart; obtained several offices about the court of Charles II.; married a daughter of the earl of Burleigh; devoted himself to lit. with Dryden, and produced some poems, the best being the *Essay on Translated Verse* and a version of *Dies Iree*. D. Jan. 17, 1684.

**Rose** [Gr. *rhōdōs*; Lat. *rosa*], a genus of flowering plants giving its name to the large and important natural order Rosaceæ, and consisting of shrubs, usually prickly, natives of the N. hemisphere from the Arctic zone to Mex. in the New World, and to Abyssinia and the Indian Peninsula in the Old. The genus is characterized by unequally pinnate leaves with serrate leaflets, or rarely simple leaves, which in one species (*R. berberifolia*, Pall.) are entirely wanting, adnately stipulate petioles, and single or corymbose terminal flowers, with 5 foliaceous sepals imbricated in aestivation, 5 petals readily multiplying under cultivation, indefinite stamens, and numerous one-seeded carpels inclosed in the receptacular calyx-cup, which becomes fleshy when ripe. From the earliest hist. of gardening to the present day the rose has been the most generally cultivated and popular of all flowers. To this fact, and to its tendency to assume new forms under cultivation, must be ascribed the difficulties of classifying or referring to original types the innumerable races and forms of the rose with which gardens abound. A classification dividing garden roses into 2 sets—summer or once-blooming, and autumnal or ever-blooming—although open to several objections, is the most convenient for the horticulturist.

Roses should be cultivated in situations fully exposed to the sun, in deep strong loam well drained and heavily manured. Indeed, too much rich food can hardly be given them to develop their greatest beauties. The soil in which they grow should be constantly stirred and kept free from other plants, and especially from the roots of neighboring trees, while a careful watch must be kept for the many insects which find a favorite food in their leaves and petals. Next to the selection of soil and situation, pruning is the most important operation in the culture of the rose. Strong-growing roses must be pruned slightly, that they may not be stimulated to excessive growth at the expense of the flowers; weak-growing roses must be pruned severely, to encourage more vigorous growth. [From orig. art. in *J. v. Univ. Cyc.*, by C. S. SARGENT.]

**Rose** (GUSTAV), b. at Berlin Mar. 28, 1798, took his degree of Ph. D. at Berlin 1820; studied with Berzelius; was connected with the Univ. of Berlin as an instructor of mineralogy from 1823 till his death; in 1829 visited the Ural Mts. with Humboldt and Ehrenberg. He pub. *Elemente d. Krystallographie*, *Mineralogisch-geognost. Reise nach d. Ural*, *d. Altai u. d. Kaspischen Meere*, etc. D. July 15, 1873.

**Rose** (HEINRICH), brother of Gustav, b. at Berlin Aug. 6, 1795; studied with Berzelius at Stockholm, and took his degree of Ph. D. at Kiel 1821. He devoted his attention chiefly to analytical chem., and contributed more than any other chemist to advance this branch of the science. D. Jan. 20, 1864.

**Rose Aca/cia**, the *Robinia hispida*, a beautiful ornamental shrub, order Leguminosæ, growing wild in mountainous parts of S. States, has large, very showy, inodorous flowers of a deep rose-color in drooping loose racemes.

**Rose-Apples**. See EUGENIA.

**Rose-Bug**, the *Macrodactylus subspinosus*, a very common coleopterous insect of N. Amer., belonging to the family Scarabæidæ. It is a small dusky-yellow beetle, very destructive, not only to the rose, but to other vegetation.

**Roseburgh**, Or. See APPENDIX.



**Rosecrans** (WILLIAM S.), b. in Kingston, O., Sept. 6, 1819, grad. at W. Pt. 1842; assistant prof. of engineering and natural and experimental philos. in the Military Acad. 1843-47; engaged in the construction of fortifications until 1854, when he resigned from the army and established himself in Cin., O., as civil engineer and arch.; was pres. of a coal co. in Va. 1855-57, and engaged in the manufacture of kerosene in Cin. 1857-61. In the early days of the c. war, as volunteer aide to Gen. McClellan, then in command of the dept. of the Ohio, he served in organizing State troops; was appointed col. and chief engineer of O. June 9, and col. 23d O. Volunteers June 10, 1861; commissioned brig.-gen. in the regular army, and in the W. Va. campaign commanded a brigade at Rich Mountain July 11, and July 21 succeeded to command of the dept. of the Ohio, and of the dept. of W. Va. Sept. 1861; appointed maj.-gen. of volunteers Mar. 1862; in May he commanded a division of the Army of the Miss. at the siege of Corinth; succeeding to command of that army in June, he fought the battles of Iuka (Sept. 19) and Corinth (Oct. 3-4); transferred to the command of the Army of the Cumberland Oct. 27, the battle of Murfreesboro' was fought Dec. 31, 1862-Jan. 3, 1863. Advancing on Tullahoma June 24, he occupied Bridgeport and Stevenson July 24; crossed the Cumberland Mts., and Sept. 19-20 fought the battle of Chickamauga, where, defeated and falling back on Chattanooga, he was relieved Oct. 30, 1863; was placed in command of the dept. of the Mo. Jan. 1864; repelled the invasion of Mo. by Price; was mustered out of the volunteer service in 1866; again resigned from the army 1867; was for a short time (1868-69) U. S. minister to Mex., after which he became a resident of San Rafael, Cal.; was in Mex. 1871-73, engaged in an unsuccessful effort to negotiate the construction of a system of narrow-gauge railways. M. C. 1881-85.

**Rose-Mallow.** See **HIBISCUS**.

**Rosemary** [Lat. *ros*, "dew," and *marinus*, "of the sea"], the *Rosmarinus officinalis*, a labiate evergreen shrub of Europe and Asia, having fragrant aromatic leaves which yield a pungent volatile oil, valued as a stimulant med., in perfumery, in hair-dressings, and in liniments. It affords excellent bee-pasture.

**Ro'sen** (FRIEDRICH AUGUST), Ph. D., b. at Hanover, Ger., Sept. 2, 1805, ed. at Göttingen, Leipsic, and Berlin; began in 1824 the study of Sans. with the aid of his father; pub., on the occasion of taking his degree as Ph. D. in 1826, his *Corporis Radiceum Sanscritarum Prolegomena*, expanded in the following yr. into his useful work *Radices Sanscritae*; studied Arabic and Per.; prepared for the press several large episodes of the *Shah Nameh*; appointed prof. of Oriental langs. in the Univ. of Lond.; pub. the Arabic text (with Eng. translation and notes) of Mohammed ben Musa's *Algebra*, and prepared for publication Ibn Khallikan's great *Biographical Dict.* Pub. in the *Journal of Education* able reviews of the philological works of Bopp and Pott; edited Sir Graves Houghton's *Dict., Bengali, Sans., and Eng.*, and 2 vols. of his friend Colebrooke's *Miscellaneous Essays* (1837); contributed advice or material assistance to nearly every important publication on E. hist. or philology during the last 10 yrs. of his life; pub. his *Rig-Veda Specimen* in 1830, and began in 1836 to print the Sans. text with a Lat. translation and explanatory notes. D. Sept. 12, 1837.

**Rose-Noble, or Gold Penny**, an anc. Eng. gold coin, first current in the reign of Edward III., and last coined under Henry V. It bore a rose on one side, and was worth one noble—6s. 8d. sterling.

**Rosenkranz** (JOHANN KARL FRIEDRICH), b. at Magdeburg Apr. 23, 1805; at 19 took up his residence in Berlin, where he studied the doctrines of Schleiermacher, and afterward those of Hegel; completed his univ. course at Halle, receiving the degree Ph. D. in 1828. In 1833 he became prof. of philos. at Königsberg, holding for 46 yrs. the chair held previously by Herbart and by Kant. R. was the best representative of the "centre" of the school of Hegel, and did much valuable work in rearranging and reclassifying the several parts of the system. Wrote *Psychology, or Science of Subjective Mind*; *Aesthetics of the Ugly*, *Hegel as the National Philos. of Ger.*, etc. D. June 1879.

**Rose of Jericho, or Rose of the Virgin**, the *Anastatica Hieracantha* ("Resurrection-flower of Jericho"), a cruciferous herb of the Levant and of Afr. After flowering it dies, the branches incurve, so that the plant assumes a globular form, and, becoming detached from the ground, is blown about by the winds. If it rests at last upon a moist place, it expands hygrometrically and sheds its seeds, which there germinate.

**Rose of Sharon.** See **HIBISCUS**.

**Rose Quartz**, a variety of quartz, sometimes crystallized, and usually translucent or transparent. It is of a pink, rose, or flesh tint, and is often cut as a gem.

**Roses, Star of.** See **ATTAR OF ROSES**.

**Roses, War of the**, the name given to the c. war lasting 30 yrs. (1455-85) between the princes of the rival houses of York and Lancaster, each claiming the throne of Eng. by right of descent from Edward III.

**Rose Tree.** See **RHODODENDRON**.

**Rosetta** [Ar. *Rashed*], a town of Egypt, on the delta of the Nile, on the W. branch of the river. Pop. 16,243.

**Rosetta Stone**, a celebrated inscription found in 1799 at Rosetta by M. Boussard, a Fr. officer of engineers. When complete it was a tablet of black basalt more than 3 ft. 1 inch high, 2 ft. 5 inches wide, and 10 inches thick. This tablet is of a trilingual character, and in its present broken condition has 14 lines of hieroglyphs, 32 of cursive Egyptian, the so called demotic or enchorial writing, and 54 lines of Gr. It appears from the last that it was an act of the priests assembled in synod at Memphis b. c. 196-97 in honor of the King Ptolemy Epiphanes in the 9th yr. of his reign; and after reciting the events of the period proceeds to order that a figure of the king should be placed in the temples; that a shrine should be placed with a gilded figure of wood

of the monarch in the adyta with the other shrines, and be carried in procession on a special festival in honor of the king on the 30th Mesori, his birthday; and above all, that a copy of this synodical act should be engraved on a tablet of hard stone and set up in every temple of the first, second, and third rank throughout the country. About  $\frac{1}{16}$  of the hieroglyphic portion, and almost the whole of the demotic and Gr. inscriptions, have been preserved. The stone was presented by George III. to the Brit. Museum. [From orig. art. in *J. de l'Univ. Cyc.* by S. Birch, LL.D.]

**Rose-wood.** (1) The beautiful and fragrant wood of several leguminous Brazilian trees of the genera *Machaerium* and *Triploloma*. (2) The wood of *Induriga latifolia*, an E. I. leguminous tree. (3) Canary Island R., the fragrant woody root of *Rhododhiza scoparia* and *florida*. From it is obtained the oil of rhodium. (4) Burmese and Afr. R. are the timber of species of *Pterocarpus*, leguminous trees.

**Ros'in** [Lat. *resina*], or **Colophony**, the residue which is obtained by distilling off the water and volatile oil from the crude turpentine from pine trees. The yield is from 70 to 90 per cent. of the whole. (See **TURPENTINE**.) It is largely manufactured, together with oil of turpentine, at Wilmington, Newberne, and Beaufort, N. C. When entirely freed from water it is translucent. The color depends upon the purity of the original turpentine and the care taken to distill at a low temperature. R. is composed chiefly of abietic acid with a small quantity of some other acid. Colophony is pale yellow and transparent ("virgin rosin"), or brownish-yellow and translucent, according to the care taken in its preparation. It has a peculiar lustre, called *resinous*, is brittle when cold, and breaks with a conchoidal fracture; sp. gr. 1.07 to 1.08. It is insoluble in water, soluble in alcohol, ether, wood-spirit, and in fixed and volatile oils; partially soluble in petroleum. Nitric acid dissolves it, forming chiefly isophthalic acid, together with trimellitic acid and a resinous acid. It dissolves in caustic alkalies and alkaline carbonates. Colophony softens at 160° F., and melts at 275° F. At higher temperatures it gives off volatile oils, acquiring a dark color. Colophony is extensively used in making varnishes and cements, in the calking of ships, in the preparation of plasters and ointments, and as a reducing agent in the soldering of metals. Large quantities are consumed in the manufacture of yellow soap. A well-known use of it is for covering the bows of violins to prevent the bow from slipping over the strings without producing vibration. C. F. CHANDLER.

**Rosolic Acid, Coralline, Pseudo-Coralline, or Aurine.** These names have been applied to red coloring-matters which have been supposed to be identical, but have been recently shown to be distinct. R. A. was obtained by Runge in 1834 from coal-tar naphtha. Previously boiled with water, it appears as a dark greenish, amorphous substance, with the greenish metallic lustre of cantharides. Its powder is red, and assumes a bright gold-like lustre when rubbed or pressed with a hard body. Thin films are orange-red by transmitted, and metallic by reflected light. When precipitated from alcohol by water, it is a bright-red powder. At 170° F. it cakes together, and in boiling water melts. It is not volatile; dissolves readily in alcohol, ether, wood-naphtha, phenol, creosote, concentrated acetic, hydrochloric, and sulphuric acids. From all of these solvents, which are miscible with water, it is precipitated unchanged when it is added. It is insoluble in chloroform, benzol, bisulphide of carbon, essential and fixed oils. It is not decolorized by sulphurous acid. Its acid properties are very feeble; it is even weaker than carbonic acid.

**Coralline** was first prepared by Persoz in 1859, by treating 3 parts of phenol, 2 of oxalic acid, and 2 of sulphuric acid for several hours. The mass effervesces, becomes thick, and acquires a deep-red color. The process is terminated when a drop of the mixture is found to dissolve in dilute ammonia with a deep-red color. The mixture is then poured into hot water. A resinous mass, with the lustre of cantharides, separates. The whole is boiled till the unchanged phenol is expelled. On cooling, orange-red flocks separate from the liquid; these with the resinous mass are separated and washed.

**Red Coralline, Paeonine, or Paeonine** (J. Persoz, 1859), is obtained by heating 9 parts of crude coralline with 23 parts of concentrated ammonia to 270° F. for 3 hours in a strong iron vessel. A thick solution with a golden-crimson reflection is obtained, from which acids precipitate the new dye as a deep-red powder, the composition of which is not determined. It is probably an amide or imide of coralline. It is almost insoluble in water, soluble in alcohol (red), and in alkalies (red, turning brown in the air).

**Aurine, or Phenyl Blue.**—This compound, the first blue, was prepared by heating 5 parts of paeonine and 8 parts of aniline for several hours at 350° F. The product appears as a violet powder with a golden iridescence, is insoluble in water, soluble in alcohol.

**Aurine, or Yellow Coralline**, is prepared by heating phenol (commercial), oxalic acid, and sulphuric acid for a long time at 280° F. The product is poured into water, the unchanged phenol distilled off by a current of steam, the aurine dissolved in caustic soda, and reprecipitated. It constitutes a brittle, resinous body, with a beetle-green lustre, and yields a red powder. It may be purified by adding alcoholic ammonia to a cold concentrated alcoholic solution of crude aurine. A crystalline compound of aurine with ammonia separates out. This is washed with alcohol and dried, when it appears as a dark-red crystalline powder with a bluish lustre. It loses its ammonia completely on long exposure to the air. By boiling it with dilute acetic acid is obtained as a brownish-red crystalline powder with a green lustre. It must be purified by repeated crystallization from strong acetic acid. Pure aurine does not melt at 488° F.; the crystals assume a darker color, which disappears on cooling, with no apparent change in the substance. At a higher temperature aurine melts, emits an odor of phenol, and



solidifies on cooling to an amorphous bottle-green mass. It dissolves in alkalis with a magenta-red color, and is precipitated by acids as a crystalline powder. With the aid of aniline red, aurine yields good scarlets. A blue color may be obtained from aurine similar to azuline. When aurine is gently boiled with aniline and a little acetic acid, the solution soon assumes a pure blue color.

**Pseudo-Coraline** is prepared by dissolving aniline red in hydrochloric acid, so as to have 3 equivalents of hydrochloric acid for 1 of the base. It melts at about 316° F. When boiled with aniline and a little benzoic acid, it forms a splendid and very permanent blue dye. C. F. CHANDLER.

**ROSS (ALEXANDER)**, b. in the parish of Kincardine-O'Neil, Aberdeenshire, Scot., Apr. 13, 1699, grad. at Marischal Coll., Aberdeen, about 1716; engaged in teaching, and became in 1732 parish schoolmaster at Lochlee, Forfarshire (or Angus), which humble occupation he followed more than 50 yrs. until his death at that place May 20, 1784. He wrote verses from his childhood, but was 69 yrs. of age when he pub. *Helenore, or the Fortunate Shepherdess, a Pastoral Tale in the Scot. Dialect, to which are added a few Songs by the Author*.

**ROSS (ALEXANDER)**, b. in Scot. in 1742, entered the Brit. army as ensign of the 50th Foot Feb. 1760; came to Amer. as capt. May 1775; was engaged in the prin. battles of the Revolutionary war; became brevet major 1781; was aide-de-camp to Lord Cornwallis and com. on his part to arrange the details of the surrender at Yorktown; became gov. of Ft. George, Madras, and was distinguished in all the campaigns of Lord Cornwallis to whom he was closely attached, and became gen. Jan. 1, 1812. D. Nov. 29, 1827.

**ROSS (ALEXANDER MILYON)**, M. D., b. at Belleville, Ont., Dec. 13, 1893; made an entomological collection of 10,000 species and a botanical one of similar extent; author of *Birds of Canada* and *Butterflies and Moths of Canada*.

**ROSS (GEORGE)**, b. at New Castle, Del., in 1730; settled at Lancaster, Pa., as a lawyer 1751; sat in the Pa. assembly 1768-76; was elected a member of the first Continental Cong. 1774; signed the Dec. of Ind.; resigned his seat Jan. 1, 1777; was afterward com. to treat with the Indian tribes, and judge of the court of admiralty. D. July 1779.

**ROSS (JAMES)**, b. in York co., Pa., July 12, 1762, was admitted to the bar in Phila. 1784; was prominent in the State constitutional convention of 1790 as a defender of the lately formed national const. and a leader of the Federalists; U. S. Senator 1794-1803, and a com. from Cong. to negotiate with the whiskey insurgents. D. Nov. 27, 1847.

**ROSS (Sir JAMES CLARK)**, b. in Lond. Apr. 15, 1800, nephew of Sir John; entered the navy in 1812, and accompanied his uncle on his first voyage in search of a N. W. passage, and was also with Capt. Parry (1819-27) in the latter's several expeditions having the same object in view; in 1829 again sailed with his uncle as second in command, and was absent 4 yrs., during which time he discovered a spot which he believed to be the N. magnetic pole; in Sept. 1839 sailed for the Antarctic seas for the purposes of magnetic and meteorological observations and investigations, reaching lat. 78° 10' S. A volcano was discovered in lat. 77° 39' S., 12,000 ft. in height, which was named Mt. Erebus, beside which much valuable knowledge was gained of that region. Wrote *A Narrative of a Voyage in the Antarctic Regions*. D. Apr. 30, 1862.

**ROSS (Sir JOHN)**, K. C. B., b. at Balsarroch, Wigtonshire, Scot., June 24, 1777, entered the navy in 1796; in 1806 was wounded 4 times under the batteries of Bilbao; rendered valuable services in the war of 1812-15, and Apr. 25, 1818, sailed from Lond. "to ascertain the existence or non-existence of a N. W. passage," returning in Nov. 1818; in May 1829 again sailed, but in Sept. 1830 became ice-bound in the Gulf of Boothia, making but little subsequent advance, and May 29, 1832, the steamer was abandoned. In Aug. 1833 the party was rescued by the Isabella, formerly commanded by Ross, but then engaged in the whaling business. In 1850 departed, in command of the Felix, 90 tons, in search of Sir John Franklin, returning the following yr.; in July 1851 attained the rank of rear-admiral. Wrote *A Voyage of Discovery, made under the Orders of the Admiralty for the purpose of exploring Baffin's Bay, and inquiring into the probability of a N. W. Passage, and Narrative of a Second Voyage, including the Reports of Commander James Clark Ross, and the Discovery of the N. Magnetic Pole*. D. Aug. 30, 1856.

**ROSS (JOHN)**, a Cherokee chief, b. in Ga. about 1790, was a half-breed; received a good Eng. education; became prin. chief of his tribe 1828; successfully conducted an appeal to the U. S. supreme court upon the validity of Cherokee land-titles in Ga. as against the govt. of that State; protested against the treaty of New Echota 1835, but was compelled to remove to the Ind. Terr., and was a reluctant ally of the Confed. States during the c. war. D. Aug. 1, 1866.

**ROSS (Sir WILLIAM CHARLES)**, R. A., b. in Lond., Eng., June 3, 1794, received an early artistic training; in 1817 became an assistant to Andrew Robertson, an eminent miniature-painter, and ultimately stood at the head of that profession; was appointed miniature-painter to Queen Victoria on her accession to the throne 1837; was patronized by all the court circle, and occasionally executed historical and imaginative pieces, having obtained a premium of £100 in the great "cartoon competition" for his *Angel Raphael discoursing with Adam*. D. Jan. 20, 1860.

**ROSSBACH**, v. of Prus., where Frederick the Great defeated the allied Fr. and Aus. armies, Nov. 5, 1757.

**ROSSE (WILLIAM PARSONS)**, THIRD EARL OF, b. at York June 17, 1800, studied first at Trinity Coll., Dublin, and then at Magdalen Coll., Ox., where he grad. in 1822. From an early age he studied astron. and optics with great interest, and concentrated his attention more especially on the improvement of the telescope. For several yrs. he was engaged in experiments referring to the construction of fluid lenses; succeeded at last in constructing a speculum of a reflecting telescope in which the spherical aberration and

the absorption of light were reduced to a minimum. In 1842 a monster telescope was successfully constructed on his plan, and mounted at his residence near Parsonstown, and in 1845 no less than 40 nebulae were reduced by this powerful instrument into groups of stars. D. Nov. 1, 1867.

**Rossetti** (DANTE GABRIEL), b. in Lond., Eng., in 1828, ed. at King's Coll., Lond.; early manifested an inclination to art, of which he became an earnest student; was led to found what is known as the "Pre-Raphaelite" school of painting, of which his *Girlhood of the Virgin* (1849) was one of the earliest specimens; has become widely known through his designs for illustrated works, beginning with Tennyson's poems (1848), and has won approval as a poet by his *Early L. Poets* (1861), *Dante and his Circle* (1874), and a vol. of *Poems* (1870). D. Apr. 11, 1882.

**ROSSI** (GIOVANNI B. DE). See APPENDIX.

**ROSSI** (PELLEGRINO). See APPENDIX.

**Rossini**, ROS-see'ne (GIOACCHINO), b. at Pesaro, It., Feb. 29, 1792. In 1807 he became a pupil in the musical school of Bologna, studying counterpoint under the Abbate Mattel, and in 1810 he produced his first opera, *La Cambiale di Matrimonia*; in 1813 his *Tancredi* excited an immense enthusiasm. In 1815 he went to Naples as director of the opera, and here he composed, among other operas, *Elizabetta, Uello, La Gazza Ladra, La Donna del Lago*, and *Admiral*. But his most celebrated production of this period is *Il Barbiere di Siviglia*, the masterpiece of the whole genre of opera buffa. In 1823 he went to Lond., and next yr. to Paris, where he was made successively director of the It. opera, inspector-gen. of song in Fr. and first composer to the grand opera. In 1828 he produced *Count Ory*, and shortly after *William Tell*; his success was astonishing. A few days after the performance of the last work he left Paris and retired to his villa near Bologna. In 1847 he removed to Florence, in 1856 to Paris, where he d. Nov. 13, 1868. In his last 40 yrs. he pub. only a *Stabat Mater* and a *Meese solenne*.

**Ros'siter** (THOMAS P.), b. at New Haven, Conn., Sept. 29, 1818, studied painting, devoting himself chiefly to portraits; sailed for Europe June 1840; studied a few months in Lond., travelled through Eng. and Scot., spent a yr. at Paris copying pictures at the Louvre and studying in the life-schools; went to It. in the autumn of 1841; took a studio in Rome, and passed there 5 consecutive winters, spending his summers at Florence, Venice, Naples, etc. Returning to Amer. in 1846, he established himself in New York, painting portraits occasionally, but chiefly occupied with historical and scriptural pieces; again made a European tour 1853, and in Dec. of that yr. opened a studio at Paris, where he remained 3 yrs., taking a gold medal in the Exposition of 1855; returned to the U. S. 1856; resided in New York until 1860, when he removed to Cold Spring, Hudson Highlands. He became an associate of the National Acad. of Design 1840, and academician 1849. His last yrs. were devoted to a series of compositions representing the life of Christ. D. May 17, 1871.

**Rost** (REINHOLD), PH. D., b. at Eisenberg, Ger., Feb. 2, 1822, grad. in 1847 at Jena, where he devoted himself to theol. and Oriental langs.; went to Eng. 1847; was appointed Oriental lecturer in St. Augustine's Coll., Canterbury, 1850, and prof. there 1852, giving lessons in 10 Oriental langs.; became sec. to the Royal Asiatic Society 1863, and succeeded Dr. Fitz-Edward Hall as librarian to the India office June 1869. He prepared a descriptive catalogue of the palm-leaf MSS. in the Imperial Library of St. Petersburg 1852; edited Wilson's *Essays on the Religion of the Hindus and on Sans. Lit.*, and Elliot's posthumous *Memoirs on the Hist., Philology, and Ethnic Distribution of the Races of the N. W. Procs. of India*.

**Rost** (VALENTINE C. F.), b. at Friedrichsroda, near Gotha, Oct. 16, 1790; appointed instructor in 1814 in the gymnasium of Gotha, and director 1842; pub. a Gr. gram. and a Gr.-Ger. lexicon; began a comprehensive lexicon of classical Gr., of which only the first part appeared, a smaller Gr.-Gr. lexicon; edited Duncan's Damm's lexicon to Homer and Pindar; engaged with Fr. Jacobs, in the *Bibliotheca Græca*, a series of Gr. classics; with Palm and Kreussler prepared an enlarged edition of Passow's Gr. lexicon. D. Aug. 6, 1862.

**Ros'tock**, town of N. Ger., in Mecklenburg-Schwerin, on the Warnow, 9 m. from its mouth in the Baltic. It has a univ., founded in 1419, and many other good educational insts.; manufactures of linen, leather, and tobacco, and a lively trade. Pop. 36,982.

**Rostoptchin**, ROS-top-cheen' (FERDINAND), b. in the govt. of Orel, Rus., about 1765, was ed. at the court as a page of Catharine II.; became minister of foreign affairs under Paul I., and was gov.-gen. of Moscow in 1812, when Nap. approached the city. Wrote *La Verité sur l'Incendie de Moscou*. D. Feb. 12, 1826.

**Rotation** [Lat. *rotare*], in mechanics, motion of a solid body about an axis—i. e. some geometrical conceived straight line within or without its mass, but which, for the instant at least, is in the relation to the body as an axle to the wheel. Angular velocity (of R.) is measured by the length of arc described in a unit of time by a point at unit's distance from the axis. All motion of a solid body may be resolved into motion of translation (which may be along rectilinear or curved paths) and motion of R.; and any point of its mass may be taken as the centre to which R. is referred, and whose own motion in space is the exponent of the translatory motion. In gen., the centre of inertia (or gravity) is taken as the centre of reference. Taking a carriage-wheel as example, its entire motion is made up of the translation along the road (which is that of its axle, and this, we know, follows all the ups and downs and crooks of the road itself) and relative R. about this axle. If we scrutinize, however, the wheel's motion more closely, we shall recognize that there is at each instant one single element of the wheel which is motionless—i. e. the linear element which touches the ground. For the instant the entire motion of the wheel consists in R. about this line, which constitutes its in-



*instantaneous axis* of R. Should the road make a bend, the shifting of the instantaneous axis involves change of *direction* too. The above may give an idea of what, in mechanics, is meant by the phrase *instantaneous axis*. In gen., the motions of whatever character of any solid body are susceptible of like resolution as those presented by the simple case of the wheel, which may either be resolved into a relative R. and a *translation*, or into R. alone about shifting *instantaneous axes*. J. G. BARNARD.

**Roth/ermel** (PETER F.), b. in Luzerne co., Pa., July 8, 1817, of Ger. extraction; was ed. for the profession of land-surveyor; opened a studio as a portrait-painter, but soon adopted historical painting; visited Europe in 1836-37. Painted *De Soto discovering the Miss.* R. belongs to the class of "sensational" artists.

**Rothsay** (DAVID STEWART), DUKE OF. See STEWART.

**Rothschild**, ros'child; Ger. röt'shilt (MEYER ANSELM), b. at Frankfurt-on-the-Main 1743; was placed in a counting-house at Hanover; returned to Frankfurt and started in business as a banker and broker; was intrusted with the money affairs of William Landgrave, afterward elector of Hesse. D. in Sept. 1812, leaving a large fortune to his 5 sons, Anselm, Solomon, Nathan, Charles, and James, who established themselves respectively in Frankfurt, Vienna, London, Naples, and Paris.—The third son, NATHAN, b. Sept. 16, 1777, went to Lond. in 1800; became the leader of the house, being consulted by his brothers on all matters involving financial speculation or investment; introduced the business of negotiating foreign loans in Eng. An act of denization was passed in his favor in Eng. in 1821, and in 1823 Aus. conv. on him the title of baron.—LIONEL NATHAN (b. Nov. 22, 1808) succeeded to the title July 28, 1836; was repeatedly elected to Parl., but not admitted until the "act for removing the disabilities of the Jews" was passed in 1858, when he took his seat. D. June 3, 1879.

**Rotif'era** (Lat. rota, "wheel," and ferre, "to carry"), a class of highly organized infusorial animals of the articulate type, distinguished by ciliated appendages at the anterior part of the body, which seem to move in a rapid rotary manner. They are commonly termed "wheel animals."

**Rot'teck, von** (KARL), b. at Freiburg, Baden, July 18, 1775; studied law, afterward hist.; travelled much; was appointed prof. of hist. at the univ. of his native city; took part in the opposition against the political reaction which set in after 1815, and received his share of persecution. D. Nov. 26, 1840. Wrote *Allgemeine Geschichte* and *Allgemeine Weltgeschichte*.

**Rot'ten Stone**, a fine earth or softened aluminous stone, much employed in polishing glass and metals. True R. S. comes from Wales and Bakewell, Derbyshire.

**Rot'terdam**, the second commercial town in Hol., on the right bank of the Maas, about 14 m. from the N. Sea and 36 m. S. W. of Amsterdam. The city is intersected by numerous canals (*grachten* or *havens*), and is traversed by the Rote, a small stream, at the junction of which with the Maas there is a large dike or dam, whence the name Rotterdam. Along the dike, which opposite the town is 30 to 40 ft. deep, is a fine quay 1¼ m. long, called the *Boompjes* ("Little Trees"), from a line of elms planted in 1615, now grown to a large size. R. is the entrepot of a large cattle-trade with Eng. and the point of departure of numerous lines of steamships, and beside an extensive commerce has important manufactures. Pop. 152,572.

**Rou'ble, or Ru'ble** [Rus. rubl. rublyn, "cut off," because it was originally cut from a silver bar], the prin. Rus. silver coin and money of account, now worth 73.4 cents U. S. money. The R. is equal to 100 kopecks. It was first struck in 1654 at Moscow.

**Roudaire** (FRANÇOIS E.). See APPENDIX.

**Rouen**, roo'en; Fr. wron [anc. *Rotomagus*], city of Fr., the anc. cap. of Normandy, at present the cap. of the dept. of Seine Inférieure, on the right bank of the Seine, 67 m. N. W. of Paris. The quays and the boulevards are new and elegant; the central part of the city is old and more interesting than beautiful. Of the many remarkable public buildings the most noticeable are the cathedral, built by Philip Augustus (1200-20); the ch. of St. Ouen, built in the 14th century; the Palais de Justice, of the 15th century, etc. In the Place de la Pucelle stands a statue of the maid of Orléans, who was burned here in 1431. The city has numerous educational and benevolent insts., and it is one of the most important manufacturing centres of Fr. The prin. manufactured articles are cotton and cotton velvet, mixed silk and woollen fabrics, flannels, blankets, and hosiery, chemicals, paper, etc. Its commerce is also very extensive; the river forms an excellent harbor. Pop. 104,902.

**Rouge**, roozh [Fr. "red"], a powder used for adding an artificial bloom to the complexion. R. is finely powdered talc, colored with safflower by an elaborate process. It is quite harmless to the skin.—ROUGE is also a name given to fine and carefully prepared peroxide of iron, used by jewelers, glass-workers, and others as a polishing-powder, and sometimes also as a pigment.

**Rougemont**, roozh-mong', de (FRÉDÉRIC CONSTANT), b. in the canton of Neuchâtel, Switz., July 28, 1808, ed. at Neuchâtel, Berne, and the univs. of Göttingen and Berlin; studied law under Savigny, theol. under Neander and Schleiermacher, philos. under Hegel, comparative geog. under Karl Ritter; on his return to his own country from extensive travels he soon began a series of publications in the Fr. lang. on a great variety of topics. His prin. works are a *Geog. and Statistics*, or *An Essay on the Geog. of Man*; *The Primeval People*, or *Essay of Comparative Mythology and Key to the Symbolic Language*; *The Age of Bronze*, or *the Shemites in Occident*; *The Two Cities*, or *Philos. of Hist. in the Various Periods of Mankind*. D. Apr. 3, 1876.

**Rouher**, roo-ä' (EUGÈNE), b. at Riom, Fr., Nov. 30, 1814. Admitted to the bar in 1838; represented the dept. of Puy-de-Dôme in the Constituent Assembly in 1848 and in the

Legislative Assembly in 1849, in which latter yr. he was made minister of justice. In 1851 he resigned, but was re-appointed Dec. 2, 1851, the day of the *coup d'état*; resigned Jan. 22, 1852, but a few days later was made v.-p. of the council of state; in Feb. 1855 was appointed minister of agriculture, commerce, and public works; was raised to the rank of senator in 1856, and in 1863 succeeded M. Billault as minister of state, which position he resigned on the occasion of the celebrated letter of the emp.'s of Jan. 19, 1867, announcing a more liberal policy, but was immediately reinstated, when the additional portfolio of minister of finance was confided to his charge; the ministry resigned July 13, 1869, M. Rouher being nominated pres. of the senate a week later. During the Franco-Ger. war he was prominent, but on the downfall of the Empire fled to Eng. Returning to Fr., he was arrested and held for a brief time, and in that yr. was returned to the Assembly. D. Feb. 3, 1884.

**Roulette**. See APPENDIX.

**Roumania**. See ROMANIA.

**Rouman'ian Rite**, a branch of the United Gr. (R. Cath.) Ch., found in Aus. and parts of Tur.

**Round-heads**, a nickname applied in 1641 to the Lond. apprentices and their associates of the lower class, who circulated and pub. a petition against popery and prelates, assaulted the bps. on their way to Parl., and had daily street-encounters with the gentlemen who had volunteered to form the king's body-guard, hence called "Cavaliers;" the epithet was extended to all the Puritans or supporters of Parl. who, 2 yrs. later, undertook the memorable contest with the Crown, designated as the "Great Rebellion."

**Round Rock**, R. R. Junc., Williamson co., Tex., 100 m. N. E. of San Antonio. Pop. 1880, 628.

**Round Towers**, a class of remarkable stone towers found chiefly in Ire., but also seen in Scot., Switz., Corsica, and other countries.

**Rouquette**, roo-ke't' (ADRIEN EMMANUEL), b. in New Orleans 1813, ed. at the Coll. of Nantes, Fr., where he studied law; was afterward ordained a R. Cath. priest, and was for many yrs. prof. in the R. Cath. sem. at New Orleans, and subsequently chaplain to that inst., being known as the ABBÉ ROUQUETTE. He wrote in Fr. and Eng., his chief works being *Les Sacramens*, *Poésies américaines*, *Wild Flowers*, *Sacred Poetry*, *La Thébaïde en Amérique*, *L'Antonie, ou la Solitude avec Dieu*, and *Poèmes patriotiques*.—His brother, FRANÇOIS DOMINIQUE, b. at New Orleans Jan. 2, 1810, was also ed. at Nantes; studied law in Phila.; wrote 2 vols. of poems, *Les Meschacébiennes* and *Fleurs d'Amérique*; has resided much in Fr., and has written a work in Fr. and Eng. on the Choctaw Indians.

**Rousseau**, roo-so' (JEAN BAPTISTE), b. at Paris Apr. 6, 1670, the son of a shoemaker, attracted attention by his verses; his dramatic attempts were received coldly, and he ascribed their bad success to the intrigues of other dramatists, whom he persecuted with epigrams, some of which were full of infamous calumnies, and, although R. denied having written them, he was banished from Fr. in 1712. He afterward wandered in Switz., Vienna, Eng., Brussels, etc., where he could find a princely patron. D. Mar. 17, 1741.

**Rousseau** (JEAN JACQUES), b. June 28, 1712, at Geneva, grew up uncared for, eagerly devouring a Bible, a copy of Plutarch, and a number of wretched novels; work was distasteful to him, and all control intolerable; fled, became a R. Cath., wandered restlessly through Switz. and N. It., became a servant, an interpreter, a seminarist. Thirty yrs. old, he went to Paris. In 1750 he wrote an essay proving that men had been demoralized by science and art, and devoted himself henceforth to lit. In 1753 he pub. his famous *Discourse on the Inequality among Men*, in which he made the first violent attack upon the throne and the altar, thus striking the keynote of his whole literary career; pub. several musical works, of which a pastoral opera, *The Village Prophet*, written and composed by him, was the most successful. In 1759 appeared his *New Héloïse*, the most generally known of his works. It is a novel in letters, abounding in graphic and most seductive appeals to the passions. The *Social Contract*, a political work, became the catechism of the Fr. Revolution, and his *Emile*, which was burned by order of the govt., and R. banished from Fr.; Hume took him to Eng. and gave him a home at Wootton. In 1770 he returned to Paris, being tacitly allowed to live there. Here he began his *Confessions*, an autobiography. Kind friends procured for him a quiet home in the forests near Paris, and here he d. July 3, 1778.

**Rousseau** (LOVELL H.), b. in Lincoln co., Ky., Aug. 4, 1818, studied law at Louisville and at Bloomfield, Ind.; admitted to the bar in 1841; member of the Ind. legislature 1844-45, and of the State senate 1847. In the war with Mex., as capt. in the 2d Indiana Volunteers, he served at Buena Vista; returned to Louisville in 1849; in 1860 was a member of the State senate, and on the outbreak of war raised the 5th Ky. Inf., of which he became col.; appointed brig.-gen. U. S. volunteers Oct. 1861; was distinguished at the battle of Shiloh Apr. 7, 1862, and at Perryville, Ky., Oct. 8, 1862, for which he was made maj.-gen. of volunteers; participated in the battle of Murfreesboro', Dec. 31, 1862; commanded the dist. of Tenn. from Nov. 1863 till the close of the war. Resigned Nov. 30, 1865; M. C. 1865, and in Mar. 1867 was appointed a brig.-gen. in the regular army and brevetted maj.-gen.; assigned to command the dept. of La. July 28, 1868. D. Jan. 7, 1869.

**Rowan** (JOHN), b. in Pa. 1773, went with his parents to Ky. 1783; became a lawyer; was a member of the State constitutional convention 1799; sec. of state 1804; sat for many yrs. in the legislature; M. C. 1807-09; was judge of the court of appeals 1819-21, U. S. Senator 1825-31, com. of claims against Mex. under the treaty of Apr. 11, 1850, and pres. of the Ky. Historical Society from 1836 to his death. D. July 13, 1843.

**Rowan** (STEPHEN C.), b. in Ire. Dec. 25, 1808, came to O. when young; entered the navy as mdpn. 1836, passed mdpn.

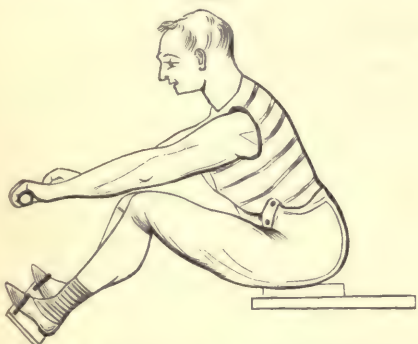


1832, lieutenant; served during the war with Mex. on the Pacific coast; made commander 1855; commanded the Pawnee in the attack upon the batteries at Aquia Creek June 1861; took part in the capture of the forts at Hatteras Aug. 1861; made capt. and commanded the flotilla at the capture of Roanoke Island Feb. 1862; participated in the attacks upon the forts in Charleston harbor; was made rear-admiral July 1866; commanded the Asiatic Squadron 1868-69; made vice-admiral 1870; was afterward supt. of Naval Observatory.

**Row'ing** [A.-S. *rowan*], to impel a boat or vessel in water by oars at the sides. In the more strict application of the word, the verb to "row" is used only where each oarsman works a single oar; where 2 are used, one in each hand, the oars are properly called *sculls*, and the oarsman becomes a *sculler*. The oar has been known for thousands of yrs. in every maritime nation that has emerged from barbarism, and it is in the galleys of the ancients that R. attained its most important practical development. It is, however, as an amusement in the A.-S. countries that the art of R. has come to be thoroughly understood. Its progress dates in Eng. from about 1826, the yr. of the first Oxford and Cambridge match; in Amer. from a few yrs. later.

The oarsman in the modern racing-craft sits upon a seat elevated some 6 or 7 inches from the floor, his feet strapped up against a board or "stretcher," which is solidly fixed to the main timbers of the boat. The seat itself is a mere

FIG. 1.



square of wood, fitted upon its lower surface with grooves which slide upon 2 rails about 18 inches in length running parallel with the keel of the boat. At the beginning of the stroke, just before the oar enters the water, the oarsman is in the position represented in Fig. 1. This position is gradually changed into that represented in Fig. 2. The important

FIG. 2.



elements of a good style are, *first*, a long, slow reach forward with the body; *second*, a rapid dash of the oar through the water; *third*, a neat and extremely quick finish with the hands. (See *Boat-Racing*, by E. D. BRICKWOOD, and *WOODGATE'S Oars and Sculls*.) [From orig. art. in *J.'s Univ. Cyc.*, by G. L. RIVES.]

**Rox'bury**, formerly a city of Norfolk co., Mass., now a part of Boston, 8 m. from State st., was the earliest settlement inland, the only communication to Boston by land being through it. In Revolutionary times it contributed much to our country's hist. In 1846 it was made a city, with a pop. of 17,000; a portion of it was set off in 1851 as a new town, and in 1868 the whole was annexed to Boston.

**Roy'all** (ISAAC), b. in Mass. early in the 18th century; was a resident of Medford, which town he long represented in the general court; was for 22 yrs. a member of the executive council; took part in the Fr. war; was appointed brig.-gen. 1761, being the first resident of N. Eng. who bore that title; adhered to the Crown in the preliminaries of the Revolutionary contest; left the country Apr. 16, 1775; was proscribed and his estate confiscated 1778, and d. in Eng. Oct. 1781, leaving 2000 acres of land in Worcester co. as the endowment of a law professorship in Harvard Coll., now known by his name.

**Royer-Collard**, rwah-yä' ko-lär' (PIERRE PAUL), b. at Somples, dept. of Marne, Fr., June 21, 1763; studied law; in the beginning of the Revolution took part in the political

movements, being a moderate and a royalist; after the fall of the monarchy (Aug. 10, 1792) fled from Paris, and lived concealed at Somples during the Reign of Terror; took his seat in 1797 in the Council of Five Hundred, but by the revolution of Sept. 4 was expelled from the Assembly as a royalist; after the crowning of Nap. as emp. he retired from political life and devoted himself wholly to the study of philos. From 1811 to 1814 he was prof. of philos. at the Univ. of Paris; adopted the system of the Scot. philos., and raised a successful opposition to the sensualism of Condillac. Jouffroy, Cousin, Guizot, etc. became his disciples. After the Restoration he was made director of the Royal Library and pres. of dept. of public education; but when, in 1830, the ultra-royalist party came into power, he resigned his office and became the leader of the liberal opposition in the Legislative Assembly, the creator of a new party, the *Doctrinaires*. The revolution of July 1830 may be considered as a realization of his ideas. After that period he took part less and less in public life. D. Sept. 4, 1845.

**Rubasse**, a variety of crystallized quartz, charged with specks of iron oxide, which give it a fine red color.

**Ru'bens** (PETER PAUL), b. at Siegen, Westphalia, June 29, 1577; received his first instruction in the art of painting from the landscape-painter Verhaeght and the historical painters Van Noort and Van Veen in Antwerp. In 1600 he went to It. with letters of recommendation from the viceroy of the Netherlands, the archduke Albert and his wife, the infanta Isabelle; and Vicenzio di Gonzaga, the duke of Mantua, invited him to his court and appointed him court-painter. In 1608 he returned to his native country, and was appointed court-painter by the viceroy. He settled in Antwerp, built an elegant mansion, and lived in great style. His masterpieces, the *Descent from the Cross* and the *Elevation of the Cross*, belong to this period. The duke of Mantua sent him on a diplomatic mission to the Sp. court, and in Madrid he painted the portraits of the king and many of the grandees, and fulfilled his mission with success. The infanta also employed him in diplomatic negotiations, and it was actually he who brought about and concluded the treaty of peace between Philip IV. of Sp. and Charles I. of Eng. His fame as a painter was, of course, vastly increased by his success as a diplomatist. He has left over 1800 pictures, most of which are very large, and even the quickest eye and the swiftest hand could not have performed such a task unaided. In many of his works, executed after 1620, only the outlines and the finishing touches are his; the rest is by some of his pupils, among whom many became great painters themselves. D. May 30, 1640.

**Ruberyth'ric** [Lat. *rubia*, "madder," and *erythros*, "red"], **Acid**, a crystalline glucoside found in madder-root. It forms yellow prisms having a silky lustre. It has a faint taste; is sparingly soluble in cold, readily in hot water; gives a golden-yellow solution in alcohol and in ether, and a blood-red solution in alkalies. It gives red precipitates with baryta-water, with an alum solution after the addition of ammonia, and with basic acetate of lead after addition of a little alcohol.

**Rubia'cea** [from *Rubia*, the madder genus, so named on account of the red roots], a large natural order of exogenous gamopetalous plants, herbs, shrubs, and trees found in all parts of the world, but largely tropical. It has opposite entire stipulate leaves, and regular flowers with an inferior ovary, and stamens borne on the corolla, as many as its lobes, and alternate with them. The exceptions to this relate to a tribe most numerous representing the order in temperate regions, the *Stellatæ*, to which *Rubia* itself belongs, and in which the leaves are in whorls without stipules; but here the accessory leaves are supposed to represent the latter. The order is rich in medicinal and economical products, furnishing as it does Peruvian bark (*Cinchona*), ipecac, one kind of catechu (or gambier), madder, and coffee. One or two tropical trees of the family yield edible fruits.

A. GRAY.

**Ru'bian** [Lat. *rubia*, "madder"], a glucoside discovered in madder-root by Schunck in 1847. It is obtained by treating a hot decoction of madder with bone-black, washing this to remove chlorogenine, extracting it repeatedly with boiling alcohol, and evaporating to dryness. It is then dissolved in water precipitated with acetate of lead; the lead compound is decomposed by sulphuretted hydrogen, and the filtrate is evaporated to dryness. As thus obtained, it is a brittle, amorphous mass, resembling gum-arabic, deep yellow in thin layers, dark brown in masses. It is very soluble in water, less soluble in alcohol, and insoluble in ether, which precipitates it from alcohol in brown drops. It is very bitter.

C. F. CHANDLER.

**Ru'bicon**, a small river of It., flows into the Adriatic, and formed in the time of the Rom. republic the boundary between It. and Gallia Cisalpina. Thus it became actually a declaration of war when Cæsar, who was proconsul of Gallia, marched his army beyond the R. When he arrived at its banks he hesitated, and the exclamation with which he then passed the river and pushed forward, *Acta est alea*, has since become a common expression whenever an important decision is made.

**Rubid'ium** [Lat. *rubidus*, "red"], one of the alkali-metals, discovered by Kirchhoff and Bunsen in 1860 as one of the first fruits of spectroscopic investigation. It occurs in extremely minute proportions in some saline mineral waters, in association with lithium and cæsium. It is a white metal with a yellowish tinge and silvery lustre. It is as soft as wax, melts at 101.5° F., and yields even below a red heat a vapor of a greenish-blue color. It is more easily oxidized by the air than potassium, and is more electro-positive than the latter. It kindles on water and burns just like potassium.

**Ru'binstein** (ANTON), b. at Vechvotyez, v. in the Rus. prov. of Bessarabia, near the Roumanian frontier, Nov. 30, 1830, of Jewish descent; received his first musical instruction from his mother; studied in Paris 1840, and in Berlin, under



Dehn, 1845; settled in 1848 at St. Petersburg, where he produced his first compositions and founded in 1850 a conservatory of music; afterward made concert-tours in Europe and Amer. As a pianist he ranks among the first. Composed *The Demon*, *Kinder der Hölle*, *Die Maccabäer*, and the *Ocean Symphony*.

**Ruble.** See ROUBLE.

**Ruby.** See PRECIOUS STONES.

**Rückert** (FRIEDRICH), b. at Schweinfurt, Bavaria, May 16, 1788; studied philology and belles-lettres at Jena; engaged in journalism at Stuttgart 1815-17; spent a yr. in Rome 1818; settled for several yrs. at Coburg, occupied in philological and poetical pursuits; was appointed prof. of Oriental langs. at Erlangen in 1826, at Berlin in 1841, and retired in 1849 to his estate, Neuses, near Coburg, where he d. Jan. 31, 1866. He is generally considered as one of the greatest lyrical poets of Germany, and his lyrical poems, *Deutsche Gedichte*, *Kranz der Zeit*, *Oestliche Rosen*, *Gesammelte Gedichte*, are often very impressive. His translations from Arabic, Per., Sans., etc., are also masterpieces.

**Rudolph**, the name of 2 Ger. emps. **RUDOLPH I.**, of Hapsburg, founder of the house of Aus., Ger. emp. 1273-91, b. May 1, 1218, was the oldest son of Albert IV., count of Hapsburg and landgrave of Alsace. He married his daughters to the 2 most powerful among his vassals, the count-palatine, Louis, and Duke Albert of Sax., and then marched against 2 others who refused to do homage, King Ottocar of Bohemia and Duke Henry of Bavaria. The latter was easily defeated; the former was killed in the battle of the Marchfeld, Aug. 26, 1278. Of his possessions, R. gave Bohemia and Moravia to his sons, but Aus., Styria, Carinthia, and Carniola he gave to his own son, Albert, thus founding the state of Aus. Against his external enemies, the count of Savoy, the duke of Burgundy, etc., he was also successful, and his internal govt. was distinguished by justice and love of order and peace. D. Sept. 30, 1291.—**RUDOLPH II.** (1576-1612), b. July 18, 1552, a son of the emp. Maximilian II. and Marie, daughter of Charles V., was ed. at the Sp. court; crowned King of Hungary in 1572, of Bohemia in 1573, and elected emp. of Ger. after his father's death, Oct. 12, 1576. He was superstitious, weak, and entirely in the hands of the Jesuits. The formation of the Prot. Union (May 4, 1608) and the R. Cath. League (July 10, 1609) brought Ger. to the very verge of a war. Meanwhile the Hungarians arose and Bohemia revolted. Matthias, a younger brother of the emp., compelled R. to cede to him all his hereditary possessions (1611). The emp. retired into private life, and d. at Prague Jan. 20, 1612. He felt some interest in science.

**Rudra**, in the Vedic mythology of India, was the name of the father of the Maruts or storm-gods, and subsequently extended to embrace the Maruts themselves as a collective appellation.

**Rue**, the *Ruta graveolens*, an herb of the Old World (order Rutaceae), having a strong smell and powerful stimulant, and even poisonous qualities.

**Ruff** (*Machetes pumax*), a wading bird of the sub-family Tringine, or sand-pipers, formerly very common in the fens and marshes of Eng. It is still found throughout N. Europe and Asia, and migrates southward in winter; it occasionally wanders into N. Amer. The ruff derives its name from a circlet of long, closely set feathers on the neck of the adult male, which he can raise or lower.

**Ruffed Grouse** (*Bonasa umbellus*), a species of the family Tetraonidae, recognizable at once among all the other Amer. grouse by the absence of feathers on the lower half of the tarsi; it has also, on the sides of the neck, a ruff of soft, broad, and truncate feathers, to which the name refers; the tail is somewhat convex, and about as long as the wings; the color of the cervical tufts is a glossy black or brown, with a semi-metallic steel-blue or greenish border; the tail has 2 bands of gray, and between them a broad black one. The species is generally distributed throughout the N. temperate parts of N. Amer. The species in some sections (N. Eng. and the W.) is known under the name of partridge; in others (the Middle States) as the pheasant, and in some of the Brit. provs. as the birch partridge.

**Ruffner** (HENRY), D. D., LL.D., b. in Va. about 1788, became a Presb. clergyman, and was pres. of Lexington Coll., Va., 1837, and for many yrs. thereafter. Author of *Judith Benadict*, a romance, *The Fathers of the Desert*, or an *Account of the Origin and Practice of Monks*, and of addresses and essays, the latest (1860) being an argument against the continuance of slavery in Va. D. Dec. 17, 1861.

**Rugby**, Tenn. See APPENDIX.

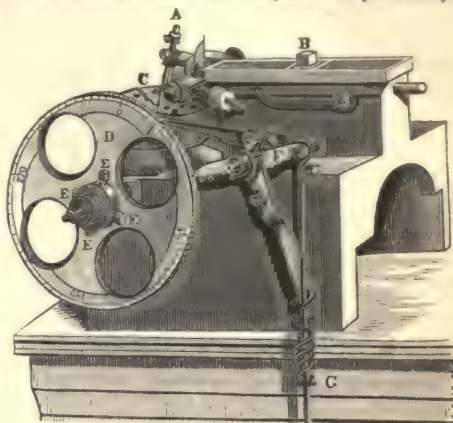
**Ruger** (THOMAS H.), b. in New York in 1833, grad. at W. Pt. 1854; practised law at Janesville, Wis., 1856-61; in June 1861 entered the army; was appointed brig.-gen. U. S. volunteers 1863, and at the battle of Franklin, in command of a division, he won the brevet of maj.-gen.; in command of dept. of N. C. until June 1866; col. 39d Inf. July 1866; transferred to the 18th in 1869; supt. at W. Pt. 1871-76.

**Rugles** (SAMUEL BULKLEY), LL.D., b. in Conn. in 1800, grad. at Yale 1814; admitted to the bar in New York 1821; elected to State legislature 1838, canal com. 1839, pres. of canal board 1840 and 1858; was U. S. com. to the Paris Exposition 1866, to the international monetary conference at Paris 1867, and to the international statistical conference at the Hague 1869; wrote numerous pamphlets on subjects of political economy, law, and education. D. Aug. 28, 1881.

**Ruggles** (TIMOTHY), b. in Rochester, Mass., Oct. 11, 1711, grad. at Harvard 1732; became a lawyer at Sandwich and Hardwick; was brig.-gen. and second in command at the battle of Lake George 1755; judge of common pleas 1756; chief-justice 1762; speaker of assembly 1762-63; delegate to Stamp Act cong. at New York 1765; accompanied Brit. troops to N. S., and was a founder of town of Digby, N. S. D. Aug. 4, 1795.

**Ruling-Machine.** Of late yrs. the art of ruling lines upon glass or metal, which shall be parallel, equidistant, and at the same time shall present sufficient uniformity of

tint and breadth, when viewed with powerful optical means, to suffice either for delicate measurements, or the diffraction of a ray of light to obtain a spectrum, or to serve as test-objects for microscopes, has received considerable attention. Among the most successful attempts may be mentioned the ruling-engine of L. M. Rutherford of New York, which performs its work with a truly wonderful precision. It is represented in the figure. C represents a plate carrying



Ruling-engine of L. M. Rutherford.

the glass or speculum plate to be ruled, which is made to advance in short successive steps in a direction parallel to the axis of a screw with 48 threads to the inch. The head of this screw is formed of a circular plate D, whose rim is notched with 360 equally spaced teeth. In the drawing the pawl is shown pressing against one of these notches at X. The oscillating motion of the lever F causes the pawl to fall into a notch of the wheel D, and by its push to rotate the wheel by a definite fraction of its circumference, then to lift the pawl, and to retract it for another forward motion on the wheel D. While the screw is thus advancing the plate C, the diamond-pointed tool A is raised and carried forward above the surface of the glass or speculum plate. After the screw has ceased its rotation, the diamond point falls gently upon the glass or speculum plate on C, and then retracts and cuts a line. The above reciprocating motion of the tool A is caused by the action of the vertical arm of a lever which is attached to the same shaft which carries the lever F. A driving-wheel, revolved by a small turbine from which leads a cord, carries a crank-pin, which is jointed to the rod below G. The errors in the thrust of the screw caused by its eccentricity, or want of coincidence of the axis of figure of the screw and its axis of rotation, are corrected by giving to the feed-wheel D an eccentricity opposed to that existing in the screw. The screws at E E E serve to alter the position of the centre of the feed-wheel D, and thus to give it the required eccentricity. [From orig. art. in *J's Univ. Cyc.*, by L. WALDO.]

**Rum**, a spirituous liquor distilled from molasses. It is largely produced on the sugar-plantations in the W. I., that from Jamaica being considered the best. The wort is prepared by mixing about 100 gals. of molasses, 300 gals. of skimmings from the clarifiers, 300 gals. of lees from previous fermentations, called *dunder*, and 400 gals. of water. This mixture averages about 15 per cent. of sugar. The fermentation is complete in from 9 to 15 days. It is then distilled, and molasses or caramel is added to color and flavor it. R. is greatly improved by age.

**Rumford** (BENJAMIN THOMPSON), COUNT, b. at Woburn, Mass., Mar. 26, 1733; became a merchant's clerk at Salem 1766, and subsequently at Boston; devoted his leisure to the study of natural science; taught school at Rumford (now Concord), N. H., 1771-72; was appointed by the royal gov. major of N. H. militia; sympathized with the early movements for resistance to Brit. oppression, but was unsuccessful in an application for a commission in the Continental service; went within the Brit. lines around Boston Oct. 10, 1775; went to Eng. with Lord Howe's despatches 1776; obtained a position in the colonial office; was chosen F. R. S. 1778; became under-sec. 1780; went to New York 1781; raised a regiment of loyalists, of which he became lieutenant-col.; served in the Carolina campaign 1782; returned to Eng. 1783; entered the service of the elector of Bavaria the same yr.; was knighted 1784; reorganized the Bavarian military service; acquired great influence with the elector, who made him maj.-gen., councillor of state, lieutenant-minister of war, and count of the Holy Roman empire 1790, when he chose as his title the name of the Bavarian council where he had resided; became pres. of the Bavarian council of regency 1796; left the Bavarian service on the elector's death, 1799; was instrumental in founding the Royal Inst. at Lond. in that yr.; settled at the rest of his life in scientific studies at his wife's villa at Auteuil. He contributed to science many valuable observations and discoveries, especially upon heat; made experiments which conducted to the discovery of the correlation of forces; was one of the pioneers of modern researches in optics and magnetism; left prizes to be awarded by the Royal Society of Lond. and the Amer. Acad. of Sciences at Boston for discoveries on light and heat; was the recipient of the first Rumford prize from the Royal Society, and endowed in Harvard Coll. the Rumford professorship of the "physical and mathematical



sciences as applied to the useful arts." (See his *Life and Works*, edited by GEO. E. ELLIS.) D. Aug. 21, 1814.

**Rump Parliament**, the popular name applied in Eng. hist. to a remnant of the Long Parl., consisting of 60 members, who, after the expulsion of 34 of that body, Dec. 6, 1648, co-operated with Cromwell in effecting the trial and condemnation of Charles I. The Rump was dissolved by Cromwell Apr. 20, 1653; was restored by Richard Cromwell: was a second time expelled by the army Oct. 13, 1659; re-assembled on the advance of Gen. Monk from Scot. 1660, and decreed its own dissolution Mar. 16, 1660.

**Rumsey** (JAMES), b. in Cecil co., Md., about 1743; made several improvements in the mechanism of mills, and in Sept. 1784 exhibited on the Potomac River a boat which ascended the stream by mechanical appliances. Two yrs. later he introduced a steam-engine of his own construction into his boat on the Potomac; obtained a patent for steam navigation from the State of Va. 1787; wrote a *Short Treatise on the Application of Steam*, which involved him in a controversy with John Fitch; organized at Phila. a "Rumsey Society" for the promotion of steam navigation 1788; went to Eng. soon afterward; organized there a similar society; built a new steamboat; obtained patents in Eng., Fr., and Hol., and made a successful trip on the Thames Dec. 1792. D. Dec. 23, 1792.

**Ru'neberg** (JOHAN LUDWIG), b. at Jakobstad, in Finland, Feb. 5, 1804, and studied, supported by a public subscription, at the Univ. of Åbo from 1822 to 1827. In 1830 he became lector of aesthetics at the Univ. of Helsingfors, but removed in 1837 to Borgo, and in 1842 became prof. of Gr. lit. at that gymnasium. His idylls, *Hanna and Julquallen*, and his tales in verse, *Elgskytterne* and *Nadeschda*, are true epics, only with a lyrical swing in the outlines. His dramas, of which *Kungarne på Salamis*, a tragedy in antique form, is the most remarkable, contain real characterization. The most celebrated of his works is *Fänrik Ståls Sägner*, a collection of ballads treating subjects taken from the war between Swe. and Rus., when Finland was conquered by the latter. D. May 6, 1877.

**Runes** [A.-S. *rūn*, "secret letter"], the alphabet used by the Teutonic races of N. Europe before their adoption of the Rom. characters. The word *rūna* means "a secret," and the Scandinavian myths say that Odin was the inventor of the R. But a similarity which exists between some of the runic characters and the corresponding ones of the Phœnician alphabet has occasioned the hypothesis that the R. were first brought to the peoples around the Baltic by Phœnician merchants. In the earliest times the R. were cut on swords, utensils, ornaments, etc. as magical signs. Later, they were much used for inscriptions on sepulchral monuments. They were, however, also used as a means of communication; a man would cut a message on a stick in runic characters and send it round to his friends. Still more extensive was the use which was made of the runic characters for the direct purpose of witchcraft; and the old popular songs contain many stories of the magical power which R. exercised over the hearts and minds of men. With the introduction of Christianity the Rom. alphabet was generally adopted, and the R. fell into desuetude.

**Runjeet Singh**, maharajah of the Punjab, commonly known as the king of Lahore, b. at Gugaranwalla Nov. 2, 1780; lost his father when he was only 12 yrs. old. His mother, who governed during his minority, endeavored to spoil him and make him effeminate, but she failed, and when he was 17 yrs. old he poisoned her and assumed the reins of govt. himself. By the aid of Fr. officers he organized and disciplined his army and subjugated the neighboring Sikh chiefs. He then attacked the Afghans, conquered Cashmere in 1819 and Peshawar in 1820, and at his death (June 27, 1839) he left an empire comprising more than 20,000,000 inhabs. and a disciplined army of 70,000.

**Run'kle** (JOHN DANIEL), LL.D., b. at Root, N. Y., Oct. 11, 1822, grad. at the Lawrence Scientific School at Cambridge, Mass., 1851; was employed in 1849, while still a student, to assist in preparing the *Amer. Ephemeris and Nautical Almanac*; has continued to take part in that work; ed. the *Mathematical Monthly* (1869-71); became prof. of math. in Mass. Inst. of Technology 1865; was its pres. 1870-78. Author of *New Tables for determining Values of Coefficients in the Perturbative Function of Planetary Motion*.

**Run'nymede**, a long slip of green meadow stretching along the right bank of the river Thames, near Egham, in Surrey, Eng., memorable as the spot where the signature of King John to Magna Charta was extorted by the insurgent barons June 15, 1215. R. has also been noted for the annual Egham horse-races in Aug., whence some authorities derive the name (i. e. "Running-mead").

**Rupce** [Sans. *rāpya*], a silver coin current in India, usually estimated as equivalent to 2s. Eng.

**Rupert's Drops**. See PRINCE RUPERT'S DROPS.

**Rupture**. See HERNIA.

**Rush** [Lat. *ruscum*], a common name for the Juncaceæ, a natural order of endogenous herbs, of which the genus *Juncus* is the type, and of various Cyperaceæ (mostly species of *Scirpus*), with naked, tough, and flexible stems. There are many species, mostly in wet and cold regions. They are employed in making chair-bottoms, mats, etc. Rushes are used in Europe for strewing the floors of cottages, instead of carpets. The pith of some kinds is used sometimes for a candlewick; hence the name "rushlight." *Juncus bulbosus* is the black grass of the salt marshes. *Scirpus lacustris* and some nearly related species are the bulrushes, of which the tule of Cal., Peru, etc. is one of the most important.

**Rush** (BENJAMIN), M. D., LL.D., b. near Phila. Jan. 4, 1746 (N. S.), grad. at Princeton 1760; studied med. at Phila., Edinburgh, Lond., and Paris; commenced practice at Phila. 1769, being at the same time chosen prof. of chem. in the med. coll. of that city; was a member of the provincial conference of Pa. 1776, in which he moved the resolution to

consider the expediency of a declaration of independence; was chairman of the committee thereupon appointed, and presented a report in favor of the measure; was chosen to the Continental Cong. to fill a vacancy in June, and was one of the signers of the Declaration of July 4, 1776; was appointed in Apr. 1777 surgeon-gen., and in July phys.-gen. of the military hospitals for the middle dept.; resigned Feb. 1778, on account of dissatisfaction with the mismanagement of the hospital stores; established in 1785 the first dispensary in the U. S.; was a member of the Pa. convention of 1787 for the ratification of the Federal const.; wrote 4 letters to the people of Pa. pointing out the defects of the State const. of 1776, and sat in the convention which formed the const. of 1780; exchanged his professorship for that of the theory and practice of med. Oct. 1789, to which he added that of clinical practice on the change of title of the med. coll. in 1791 to that of the Univ. of Pa. and that of the practice of physio 1796; rendered eminent services during the yellow-fever epidemic of 1793; participated in the professional education of above 2000 med. students; was one of the founders of Dickinson Coll., v.-p. of the Phila. Bible Society and of the Amer. Philos. Society, pres. of the Phila. Med. Society and of the Society for the Abolition of Slavery, and treas. of the U. S. mint from 1799 until his death. Among his works are *Med. Inquiries and Observations, Med. Inquiries and Observations upon the Diseases of the Mind, Sixteen Introductory Lectures on Courses of Med., and Essays, Literary, Moral, and Philosophical*, and left unfinished a treatise on *The Med. of the Bible*. D. Apr. 19, 1813.

**Rush** (JAMES), M. D., son of the preceding, b. at Phila. Mar. 1, 1786, grad. at Princeton 1805; studied med. with his father, also at the Univ. of Pa. and in Edinburgh; practised his profession some yrs.; wrote *Philos. of the Human Voice, Hamlet, a Dramatic Prelude, An Analysis of the Human Intellect, and Rhymes of Contrast on Wisdom and Folly*. By will he bequeathed above \$1,000,000 to found the "Ridgway Branch of the Phila. Library," upon certain conditions, one of them being that no bound vols. or other collections of newspapers should ever form part of the library. D. May 26, 1869.

**Rush** (RICHARD), son of Dr. Benjamin, b. at Phila. Aug. 29, 1780, grad. at Princeton 1797; was admitted to the Phila. bar 1800; became atty.-gen. of Pa. Jan. 1811; comptroller of the State treasury Nov. 1811; was atty.-gen. of the U. S. Feb. 1814-Dec. 1817, having temporarily acted as sec. of state in the latter year; was minister to England 1817-23; negotiated treaties respecting the fisheries, the N. E. boundary, the Or. question, and the slaves carried from the U. S. in Brit. vessels after the Treaty of Ghent; was sec. of the treas. under Pres. J. Q. Adams 1825-29; was a candidate for the Vice-Presidency on the ticket with Adams 1828; negotiated in Hol. a loan for the corporations of D. C. 1829; was a com. to adjust the boundary between O. and Mich. 1836; went to G. Brit. in 1836 as com. to lay claim in the chancery court to the Smithsonian legacy; returned with the money Aug. 1838; was minister in Fr. 1847-49, after which he spent his closing yrs. in retirement. He wrote in support of the war of 1812 and against the U. S. bank and on other subjects; superintended the publication of an edition of the laws of the U. S.; wrote a *Narrative of a Residence at the Court of Lond.* from 1817 to 1825, and *Washington in Domestic Life*. D. July 30, 1859.

**Rush'ford**, city, on R. R., Fillmore co., Minn., at confluence of Root River and Rush Creek, has fine water-power on both streams. Pop. 1870, 1245; 1880, 941.

**Rush'ville**, on R. R., cap. of Schuyler co., Ill. Pop. 1870, 1589; 1880, 1602.

**Rushville**, R. R. junc., cap. of Rush co., Ind. Pop. 1870, 1696; 1880, 2515.

**Rusk** (THOMAS JEFFERSON), b. in S. C. 1802, became a lawyer in Ga.; went to Tex. 1835; was a member of the convention that declared Texan independence Mar. 1836; was the first sec. of war; took command of the army at San Jacinto after Gen. Houston was wounded; became chief-justice of Tex.; was pres. of the convention which effected annexation to the U. S. 1845, and U. S. Senator 1846-56. D. July 29, 1856.

**Ruskin** (JOHN), LL.D., b. in Lond., Eng., in Feb. 1819; gained the Newdegate prize for Eng. poetry at Ox. 1839; grad. from Christ Ch. 1842; wrote while an undergraduate a series of articles in a Lond. magazine on *The Poetry of Arch.*; devoted himself to art; issued from 1842 to 1856 a series of vols. in defence of Turner and his school, which provoked great controversy by the novelty of its ideas. The yrs. which elapsed between the first and last vols. were spent in an industrious study of art, including a long residence in Venice and visits to the prin. European capitals. As the result of a careful study of mediæval arch., R. pub. *The Seven Lamps of Arch.* and *The Stones of Venice*, a pamphlet on *Pre-Raphaelitism, Lectures on Arch. and Painting, The Political Economy of Art*, etc. He delivered lectures on Gothic arch. at Edinburgh 1853; was appointed prof. at the Cambridge School of Art 1858; became Rede lecturer at Cambridge 1867; was elected to the Slade professorship of fine arts at Ox. 1869, and re-elected Mar. 1876. The artistic movement known as "Pre-Raphaelitism," which was developed among Brit. artists, such as Millais, Holman Hunt, and the Rossettis about 1850, was largely due to the study of R.'s earlier works. He has since pub. a large number of pamphlets and small books under fanciful titles, many of which are professedly addressed to workmen and advocate peculiar theories in political economy and ethics, but have apparently not attracted the notice of the class of readers for which they were designed.

**Russ** (JOHN DENISON), M. D., b. at Chebacco (now Essex), Mass., Sept. 1, 1801, grad. at Yale 1823; studied med. in Europe; began to practise in New York 1826; went to Gr. with a cargo of provisions for the patriots 1827, and resided there until 1830; devoted himself in New York to the instruction of the blind, for whose use he invented the dot alphabet



and devised other educational expedients: became supt. of the New York inst. for the blind 1832; was one of the founders of the New York Prison Reform Association, supt. of a juvenile asylum 1851-58, and an active promoter of other benevolent associations. D. Mar. 1, 1881.

**Russell**, city, on R. R., cap. of Russell co., Kan., 263 m. W. of Kansas City. Pop. 1880, 861.

**Russell** (ALEXANDER JAMIESON), b. in Glasgow, Scot., Apr. 29, 1807. With his parents he settled in Megantic co., Canada, in 1822. In 1829 he became deputy provincial surveyor, and in 1830 entered the commissariat dept.; was called to head-quarters, Que., where he was engaged for 8 yrs. in the extra staff of that dept. In 1841 he entered the service of the provincial govt., as civil engineer in charge of public works in the maritime cos. of Lower Canada. In 1846 was transferred to Crown timber office at Ottawa to settle difficulties between lumbermen, etc.

**Russell** (BENJAMIN), b. at Boston Sept. 13, 1761; learned the printing trade; was a soldier in the Revolutionary war; established at Boston, Mar. 24, 1784, a semi-weekly newspaper, *The Columbian Centinel*, to which many eminent writers contributed, and which became an influential political organ of Federalist doctrines; was 24 yrs. representative of Boston in the general court; several yrs. member of the State senate and of the executive council. He was editor of the *Centinel* until Nov. 1, 1823. D. Jan. 4, 1845.

**Russell** (DAVID ALLEN), b. at Salem, N. Y., Dec. 10, 1820, grad. at W. P. 1845; served in the war with Mex., and brevetted first lieutenant; was engaged on the frontier against the Indians; in Jan. 1862 accepted the colonelcy of the 7th Mass. Volunteers, which he led through the Va. peninsular campaign of 1862, gaining the brevet of lieutenant-col., and in the battle of Antietam; appointed brig.-gen. U. S. volunteers Nov. 1862; he commanded a brigade at the battles of Fredericksburg, Chancellorsville, and Gettysburg. In the Richmond campaign of 1864, in command of a division; in July 1864 his corps was called to Wash. to resist the threatened attack of Early upon it, and in the subsequent pursuit he was killed at the battle of Opequan, Sept. 19, 1864.

**Russell** (JOHN), EARL, third son of the sixth duke of Bedford, b. in Lond., Eng., Aug. 18, 1792, ed. at Westminster School and at the Univ. of Edinburgh; entered Parl. as a Whig 1813; pub. *Lives of his ancestors, An Essay on the Hist. of the Eng. Govt. and Const., The Nun of Arnona, a Tale, Don Carlos, a Tragedy, Memoirs of the Affairs of Europe from the Peace of Utrecht*, etc.; was the parliamentary leader of the great movement which effected in 1828 the repeal of the Test and Corporation acts, in 1829 the emancipation of the R. Caths., and in 1832 laid the foundation of the modern era of Eng. hist. by the long-delayed victory of the Reform bill. In 1830-34 Lord John Russell was paymaster of the forces in the Grey administration; was sec. of state for the home dept. 1835-39, for war and the colonies 1839-41; was returned to Parl. in the election of 1841 for the city of Lond., which he continued to represent for many yrs.; was the leader of the opposition to the Peel ministry 1841-45; declared in favor of the immediate repeal of the Corn laws Nov. 1845. Upon the dissolution of the old Tory party in 1846, Lord John Russell became prime minister and first lord of the treas., and conducted the affairs of state through the difficult period embracing the Irish famine, the Chartist agitations, and the continental revolutions of 1848-49. His ministry was overthrown in Feb. 1852, but the Aberdeen cabinet was formed Dec. 1852, in which Lord John Russell accepted the position of sec. of foreign affairs. He introduced a new Reform bill 1854, became colonial sec. in the first Palmerston ministry Feb. 1855, and soon afterward went as com. to the Vienna Conference, but retired from the cabinet July 16. In June 1859 he returned to office as sec. of foreign affairs in the second Palmerston ministry; was elevated to the peerage as Earl Russell of Kingston-Russell July 1861; incurred criticism by his unfriendly course toward the U. S. during the c. war, as also by his fruitless manifestations of sympathy for Poland and Den. On the death of Lord Palmerston, Earl R. again became prime minister, Oct. 1865 till June 1866. He then edited the *Correspondence of John, Fourth Duke of Bedford, the Memoirs and Correspondence of C. J. Fox, the Memoirs, Journal, and Correspondence of Thomas Moore*, selections from his own *Speeches and Despatches*, etc. D. May 28, 1878.

**Russell** (JOHN SCOTT), F. R. S., b. in the Vale of Clyde, Scot., in 1808, studied at the univs. of Edinburgh, St. Andrews, and Glasgow, graduating at the latter 1824; devoted himself to applied mechanics, engineering, and natural philos.; engaged at Edinburgh in the construction of small steamboats for canal and river navigation, and of steam carriages which ran upon the common roads between Paisley and Glasgow; introduced the "wave system" into the construction of ocean steamships 1835; established himself in Lond. 1844 as a builder of the largest class of steamships, including the Great Eastern; read in 1857 to the British Association a paper upon *The Mechanical Structure of the Great Ship*; was one of the 9 original promoters of the great exhibition of 1851, and joint sec. of the royal coms. for the management of that enterprise; was one of the founders of the Inst. of Naval Archs., of which he was v.-p.; was also v.-p. of the Inst. of Civil Engineers, and member of several scientific societies. Wrote *Modern System of Naval Arch. for Commerce and War and Systematic and Technical Education for the Eng. People*. D. June 10, 1882.

**Russell** (JONATHAN), LL.D., b. at Providence, R. I., 1771, grad. at Brown Univ. 1791; studied law, but exchanged his practice for commercial pursuits; was an accomplished and effective writer and an active politician; was several yrs. U. S. minister to Swe.; signed the Treaty of Ghent 1814 as one of the 5 Amer. coms., and was M. C. 1821-23. D. Feb. 16, 1832.

**Russell** (MICHAEL), LL.D., D. C. L., b. at Edinburgh, Scot., in 1781, ed. at Glasgow Coll.; was ordained in the Episcopalian Ch.; became minister of St. James's chapel,

Leith, 1800, a post he retained through life, adding to it in 1837 the bishopric of Glasgow and Galloway. He possessed extensive erudition; contributed largely to the *Encyclopædia Metropolitana*, and wrote *The Conversion of Sacred and Profane Hist., from the Death of Joshua until the Decline of the Kingdoms of Israel and Judah*, etc. D. Apr. 2, 1848.

**Russell** (WILLIAM), LORD, b. in Eng. Sept. 22, 1689, ed. at Cambridge and at Augsburg; entered Parl. 1660; married Lady Rachel Vaughan 1669; became prominent in 1673 as one of the leaders of the Prot. or "country party;" proposed in Nov. 1678 the removal of the duke of York from the royal councils, and on June 16, 1680, appeared before the king's bench in Westminster to present that prince as a recusant, and headed the deputation of the House of Commons which carried up to the House of Lords the bill for the exclusion of James as a papist from the succession. Arraigned for treason at the Old Bailey July 13, 1683; was condemned to death and beheaded in Lincoln's Inn Fields, July 21, 1683.

**Russell** (WILLIAM HOWARD), LL.D., b. at Lily Vale, co. Dublin, Ire., Mar. 28, 1821; studied at Trinity Coll., Dublin; became a lawyer at Lond.; is known as a correspondent of the *London Times*. He founded in 1858 the *Army and Navy Gazette*.

**Russellville**, on R. R., cap. of Logan co., Ky., 143 m. S. W. of Louisville. Pop. 1870, 1843; 1880, 2058.

**Russia**, rush'-e-a, the largest empire of the world, occupying about  $\frac{1}{4}$  of the firm land of our globe, extends in Europe and Asia from lat. 38° 20' to lat. 77° 30' N., and from lon. 17° 38' E. to lon. 170° W.; bounded N. by the Arctic Ocean, E. by the Pacific, S. by Chi., Independent Turkistan, Pers., Asiatic Tur., the Black Sea, and Roumania, and W. by Aus., Prus., the Baltic, and the Scandinavian peninsula. Area, 8,387,816 sq. m. Pop. 100,372,553, of which Asiatic Russia, consisting of Caucasus (area, 308,087 sq. m., pop. 6,290,539), Siberia (area, 4,826,287 sq. m., pop. 3,947,908), and Central Asia (1,165,073 sq. m., pop. 5,075,696), comprises 6,290,539 sq. m., with 15,314,138 inhab.; while European R., consisting of R. proper (area, 1,895,041 sq. m., pop. 75,731,384), Poland (area, 49,157 sq. m., pop. 7,245,419), and Finland (area, 144,221 sq. m., pop. 1,857,035), comprises 2,088,419 sq. m., with 85,058,415 inhabs.

Asiatic R. is described in the articles on CAUCASUS, KIRGHIZ, SIBERIA, and TURKISTAN. European R., including FINLAND and POLAND (which see), forms one vast plain, bounded E. by the Ural chain, S. by the Caucasian Alps and the Yalla Mts., an isolated chain occupying the Crimean peninsula and rising to the height of about 5000 ft.; S. W. and N. W. by spurs of this plain stretches a low plateau, on which the Valdai Hills, rise to about 1000 ft., connecting to the E. with the Ural Mts., and presenting an undulating surface covered with large forests of beech. From this plateau the ground slopes N. to the Arctic Ocean and the White Sea, traversed by the Onega, Dwina, Mezen, and Petchora; W. to the Baltic, drained by the Neva, Düna, Niemen, and Vistula; and S. to the Black and the Caspian seas, watered by the Pruth, Dniester, Dnieper, Don, Volga, and Ural. The N. slope terminates along the Arctic Ocean in frozen swamps, where all vegetation ceases; the W. is dotted with numerous lakes, and is often marshy, but favorable to vegetable life; the S. presents many large wooded tracts of steppes. On an average, 20 per cent. of the surface of European R. is arable land, 11 meadow, 27 pasture, and about 40 forest, but the ratio varies very much in different parts of the empire. Rye, oats, barley, wheat, and maize are raised, and although the method of cultivation is still very primitive, the product far exceeds the home demand in quantity. In the Baltic provs. flax, hemp, and hops are much cultivated. In Bessarabia and the Crimea the vine is grown with success, and about 54,000,000 gals. of good wine are annually produced. Tobacco is cultivated along the Volga, the Don, and in Bessarabia, and yields about 70,000,000 rubles annually. The potato is raised throughout the country, and the cultivation of beet-root is steadily increasing. Excellent fruits—apples, pears, apricots, peaches, but especially plums and cherries—are grown in Bessarabia, the Crimea, and Taurida, and the immense forests, consisting mostly of fir, spruce, and pine N. and E. of the Valdai Hills, and oak to the S., contain excellent timber for building purposes, and are administered with great care. Cattle-raising is extensively carried on in the W. and S. provs. Bee-culture is gen. in Poland and on the Volga. The silk-culture, which formerly was quite extensive in the S. provs., has suffered much of late, partly from disease among the silkworms, partly from the emigration of the Mennonites, who principally carried it on. Reindeer are kept in large herds in the N.; camels are bred in the S. Of wild animals, the ermine, N.; marten, bear, etc. are found in the N.; the elk, aurochs, and boar in the W. (Poland and Lithuania); the wolf, rochs, and fox everywhere. The fisheries form a very important source of wealth—cod and herring in the White Sea; herring and flounder in the Baltic; mackerel, sardine, and herring on the Crimean coast; sturgeon in the Caspian; salmon, trout, and a great variety of delicious freshwater fish in the lakes and rivers. The preparation of caviar from the roe of the sturgeon is a peculiar Rus. branch of industry.

Mining and manufacturing are carried on in R. extensively, and with great success. Large deposits of coal and an abundance of salt are found in all the S. provs. All the metals are found in the Ural and Altai mts., some of them in great abundance and of excellent quality. Platinum is found only around Yekaterinburg. The govts. of St. Petersburg, Moscow, Nizhne-Novgorod, Vladimir, Saratov, Warsaw, Plock, and Kalisz are the prin. seats of manufacturing industry, which is steadily increasing and receives much encouragement from the govt.

The pop. of R. is very various; it comprises about 100 different nationalities, more or less distinct, and about 40 dif-



ferent langs. are spoken in the empire. The Slavic element, however, is absolutely predominant in European R., numbering 61,000,000 out of 73,000,000. The prin. non-Slavic races are the Finns in Finland, the Letts in Courland, the Gers. in the Baltic provs. and S. R., the Tartars, Cossacks, and other Mongolian tribes in the S., and the Jews, 2,647,000, of whom 1,829,000 are in R. proper and about 800,000 in Poland.

The Gr. Ch. is the official religion of the state, professed by the Imperial family and a large majority of the inhabs. The govt. is a pure despotism. There are no constitutional checks whatever to the power of the emp. The army, which now is formed by universal conscription, consists of an active body numbering about 880,000, and a reserve of about the same number, with 1424 guns and 300,000 horses. Fleets are kept in the Baltic, the Black Sea, and the Caspian, squadrons in the Arctic and Pacific.

The hist. of R. as a member of the political system of Europe begins with Peter the Great (1689-1725) of the house of Romanoff. He brought it into connection with Western Europe, and procured for it the necessary conditions of such a connection—access to the Baltic and the Black Sea. Under Catharine II. (1762-76) its influence began to be felt in European politics, and under Alexander I. (1801-25), after the fall of Nap., R. became the predominant power in Europe, which position it still holds, though often checked in its ambitious plans by Eng. and Ger.

#### Russia Leather. See LEATHER.

**Russian Literature.** The Russian lang. is the most flourishing section of the Slavonic branch of the Aryan family of speech. Its name dates from the second half of the 9th century. The earliest literary productions of Rus., being due to ecclesiastics versed in Ch.-Slavonic, the Old Bulgarian dialect of Slavonic speech employed by Cyril and Methodius for their translation of the Scriptures, evince a strong Ch.-Slavonic influence. As regards their style, they are for the most part copies of Byzantine models. Their contents are mostly of a religious character. Of the *Chronicles*, the earliest is that of Kief, generally known under the name of its first compiler, the monk Nestor, who lived from about 1056 till after 1113. It was followed by other works of a similar nature, such as the *Chronicles* of Novgorod, Volhynia, Tver, Moscow, etc., which run on almost without a break from the 11th to the 17th century. Beside these historical and religious works the first period of R. lit., dating from the introduction of Christianity to the first defeat of the Rus. by the Tartars (A. D. 988-1223), produced little that has been preserved.

The Mongol conquest suddenly stopped the development of R. lit. For more than 2 centuries scarcely anything of note was written, and it was not till the Moscow princes established their independence that any improvement took place. Even then little attention was paid to education. A few records of travel were produced, and some semi-historical tales, and the *Chronicles* were sedulously carried on. In the 16th century the printing-press was introduced into Rus. Its first production was the *Acts of the Apostles* and *Epistles of Paul*, which appeared at Moscow in 1564; the most important of its early fruits was the Bible, printed at Ostrog in 1581. The introduction of printing was due to the czar Ivan the Terrible. His writings, especially his correspondence with prince Kurbsky, form the most interesting of the secular literary productions of that period. During the "troublesome times" which followed Ivan's death little attention could be paid to education or its results, and it was not until the reign of Peter the Great that any decided impulse was given to literary activity.

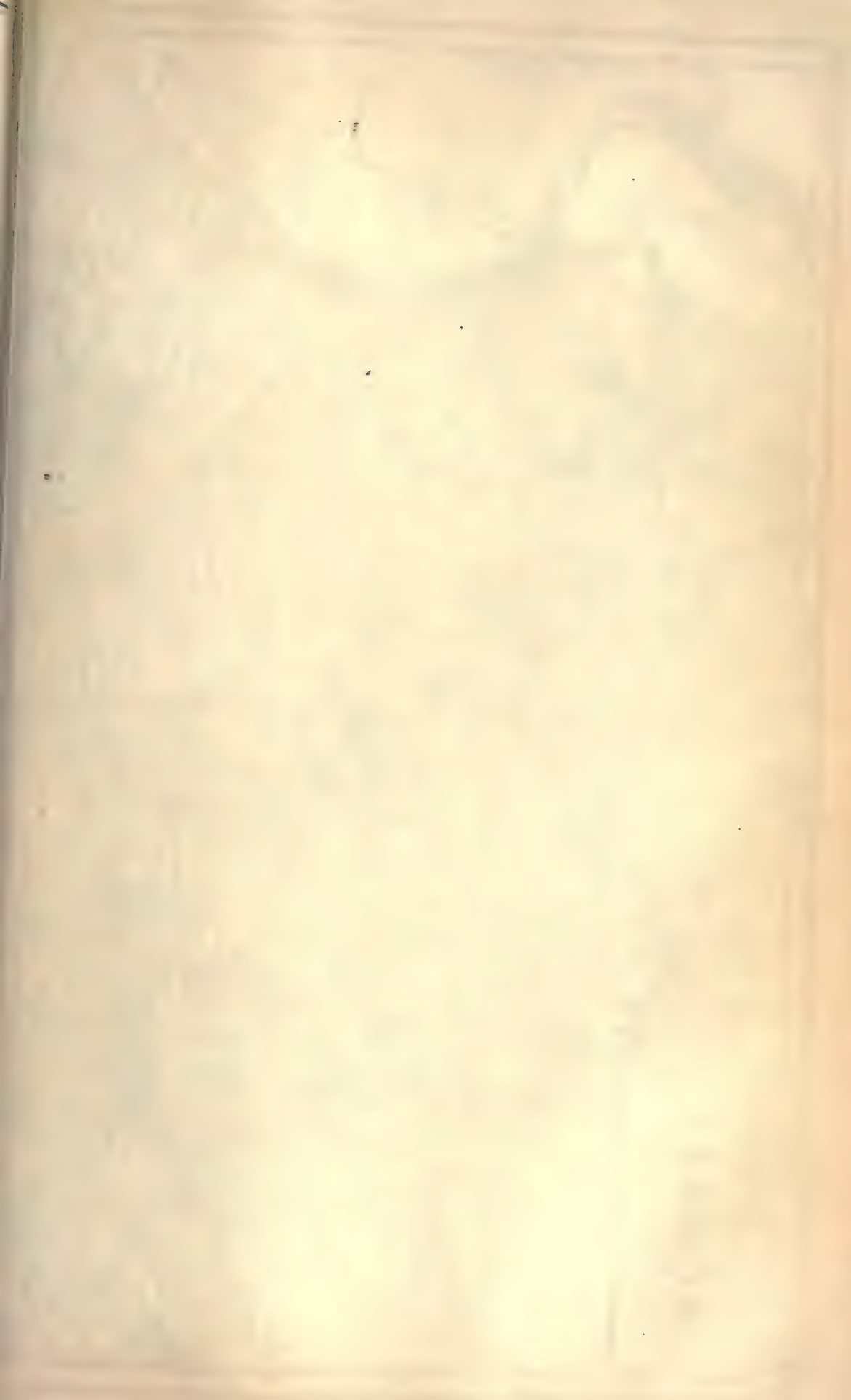
With the reign of Peter the Great begins the hist. of the modern lit. of Rus. R. printing was encouraged, the R. alphabet was simplified and rendered more apt for typographical uses, and secular lit. began to assert itself. Among its first representatives during the period which followed Peter's death was Prince Antiochus Kantemir (1708-44), who wrote in R. verse such satires as were natural to a period of transition. Another was Vassily Tatishchev (1685-1750), whose chief literary production was the *Rus. Hist.*, and a moral treatise which he wrote in 1733, entitling it his *Testament*. A third was Vassily Trediakovsky (1704-69). The appearance of the guide to versification which he pub. in 1735 forms an epoch in the hist. of R. poetry. But the first lay writer of real mark was Michael Lomonosof (1711-65), the son of a serf. His chief merit was that he laid down the laws of R. gram., and rescued the literary lang. of his country from the state of anarchy into which it seemed to be falling under the pressure of many forces from without. From his time the R. lang., no longer cramped by the archaic stiffness of the Ch.-Slavonic, and to a great extent freed from the danger of being corrupted by alien influences, served as a fit interpreter of the ideas of the fast-increasing school of thinkers and writers who illustrated the brilliant age of Catharine II. But although the written lang. became more natural, the spirit of R. lit. remained foreign to the land. R. authors turned for their models to other countries. This was the age of the lit. of the *salon*, marked by much culture, grace, and vivacity, but wanting in anything like depth or earnestness of thought; almost the sole exception being Radishchev's *Journey from Petersburg to Moscow* (1790), in which appears such a strong feeling on the subject of serfdom as led to the author's exile. Of other writers the most remarkable were—Alexander Sumarokof (1717-77), who wrote 26 dramas, beside numerous essays, satires, poems, etc.; Denis von Wizin (1744-92), a dramatist, satirist, and miscellaneous writer; Ivan Khennitsner (1744-84), a fabulist of renown; Michael Kheraskof (1733-1807), the author of an immense number of dramas and poems, including 2 epics; Ippolit Bogdanovich (1743-1803), a Little Russian, best known by his *Dushenka*, an imitation of the tale of Cupid and Psyche, which La Fontaine adapted from Apuleius; and Gabriel Derzhavin (1734-1816), by far the most notable of all. His fame chiefly rests upon his lyrical poems, one of which, the *Ode to God*, has acquired an im-

mense reputation. Many other R. writers of renown illustrated the 18th century, for during the reigns of the 3 empresses lit. became creditably represented in Rus. in almost every branch. The drama from the yr. 1746 thrived vigorously. Journalism had begun to make its way, and the study of R. hist. was greatly favored by Catharine II. Nicholas Karamzin (1765-1826) may be taken as the first representative of the new school of writers which prevailed throughout the reign of Alexander I. and a considerable part of that of Nicholas. During those reigns R. lit. attained its full development, and it was illustrated by the greatest names of which it as yet had to boast. Karamzin rendered to R. style a service like that which Lomonosof had already rendered to R. gram., rendering it far more fit than it had previously been for the expression of simple and natural ideas. It is the *Hist. of the Rus. Empire* (1803-16) to which he owes his cosmopolitan reputation. During the reign of Alexander I. a romantic school of poets arose. Among the first was Vassily Joukovsky (1783-1852), who took the modern German poets, and especially Schiller, as his models. Alexander Pushkin (1799-1837) owed much of his early inspiration to the genius of Byron. His prin. work is *Eugene Onegin*, which ranks as one of the chief masterpieces of R. lit. Pushkin met with an untimely death, being killed in a duel, and a similar fate befell the second of Russia's poets, Michael Lermontof (1814-41), who also was killed in a duel. In his poem *The Demon* he described the love of the chief of the fallen angels for a Circassian maiden; in his *Mtsyri*, the feelings of a young mountaineer who has been brought up in the peaceful seclusion of a monastery, but who cannot withstand his inborn craving for a free and open life, and his *Hero of Our Time* has been translated as often and into as many langs. as Pushkin's tale of *The Captain's Daughter*. It is when they fall back upon the popular poetry of their native land that the R. poets evince most power. This is especially manifest in the writings of Alexis Koltsof (1809-42), a poet belonging to the *bourgeoisie*, his father having been a small trader in Voronezh. His fellow-townsmen, Irvin Nikitin (1826-61), who also belonged to the class of small traders, has produced a number of poetic sketches of humble life. The *Gore of Uma* of Alexander Griboyedof (1795-1829) is a comedy which is regarded in Rus. as one of the few acknowledged masterpieces of native lit., and was completed in 1823. Nicholas Gogol (1806-52), a native of Little Rus., became the leader of the realistic school. In his shorter tales, such as the *Cloak*, etc., there is pathos mingled with the humor on which his reputation is mainly based. In his comedy of the *Revizor* a picture is drawn of the evils inherent in the official life of the time—evils which the author intended to be not only laughed at, but sorrowed over. The subject of the play was suggested to Gogol by Pushkin, who exercised over him a great influence, as was also that of his most famous work, the novel if it may so be styled, entitled *Dead Souls*, a work which obtained, and still enjoys, an immense success, but the reputation of which is never likely to become cosmopolitan. Among the few writers who have shown themselves truly national we still mention Koltsof and perhaps the fabulist, Ivan Krilof (1768-1844).

During the second half of the reign of Nicholas several writers of mark began to appear. Among those who made their names most known abroad was Alexander Herzen. Founding a "free Russian press" abroad, he and his fellow-workers turned their whole attention toward publishing, in Eng. and in Switz., in the form of books, journals, and pamphlets, ceaseless attacks upon the govt. of the land from which they were exiled. Until the death of Nicholas this R. revolutionary press exercised great power, but the sweeping reforms introduced by Alexander II. almost annihilated its influence. Freed from the crushing weight by which, in the time of Nicholas, it was kept down, R. lit. under the milder rule of his successor gained greatly in strength and in activity. In one dept., indeed, that of poetry, it manifested a falling off, but in almost every other branch it thrived rapidly and bore fruits both plentiful and rich. In poetry the first place is due to Nicholas Nekrasof, who began to write in 1838. A bitter satirist and an ardent reformer, he took as his early themes many of the evils of R. life, laying especial stress upon the sad condition of the peasantry before the emancipation. Among the best known of Nekrasof's rivals may be mentioned Leo Mel (1822-62) and Apollo Maikof and Afanasius Fet, both of whom were born in 1821. Of dramatic lit. the leading representative is Alexander Ostrovsky, who was b. in 1824. Beside dealing with the sins of public functionaries, he created a special field of his own in representing on the stage the manners and customs of the R. mercantile class. He has also produced several historical dramas, as have some other of his contemporaries, among whom may be mentioned Count Alexis Tolstoi (1817-75), whose trilogy of *The Death of Ivan the Terrible*, *Tsar Fedor Ivanovich*, and *Tsar Boris*, deserves special notice. Among the numerous novelists of Rus. several men of mark are to be found, but by far the first is Ivan Turgeneff, the solitary R. writer whose fame is cosmopolitan. Born in 1818, he began his literary career as a poet, publishing numerous poems between 1841 and 1846. In 1843 appeared his first prose work, a "dramatic sketch, and in 1844 his first tale, *Andrei Kolosof*. His prin. works are *Zapiski Okhotnika* ("A Sportsman's Notes"), the novels entitled *Dvornianskoe Gnyezdo* (translated into Fr. under the title of *Une Nichee de Gentilhomme*), and into Eng. under that of "Liza"), *Fathers and Children*, *Smoke*, *Spring Floods*, *On the Eve*, *Roudine*, etc. Among other modern R. novelists are Count Leo Tolstoi, whose *Peace and War* is by many R. critics considered the best of R. novels; Goncharof, whose chief work is *Obломov*; Dostoevsky, best known by his *Crime and Chastisement*, and *Notes from the Dead House*.

It is not, however, so much in the field of imagination as in that of serious study that R. lit. has of late most distinguished itself. In no country has more been done than





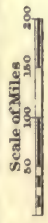


MAP OF

# RUSSIA

Drawn and Engraved on Copper-Plate  
EXPRESSLY  
FOR

JOHNSON'S UNIVERSAL CYCLOPEDIA







Longitude East 117 from Washington







in Rus., during the last 20 yrs., toward investigating and editing national records. R. literary energy is at present restless, eager, and impatient. [From orig. art. in *J.'s Univ. Cyc.*, by W. R. S. RALSTON.]

**Rust, Smut, Blight, Brand, and Bunt** are diseases of plants produced by the microscopic vegetation (fungi) upon the plant. (See *MILDEW* and *UREDINEÆ*.)

**Rustschuk**, roos-chook', town of Tur., built on several hills along the Danube and surrounded with extensive fortifications. It is the see of a Gr. abb., has several fine mosques, and manufactures of leather, muslin, silk, and tobacco. Pop. about 30,000.

**Ru'ta Ba'ga**, the Swe. turnip, believed to be an artificial variety of *Brassica campestris*.

**Ruta'cea** [from *Ruta*, one of the genera], a natural order of exogenous trees, shrubs, and herbs. Rue, buchu, and the prickly ash (*Xanthoxylum*) are representative plants of the order. Recently botanists have attached the Aurantiæ (orange, lemon, citron, etc.) to this family, which now numbers some 500 species.

**Ru'ter** (MARTIN), D. D., b. at Charlton, Mass., Apr. 3, 1785, was licensed as a Meth. preacher when 17 yrs. old; presided at one time over the Wesleyan acad. at Newmarket; became agent of the W. book establishment at Cin. 1820; was president of Allegheny Coll., Meadville, Pa., 1834-37, after which he went to Tex. as supt. of Meth. missions. Author of a Heb. *Gram.* and several theological treatises. D. May 16, 1838.

**Rutgers** (HENRY), b. in New York about 1746, grad. at Columbia Coll. 1766; was a capt. during the war of the Revolution, and subsequently a col. of militia. He was a prominent member of the Reformed Dutch Ch., a philanthropist, and an active politician; was several times a member of the N. Y. assembly, and a regent of the Univ. of New York from 1802 to 1826. Rutgers Coll. took his name on account of a donation of \$5000, and several charities in New York were recipients of his bounty. D. Feb. 17, 1830.

**Rutgers College**, originally called **Queen's College**, chartered in 1770, was located in 1771 at New Brunswick, N. J. It was the outgrowth of a desire on the part of its Dut. founders to perpetuate their distinctive theol. and forms of worship. During the Revolutionary war it was closed for 6 yrs., and on account of financial embarrassments again closed twice, being reopened in 1825 under the care of the General Synod of the Reformed Dut. Ch., and the name changed to Rutgers Coll. Some yrs. ago the General Synod transferred its entire right to the trustees, rendering the coll. independent. In 1834 the State coll. for the benefit of agriculture and mechanic arts provided for by an act of Cong., became attached to R. C., which has now an endowment of about \$500,000.

**Ruth**, **Book of**, one of the Hebrew Hagiographa, a canonical book of the O. T., is a pastoral story, relating the love of Ruth, a young Moabitess, the widow of a Heb. for her mother-in-law, Naomi, and of the subsequent marriage of Ruth to Boaz, a rich husbandman of Bethlehem-Judah. It is a picture of domestic virtue and happiness amid the troubled times of the Judges when might was right.

**Ruthenian Rite**, a branch of the R. Cath. Ch., consisting of the united Grs. of Ans., Hungary, and Poland, who as a rule speak the Russiack lang., a Slavic tongue resembling the Polish.

**Ruthenians**, or **Russniaks**, a branch of the Slavic family of nations, inhabiting the E. part of Galicia, the N. W. part of Hungary, and the adjacent regions of Poland and Rus. Their number is estimated at from 5,000,000 to 13,000,000. They are agriculturists, belong to the Gr. Ch., and their general standard of civilization is low. Their lang. forms an intermediate link between the Rus. and the Polish. They translated the Bible in 1581.

**Ruthenium**, a metal discovered in association with native platinum by Claus in 1846. It occurs chiefly in the hard grains of Iridosmine in small proportion, not above 6 per cent. Its extraction is difficult, tedious, and even very dangerous, owing to the deadly fumes of osmium. The metal is obtained as a white spongy mass. Next to osmium it is the most infusible known metal.

**Rutherford**, R. R. Junc., Bergen co., N. J., 8½ m. from Jersey City. Pop. 1880, 2299.

**Rutherford** (GRIFFIN), b. in Ire. about 1730, was one of the pioneers in the "Locke Settlement" in W. N. C.; was a member of the N. C. convention at Newberne 1775; commanded an expedition which penetrated into the Cherokee country 1776, in which yr. he was appointed a brig.-gen.; was taken prisoner at Camden Aug. 1780; took command at Wilmington upon its evacuation by the Brit.; was a State senator 1784; removed soon afterward to Tenn., where he was pres. of the legislature in Sept. 1794.

**Rutherford** (JOHN), b. in New York 1760, grad. at Princeton 1776; became a lawyer; was a Presidential elector 1798, 1813, and 1821, and U. S. Senator 1791-98; retired early from public life to devote himself to the management of his landed estates in N. J.; was a promoter of scientific agriculture and of internal improvements, and was the last survivor of the Senators who sat in Cong. during the administration of Washington. D. Feb. 23, 1840.

**Rutherford** (SAMUEL), b. in Roxburghshire, Scot., about 1600, grad. M. A. from the Univ. of Edinburgh 1621; became minister of Anwoth 1627; was deprived by the high commission court of Galloway 1630, and silenced for preaching against the "Articles of Perth" 1636; was a delegate to the gen. assembly Nov. 1638; prof. of divinity in New Coll., St. Andrew's, Oct. 1639; prin. of that coll. and rector of the Univ. 1649; was com. to the Westminster Assembly 1643-47, but was deprived of his posts 1660. D. at Edinburgh Mar. 20, 1661. Wrote theological treatises.

**Rutherford** (THOMAS), D. D., b. at Papworth-Everard, Cambridgeshire, in 1712, ed. at and fellow of St. John's Coll., Cambridge; became regius prof. of divinity at Cambridge 1745; rector of Barrow in Suffolk, Shenfield in Essex, and

Barley in Hertfordshire, and archdeacon of Essex in 1752; beside sermons and charges to the clergy, wrote *Ordo Institutionum Physicarum, in privatis suis Lectionibus, Essay on the Nature and Obligations of Virtue, A System of Natural Philos., being a Course of Lectures on Mechanics, Optics, Hydrostatics, and Astron.*, etc. D. Oct. 1771.

**Rutile** [Lat. *rutilus*, "red"], a ferruginous oxide of titanium, valued in coloring porcelains yellow. It is very widely distributed.

**Rutland**, R. R. centre, cap. of Rutland co., Vt., on Otter Creek. The town was chartered by N. H. in 1761, settled in 1770, and again chartered as "Socialborough" in 1772 by the royal govt. of N. Y. It was the most N. town of the State that was not depopulated by the advance of Burgoyne in 1777. From 1784 to 1804 it was one of the caps. of the State; the State-house erected in 1784 is still standing. R. has immense quarries of limestone, the prin. variety of which, known as "Rutland marble," is here seen in slabs, and is also transported in blocks for building purposes. It has the Rutland Military Institute and a U. S. court-house. Pop. tp. 1870, 9634; 1880, 12,149, including v. 7502.

**Rutledge** (EDWARD), b. at Charleston, S. C., Nov. 23, 1743, studied law in the office of his brother John and at the Temple in Lond.; commenced practice in Charleston 1773; was elected a member of the first Continental Cong. 1774; was one of the signers of the Dec. of Ind., a member of the first board of war (June 1776), of the committee appointed to draft Washington's commission (1775), and to draw up the first Articles of Confederation; also of that sent to confer with Lord Howe on Staten Island; commanded a company of artil. during the siege of Charleston, where he was taken prisoner 1780, and detained 11 months; sat in the legislature 1791, when he drew up the act for the abolition of the rights of primogeniture; became U. S. Senator 1794, gov. of S. C. 1798. D. Jan. 23, 1800.

**Rutledge** (FRANCIS HUGH), D. D., son of the succeeding, b. at Charleston, S. C., 1759, grad. at Yale 1821; studied at the Gen. Theological Sem. of the P. E. Ch.; was ordained deacon 1823, and priest Nov. 20, 1825; became rector of Trinity ch., St. Augustine, Fla., 1839, of St. John's ch., Tallahassee, 1845, and bp. of Fla. Oct. 1851. D. Nov. 6, 1866.

**Rutledge** (HUGH), brother of Edward, b. at Charleston, S. C., about 1740; became judge of admiralty 1776; was speaker of the legislative council 1777; imprisoned at St. Augustine 1780-81, speaker of house of reps. 1782-85, and chancellor of State from 1791 until his death, Jan. 1811.

**Rutledge** (JOHN), brother of Edward, b. at Charleston, S. C., in 1739; studied law at the Temple, Lond., commenced practice at Charleston 1761; was a member of the "Stamp Act Cong." at New York 1765, of the S. C. convention of 1774, and of the Continental Cong. 1774-75; sat in the S. C. convention of 1776, in which he was chairman of the committee which drew up the State const.; was pres. of the new govt. and commander-in-chief of the State; resigned, through dissatisfaction with the new State const., 1778; was chosen gov. 1779; took the field at the head of the militia against the invaders; retired to N. C. on the fall of Charleston, May 1780; accompanied the army of Gates until 1782, when he was elected to Cong.; became chancellor Mar. 1784; was a member of the convention which framed the Federal const.; was appointed a justice of the U. S. supreme court Sept. 1789; resigned 1791 to accept the chief-justice-ship of S. C.; was appointed by Washington chief-justice of the supreme court of the U. S. July 1795, and presided at the succeeding term, but having lost his reason shortly afterward, the Senate declined to confirm the appointment. D. July 23, 1800.—His son JOHN, b. at Charleston in 1766, was M. C. 1797-1803, and d. Sept. 1, 1819.

**Rutuli**, a people of anc. It., inhabiting the coast of Latium, where they built the city of Ardea. They were subdued by the Romans before the overthrow of the monarchy, and they are not mentioned in hist. after that time.

**Ruysbroek**, rois'brook (JOHN), the patriarch of the Dut. and Ger. Mystics, b. about 1293, taking his name from the place of his nativity, a v. between Brussels and Hall. About 1316 he became vicar of a ch. in Brussels; about 1332 he joined the monastery of Grönthal. D. Dec. 2, 1381. He adjoined the monastery of God and assimilation to him, to be achieved by contemplation. He avoided the antinomianism of pantheistic Mystics, and had the spirit of a reformer.

**Ruysbroek** [Lat. *Rubricus, Rubricus*], William of, a distinguished Franciscan monk and missionary, b. near Brussels about 1230; was sent in 1253 by Innocent IV. (1243-54) to the court of Mangu Khan, the grandson of Genghis Khan, to attempt his conversion to Christianity; returned in 1255. D. after 1293. Roger Bacon speaks of him, and may very likely have seen him; and, as gunpowder was then in use among the Tartars, it has been conjectured that R. may have given Bacon a clue to the discovery.

**Ruysdael**, rois'dahl (JACOB), b. in Haarlem, Hol., in 1625. Of his life little is known. His pictures represent Dut. scenery and landscape on or near the Rhine. The catalogues ascribe to him 48 pictures of undoubted genuineness. D. at Haarlem 1661.

**Ruyter**, van (MICHAEL ADRIAENZON), b. at Vlissingen, Zealand, in 1607, of humble parentage; went to sea as a cabin-boy in 1618; was made capt. in the Dut. navy in 1635, and rear-admiral in 1645; distinguished himself in the war between Sp. and Port., the war between Hol. and Eng., and in the Dan. service. In 1667 he sailed up the Thames, and burned a number of Eng. men-of-war, and compelled Eng. to conclude the Peace of Breda. In the war with Fr. he commanded in the Mediterranean, but was defeated. D. Apr. 29, 1676.

**Ryan** (STEPHEN VINCENT), D. D., b. in Upper Canada Jan. 1, 1826, removed to Pa. in infancy; was ed. at St. Charles's Sem., Phila.; completed his theological studies at St. Mary's Sem., Barrens, Mo.; was ordained priest June 24, 1849; was prefect and prof. for some yrs. at St. Mary's Sem., and afterward at St. Vincent's Coll., Cape Girardeau, Mo.,



of which inst. he became pres. about 1856; was named provincial visitor of the Congregation of the Mission in 1857; appointed by the Holy See second bp. of Buffalo Mar. 3, 1868, and was consecrated Nov. 8 of the same yr.

**Rycaut**, re-kŭ' (Sir PAUL), b. in Lond. about 1630, was sec. to the earl of Winchelsea during his embassy at Constantinople 1661-69; pub. *The Present State of the Ottoman Empire* (1668); was consul at Smyrna about 1670-81; sec. to the earl of Clarendon when lord lieut. of Leinster and Connaught 1685, in which yr. he was knighted and made judge of the court of admiralty and privy councillor for Ire.; lost his offices at the revolution of 1688; was Eng. resident at the Hanse Towns 1690-1700. D. in Eng. in 1700. Wrote *The Hist. of the Tur. Empire from 1623 to 1677* and *A Hist. of the Turks from 1679 to 1699*.

**Ryder** (JAMES), D. D., b. at Dublin, Ire., Oct. 1800, came to the U. S. in boyhood; became a novice in the Jesuit order 1813; was ed. at Georgetown Coll.; studied theol. at Rome 1820-25; was ordained priest 1825; taught theol. at Spoleto 1825-28; was for some time v.-p. of Georgetown Coll.; was its pres. 1840-45, and again 1848-51; pastor of chs. at Phila. and at Frederick, Md., 1839-40; pres. of the coll. of the Holy Cross at Worcester, Mass., 1846-48; superior of the order of Jesuits of N. Amer. D. Jan. 12, 1860.

**Rye** (*Secale cereale*), a cereal grain belonging to the subtribe Hordeineae, which flourishes in the higher latitudes of the temperate zone, thrives upon poor soil, and yields a useful straw. The grain is wholesome, but darker and less nutritious than wheat. Whiskey is extensively distilled from rye in the U. S., gin in Hol., and quass in Rus.

**Rye-Grass**, the *Lolium perenne*, a European grass naturalized in the U. S., esteemed both for hay and pasture.

**Rye**, N. Y. See APPENDIX.

**Rye-house Plot** [so called from the Rye-house, a farm near Newmarket, where the murder of the king was to be undertaken] was a scheme devised by some Eng. Whigs to kill King Charles II., and to give the crown to the duke of Monmouth. The plot was discovered, and many leading Whigs were sent to the block.

**Ryerson** (ADOLPHUS EGBERTON), D. D., LL.D., b. at Charlotteville, Canada, Mar. 24, 1803, was ordained to the (Wesleyan) Meth. ministry 1825; became ed. of the *Guardian*, the organ of the M. E. Ch. in Canada, 1829; became prin. of the Univ. of Coburg (Victoria Coll.) 1841; was supt. of public schools for Upper Canada 1844-50; travelled in the U. S. studying systems of education, and prepared the legislation for a new scheme of public instruction. D. Feb. 19, 1882.

**Rye, Spurred**. See ERGO.

## S.

**S**, a consonant of the sibilant class, frequently interchanged with z, and also with the mute sound of *th*—the latter more especially in the lisping speech of children. *S* in Eng. often has the sound of *z*, as in *clothes*. *S* is the abbreviation for south. *S* in chem. designates sulphur.

**Saarbrücken**, town of Rhenish Prussia, on the left bank of the Saar, connected by a floating bridge with the suburb of St. Johann on the right bank, has 21,800 inhab., and was the theatre of the opening of the Franco-Ger. war of 1870-71. The Fr. retreated across Eslingon to Bilitersdorf, leaving behind them many prisoners, their camp equipage, pontoons, and provisions.

**Sabadilla**, or **Cebadilla**. See ASAGREA.

**Sabaism**, or **Zabism**, the religion of the Sabæans, originally a people of Arabia Felix, supposed to be the Sheba of the O. T. Their religion was a system of sun, moon and star worship, widely prevalent, not only in Ar., but in Chaldea, Syria, and Ethiopia. The name Zabism especially designates the Syrian development of the system, which impressed itself upon anc. philos., and upon Judaism and Christianity as well. Neo-Platonism, the Cabbala, and Gnosticism were among its fruits. The Mendæites, or Chrs. of St. John (so called), are descendants of the old Zabians.

**Sabbath**, the weekly day of religious rest. The first mention in the Bible of such an inst. is in Genesis ii, 2, 3. The seventh day is consecrated by the Creator, who, having finished the creative work of six days, blessed and hallowed the seventh day, because he rested therein. The natural law of periodic rest was thus lifted out of the sphere of mere physical necessities into that of spiritual privilege. The first mention of the *S*. by name occurs in Ex. xvi. 23 seq. It next appears among the Ten Commandments. Its observance was enforced by gratitude for deliverance from bondage, and was constituted a sign of covenant between God and the Jews. The law of the *S*. reappears in the Jewish municipal and ceremonial code with special prescriptions and penalties, all of which show the importance attached to its observance. Connected with the weekly *S*. there was ordained in the Jewish municipal and ceremonial law a system of sabbatical yrs. of local and national significance and use. The *S*. also, in its leisure and opportunity for social intercourse and holy convocation, sustained an important relation to the free republican insts. of the Jews. Christ, while observing the *S*., sought by his example and teachings to rescue it from the puerile superstitions by which it had come to be degraded. He performed miracles of healing, and, with his disciples, gathered ears of grain for food as he passed through the fields, on the *S*.

The resurrection of Christ and his subsequent appearances to his disciples till his ascension, and the miraculous descent of the Holy Spirit on the first day of the week, led to that day being set apart for the special religious assemblies of the Chrs. and for the simple services of their faith. Within a century after the death of the last of the apostles we find the observance of the first day of the week, under the name of the Lord's day, established as a universal custom of the Ch. But the position of the early Ch., struggling

into existence, exposed to persecution, and with many of its members slaves of heathen masters, would prevent unbroken regularity of worship and a general cessation of labor, until in the time of Constantine (321) the observance of Sunday as the weekly rest-day was protected by law. At the Ref., Luther, Zwingle, Calvin, and Bucer at first favored the abolition of all holy days but the Lord's day. But their antagonism to what they considered the Judaizing legalism of Rome, and their zeal for evangelical freedom, led them at times to deny the scriptural obligation of a weekly rest-day. Upon the Continent, since the Ref., both among R. Caths. and Prots., the observance of Sunday has been based chiefly upon ecclesiastical authority. A different view early obtained in G. Brit., and there and in this country the prevalent doctrine recognizes the weekly rest-day as founded in the nature of man, consecrated by the example of God at the Creation, authoritatively promulgated in the Fourth Commandment, confirmed by Christ, and, while transferred from the seventh to the first day of the week and invested with new significance, perpetuated in the Lord's day of the Chr. Ch. [From orig. art. in *J.'s Univ. Cyc.*, by REV. W. W. ATTERBURY.]

**Sabbatical Festivals**. The laws of Moses enjoined these 4: (1) The Sabbath day, noticed above. (2) The Sabbath month, which was Tisri, the seventh in the Hebrew yr., corresponding with our October. It opened with the Feast of Trumpets, contained the Day of Atonement (10th), and the Feast of Tabernacles (15th to 22d). (3) The Sabbath yr., which in Ex. (xxiii. 10, 11) has an agricultural aspect (the land is to rest from culture); in *Levit.* (xv. 1, 2) has a commercial aspect (debts were either to be relinquished or held in abeyance); and in *Lev.* (xxv. 3-7) a religious aspect ("for the Lord"). Every 7th yr. was thus interdicted to secular and selfish uses. But before the Babylonian captivity, the ordinance appears not to have been well observed, as may be gathered from Jer. xxv. 11, 12, compared with 2 Chron. xxxvi. 21. After the Captivity it was different. Alexander, who conquered Syria 332 B. C., remitted the tribute of the Jews every 7th yr., "that they might enjoy the laws of their forefathers" (Josephus, *Ant.* xi. 8, 5). Julius Cæsar afterward did the same (*Ant.* xiv. 10, 6). According to Jewish reckoning, the last sabbatical yr. was from Oct. 1881 to Oct. 1882. (4) The yr. of Jubilee, which was not, as some say, every 49th, but every 50th yr., so that there were then 2 successive yrs. of rest. In that year, every Heb. servant was to regain his freedom, and landed property revert to the representatives of its original proprietors. It has been a question whether this jubilee yr. was ever observed. Michaelis doubts, Hupfeld denies, but Ewald asserts its observance. (See also FEAST.) R. D. HITCHCOCK.

**Sabellianism**. See SABELLITUS.

**Sabellius**, a presbyter of the church of Ptolemais in Egypt, excommunicated by Bp. Dionysius of Alexandria in 261 for a heresy which is called after his name. He taught that the Trinity of the Godhead is not a trinity of persons, but of manifestations and periods in the history of revelation. God is strictly one in person, but reveals himself in a threefold aspect as Father, Son, and Holy Spirit in the works of creation, redemption, and sanctification.

**Sabetha**, Kan. See APPENDIX.

**Sabine**, sab'in (SIR EDWARD), D. C. L., F. R. S., b. in Dublin, Ireland, in Oct. 1788, ed. at the military schools of Marlow and Woolwich; entered the Brit. army 1803; became capt. 1813; took part in the campaign on the Niagara frontier, commanding the batteries at the siege of Ft. Erie, 1814; accompanied the Arctic expedition of Ross and Parry 1818, and that of Parry 1819-20, when he made important researches in terrestrial magnetism; edited during the latter voyage the *North Georgia Gazette and Winter Chronicle*; aided in the preparation of the *Nat. Hist.* of Parry's first expedition (1824); made a series of voyages, ranging from the equator to the Arctic circle (1821-25), in quest of data concerning the variations of the magnetic needle, the figure of the earth, and other problems in meteorology and terrestrial physics; pub. *An Account of Experiments to determine the Figure of the Earth* (1825); was sec. of the Royal Society 1827-30; made valuable reports on magnetic forces to the Brit. Association 1836-38, which led to the establishment of a system of magnetic observatories; pub. *The Variability of the Intensity of Magnetism upon many parts of the Globe*; made a knight of the Bath 1869, full gen. 1870, and corresponding member of the Fr. Acad. of Sciences, 1875. D. June 26, 1883.

**Sabine** (LORENZO), b. at Lisbon, N. H., Feb. 28, 1803; became a merchant and subsequently a bank officer; collector of the board of trade and confidential agent of the treas. dept. at Boston; resided some yrs. at Eastport, Me., which town he 3 times represented in the Me. legislature; was collector of the port of Passamaquoddy, where he made inquiries into the personal histories of the Amer. loyalists who emigrated into the neighboring provs. of N. B. and N. S.; was M. C. from Mass. 1851-53, and for many yrs. U. S. fishery com. He wrote *The American Loyalists, Report on Fisheries*, etc. D. Apr. 14, 1877.

**Sabine River**, rises in Hunt co., Texas, flows S. E. to the W. boundary of La., and then turns S., forming throughout the rest of its course the boundary between Tex. and La. for 250 m. It is 500 m. long, is navigable in its lower course, and after traversing Sabine Lake enters the Gulf of Mexico through Sabine Pass, its mouth, which has a maximum depth of 8 ft. on the bar.

**Sabines** [Lat. *Sabinus*], a valiant people of anc. It., inhabiting the mt.-region N. E. of Rome. The original pop. of Rome, it would appear, was largely Sabine; and a Sabine king, Numa, was the most eminent of the royal line of old Rome. The Sabine religion, modified by other It. and Etruscan elements, became in substance that of the Rom. state. The Titles, one of the original patrician tribes, were Sabine, as in later times was the Claudia gens. The *S*. were renowned not only for valor, but for gravity, dignity, and austere virtue.



**Sa'ble** [Fr. *zibeline*], a name given to species of the family Mustelidae and genus *Mustela*. The species resemble the weasel, but their bodies are not so elongated. In summer the color is reddish or brownish yellow, clouded with black, and becoming lighter toward the head; in winter it is dark. The length of the body in well-grown animals does not vary much from 17 inches. The Old-World form (*Mustela zibellina*, Linn.) inhabits N. Europe and Asia. The S. furs are chiefly obtained in Siberia. The Amer. S. (*Mustela Americana*) is most abundant in Brit. Amer., and the furs in the markets are chiefly obtained by the Hudson's Bay Co.

**Sa'bre** [Fr., a word of E. origin], a long, heavy, curved or straight cut. sword, used for cutting and thrusting, and usually one-edged.

**Saccarappu**, Me. See APPENDIX.

**Sac City**, Ia. See APPENDIX.

**Sachs**, sahsks (HANS), b. at Nuremberg Nov. 5, 1494, was apprenticed to a shoemaker; undertook, after finishing his apprenticeship, the professional wanderings (1510-15) which at that time formed a part of the education of a thorough mechanic; visited many Ger. cities, studying in the guilds his trade and the art of the meistersingers; settled in 1515 in his native city as a shoemaker and a poet. D. there Jan. 20, 1576. He became the representative poet of his age, and produced several thousand strophic poems and several hundred dramas, dialogues, *Schwänke*. His pen was a power in the camp of the Reformers.

**Sack** [Fr. *sac*, "dry"], a name formerly applied to wines of the class now called "dry"—4. *e.* not saccharine—but especially given to "sherish sack," represented now by the amontillado sherry wines.

**Sack-cloth**, coarse hempen or hair cloth, such as was used for making bags, was worn by the anc. as an emblem of grief, and in later times as a means of penitential maceration of the body among ascetics.

**Sack-et** (DELOS B.), b. in New York May 1822, grad. at W. Pt. 1845; was engaged in the battles of Palo Alto, Resaca de la Palma, and Monterey. From 1847 to 1861 he served mainly on frontier duty; was assistant instructor of cav. tactics at W. Pt. 1850-55; in May 1861 he had risen to be lieut.-col. of the 2d Cav.; transferred to the staff in Oct. 1861 as inspector-gen., with rank of col., and served in that capacity through Va. Peninsular campaign, at battles of South Mountain, Antietam, and Fredericksburg; brevet brig. and maj.-gen. U. S. A. 1865; brig.-gen. 1881. D. Mar. 8, 1885.

**Sack-ville** (GEORGE GERMAIN), Viscount, better known as LORD GEORGE GERMAIN, third son of the first duke of Dorset, b. in Eng. Jan. 26, 1716, ed. at Westminster School and at Trinity Coll., Dublin; entered the army as LORD GEORGE SACKVILLE; served with credit at the battles of Dettingen (1743) and Fontenoy (1745), and against the Pretender in Scot.; became a privy councillor; was sec. for Ire. 1751; made lieut.-gen. 1758; commanded the allied cav. at the battle of Minden, Aug. 1, 1759, when he failed to execute the orders of the commander-in-chief; was tried by court-martial and cashiered early in 1760, but was restored to favor at the accession of George III. (Oct. 1760); entered Parl. 1761; was restored to the privy council 1766; fell heir to the estate of Lady Betty Germain, and assumed her surname 1769; entered the cabinet of Lord North as sec. of state for the colonies Oct. 1775; retained that post throughout the war of the Amer. Revolution; resigned Feb. 1782, on which occasion he was created Viscount Sackville. D. Aug. 26, 1785. Perhaps author of the *Junius Letters*.

**Saco**, saw'ko, city and R. R. centre, York co., Me., 100 m. E. of Boston, and on Saco River, 9 m. from its mouth, has water-power and considerable manufactures and ship-building. Old Orchard is a popular watering-place. The Meth. national and dist. camp-meeting grounds are at the beach. Pop. 1870, 5755; 1880, 6889.

**Saco**, a river of Me., rises in the White Mts., N. H., and flows 160 m. S. E. to the Atlantic; has several considerable falls, one of which, Great Falls, is 72 ft. in height.

**Sacrament** [Lat. *sacramentum*, "an oath," especially a military oath, and also a gage in money laid down in court by two contending parties], used in the Ch. since Tertullian, in a loose sense, of sacred doctrines and ceremonies (like the Gr. *μυστήριον*), and then, more particularly, of Baptism and the Eucharist, and a few other solemn rites connected with Chr. worship. St. Augustine defines S. in the narrower sense to be the visible sign of an invisible grace (*signum visibile gratiæ invisibilis*). To this was afterward added by Prots., as a third mark, that it must be instituted by Christ and enjoined upon his followers. S. are also called signs, seals, and means of grace. Their number is by Prots. confined to 2—Baptism and the Lord's Supper—because these alone are instituted by Christ and commanded to be observed to the end of time. The R. Cath. and the Gr. chs. add to them 5 others—confirmation, penance, extreme unction, ordination, and matrimony. The Council of Trent anathematizes those who deny that there are 7 S. (*esse plura vel pauciora quam septem sacramenta*). In the R. Ch. they are called "mysteries." As to the efficacy of the S., Protestants require faith as a subjective condition, while the R. Cath. Ch. teaches that the S. work *ex opere operato*—i. e. by the inherent power of the institution or by the performance of the act, independently of the moral character of the priest and the state of the recipient. The Quakers reject the S. as external ceremonies, and hold only to internal baptism or regeneration of the Spirit, and internal communion with Christ. (See articles on the several S., especially EUCCHARIST.)

PHILIP SCHAFF.

**Sacramentarians**. See TETRAPOLITAN CONFESSION.

**Sacramen'to**, city and important R. R. centre, cap. of Cal. and co.-seat of Sacramento co., on left bank of Sacramento River, at its junction with American River and at the head of navigation for large steamboats; it is 135 m. by rail from San Francisco and Pacific Ocean, and is nearly in centre of State. The corporate limits are 2½ m. square. City indebtedness, Jan. 1889, \$1,500,000; estimated

value of all property in city, \$25,000,000; assessed value of all city property, real and personal, \$11,179,625. It has an extensive trade with the mining-dists. and with large wheat-raising and agricultural regions, of which it is the centre. Its manufactures are extensive, various, and rapidly increasing. The Central Pacific R. R. shops and manufactories at this point are very extensive. The banks have united capital and deposits of \$10,000,000. A line of steamers and numerous sailing vessels ply on the river between this place and San Francisco. The river is navigable for small steamers for more than 100 m. above the city.

**Public Buildings**.—The prin. buildings are the State Capitol (cost \$2,500,000), in a park of 50 acres; a fine structure occupied as a State printing-office and armory; Odd Fellows' temple, Masonic temple, agricultural hall, and Turner hall.



State Capitol (Sacramento, Cal.).

**Education**.—There are 14 public-school buildings. The libraries are the City, the Odd Fellows', and the State.

**Water-works, Etc.**—Is well supplied with water from the river by the improved Holley pumps. The streets, which are wide, are laid out at right angles, and lighted with gas. It has a paid fire department, with steam fire-engines, etc. Among the charitable institutions are the Howard Benevolent, the Prot. and R. Cath. orphan asylums, 10 lodges of F. and A. Masons, and 13 lodges of Odd Fellows.

**History**.—The land on which the city is built was originally a part of the New Helvetia grant given by the Mex. govt. to Gen. John A. Sutter, the remains of whose fort are still standing within the corporate limits. It was from this fort Marshall was sent to build a saw-mill on American River, where he made the discovery of gold which caused an immigration to California within one year of more than 100,000 persons. A settlement commenced in the vicinity of Sutter's Fort immediately after this discovery, as it was an important point for the supply of the mines. The pop. Apr. 1, 1849, was estimated at 150 persons, keeping stores in tents and canvas houses. In 1853 it had an estimated pop. of 12,000, living in brick and wooden houses, and was the great centre of the principal stage lines of the State. Pop. 1870, 16,283; 1880, 21,430; 1883, about 23,000. [From orig. art. in *J. S. Univ. Cyc.*, revised by JOSEPH D. REDDING.]

**Sacramento River** rises in Lassen co., Cal., and flows first in a W. and then in a S. course. Its upper portion is called Pitt River, the name Sacramento being of Mt. Shasta. The S. is navigable from its embouchure in Suisun Bay, some 50 m., and by small vessels to Red Bluffs, 330 m., in good stages of water. Its length is 500 m.

**Sacred Heart, Ladies of the**, an order of nuns founded in 1800 in Fr.; approved by the pope in 1826; first came to the U. S. in 1819, and have now many houses here. There is also a congregation of Sisters of the Sacred Agonizing Heart of Jesus, with a few houses in the U. S.

**Sacred Heart, Regular Clerks of the, or Pac-canarists**, an association of R. Cath. priests, recognized in 1800 by the pope, sometimes called **Regular Clerks of the Faith in Jesus**, designed to replace the Jesuits; in 1814 the order was united with the Jesuits.

**Sacred Hearts of Jesus and Mary, Brothers of**, a R. Cath. community founded in Fr. in 1822. They were first established in the U. S. in 1847. Their work is educational.

**Sacred Music**. See MASS and ORATORIO.

**Sacrifices** [Lat. *sacrificium*]. The origin of S. is lost in the dimness of antiquity. The earliest records of our race show S. as an existing institution. Their object was everywhere alike—to provide a means whereby man, conscious of his own sinfulness, might approach a holy God. Among heathens, S. were looked upon as in some sort a compensation to the gods, and their efficacy depended somewhat upon their value; among the chosen people the fact was recognized that the disturbed communion with God could only be restored on the basis of holiness. S. in great variety were provided, but those especially appointed as "sin-offerings" were always of the same character and value. Their efficacy was made to depend simply upon the Divine appointment.

The chief kinds of Heb. S. were—the whole burnt-offering: the sin-offering, of which only the fat and kidneys were burned upon the altar; and the trespass-offering. These were all propitiatory offerings, and with them the priest was required "to make atonement" for the people. Beside these were the peace-offerings, perhaps the most common of all, which might be offered in any number and of any sacrificial animal. There were other important S. required. The Passover was a lamb offered in memory of the deliver-



ance from Egypt; the 2 goats on the great day of atonement in each yr., of which one was sacrificed at the altar, the other sent as a "scapegoat" into the wilderness; the red heifer, used in purifications; and a great variety of S. for individuals on special occasions. (See *FABER, On the Origin of Sacrifice*; *KEIL, Die Opfer des alten Bundes*.)

**Sacy, sah-se', de** (ANTOINE ISAAC SILVESTRE), BARON, b. at Paris Sept. 21, 1758, studied jurisprudence and Oriental langs.; was appointed prof. in 1795 at the newly founded École des Langues orientales, and in 1808 at the Collège de France; succeeded Rémusat in 1831 as keeper of the MSS. of the Royal Library. D. at Paris Feb. 21, 1838. Wrote *Mémoires sur Diverses Antiquités de la Perse, Principes de Grammaire universelle, Mémoires sur l'Etat actuel des Samaritains, Exposé de la Religion des Druses*.—His son, SAMUEL USTAZADE SILVESTRE DE SACY, b. at Paris Oct. 17, 1801, became in 1828 a contributor to the *Journal des Débats*, and held for more than 25 yrs. a most prominent position in Fr. journalism; was elected a member of the Acad. in 1854; appointed keeper of the Mazarin Library in 1856, its administrator in 1848; member of the council of public education in 1864. Edited *Lettres de Madame de Sévigné*. D. Feb. 14, 1879.

**Sadducees.** See JEWISH SECTS and KARAITES.

**Sad'ler** (MICHAEL THOMAS), F. R. S., b. at Snelston, Derbyshire, Eng., Jan. 1780, was for some time a merchant at Leeds; became an accomplished popular orator; took a philanthropic interest in behalf of the agricultural poor and the children in factories, and sat in Parl. from 1829 to his death, which occurred in Ire. July 1835. Author of *Ire., its Evils and their Remedies*, and *The Law of Pop.*

**Sadler, or Sadtler** (SIR RALPH), b. at Hackney, Eng., in 1507, was employed by Henry VIII. in effecting the dissolution of the religious houses, and shared in their spoil 1535-37; was ambassador to Scot. in 1537, and again in 1540 and 1541-43; negotiated a treaty for a marriage between Prince Edward and Mary, the infant queen of Scots, July 1, which was declared null by the Scots Dec. 11, 1543; distinguished himself in the ensuing war with Scot., being made knight-banneret upon the battle-field of Pinkie, Sept. 10, 1547; was made privy councillor by the will of Henry VIII., and master of the wardrobe soon afterward; bore a prominent part in the administration under Edward VI.; was recalled to the privy council on the accession of Elizabeth, and again sent on a mission to Scot. 1558; was one of the coms. in the conferences at York respecting the charges made against Mary queen of Scots, Oct. 4, 1568; was her keeper when imprisoned at Tutbury Castle 1562, and was again envoy to Scot. about 1566. D. at Standon Mar. 30, 1587. Wrote *Letters and Negotiations*.

**Sadowa**, v. of Bohemia, on the Bistritz, near Königgrätz. The battle fought between the Prus. and Aus. (July 3, 1866) in this vicinity is familiarly known by the names of both these places. Within a week of crossing the frontier the Prus. utterly routed the Aus. in a pitched battle; within a month they dictated peace to them in sight of Vienna, the result being the supremacy of N. Ger.

**Safe-Conduct and Safe-Guard** are not essentially different from *PASSPORT* (which see).

**Safed** (Heb. *Zephath*), town of Pal., anc. prov. of Galilee, at an elevation of 2775 ft. The Jews consider it a sacred city, expecting that the Messiah will make it his cap.; its coll. is one of the prin. seats of Heb. learning. Pop. about 4000.

**Safes, Fireproof.** See FIREPROOF SAFES.

**Safety Cage**, an apparatus worked by steam-power at the mouth of deep mines to facilitate the descent and ascent. The apparatus consists generally of a square cage in which the miners place themselves, and which travels in guides fixed vertically down the sides of the shaft or pit. The term is more especially given to a contrivance for arresting the cage in case of accident, consisting of a catch which, if the rope or chain should snap, takes fast hold of a toothed guide and prevents the cage from falling to the bottom.

**Safety Lamp**, an illuminating apparatus for mines, so constructed as to obviate the dangers of explosion when artificial light is needed in places where fire-damp exists. In deep coal-mines accumulations of carburetted hydrogen take place; this gas, when mixed with air, is highly explosive, and fearful accidents have resulted from the use of ordinary lamps in such places. The earlier contrivances to effect illumination without danger were clumsy and imperfect. In 1813 Dr. W. R. Clanney, and in 1815 George Stephenson and Sir Humphry Davy, each invented, independently, true S. L. Of these, Davy's has been most used. It consists of a closed cylinder of gauze made of wire from  $\frac{1}{16}$  to  $\frac{1}{80}$  of an inch in diameter, with 28 wires to the inch; over the closed top is fitted a lid like a pill-box cover, fitting closely around, but not closely down over it, and so leaving between the 2 gauze tops a sort of air-chamber, which protects the upper lid from excessive heat. The cylinder should not exceed  $1\frac{1}{2}$  or 2 inches in diameter, or the volume of gas within will be sufficient to induce explosion. Three strong vertical wires extend up the outside of the cylinder and unite above the lid, where a handle is attached; beneath is a common lamp. The objections to this lamp are that the light is feeble, and that it is perfectly safe only in still air and when cautiously moved.

**Safflower** [from *saffron* and *flower*], or **Carthamus**, the flower of *Carthamus tinctorius*, of the thistle tribe, contains 2 coloring matters—one, yellow, is an acid, bitter, soluble in water, and useless; the other, *carthamine* or *carthamic acid*, red, insoluble in water, but soluble in alcohol and in alkalies, and valuable as a dye. To prepare carthamic acid the S. is placed in bags and washed to remove the yellow coloring-matter. It is then macerated in water with 15 per cent. of its weight of crystallized carbonate of soda. Into the clear solution cotton yarn is dipped. On acidulating with dilute acid the cotton takes up the carthamic acid. The dyed cotton is washed and digested with a solution of car-

bonate of soda, which dissolves the carthamic acid, but leaves yellow matter fixed on the cotton. By acidulating the alkaline solution the carthamic acid is precipitated as a brilliant red powder. This may be further purified by solution in alcohol and precipitation with water.

**Safford** (JAMES MERRILL), Ph. D., M. D., b. in Zanesville, O., Aug. 13, 1822, grad. in the Ohio Univ., and afterward entered Yale Coll., from which inst. he received the degree of Ph. D.; before leaving Yale was elected to 2 professorships—one of math. in the Ohio Univ., the other of chem., nat. hist., and geol. in Cumberland Univ. at Lebanon, Tenn.; accepting the latter, he located in Lebanon in 1848; in 1853 resigned from Cumberland Univ. and moved to Nashville; in 1854 was made State geologist of Tenn. His report on the geol. of Tenn., pub. in 1869, is one of the best of the State reports. In 1872 received the degree of M. D. from the Univ. of Nashville; in 1873 was elected to the chair of chem. in the med. dept. of the Univ. of Nashville, and the following yr. to the same position in Vanderbilt Univ.; in May 1875 was elected prof. of mineralogy, bot., and economic geol. in Vanderbilt Univ.; also prof. of chem.

**Safford** (ROBERT), b. July 7, 1767, in Worcester, Mass., emigrated in his 22d yr. to the N. W. Terr., then an unbroken wilderness from the Ohio River to the lakes; did much to reclaim the W. wilderness; was appointed judge over a vast dist., embracing nearly all of what is now known as the State of O.; filled nearly all the offices of honor and trust which could be conferred at that time, taking an active part in the Indian wars, being commissioned col. D. July 26, 1863.

**Safford** (TRUMAN HENRY), b. at Royalton, Vt., Jan. 6, 1836, obtained in early boyhood great celebrity for his mathematical powers; prepared an almanac at the age of 9; calculated the elliptic elements of the first comet of 1849; devised an original method of calculating the moon's risings and eclipses; grad. at Harvard 1854; was some yrs. engaged in astronomical studies; became in 1863 adjunct observer in the Cambridge Observatory, acting director Feb. 1865, and director of the Chicago Observatory Dec. 28, 1865. He determined at Cambridge the right ascension of 1700 stars, the declination of 450, observed 6000 transits, and completed Prof. Bond's report of discoveries in the constellation Orion.

**Saffron**, a yellow substance, consisting of the stigmas, with part of the styles, of the S. *crocus* (*Crocus sativus*). S. was formerly imported in 2 forms—*hay S.*, consisting of the stigmas of the flowers, and *cake S.*, an artificial compound of safflower, gum, etc.; the former only occurs in commerce at present. Sp. S. is the best. It is said 100,000 flowers are necessary to produce 1 lb. of S. This dye is often adulterated with safflower, marigold, pomegranate, and other flowers. S. was formerly a favorite dye, but is now rarely used as such.

**Saffron, Meadow.** See COLCHICUM.

**Saffranine** [from *saffron*], **Safranin**, **Aniline Pink**, or **New Rose**. This dye, which has to a large extent superseded safflower for dyeing silk and cotton, is obtained by treating heavy anilines with nitrites and arsenic acid. The colored mass is then treated with boiling water, the solution neutralized with an alkali, filtered, and treated with chloride of sodium, by which the new dye is precipitated. It is filtered and drained, and sent into commerce as a paste. The S. of commerce is either in the form of a paste or a yellowish red powder, consisting of the hydrochlorate of a base S. mixed with calcic carbonate and sodic chloride. It may be purified by repeated solution in boiling water and precipitation by hydrochloric acid. By decomposing this salt with oxide of silver, the free base is obtained as a red solution, which yields reddish-brown crystals on evaporation, very soluble in alcohol and in water. In fact, S. when treated with aniline yields a purple dye, and mauveine and S. give similar reactions with sulphuric acids.

**Sage** [Fr. *sauge*], the *Salvia officinalis*, a garden-herb of the order Labiata. Its leaves are employed in flavoring force-meats and other dishes, and S. tea, a decoction of its leaves, is a useful domestic remedy, having aromatic, stimulant, and tonic powers.

**Sage, Le** (ALAIN RENÉ). See LE SAGE.

**Sage-Cock** (*Centrocercus urophasianus*), a species of grouse (belonging to the family Tetraonidae and sub-family Tetraoninae), also called **Cock of the Plains**. It is characterized, among the forms which are feathered to the toes but with the toes themselves bare, by the tail being much elongated and cuneate, and the constituent feathers narrow and attenuated, the nasal fossae equal to  $\frac{2}{3}$  of the culmen, and the shafts of the feathers on the lower part of the throat very spinous. The color above is brownish yellow, with blackish areas on the inner fields of the feathers; the wing has light-colored shafts to the feathers of the coverts; the lower portions of the breast are whitish, the abdomen marked with a broad black area. The male bird has very large, dilatable, naked, and yellow-colored air-sacs on each side of the neck, bordered by stiff, scale-like feathers. The species is the largest Amer. representative of the family, and is confined to the arid plains of the W., ranging from the Black Hills in the E. to Cal. and Or. in the W., and in the N. from Brit. Amer. to Ari. in the S.

**Sag Harbor**, Suffolk co., N. Y., on R. R. and Peconic Bay. It is the prin. market town for the E. end of L. I., and is engaged in maritime pursuits. Pop. 1870, 1723; 1880, 1996.

**Saginaw**, city and R. R. centre, cap. of Saginaw co., Mich., on Saginaw River, navigable for the largest lake craft, 18 m. above its mouth. It is 100 m. N. W. of Detroit, 64 m. N. E. of Lansing, the State cap.; and has a large trade in lumber and salt. Pop. 1880, 10,525; 1884, 13,767.

**Saginaw Bay**, in the E. of Mich., extends 60 m. S. W. from Lake Huron. It is studded with islands, and has clear and pure water and valuable fisheries. It is 30 m. in breadth.



**Saginaw, East.** See EAST SAGINAW.

**Saginaw River,** Mich., is formed by the junction of Flint and Shiawassee rivers; flows N. 30 m. to Saginaw Bay, and is navigable 24 m. by steamers of 10-ft. draught.

**Sagittarius** [Lat. "archer"], the sign of the zodiac into which the sun enters about Nov. 22. There is also a constellation S., corresponding to the sign Capricornus.

**Sago** [Malay *sagu*], a variety of starch obtained from the medullary matter or pith of the stem of the sago-palm (*Sagus Rumphii*), an E. I. tree which grows in low lands in all the islands of that part of the world. It is a low tree, with a thick trunk, of which the woody part is but an inch or two in thickness, the whole cavity being filled, at a certain stage of its growth, with the farinaceous pith. This is mixed with water, which is passed through sieves, and the starchy matter is allowed to settle.

**Saguenay River,** a tributary of the St. Lawrence, entering it on the N. shore, 120 m. below Que.; length of course, 357 m. It drains an area of about 23,716 sq. m., generally high, very rugged and mountainous, in the centre of which is a great oblong basin of comparatively low country, about 100 m. in length by 60 in breadth, in the S. side of the middle of which is Lake St. John, 28 m. long by 20 wide, the reservoir of the S. From the S. E. end of the lake the S. issues, discharging a most extraordinary volume of water; but its width seldom exceeds  $\frac{1}{4}$  m., till at the foot of its lowest rapid, 36 m. from the lake, it meets the influence of the tides; 7 m. below which, at Chicoutimi, it becomes navigable by large ships, and receives the river Chicoutimi, 110 m. long, on the W. Ten m. lower it expands to 2 m. in width, and with a depth often exceeding 100 fathoms, narrows gradually to 1 m. in width at its mouth, 75 m. below Chicoutimi.

**Sahara** [properly *Eç-Qahrâ*, an Arabic substantive meaning "a reddish waste plain deprived of vegetation"], the name of the great desert of N. Afr., which extends from the Red Sea on the E. to the Atlantic Ocean on the W., and from the last ranges of the mts. of Berberia on the N. up to the fertile regions of the Negroland on the S. It covers 2,335,644 sq. m. The E. part of the S. has a northerly slope. This is cut by the Nile, which forms a long oasis—Egypt. Westward from the Nile Valley various ranges, clumps of mts., and table-lands occupy the central parts of the S. on its whole length, following one after the other from E. to W. on a sinuous line, and separating the 2 prin. N. and S. watersheds. The S. has not been a desert from the date of its emersion out of the sea-waters. During the period that preceded the present aspect and life of the earth's surface, the valleys of the S. were real rivers, and extensive low tracts of that country were true lakes. A complete change in the climate of the whole of N. Afr. brought a diminution of the quantity of rain, stopped the flow of the rivers, and caused the S. to be what it now is. At present the climate of S. is the genuine desert, a climate of extremes, of sudden leaps from hot to cold, and of constant dryness. During the winter the temperature of the air falls sometimes to even more than 3° C. During the summer the temperature of the air in the shade reaches up to 44°, 45° on the table-lands, and to about 50° in some low countries. Under the influence of these meteorological processes operating through centuries, the particles composing the sandstone and other rocks are disintegrated, and these particles, carried away by the mighty winds that sweep the soil, wander afar till they come to a standstill in the hollow parts. The heating of that immense mineral surface produces there an atmospheric current from S. to N. toward Europe (the *sirocco*); a current from N. E. to S. W. toward Senegambia (the *harmattan*); and a current from E. to W. (the *efe*).

The natural productions of the S. are not many. Salt, alum, saltpetre, natron, iron, sulphur of antimony, among the minerals, are the most common. On account of the similarity of soil and climate, the flora of the S. shows greater affinities with the flora of Ar. and Per. than with any other. Of the animals none are more copiously represented than the insects. Several species of lizards and snakes deserve notice among the reptiles. Rather few species of birds inhabit the S. The prin. wild Mammalia are the hyena, the jackal, several descriptions of antelopes, etc. The one-humped camel is the most useful of all the domestic Mammalia. Pop. 2,850,000.

Negroes were the first inhabs. of the S. Subsequently branches of that primeval pop. sought a refuge in the more fertile parts of the country. Another branch of that race turned toward the centre of the country, where they became nomads. Two migrations of the white races afterward scattered over the W. S. its present inhabs., the Berbers and the Arabs. The Berbers peopled the W. half. The nomadic Arabs followed; they are scattered on the borders of the Nile and on all the most N. and W. dists. of the S. [From orig. art. in *J. v. Univ. Cyc.*, by HENRY DUVEYRIER.]

**Sahib, Tippoo.** See TIPPOO SAHIB.

**Saigon**, cap. of the Fr. possessions in Cochín-China, farther India, situated on the Douнай, a branch of the Saigon, 95 m. from its mouth in the China Sea. The Douнай, which here winds through a dist. of exuberant fertility, is navigable for the largest vessels, and forms at S. one of the finest harbors of the E. coast of Asia. The town carries on an active trade, exporting annually more than 8000 tons of cotton, rice, sugar, indigo, and dyewoods. Pop. 120,000, of whom 10,000 are Chinese.

**Saikio**, city of JAPAN (which see).

**Saimuri**, a name given to species of New-World monkeys (family Cebidae) whose tail is hairy to the tip, and scarcely, if at all, prehensile; the lower jaw is moderately dilated behind, and the incisor teeth are vertical.

**Sainfoin** [Lat. *Sanum fœnum*, "sound hay"], a forage-plant, the leguminous *Onobrychis sativa*, very valuable on dry chalky lands. It is prized as green forage, as hay, and as a crop to be ploughed under.

**Saint** [Lat. *sanctus*, "holy;" Gr. *ἅγιος*, "pure," "clean," "venerable," from *ἀγος*, "to fear," "to venerate;" Heb. קדוש], in the N. T. a title of all Chrs. (Rom. i. 7; 1 Cor. i. 2; Eph. i. 1; Phil. i. 1, etc.), in the sense that they are called out of the world, regenerated by the Holy Spirit, and consecrated to God and to holiness. In the Apostles' Creed, "the communion of saints" is one of the articles of faith, closely related to the preceding article on "the holy catholic Ch.," but is not found in the earlier forms of that symbol. The oldest MS. copies of the Gospels bear simply the names of Matthew, Mark, Luke, and John, without "S." attached to them. After the 4th century the term began to be applied to particular persons of special eminence in piety and services to the Ch., as the apostles, evangelists, and martyrs. It became the exclusive title of a spiritual nobility or aristocracy. Special honor was paid to their memory, which gradually assumed the character of a limited Ch. hero-worship, called by the scholastic divines *doula* or *veneratio* (as distinct from *latría* or *adoratio*, which is due to God alone, and *hyperdulia*, or a peculiar degree of veneration which is claimed for the Virgin Mary as the mother of our Lord and queen of saints). The Gr. and Rom. chs., believing in the active intercession of the saints in heaven in behalf of the struggling Chrs. on earth, consider it proper and useful to pray to them: with this difference, however, that God is to be implored as the giver of all blessings, while the saints are to be implored as the friends of God, that through their advocacy of our cause we may obtain from him all necessities of life (hence the form *Ora pro nobis*, "Pray for us"). Prots. reject the worship of saints, images, and relics as inconsistent with the first and second commandments and the exclusive worship of God.

The R. Cath. Ch. celebrates the memory of each canonized saint on the day of his death (which is regarded as his birthday in heaven). The Rom. calendar of saints includes (1) the apostles, evangelists, and most eminent martyrs, fathers, schoolmen, and missionaries down to the Ref., who are the gen. property of Christendom; (2) the specifically Rom. saints who lived after the Ref. and zealously opposed Prot. doctrines (as Ignatius Loyola, Charles Borromeo); (3) a few popes. The last canonized pope was Plus V. (1566-72), who excommunicated Queen Elizabeth. The biography of saints has given rise to an immense body of lit. The most learned and extensive work on the subject is the *Acta Sanctorum* of the Bollandists, 1643-1875, Paris, 61 vols. fol.

PHILIP SCHAFF.

**St. Alban's**, city and R. R. centre, cap. of Franklin co., Vt., 32 m. N. of Burlington and 63 m. S. of Montreal, on Lake Champlain. Pop. pt. 1870, 7014; 1880, 7193.

**Saint Alban's** (HARLETT MELLON), DUCHESS OF, b. in Eng. about 1775, in a low condition of life; became a popular comic actress; married Mr. Coutts, a wealthy Lond. banker; was soon afterward left a widow with one of the largest fortunes in Eng., and married, June 16, 1827, the duke of St. Alban's. D. Aug. 6, 1837.

**Saint Anthony's Fire.** See ERYSIPELAS.

**Saint-Arnaud.** See LEROY DE ST.-ARNAUD.

**Saint Augustine**, city, cap. of St. John's co., Fla., on R. R. and the narrow peninsula formed by Matanzas and San Sebastian rivers, and behind the N. end of Anastasia Island, which separates it from the Atlantic Ocean. It is the oldest city in the U. S., having been permanently settled by the Sp. in 1565. During the 2 centuries of occupation by the Sp. the town acquired a maximum pop. of upward of 3000, beside a garrison of 2500. Perhaps their only finished undertaking was the present Ft. Marion, called the castle of St. Mark by the Spaniards, which was upward of 100 yrs. in course of construction. In 1842-43 the U. S. govt. added a water-battery, excepting which and some repairs the ft. is essentially as completed in 1756. The old R. Cath. cathedral, commenced in 1793, has a bell in its tower bearing date 1682. The building now the U. S. barracks was originally a Franciscan convent. The present custom-house was formerly the residence of the Spanish govs. Among the early buildings of the Spaniards was a light-house on Anastasia Island, with fortified walls, etc., the remains of which yet exist. A new light-house has been erected by the U. S. on the N. end of this island and S. side of the entrance to the harbor. Traces also yet exist of the 2 lines of defences which stretched across the peninsula, consisting of a ditch and embankment. In 1586 Sir Francis Drake made a descent upon and destroyed St. A. With the rest of Fla. it was in the possession of the Eng. 1763-1783, and during the war of the Revolution was an important Brit. depot. In 1821 the Amer. flag supplanted that of Sp., which had been raised there 256 yrs. before. Pop. 1870, 1717; 1880, 2293.

**Saint Bartholomew, Massacre of.** See BARTHOLOMEW, ST., MASSACRE OF.

**Saint Bernard**, the LITTLE, a celebrated pass across the Graian Alps, on the frontier of Savoy and Piedmont, It., S. of Mont Blanc, is 7200 ft. high, leads from the valley of the Isère into that of Dora Baltea, and has near the summit a convent for the relief of travellers.

**Saint Bernard Pass.** See BERNARD, THE GREAT ST.

**Saint Charles**, city, on R. R., Winona co., Minn. Pop. 1870, 1151; 1880, 1155.

**Saint Charles**, city, cap. of St. Charles co., Mo., on R. R. and Mo. River, 30 m. from its mouth and 19 m. by rail from St. Louis. It is one of the earliest Sp. and Fr. settlements. Here the first State legislature of Mo. met and the first State gov. was inaugurated. It has a college, the Lindenwood Female Seminary (Presb.), and a convent school conducted by the ladies of the Sacred Heart. Pop. 1870, 3570; 1880, 5014.

**Saint Christopher**, or **Saint Kitt's**, one of the Lesser Antilles, in the W. I., belongs to G. Brit. It is 20 m. long, 5 m. broad, and traversed by a mt.-range of volcanic origin. From this range the ground slopes gently toward the coast. The soil is very fertile and eminently well adapted



ed for sugar-plantations; it is also well cultivated. Chief towns, Basseterre and Sandy Point. Pop. about 25,000.

**Saint Clair, Mich.** See APPENDIX.

**Saint Clair** (ARTHUR), b. at Thurso, Scot., 1734, ed. at the Univ. of Edinburgh; studied med.; inherited a large fortune; entered the army as an ensign 1757; came to Amer. 1758; served under Amherst at the taking of Louisburg; was distinguished under Wolfe at Que.; resigned his commission Apr. 1762; settled in Ligonier Valley, Pa., 1764, erecting there a fine residence and several mills; held several public offices; became col. of militia July 1775; was appointed col. of the 2d Pa. regiment Jan. 1776; accompanied Sullivan in the expedition against Que.; was appointed brig.-gen. Aug. 1776; joined Washington Nov. 1776; was detailed to organize the N. J. militia; was appointed maj.-gen. Feb. 19, 1777; succeeded Gates in command at Phila. in Mar.; took command at Ticonderoga Apr. 1; was forced to evacuate that post July 4, thereby incurring unpopularity and retirement from his command, but acted as volunteer aide at the battle of Brandywine, Sept. 11, 1777; was acquitted by a court-martial in respect to the surrender of Ticonderoga Sept. 1778; commanded at W. Pt. from Oct. 1; took part in the suppression of the mutiny in the Pa. line Jan. 1781; distinguished himself in the S. campaigns; was a member of the Pa. house of censors 1783, of the Continental Cong. 1785-87, being its pres. during most of the latter yr.; was pres. for Pa. of the Society of Cincinnati 1788-89; became first gov. of the N. W. Terr. Feb. 1, 1788; made the treaty of Ft. Harmer with the Indian tribes 1789; became commander-in-chief of the U. S. A. Mar. 1791; made an expedition against the Indians of the Miami and the Wabash, and suffered a severe defeat Nov. 4, 1791; was vindicated from all blame by a committee of investigation appointed by Cong.; resigned the command of the army May 1792; was removed from the post of gov. by Jefferson Nov. 1802, when he settled in a log house near Greensburg, Pa., where he passed his remaining yrs. in poverty and fruitless efforts to effect a settlement of claims against the U. S., but receiving small pensions both from the national and State govts. D. near Greensburg, Pa., Aug. 31, 1818.

**Saint Clair, Lake**, lying between Mich. and Canada. Through St. Clair River it receives the waters of Lake Huron, and its own waters are discharged through Detroit River into Lake Erie. It is 30 m. in length and 24 in maximum and 12 in mean breadth. Area, 360 sq. m. Its mean depth is 20 ft., but the shoals off the mouth or inlet of St. Clair River formerly obstructed the navigation of its upper part. This impediment has been removed.

**Saint Clair River**, the outlet of Lake Huron, has a total fall of 7 ft. in the 33 m. of its course. It is from 40 to 60 ft. deep, and is a part of the boundary between Mich. and the prov. of Ont.

**Saint Clairsville, O.** See APPENDIX.

**Saint Cloud**, a small town of Fr., dept. of Seine-et-Oise, on the Seine, 6 m. S. W. of Paris, derives its name from St. Cloodald, grandson of Clovis, who founded a monastery here in 551. The palace of St. C. was built in 1572. In 1870 it was seriously injured by fire. Pop. about 5500.

**Saint Cloud**, city, on R. R., cap. of Stearns co., Minn., on the W. bank of Miss. River, 75 m. above St. Paul; has the State normal school. Pop. 1870, 2161; 1880, 2462.

**Saint Croix River**, a part of the boundary between Me. and N. B. flows from Grand Lake in a general E. S. E. course, and falls into Passamaquoddy Bay. It is navigable to Calais, Me., above which it affords fine water-power. It is 75 m. in length. It is also called the *Schoodic*.

**Saint Croix River rises** in La Pointe co., Wis., flows S. W. to the Minn. line; from this point S. for more than 100 m. it is the boundary between Wis. and Minn. It is some 150 m. long, and is navigable 54 m. to the Dalles or Falls of the St. Croix. After passing through Lake St. Croix it falls into the Miss. at Prescott, Wis.

**Saint Denis**, town of Fr., dept. of Seine, 6 m. N. of Paris, on the Great Northern Railway, the site of the anc. Benedictine abbey, the chosen place of burial of the kings of Fr. Up to the Revolution the remains of the kings and princes of Fr. were deposited here. The Convention of 1793 ordered the removal of these bodies. Pop. 43,895.

**Saint Domingo.** See HAYTI and SANTO DOMINGO.

**Sainte-Beuve**, *sant-buv'* (CHARLES AUGUSTIN), b. at Boulogne Dec. 23, 1804; entered in 1824 on his literary career as a contributor to the *Globe*; removed to the *National* and *Revue des Deux Mondes*; received employment at the Mazarin Library in 1840 after publishing the first vol. of his celebrated work, *Poet Royal*; held various positions under Nap. III., contributing steadily to the *Moniteur*; was made a senator in 1865. D. at Paris Oct. 13, 1869. The various series of his *Critiques* or *Portraits* or *Galleries* or *Causeries*, comprising over 30 vols., contain some of the finest, most delicate, and most striking delineations of characters from hist. and lit. which have ever been written. They were originally printed as *feuilletons*, appearing every Monday, and attracted great attention; but they have lost none of their charm by being collected and pub. in book-form.

**Sainte Croix.** See SANTA CRUZ.

**Saint Elias, Mount**, a volcano on the boundary-line between Alaska and Brit. Amer. (lat. 60° 15' N., lon. 141° W.). The trigonometrical observations of Dall show its height to be 19,500 ft., or several hundred ft. higher than any other summit in N. Amer.

**Saint-Etienne**, *sant-a-te-en'*, town of Fr., dept. of Loire, on the Furens, an affluent of the Loire, is situated in the centre of very rich coal-fields, from which 600,000 tons are annually raised, and which have given to the city a most vigorous manufacturing impulse. Its 2 prin. branches of manufacture are ribbons and firearms. The appearance of the city is that of a great manufacturing place, where coal-smoke makes the sky and coal-dust the rain. The first R. R. of Fr., the Chemin de fer de St. Etienne à Lyon, was constructed to carry coal to Lyons. Pop. 123,813.

**Saint-Evremond.** See EYREMOND.

**Saint Francis**, a river of Mo. and Ark., between which States it partially forms the boundary, rises in the Iron Mt. dist. of S. W. Mo., and flows S. W. 450 m., entering the Miss. near Helena, Ark., is navigable 150 m., passes through a continuous swamp after entering Ark., and spreads into numerous lakes.

**Saint Ger'mans** (EDWARD GRANVILLE ELLIOT), LL.D., EARL OF, b. in Eng. Aug. 29, 1793, ed. at Christ Ch., Ox.; served for several yrs. in various European caps. as attaché and sec. of legation; entered Parl. as a Liberal 1823; was a lord of the treas. 1827-30, envoy to Sp. 1834-35, chief sec. for Ire. 1841-45; became privy councillor 1841; succeeded to the earldom on the death of his father Jan. 19, 1845; became P. M.-gen. 1846; was lord lieut. of Ire. 1852-55, lord steward of the household 1857-58, and again 1859-65, and attended the prince of Wales in his tour in the U. S. 1860.

**Saint Gothard, Tunnel of.** From remote ages until a very recent period most of the travel and a very large proportion of the transport of merchandise between It. and N. Europe were conveyed over Alpine passes having their N. terminus in Switz. After the construction of the 3 great carriage-roads—the Simplon in 1806, the Splügen in 1818, and the St. Gothard in 1830—these routes monopolized most of the transit, though the Stelvio, the Brenner, and other less conspicuous passes, and especially that of Mont Cenis, maintained an active competition with the Swiss highways. The completion of the Brenner railway from Innsbruck to Verona (1867), and the opening of the Fréjus (or Mont Cenis) tunnel (1870), at once intercepted a great proportion of this important communication; and the construction of a new, direct, and independent railway route across the Alps was felt to be a matter of vital necessity to N. It. and Switz., as well as of great interest to all the W. and central Ger. states. The St. G. line—commencing on the Lake of Lucerne, passing to Lago Maggiore and to the Lake of Lugano, and there connecting with the It. lines, and especially with the port of Genoa—became the favored project. The only serious objection was the unavoidable necessity of a tunnel more than 9 m. in length. This objection was, however, overruled Oct. 15, 1869, a treaty was concluded between It. and Switz., and on Oct. 28, 1871, the Ger. empire adhered to the treaty. The 3 contracting powers were to contribute to the enterprise 85,000,000 francs, in the proportion of 45,000,000 by It., 20,000,000 by Switz., and 20,000,000 by Ger. This convention was adopted as a basis at a conference in which the great It. and Swiss railways and various It. and Swiss local jurisdictions were represented, and a company formed in accordance having been incorporated and organized, proposals for construction were at once invited. On Aug. 7, 1872, a contract was concluded between the company and M. Louis Favre of Geneva for the perforation of the tunnel by him within 8 yrs. from the acceptance of the contract by the Swiss govt., at fixed rates per metre lineal measure, amounting altogether to 48,500,000 francs, with a large premium in case of completion of the works in a shorter time, and a heavy penalty in case of delay. The length of the tunnel is 14,900 metres or 16,295 yards, equal to rather more than 9½ m.

The line of the tunnel leaves the St. G. carriage-road to the left at Airolo, and running about 5° W. of N. passes under the Kastelhorn, 2977 metres high, the St. Anna glacier, the v. of Andermatt, the river Reuss about at the Devil's Bridge, and comes out at Göschenen, at the level of that v. and the carriage-road. At the S. end is a curve of junction 145 metres in length, but a straight gallery is excavated through the mt. from terminus to terminus. The station at Airolo is 1145 metres above the sea. From this point the grade ascends, at the rate of 1/1000th, 7400 metres; then follows the summit-level of 180 metres at the height of 1152.4 metres, or 10 metres lower than the highest limit allowed by the convention; then a descending grade of 5.82:1000, 7457 metres to the N. terminus at the station of Göschenen, 1109 metres above the sea. The perforation of the tunnel was completed Feb. 29, 1880, and it was opened for travel Jan. 1882.

GEORGE P. MARSH.

**Saint Helena**, an island of the Brit. empire, in S. Atlantic Ocean, lat. 15° 55' S. and lon. 5° 44' W. It is 10½ m. long and 6½ broad, inclosing an area of 47 sq. m., with a population of 5069. The only good inlet is St. James's Bay, on the N. W. of the island, possessing a good harbor, where the chief town (Jamestown) is built. Though 800 m. from the nearest land, Isle of Ascension, and 1400 m. from the nearest point of the Afr. continent, it is one of the best known of all the solitary islands of the world, as being the place of exile and death of Napoleon Bonaparte, and because of its importance as a stopping-place for provisions and water for ships engaged in European and E. I. trade.

**Saint Helena**, on R. R., Napa co., Cal. Pop. 1880, 1339.

**Saint-Hilaire, Geoffroy.** See GEOFFROY ST.-HILAIRE.

**Saint Ignace**, Mich. See APPENDIX.

**Saintine**, *sant-teen'*, the pseudonym of JOSEPH XAVIER BONIFACE, b. at Paris, July 10, 1793; pub. a vol. of poems in 1823, which was well received; became one of the most prolific writers for the stage, producing, alone or in connection with others, about 200 plays, and pub. in 1836 his celebrated sketch, *Picciola*. D. Jan. 21, 1865.

**Saint-Jean d'Acre.** See ACRE.

**Saint John**, city, seaport, and R. R. centre, cap. of St. John co., N. B., Canada, on a harbor of the same name in the Bay of Fundy, at the mouth of St. John River, 54 m. S. E. of Fredericton, is very regularly laid out, some of the streets being cut through solid rock to a depth of 30 ft.; is divided by a projecting rock into an upper and lower town; has several fine public buildings, and good civic insts. Its harbor is one of the best on the Atlantic coast, and it has connections by steamer with ports in Amer. and Europe. It is connected by street-cars with the town of Portland, which is practically a suburb, and with Carleton, a portion of the city situated on the W. side of the river, by a mag-



nificent suspension bridge 100 ft. high. A conflagration occurred June 20, 1877, causing a loss of about \$10,000,000. Pop. 1881, 26,127.

**Saint John (HENRY).** See BOLINGBROKE.

**Saint John (JAMES AUGUSTUS),** b. in Caermarthenshire, Wales, Sept. 24, 1801, ed. at the v. school, and acquired a good knowledge of langs., including Arabic and Per.; was at an early age engaged by Mr. J. S. Buckingham as sub-editor of the *Oriental Herald*; started the *London Weekly Review* 1827; settled in Normandy 1829; travelled in Nor. the same yr.; visited Egypt and Nubia, ascending the Nile to the second cataract; made several interesting discoveries in phys. geog. and archaeology, including that of the site of the tomb of Osiris on the Sacred Isle; explored Lake Moeris; followed the (supposed) track of the Israelites through the Desert of Sinai; returned to Eng. by way of Malta, Sic., and Naples; gave an account of this journey in his *Egypt and Mohammed Ali*, etc.; wrote *The Hellenes, or the Manners and Customs of Anc. Gr.*; pub. *The Genesis of Power, the Hist. of the Four Conquests of Eng.*, a *Life of Sir Walter Raleigh*, etc.

**Saint John (OLIVER),** b. at Stanton, Oxfordshire, Eng., about 1568; studied at Queen's Coll., Cambridge, and at Lincoln's Inn; was called to the bar 1626; married in 1629 a lady who was nearly related both to Hampden and to Cromwell; was prosecuted by the Star Chamber 1630; was one of the counsel for Hampden in the great ship-money trial, Nov. 1637; married as his second wife Elizabeth Cromwell, cousin of Oliver, Jan. 21, 1638; was elected to the Short and the Long. Parls. 1640; became solicitor-gen. Jan. 29, 1641, a com. of the great seal Nov. 1643; was one of the Parliamentary coms. appointed to treat for peace at Uxbridge Jan. 1645; became lord chief-justice of the common pleas Nov. 22, 1648; was a joint ambassador to the Netherlands Mar. 1651, com. for the affairs of Scot. in Oct. and a member of the council of state in Nov. of the same yr.; became afterward chancellor of the Univ. of Cambridge; was a member of the Rump Parl.; narrowly escaped proscription at the Restoration, and lived on the Continent for some yrs. under an assumed name. D. Dec. 31, 1673. Author of the famous "Navigation act."

**Saint John (PERCY BOLINGBROKE),** eldest son of James A., b. at Plymouth, Eng., Mar. 4, 1691; accompanied his father in his E. travels while a boy; made a tour through the U. S., Tex., and Mex. about 1840; wrote sketches of his travels and numerous Indian tales, usually first pub. in *Chambers's Journal*; lectured on Tex. and Mex.; became Paris correspondent of the *N. Brit. Daily Mail* 1847; was a witness of the Fr. revolution of Feb. 1848; wrote the *Book of the War*, for which he received the thanks of the Gr. Parl.; has written numerous novels and been a contributor to many literary periodicals.

**Saint John of Jerusalem, The Order of the Knights Hospitallers of,** also called the **Order of the Knights of Rhodes or Malta**, originated at the close of the 11th century; its first const. was confirmed by Pope Paschal II. in 1113, its second and final by Pope Calixtus II. in 1120. In 1048 some merchants from Amalfi founded a hospital and hostelry for pilgrims in Jerusalem. During the siege and capture of Jerusalem by the crusaders in 1099, Godfrey of Bouillon gave it a large endowment, and several knights joined it as Hospitallers. The confraternity was then organized as a monastic order with philanthropic purposes, and the members assumed the black Augustinian garment with a white cross. In 1118 Raymond du Puy, provost of the order, undertook a reorganization of the whole inst. on a military basis. Many celebrated knights now joined it, and in a short time it rose to be one of the richest and most famous of the Chr. orders. Soon, however, its embroilments with the Templars caused much scandal. After the conquest of the Holy Land by the Saracens the knights removed in 1291 to Limisso in Cyprus, and hence in 1309 to Rhodes. Their life here was one perpetual war against the Turks, and in 1522 they were compelled to surrender Rhodes to Solymán II., and at the same time they lost by the introduction of the Ref. many of their possessions. In 1530 Charles V. gave them the island of Malta, and here Solymán II. attacked them in 1565 with an immense force. Under the grand master Lavelette they offered a most heroic resistance, and finally succeeded in repelling the Turks. Soon after, however, the order began to sink into insignificance. In 1798, on his way to Egypt, Nap. drove them from Malta, and the Eng., who conquered the island in 1800, refused to reinstate them.

**Saint John River,** of Me. and N. B., rises on the boundary of Somerset co., Me., and Dorchester co., Que., near the head of the Penobscot. It is for nearly 40 m. the boundary between the U. S. and Canada. It then traverses for 112 m. the wilds of N. Me., and is known as the Walloostook or Main St. John. Some 150 m. below its origin it joins with the St. Francis, and changes its N. E. to a more E. course. Below the mouth of the St. Francis it is the N. boundary of Me. for about 75 m. Below this it is wholly in Canadian terr., shortly after entering which its Grand Falls occur, 225 m. above its mouth. The river here falls 75 ft. perpendicularly. From its mouth at St. John, N. B., it is navigable by large steamers for 80 m. to Fredericton. At its mouth a singular phenomenon occurs. The water, here compressed into a narrow channel, falls at low tide some 12 ft. in order to reach the harbor, but at high tide the level of the harbor is from 5 to 8 ft. higher. Vessels can consequently pass from the river to the harbor, or from the harbor to the river, only at the turn of the tide. The total length of the river is 550 m. Its navigation is free to U. S. citizens by the Ashburton Treaty.

**Saint John's,** cap. of Newfoundland, on the E. coast of the peninsula of Avalon, about 65 m. N. of Cape Race and 18 m. S. of Cape St. Francis. The harbor is spacious and secure, has 90 ft. of water in the centre, and is accessible for the largest vessels at all periods of the tide. Several

lines of steamers plying between G. Brit. and Amer. stop here on the passage each way. The main business is connected with the fisheries of seal and cod. Pop. 30,000.

**Saint John's,** on R. R., cap. of Clinton co., Mich., 100 m. W. of Detroit. Pop. 1880, 2370.

**Saint John's,** a lake of Que., Canada, forming the source of Saguenay River, is nearly circular in form, 30 m. long and 25 broad, and lies on a high plateau sheltered N. E. by lofty mts. Its prin. tributaries are Assuapmoussin, Mistasini, and Curious rivers.

**Saint John'sbury,** R. R. centre, cap. of Caledonia co., Vt., 50 m. S. of the Canada line. It has the largest scale manufactory in the world. Pop. tp. 1870, 4665; 1880, 5800, including 3360 in v.

**Saint John's River,** Fla., rises in Brevard co., and after a course of nearly 400 m., reaches the Atlantic. It is regularly navigated by steamboats to Enterprise, 280 m. from its mouth, and small steamers have ascended some 60 m. above that point. For nearly 100 m. from its mouth it forms a wide, sluggish sheet of water, more resembling a lagoon than a river.

**Saint John's University,** Stearns co., Minn., was founded in 1863 by the Very Rev. Demetrius Maragna.

**Saint Johnsville,** N. Y. See APPENDIX.

**Saint Joseph, Berrien co., Mich.,** on R. R. and Lake Mich., at the mouth of St. Joseph's River. Pop. tp. 1870, 2394; 1880, 3550, including 2603 in v; tp. 1884, 3482.

**Saint Joseph,** city and important R. R. and commercial centre, cap. of Buchanan co., Mo., on the right bank of Mo. River, on the W. boundary of the State. It is one of the oldest cities in the U. S. between Miss. River and the Pacific coast, having been chartered as a city in 1851. It has the State asylum for the insane, a fine opera-house, and c-h. Pop. 1870, 19,585; 1880, 32,431.

**Saint-Just, de (ANTOINE LOUIS LÉON),** b. at Decize, dept. of Nièvre, Fr., in 1768 or 1769; wrote in 1791 *Esprit de la Révolution*; entered the Convention in 1792 as a member for Aisne; became a member of the Committee of Public Safety; was one of the most conspicuous leaders during the Reign of Terror; became pres. of the Convention in Feb. 1794; brought Danton to the guillotine; attempted on the 9th Thermidor to defend Robespierre, but was arrested, and executed the next day, July 28, 1794.

**Saint Lawrence River and Gulf.** The river St. Lawrence, from its mouth in the Gulf to the W. end of Lake Superior, is about 2000 m. long, or to its farthest source, that of the River St. Louis, 2150 m. long from E. to W. The country it drains has an area of about 510,000 sq. m.—187,440 in the U. S. and 329,560 in Canada. The infant St. L., entering the W. end of Lake Superior as the river St. Louis, meets the accumulated waters of many tributaries, including the Pigeon River, and the Kamistiquia, with its great falls of 130 ft. before receiving its greatest, the Nipigon, with its mt.-guarded entrance and island-studded lake. Lake Superior is 400 m. long by 160 wide. The St. L. leaves it a great river, 1 m. to  $\frac{1}{2}$  m. wide. Descending 23 ft., chiefly at Sault Ste. Marie, it enters Lake Huron, 240 m. long by 170 wide. Its chief Canadian tributary is the French River, from Lake Nipissing. In Lake Huron the St. L. receives the waters of Lake Michigan. The St. L. leaves Lake Huron as the River St. Clair, only  $\frac{1}{2}$  to  $\frac{1}{4}$  m. wide; at 33 m. crosses Lake St. Clair, 25 m. long, receiving the Thames from Ontario; and at 18 more, with a descent of 11 ft., enters Lake Erie.

From Lake Erie the St. L. flows rapidly,  $\frac{3}{4}$  m. wide, 20 to 40 ft. deep. Expanding around Grand Island and many lesser ones, at 22 m. it descends the Falls of Niagara with its enormous mass of water. Then narrowing to  $\frac{1}{4}$  m., it surges down its deep precipitous ravine, through its fierce Whirlpool, and at 35 m., with a total descent of 390 ft., overcome by the Welland Canal, enters the S. side of Lake Ontario. Passing 170 m. through it, it receives on the S. Genesee, and the Oswego, with its 8 lakes and branches, and on the N. the Trent, of the same area. Leaving Lake Ontario, passing through the romantic Lake of the Thousand Isles, then gradually narrowing to  $\frac{3}{4}$  m., at 66 $\frac{1}{2}$  m. the St. L. enters on the series of alternate rapids, by which it descends 176 ft. in 96 m. to Lake St. Louis. Traversing Lake St. Louis, 15 m. to Sault St. Louis, the St. L. descends 44 $\frac{1}{2}$  ft., and at 8 $\frac{1}{2}$  m. enters the harbor of Montreal. Partly in Lake St. Louis and partly below the island of Montreal it receives the Ottawa, draining over 60,000 sq. m. Fifty m. lower, above Lake St. Peter, 30 m. long, it receives the Richelieu from Lake Champlain. In Lake St. Peter it receives the Yamaska, and the St. Francis from the Eastern Townships. At Three Rivers it meets the tide, and receives from the N. the St. Maurice. From Montreal to Que. its average width is about  $\frac{1}{4}$  m. At 120 m. below Que. it is 16 m. wide, receiving from the N. the Saguenay. Fed by the frequent rains and winter snows (6 to 8 ft. deep) of mountainous and elevated N. regions, it is of extraordinary volume, as also are the large rivers Berslamis, Outard, and Manicougan, and other tributaries eastward. Widening to 36 m. at Metis, the St. L. expands to 90 at its mouth, at the W. end of the island of Anticosti. The St. L. presents the extraordinary characteristic of being navigable for large ships from the head of Lake Superior, almost its source, to the sea, a distance of about 2000 m.

The *Gulf of St. Lawrence* lies between lat. 45° 6' and 51° 17' N., and lon. 55° 23' and 65° W. It is 490 m. long north-eastward and 275 wide, and includes an area of about 64,000 sq. m. It is bounded on the N. W. from the mouth of the river St. L., at the W. end of Anticosti, to the Straits of Belle Isle, 356 m., by the coast of inner or Canadian Labrador. It has many harbors for fishing-boats and vessels, and is sheltered by clusters of small islands. Its fisheries are very rich. On the S. E. side the gulf is bounded for 300 m. of its extent by the hilly W. coast of Newfoundland. Then, crossing the main outlet of the gulf, 75 m. wide, the W. coast of Cape Breton Island for 115 m. completes the S. E. boundary to the Gut of Canso. On the S. it is bounded



for 140 m. by N. S., and on the W. for 245 m. by the coasts of N. B. and Gaspé, to the mouth of the St. L. This S. and W. circuit of the gulf coast, from Cape Breton to Gaspé, inclusively, contrasts strongly with the more northerly portion of it. Being of generally favorable soil, surface, and climate for agriculture, and of varied and favorable geological formation, with numerous and excellent ship-harbors, it is well studded with important towns and settlements, whose numerous and intelligent pops. are prosperously engaged in agriculture, ship-building, coal-mining, lumbering, and general commerce, in addition to the fisheries. The inhabs. of the small sandbar-like Magdalen Islands, out in the gulf, are exclusively occupied in fisheries. The populous little prov. of Prince Edward Island, 2134 sq. m. in area, in the S. end of the gulf, is pre-eminent in agriculture. The island of Anticosti, 3000 sq. m. in area, is almost entirely uninhabited. The chief bays of the gulf are the Baie des Chaleurs, between Gaspé and N. B., into which fall the large river Restigouche and 4 other strong rivers. The equally large river Miramichi of N. B. enters a smaller bay. The most important on the W. coast of Newfoundland is St. George's Bay. The gulf has 3 outlets—the main one mentioned, the Gut of Canso, and the Straits of Belle Isle. By it a strong current sets in, bringing with it icebergs in early summer. The value of the fisheries of the gulf is very great. [From orig. art. in *J.'s Univ. Cyc.*, by A. J. RUSSELL.]

**Saint Léger** (BARRY), b. in Eng. about 1730, entered the Brit. army as ensign 1756; served as capt. at Louisbourg 1758, and at Que. under Wolfe 1759; was sent to Canada 1775; commanded the unsuccessful expedition against Ft. Schuyler Aug. 1777, with the local rank of brigadier, and became col. Nov. 1780. D. in Eng. in 1789.

**Saint Leonards** (EDWARD BURTENSHAW Sugden), D. C. L., BARON, b. in Lond., Eng., Feb. 12, 1781, son of a hardware dealer; studied law at Lincoln's Inn; became a leader of the chancery bar and a bencher of Lincoln's Inn; was made king's counsel 1822; entered Parl. for Weymouth as a Tory 1828; was knighted and appointed solicitor-gen. 1829; was a strenuous opponent of the Reform bill; was lord chancellor of Ire. 1835 and 1841-46, and lord chancellor of Eng. 1852, when he was raised to the peerage; was a privy councillor, high steward of Kingston-on-Thames, and deputy lieut. of Sussex. D. Jan. 29, 1875. He was generally recognized as the highest Eng. authority on property law.

**Saint Louis**, 100' is, on R. R., Gratiot co., Mich., 33 m. W. of Saginaw. The Mich. Magnet Springs are located here. Pop. 1870, 888; 1880, 1975.

**Saint Louis**, city, and important R. R. and commercial centre, cap. of St. Louis co., Mo., is on W. bank of Miss. River, 20 m. below the mouth of the Mo., and has a commanding site, with beautiful suburbs and a fine harbor.

**Public Buildings.**—St. L. presents a solid and substantial, rather than a costly aspect. It has, however, many fine buildings; among them are the custom-house and post-office, estimated cost \$4,000,000; the Merchants' Exchange, which cost nearly \$2,000,000; the Four Courts, used for a prison and place of justice; the court-house (cost, \$1,250,000); the Insane Asylum, the Emigrants' Home, the Widows' and Infants' Asylum, the State Inst. for the Blind, and the Inst. for the Deaf and Dumb.

**Bridge.**—The most noted structure of St. L. is the bridge, 2225 ft. long, across the Miss. River. It contains 5600 tons of steel and iron, cost over \$10,000,000, and consists of 3 arches, supported by abutments on either shore, and 2 massive granite piers, built up from the rock foundations 110 ft. below the level of the river; 2 of the spans are 500 ft. each, and the central one 520 ft.

**Water-works.**—The supply is drawn from the Miss. River, some m. above the city, pumped into settling basins, and then into distributing reservoirs. The average daily consumption of water is 27,500,000 gallons.

**Parks.**—These embrace the O'Fallon Place, 180 acres; the Fair Grounds, 83 acres; Forest Park, 1374 acres; the Mo. Botanical Garden, 50 acres; Tower Grove Park, 350 acres; and Carondelet Park, 120 acres, all closely connected with the city by street R. Rs. In addition there are many fine public squares in the heart of the city.

**Education.**—St. L. has colls. of great excellence and many noted acads. and private schools. Of sectarian insts., the prin. are the St. L. Univ., the Acad. of Loretto, the Sacred Heart, the Visitation, and the Ursuline. Of those non-sectarian, the Washington Univ., Mary Inst., and Bonham School are the more important. Its public-school system is admirably organized and largely endowed, consisting of a normal school, high and dist. schools, and the kindergarten.

**Finances.**—St. L. has 6 national and 18 State banks, with a combined cap. of \$13,492,964. It has also many private banks. The bonded debt of the city in 1882 was \$22,417,000; assets, \$20,512,740; real and personal estate, \$191,948,000.

**Manufactures.**—St. L., by census of 1880, had 2924 manufacturing establishments, with \$50,882,885 capital, and \$114,333,375 products. The vast coal-fields in the vicinity supply cheap and inexhaustible fuel. The manufacture of steel and iron is yet in its infancy here, but this city has one of the largest rolling-mills in the world for steel rails. Among the prin. manufactures are flour, meat-packing, and tobacco.

**Commerce.**—The commerce of St. L. has been largely increased by R. R. connections and the improvement of the navigation of the Miss. River. The shipments of grain to New Orleans in 1870 were only 66,000 bushels, and in 1881 were 12,993,947 bushels. Custom-house collections in 1882 were \$1,382,673; foreign value warehoused, \$1,122,347. St. L. has over 6000 m. of direct river navigation by steamboats and barges, and its commercial advantages are excellent; the number of steamboats is 2480, and of barges, 1824.

**History.**—St. L. was founded Feb. 15, 1764, by Pierre Laclède Linguette as a trading-post, and named in honor of Louis XV. of Fr. The next yr. the arrival of St. Ange de Bellerive and his command from Ft. Chartres, which had

been surrendered to the Eng., gave additional importance to it and made it the cap. of upper La. Although subject to Sp. by treaty of 1763, St. L. was under Fr. control until formal possession of it was taken by Don Pedro Piernas, Nov. 29, 1770. In 1800 the Terr. of La. was retroceded to Fr., and on Apr. 30, 1803, was purchased by the U. S. St. L. was incorporated as a town Nov. 9, 1809, and chartered as a city in 1822; Aug. 2, 1817, the first steamboat arrived there, and an American pop. soon began to flow in. Pop., 1810, 1400; 1870, 310,884; 1880, 350,518. [From orig. art. in *J.'s Univ. Cyc.*, by Hon. B. GRATZ BROWN, LL.D.]

**Saint Lucia**, loo-see'-ah, an Eng. island of the Windward group, W. I., 24 S. E. of Martinique and 21 N. E. of St. Vincent; is 26 m. in length by 11 in breadth; has a circumference of 150 m., an area of 237 sq. m., and a pop. of 37,250. The surface is mountainous and covered with valuable timber and dyewoods, and an extinct volcano supplies an inexhaustible quantity of sulphur. The climate is warm and unhealthy. Staple productions, sugar and cacao.

**Saint Martin**, one of the Lesser Antilles, in the W. I. Area, 30 sq. m. The N. part belongs to Fr., and has 3450 inhabs.; the S. to the Netherlands, and has 8157. From its salt marshes over 300,000 vats of salt are made annually.

**Saint Mary's**, Kan. See APPENDIX.

**Saint Mary's**, R. R. junc., Auglaize co., O., on Miami Canal. Pop. 1870, 1870; 1880, 1745.

**Saint Mary's**, Pa. See APPENDIX.

**Saint Mary's River**, connecting Lake Superior with Lake Huron, is a series of small lakes. Mud Lake is entered from Lake Huron through several broad and deep outlets. Thence to the foot of the falls (Sault), 40 m. farther, there are 2 channels. From the head of the falls to Lake Superior (15 m., making total length 75 m.) the river is partly a lake and partly a gradual expansion into Lake Superior. The total fall is estimated at 21½/10 ft., of which 18 ft. are at the falls. Ste. Mary's Falls Canal, opened June 18, 1855, was built to enable vessels to pass around these rapids.

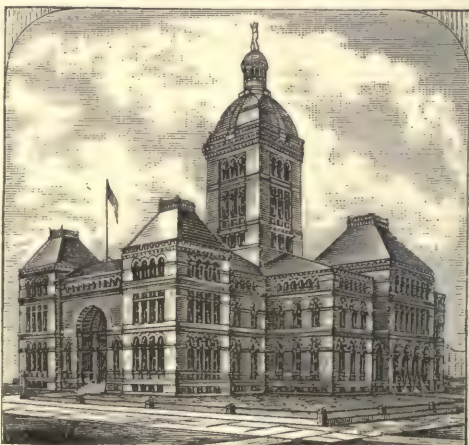
**Saint Maurice** (mo-reess') River, a N. tributary of the St. Lawrence, which it enters at the city of Three Rivers, 9 m. below Lake St. Peter, in the prov. of Que. From its source, 216 m. N. N. W. from Montreal, it flows N. E. 66 m., then 167 m. S. E., then 130 m. S. to its mouth; total length of course, 363 m.; extreme length of valley 223 m., width 140 m.; area, about 16,000 sq. m. The St. Maurice is navigable for steamboats from the Grand Piles, 34 m. above its mouth, to La Tuque Rapids, 66 m. farther up. Its forests contain much valuable timber.

**Saint Michael**, the largest of the Azores, in lat. 37° 44' N., lon. 25° 30' W., comprises an area of 340 sq. m., with about 81,000 inhabs. It is the most fertile and best cultivated of the Azores. Grain is exported to Port., coarse linen and pottery to Brazil. Chief towns, Ponta Delgada and Ribeira Grande.

**Saint Paul**, city and important R. R. and commercial centre, cap. of Minn. and of Ramsey co., is a port of entry, on Miss. River, 2082 m. from its mouth, in lat. 44° 53' 46" N., lon. 93° 4' 54" W.

**Topography, Area, Etc.**—It is built mainly on the E. bank, but now includes a large tract on the W. side of the river, the 2 sections being connected by a free bridge. It is situated on 3 tables of land, the lowest being the "river bottom," the second a plateau on which the main portion of the city is built, and the third an amphitheatre of beautiful hills or "bluffs," on which most of the fine residences are built. The area of the city proper is 13,583 acres.

**Commerce and Industries.**—There are 3 national, 1 savings, and 3 private banks; total capital, \$2,625,550. There are 9 R. Rs. terminating in the city, and 1 steamboat line. There are 3 grain elevators, with a capacity of 1,585,000 bushels, and many fine business blocks. The jobbing trade for 1881 was \$51,232,667. There were, in 1881, 792 manufacturing establishments, producing \$16,071,535 of products.



New State Capitol (St. Paul, Minn.).

**Public Institutions, Buildings, Etc.**—There are 2 orphan asylums, 3 hospitals, a home for the friendless, 2 Magdalen reformatories, and the State Reform School is located in the suburbs. The U. S. has a granite custom-house and P. O., costing \$350,000; the State has just erected a new capitol, costing \$250,000. The city owns a park of 260 acres, costing \$100,000, and several ornamental public squares; there are



2 handsome cemeteries. The city is supplied with pure water from a lake on the high land back of its site, having an effluent capacity of 6,000,000 gals. per day. The sanitary condition of the city is well cared for; the mortality in 1881 was 15 in each 1000 inhabs.

**Educational.**—Its public school system is very complete, having 16 school buildings, valued at \$379,100, with 6522 scholars enrolled, 115 teachers, and a fine high school, all costing \$120,000 annually. There are also 2 female sems. of high grade and a number of kindergarten schools, while the Catholics have parochial schools with over 2000 scholars. The city has a free library of 8000 vols.

**History.**—The first house was built in 1838, and the city derives its name from a Catholic mission chapel erected in 1841; surveyed and plot recorded 1847, incorporated as a town 1849, and as a city 1854.

**Population, Taxable Wealth, Etc.**—The pop. in 1838 was 3; in 1850, 1112; 1870, 20,030; 1880, 41,473; 1883 (estimated), 60,000. Assessed valuation of property, \$40,000,000; debt, \$1,580,000. J. F. WILLIAMS.

#### **Saint Paul, Neb.** See APPENDIX.

**St. Paul de Loand'a**, cap. of the Port. dominions in Lower Guinea, Afr., at the mouth of the Benzo, in lat. 8° 48' S., lon. 13° 13' E. Its harbor is excellent and strongly fortified; exports beeswax and ivory. Pop. 5600, of whom 1000 are white.

**Saint Peter**, city and R. R. centre, cap. of Nicollet co., Minn., on Minnesota River. The Minn. hospital for the insane is located here. Pop. 1870, 2124; 1880, 3436.

**Saint Petersburg**, cap. of Rus., the residence of the czar, and the seat of the govt., in lat. 59° 56' 30" N., lon. 30° 19' E., on the delta of the Neva, about 20 m. E. of its port, Cronstadt. Its location is not very favorable. Nevertheless, Peter the Great, who founded the city in 1703, and declared it his cap. in 1712, and Catharine II., who was very solicitous for its growth and prosperity, succeeded in building up here one of the most brilliant capitals of Europe, and forming a commercial and industrial centre of great importance. The city consists of 2 parts—the Great Side, situated on the main land, on the S. side of the Great Neva; and the Petersburg Side, situated on the numerous islands formed by the arms of the Neva. Only one permanent bridge leads across the Great Neva—viz. the Nikolaievski. The other bridges across the Great Neva are all temporary, supported on boats and removed each autumn when the frost comes. About 150 bridges connect the islands with each other. The Great Side is the most elegant part of the city, containing a great number of palaces, chs., govt. buildings, etc., all of which are of immense dimensions, generally gorgeously decorated, and often of a fine architectural effect. The Petersburg Side is principally the seat of the commercial and industrial interests; some of the islands are occupied by villas and gardens. The most remarkable of the public buildings is the ch. of St. Isaac, 390 ft. long, 290 ft. broad, 310 ft. high, built in the form of a Gr. cross, and surmounted by a dome rising 120 ft. above the peristyle, resting on 30 columns, covered with copper, and richly gilded. In the ch. of St. Peter and St. Paul the Rus. czars have been buried since the time of Peter the Great. In the ch. of St. Alexander Nevskoi the body of this saint is preserved in a sarcophagus of solid silver. The Winter Palace, one of the largest palaces in the world, forms a square 455 ft. long, 350 ft. broad, contains immense wealth in its decorations and furniture, and is inhabited, when occupied by the czar, by 6000 persons. The Hermitage, built by Catharine II., and connected with the Winter Palace, contains one of the most valuable picture-galleries in the world, rich especially in works of the Sp. school. The Annitchkoff Palace was the residence of Nicholas I. The educational and benevolent insts. are numerous and good. The imperial library contains over 1,000,000 vols. and 35,000 MSS. The Academy of Sciences, founded by Peter the Great, has a library of 120,000 vols., an excellent ethnographic museum, large numismatic and anatomical collections, etc., and a botanical garden with the largest palm-house in Europe. The univ. was founded in 1819. The mining school has the best collection of minerals in the world. Many special schools and female gymnasias are established, and a number of compulsory elementary schools were opened in 1873. A celebrated inst. is the founding hospital. The manufactures, imperial and private, comprise glass, porcelain, and malachite ware, Gobelins tapestry and embroidery, arms, surgical and optical instruments, linen, woollen, cotton, and silk goods, paper, soap, tobacco, etc. Pop. 1881, 876,575.

CLEMENS PETERSEN.

**Saint Petersburg**, on R. R., Clarion co., Pa., 90 m. N. of Pittsburg. Annual exportation of crude petroleum, 2,000,000 barrels. Pop. 1880, 1044.

**Saint-Pierre**, de (JACQUES HENRI BERNARDIN), b. at Havre Jan. 19, 1737, went in 1750 to Martinique as a sailor; attended the school of engineering at Rouen, but lost in 1760 his position in the army on account of insubordination; gave lessons in math. in Paris; worked as an ed. at Amsterdam; went to St. Petersburg, and was appointed a capt. in the engineering corps of Finland; left the country in 1766; fought against the Rus. in Poland; then again in Sax. against the Poles; returned to Fr. and received a position as an engineer in the Isle de France; returned in 1771 to Paris and determined to devote himself to lit.; pub. *Voyage à l'Isle de France, Etudes de la Nature, Paul et l'Indigine*, which became one of the most celebrated books of the age; *La Chaudière indienne*, and *Le Café de Surate*, etc.; was made director of the botanical garden in 1792, prof. in morals at the normal school in 1794. D. Jan. 21, 1814.

**Saint Quentin**, san kon-tan', town of Fr., dept. of Aisne, on the Somme, has extensive manufactures of cotton yarn, linen, lace, muslin, and gauze, beside large distilleries and soap-works. It contains a celebrated Gothic ch., and is surrounded by beautiful promenades occupying the site of its old fortifications. Pop. 45,838. A battle took place

here on Aug. 10, 1557, between the army of Philip II. of Sp. and the Fr., in which the latter were defeated; and on Jan. 18, 1871, the Fr. army of the North met here with the 1st Ger. army. The Fr. were defeated.

**Saints' Days**, in the calendar of the Ch., are days set apart for the special commemoration of any saint. In the R. Cath. Ch. a considerable number of saints are commemorated on each day of the yr.; but it is the custom to assign to particular countries, dists., or dioceses a certain number of saints for special commemoration.

**Saint-Simon**, de (CLAUDE HENRI), COUNT, b. at Paris Oct. 17, 1760, entered the army in 1777; went to Amer. in 1779, and distinguished himself at Yorktown in 1781, but was captured by the Eng. when attempting to return to Fr., and brought to Jamaica, where he was held till peace was concluded in 1783; speculated in the confiscated estates of the *émigrés*; made a fortune; lost it again; finally entered upon a literary career by his *Lettres d'un Habitant de Genève d'ees Contemporains* (Geneva, 1803), which fell flat to the ground. A short time after he received a small clerkship in the office of the Mont de Piété at Paris, and, though he often suffered from want, he continued publishing *Introduction aux Travaux scientifiques du 19me Siècle* (Paris, 3 vols., 1808), *Réorganisation de la Société européenne*; in 1817-18, *L'Industrie, ou Discussions politiques, morales, et philosophiques*; in the mean time the striking criticisms which his works often contained, the fertile hints which he threw out now and then, and the mental vigor which characterized even his confusion, attracted to him young men of great talents, such as Augustin Thierry, Auguste Comte, and others, who helped him both with money and with ideas. Yet the success would not come; he fell into despair, and Mar. 9, 1823, attempted to commit suicide. He only lost one eye. He lived 2 yrs. longer, and in a more collected state of mind wrote his 2 best works—*Catholicisme industriel* and *Nouveau Christianisme*. D. at Paris, May 19, 1825.

**Saint-Simon**, de (LOUIS DE ROUVROU), DUKE, b. Jan. 16, 1675, entered the army in 1693, but left it again for the court in 1702; exercised considerable influence under the regent, but retired to his estates after the death of the latter in 1723. D. March 2, 1755. This long term of leisure he employed to prepare his *Mémoires*, which were intended to be pub. by his grandchildren. But at his death the govt. seized them, and the MS. was not returned to the family until the reign of Charles X. Two complete and authentic eds. have appeared, one in 21 vols. (1829-30), and another in 20 vols. (1856-58), and the work has proved to be a historical document of considerable value.

**Saint-Simonism**. See SOCIALISM.

**Saint Stephen's College**, at Annandale on the Hudson, was established in 1860 to provide special instruction for persons who at mature age had devoted themselves to the ministry. It was soon found necessary to enlarge its sphere, that young boys might be encouraged to devote themselves to the same work. In 1860 a charter was obtained. The powers of the coll. have been enlarged, and the authority to confer degrees has been granted. It has been brought under the visitation of the board of regents of the Univ. of the State of N. Y. The professorships of Lat., of Gr. and Heb., of math. and natural philos., of hist. and of Eng. lang. and lit., of moral philos., and of logic and metaphysics have been created and filled.

**Saint Thom's**, an island off the W. coast of Afr., in the Gulf of Guinea, belongs to Port. Area, about 140 sq. m. Pop. 18,266. The island is high, of volcanic origin, fertile, but unhealthy. Sugar and coffee are the prin. products. Forests abound, yielding excellent timber and the finest varieties of wood. Chief town, St. Thomas.

**Saint Thomas**, one of the Virgin Islands, in the W. I., in lat. 18° 20' N., lon. 64° 55' W., belongs to Den. Area, 45 sq. m. Pop. 15,500. The soil is almost totally unproductive. The island is important only on account of its excellent harbor, Charlotte Amalie.

**Saint Valier**, de (JEAN BAPTISTE DE Lacroix), CHEVRIÈRE, b. at Grenoble, Fr., Nov. 14, 1633, became chaplain to Louis XIV.; was appointed vicar-gen. of Que. by Bp. Laval 1684; arrived in Canada July 30, 1685; returned to Fr. Nov. 1687; was consecrated bp. of Que. Jan. 25, 1688; arrived in Canada in Aug. of the same yr.; founded the gen. hospital at Que.; was captured by the Eng. at sea while returning from Fr. July 1704, and remained a prisoner until 1709. D. at Que. Dec. 26, 1727. Wrote *État présent de l'Eglise et de la Colonie française dans la Nouvelle France*.

**Saint Viator**, Congregation of, a R. Cath. congregation; received papal approbation in 1833 and 1838; introduced into N. Amer. in 1847; devoted to religious and other instruction.

**Saint Vin'cent**, one of the Lesser Antilles, in the W. I., in lat. 13° 13' N., lon. 61° 15' W., belongs to G. Brit. Area, 147 sq. m. Pop. 35,688. The surface is high, volcanic, and mountainous. The climate is hot and very moist, though not unhealthy. The soil is very fertile, and sugar, rum, and molasses are exported. Chief town, Kingstown.

**Saint Vincent**, Cape. See CAPE ST. VINCENT.

**Saint Vincent**, EARL OF. See JERVIS (Sir JOHN).

**Saint Vitus's Dance**. See CHOREA.

**Sai'vas**, the members of one of the 3 great modern groups of sects of the Hindoo religion, who pay pre-eminent adoration to Siva in his various incarnations.

**Sa'ki**, the rice-beer of Japan, is usually heated before drinking. Its use in Japan is very extensive.

**Sak'ias** [Sans. *sakti*, "power" or "energy"], the members of one of the 3 great modern groups of sects of the Hindoo religion, designating the votaries of the female consorts of the gods of the Triad.

**Sakti**. See SAKTAS.

**Sakunta'ia**, the heroine of a considerable cycle of anc. mythology, commemorated in the noted drama of *Kalidasa*.

**Sakya-Muni** [Sans. *Saint Sakya*], one of the most usual designations of the founder of the Buddhist religion.



**Sa'la** (GEORGE AUGUSTUS HENRY), b. in Lond., Eng., of It. parentage, in 1828; ed. as an artist, but devoted himself to lit. as a constant contributor to Dickens's *Household Words*, the *Illustrated Lond. News*, and the *Cornhill Magazine*; visited the U. S. 1863-64 as correspondent of the *Daily Telegraph*; represented the same paper in Algeria 1864, and again 1875, at the Paris Exposition 1867, on the Continent during the Franco-Ger. war 1870-71, and in Sp., Morocco, and Venice 1875. Author of several novels and works of travel, and founder and ed. of the *Temple Bar* magazine.

**Salaam** [Ar. *salam*, "peace"], the Oriental salutation, of which there are various forms, mostly accompanied by the words "Peace be with you."

**Sal'adin** (SALAH-ED-DIN YUSSUF), a son of Ayub, the founder of the dynasty of the Ayubides, b. at Tekrit on the Tigris in 1137, a Kurd by descent and a subject of Nouredin, sultan of Syria; accompanied in 1163 his uncle, Shirkuh, to Egypt, where he soon gained celebrity for his military talents. After the death of Shirkuh, S. governed Egypt as Nouredin's emir. The country prospered, and after the death of Nouredin in 1173 it became an independent empire under the rule of S. He also interfered in the controversies in Syria between the heirs of Nouredin, and in 1184 made himself complete master of this country too, and was confirmed by the caliph of Bagdad as sultan of Egypt and Syria. In 1186 he attacked Pal., routed the Chrs. completely at Tiberias (July 4, 1187), and conquered Jerusalem Oct. 2. When these tidings came to Europe the third crusade was preached, and Frederick Barbarossa of Ger., Philippe Augustus of Fr., and Richard Cœur de Lion of Eng. took the cross and led great armies toward the Holy Land in 1189. Frederick d. soon, and after the conquest of Acre, Philippe Augustus returned, but between Richard Cœur de Lion and S. a long tournament took place. Sept. 2, 1192, a truce of 3 yrs. was concluded, by which the coast of Pal. from Tyre to Jaffa was ceded to the Chrs. Shortly after, Richard Cœur de Lion returned to Europe, and S. d. Mar. 4, 1193.

**Sala'do**, a river of the Argentine Republic, S. Amer., has its source in an outlying spur of the Andes, flows S. S. E. 600 m., and enters the Paraná near Santa Fé.

**Sal Aëra'tus** [Lat. "aërated salt"]. The commercial product known by this name, formerly a very large article of domestic consumption, has during the present generation been chiefly displaced by the cheaper and in every way preferable compound, bicarbonate of soda, known as "cooking soda," sometimes "soda salæratum." S. A. is a somewhat impure and imperfectly carbonated bicarbonate of potash, made by exposing a concentrated solution of neutral potassic carbonate to an atmosphere of carbonic acid gas proceeding from fermentation or other source.

**Salaman'ca**, town of Sp., cap. of the prov. of the same name, on the right bank of the Tormes, which is here crossed by a magnificent bridge of 27 arches. It is surrounded with old walls. The streets are mostly steep, the town being built on 3 hills, narrow, crooked, and dark, but they are often lined with lofty edifices most interesting in architectural respects. The univ. was founded in 1200, and is still the first inst. of its kind in Sp. Pop. 18,700.

**Salamanca**, R. R. junc., Cattaraugus co., N. Y. Lumbering is extensively carried on. Pop. tp. 1870, 1881; 1880, 3498, including 2531 in v.

**Sal'amauder** [anglicized from the Lat. *salamandra*], an Eng. name, vaguely applied to numerous forms of amphibians of the order Gradientia, including the typical salamanders and newts of the Old World, but more especially restricted to species of Salamandridæ. This family includes 2 genera, *Salamandra* and *Triton*, both of which are represented in Europe and temperate Asia.

**Sal'amis**, the modern *Kolouri*, an island of Gr., in the Gulf of Ægina, comprising an area of 36 sq. m., with about 5000 inhabs. It is mountainous, well wooded, and produces cotton, olives, and wine. In the narrow strait, between S. and Attica, was fought the naval battle in which the Grs. under Themistocles almost destroyed the Per. fleet (480 B. C.).

**Sal Ammo'niac** [Ger. *Salmiak*; synonyms, *Muriate of Ammonia*, *Hydrochlorate of Ammonia*, *Chloride of Ammonium*] was first made in Egypt or Libya from the urine of camels; hence the name, and our important word *ammonia*, *ammoniac*, *ammoniaque*. It results from the bringing together of the 2 permanent gases ammonia and hydrochloric acid. The reaction consists in the passing over of the hydrogen of the hydrochloric acid to the ammonia to form a compound radical or elementoid substance, *ammonium*, which has the same relations and performs the same functions as *potassium* and *thallium*. This radical unites with the chlorine to form chloride of ammonium. S. A. of commerce is obtained by subliming together crude sulphate of ammonia with common salt, sulphate of soda remaining as a residual product. Compact cakes of S. A. are thus obtained, which are free from any impurity except a little ferrous chloride. Commercial S. A., as obtained by sublimation, is in hard, compact loaves, transparent or translucent, splitting with a sub-columnar fracture in a direction normal or perpendicular to the planes of original condensation. The fibres thus obtained have a characteristic toughness and flexibility, bending somewhat, without loss of transparency, before they break, though quite destitute of elasticity. S. A. has a taste at once saline, pungent, and cooling. It is often found native about volcanoes, subliming and condensing in fissures, both the muriatic acid and the ammonia constituting it being presumably derived from the chloride of sodium and animal matter in ocean-water which has found its way through the oceanic floor to the volcanic focus. It has also been observed in guano.

**Saldan'ha** (JOÃO CARLOS OLIVEIRA e DAUN), DUKE OF, grandson of the marquis of Pombal, b. at Lisbon, Port., Nov. 17, 1791, ed. at the Coll. of Nobles at Lisbon and at the Univ. of Coimbra; was made minister of foreign affairs 1825; became gov. of Oporto and minister of war 1826; re-

signed and went to Eng. June 1837; afterward took part in the war against Dom Miguel at the head of the insurgents at Oporto, but was defeated; took refuge in Eng.; returned to Port. with Dom Pedro 1832; took Oporto 1833; took Lisbon; received the capitulation of Dom Miguel at Evora 1834; placed himself at the head of the opposition party; became minister of war and pres. of the council May 31, 1835; took part in the unsuccessful conservative revolution of 1836, after which he lived in exile, until recalled by the queen; was placed at the head of the ministry after the intervention of the quadruple alliance 1847; was replaced by the second dictatorship of Costa Cabral 1849; overthrew that administration by force of arms 1851; conducted the gov. until the accession of Pedro V. (1856), when he became again the head of the opposition; was minister at Rome 1862-64, and again 1866-69; went to Paris as minister Mar. 1869; instigated a revolution in the palace May 19, 1870, in consequence of which he again became prime minister, but resigned in Aug., and was sent as minister to Lond., where he d. Nov. 21, 1876.

**Sale** (GEORGE), b. probably in Kent, Eng., about 1680, ed. at King's Coll., Canterbury; became a lawyer and a ripe Oriental scholar; contributed the cosmogony and portions of the Oriental hist. to the *Univ. Hist.*; wrote the Oriental biography and criticism for Dr. Thomas Birch's translation of Bayle, and executed a translation of the *Koran*, to which he prefixed a *Preliminary Discourse* upon Ar. hist., manners, customs, and religion before Mohammed. D. in Lond. Nov. 14, 1736.

**Sale** (SIR ROBERT HENRY), K. C. B., known as the "hero of Jellalabad," b. in Eng. in 1782; entered the army at 13; was engaged in the storming of Seringapatam 1790, at the storming of the Travancore lines 1809, at the capture of Mauritius 1816, and the occupation of Rangoon 1824; was appointed in 1838 to the command of the first Bengal brigade in the army on the Indus, which constituted the advance-guard of the expedition against Afghanistan; commanded the storming-party at Ghuznee July 23, 1839; subdued the Kohistan country Sept. 1840; defeated Dost Mohammed Khan at Purwan, obliging him to surrender; stormed the Khoord, Cabool, and Juggdollok passes and other strongholds, 1841, but was compelled to retreat upon Jellalabad, where he was besieged by Akbar Khan from Nov. 12, 1841, to Apr. 9, 1842, when he attacked and utterly routed the Afghans; took part in the gen. action of Teezen and the recapture of Cabool, and in the Punjab campaign of 1845; was mortally wounded at the battle of Moodkee, Dec. 18, 1845, and d. Feb. 28, 1846.—His wife, LADY FLORENTIA WYNCH SALE, b. in Eng. about 1790, married in 1809, was a witness of much of her husband's gallant career in India, and wrote *A Journal of the Disasters in Afghanistan in 1841-42*. D. at Cape Town, S. Afr., in 1853.

**Sale, in Law.** By the term "sale" is meant the transfer of the property in a thing, whether real or personal, for a price in money, and not in goods or other property. Owing to the peculiar theories of the Eng. law concerning real estate, the rules governing the sale of land are not the same as those governing the transfer of chattels, though bearing a gen. resemblance. They are accordingly treated separately by law-writers, the doctrines governing in real property law being usually found under the head of "vendor and purchaser." These topics are very extensive, and an adequate discussion of them cannot be brought within the compass of this work. Reference will only be made to trustworthy and useful sources of information. For information as to sales of personal property see Blackburn on *Sales*; Benjamin on *Sales*. Amer. ed.; Long on do.; Story on do.; Langdell's *Leading Cases*; also the works on *Contracts* of Chitty, Comyn, Parsons, and Addison, and Browne on the *Statute of Frauds*. As to sale of real property consult Sugden on *Vendors and Purchasers*; Dart on do.; Fry on *Specific Performance*; Gerard on *Titles to Real Estate*; Curwen on *Abstracts of Title*; Cruise's *Digest*, Greenleaf's ed. For information on the rules of the Rom. law consult the treatises of Pothier, Troplong, Ortolan, etc., and the *Institutes of Justinian*, by Sandars.

**Sale'm**, city, on R. R., cap. of Marion co., Ill. Pop. 1870, 1182; 1880, 1327.

**Salem**, city and important R. R. and commercial centre, one of the caps. of Essex co., Mass. It was the first permanent settlement of the old Mass. Colony, Roger Conant having come here in 1626. The Essex Inst., the Peabody Acad. of Science, and one of the State normal schools are located here. It has many interesting old houses. For a great many yrs. S. was one of the leading commercial cities of Amer., carrying on more trade with the E. I. at one period than all other Amer. ports combined. It has one of the best harbors in N. Eng. It has now very little foreign commerce, but has quite a large coasting-trade, and it is a point of shipment for large quantities of coal landed here in vessels and sent to the interior by rail. The leading industry is the manufacture of leather. It is an important centre of retail trade. S. was the scene of the witchcraft delusion of 1692. It was in S. that the house of reps. of the prov. of Mass. resolved themselves into a sovereign political power Oct. 7, 1774, with John Hancock as chairman, and then adjourned to Concord. It was also at the N. Bridge in S. that (Feb. 26, 1775) the Brit. commander, Col. Leslie, was compelled to return to Boston. Pop. 1870, 24,117; 1880, 27,563.

**Salem**, Mo. See APPENDIX.

**Salem**, city, cap. of Salem co., N. J., on R. R. and Salem River, 34 m. S. W. of Phila.; has collegiate and musical insts. Pop. 1870, 4555; 1880, 5056.

**Salem**, on R. R., Washington co., N. Y., 46 m. N. of Albany, has an acad. established in 1791. Prin. business, farming and dairying. Pop. 1870, 1239; 1880, 1410.

**Salem**, N. C. See APPENDIX.

**Salem**, on R. R., Columbiana co., O., 70 m. W. of Pittsburg, contains large galvanized iron-cornice works. Pop. 1870, 3700; 1880, 4041.



**Salem**, city, cap. of Marion co., Or., and also of the State, on R. R. and E. bank of Willamette River, 50 m. S. of Portland, with which city it is connected by steamer for 9 months in the yr., is surrounded by fertile prairies, has good water-power from the falls of Mill Creek, the State penitentiary, deaf-mute school, and inst. for the blind, and is the seat of Willamette Univ. Pop. 1870, 1139; 1880, 2538.

**Salem**, on R. R., cap. of Roanoke co., Va., 180 m. W. of Richmond, is the seat of Roanoke Coll. Fine water-power exists. Pop. 1870, 1355; 1880, 1759.

**Sal'ep** [Ar. *sahleb*], a substance of a mucilaginous nature, made by drying the bulbs of the male orchis. The dried bulbs are very hard and horny, translucent, and swell up slowly in cold water like tragacanth, forming a mucilage.

**Saleratus**. See SAL AERATUS.

**Saler'no**, city of S. It., chief town of the prov. of Salerno. It is situated about 30 m. S. E. of Naples, on the Gulf of Salerno. The chief object of interest in the town itself is the old Norman cathedral (1084), the most imposing specimen of Norman arch. in S. It. S. was probably settled by the Grs. at a very early period, was colonized by the Roms. not far from 200 B. C., and was a place of importance during the best Rom. period. Its hist. under Lombard, Norman, Swabian, and Angevine rulers abounds in romance, but the great and just boast of mediæval S. was its celebrated med. school. Pop. 31,345.

**Sales, de** (FRANCIS). See FRANCIS DE SALES.

**Sales** (FRANCIS), b. in Roussillon, Fr., in 1771, was instructor in Fr. and Sp. in Harvard Coll. from 1816 to 1839, and of Sp. alone from that time till his death at Cambridge Feb. 16, 1854. Author of a *Sp. Gram.*; ed. of several vols. of select works.

**Salford**. See MANCHESTER, ENG.

**Salicaceæ**, or **Salic'ineæ** [Lat. *salix*, "willow"], a natural order of apetalous dicotyledonous plants, consisting of the willows (160 species) and poplars (about 20 species), trees and shrubs of the N. hemisphere, well marked by the dioecious flowers, both sexes in catkins, foliaceous fruit, and cottony-comose seeds. The wood is soft and light; the young shoots of various willows (osiers) are largely employed for wickerwork; and the bark of many or all the species yields salicine or populine, bitter principles used as febrifuges.

**Salicine**, sal'i-sin [Lat. *salix*, the "willow tree"]. All the willow tribe contain in their bark a bitter crystalline principle known by this name. It has no alkaloid properties, like quinine, strychnine, and some other crystalline bitter principles, but is a *glucoside*. By the action of hot dilute acids or of the ferment *emulsine* or *synaptase*, it breaks up into glucose and another compound called *saligenine*. Its main interest at present is in its being one source of salicylic acid.

**Sal'ic Law** [Lat. *Lex Salica*] was written in the 5th century in corrupted Lat., and contains the code of the Salian Franks, who shortly before had invaded Gaul, and shortly after established there a Frankish kingdom. The code exists in numerous MSS.

**Salicylic** (**Hyperspinoylic**, **Spinoylic**, or **Metaoxybenzoic**) **Acid**, an organic acid existing in the flowers of *Spirea ulmaria*, and in combination as acid methylsalicylate, forming the essential oil of wintergreen.

**Formation**.—S. A. may be obtained (1) by treatment of salicyl with an oxidizing agent, as chromic acid; (2) by fusing salicyl with caustic potassa; (3) by treating oil of wintergreen with strong potassa lye, or (4) with gaseous hydriodic acid; (5) by heating a mixture of indigo and caustic potassa to 300°; (6) by treating phenol (carbolic acid) with sodium and carbonic acid gas; (7) with sodium and ethylchlorocarbonate; (8) with acid potassium carbonate, or (9) with caustic soda, the mixture being heated and carbonic acid gas passed into it.

**Properties and Uses**.—S. A. when pure crystallizes in white 4-sided prisms. It has a sweetish-sour taste, reddens litmus strongly, and has no action on polarized light. It is lightly soluble in cold water, more so in hot, still more so in alcohol, ether, and oil of turpentine. By heating with strong hydriodic or hydrochloric acid or with dilute sulphuric acid it decomposes into phenol and carbonic acid. It is a dibasic acid, forming acid and neutral salts. By treatment with chlorine, bromine, iodine, nitric acid it forms chloro-, bromo-, iodo-, and nitro-salicylic acids. In very small quantities it acts as an antiseptic. On account of its being odorless and less irritating than carbolic acid, and not poisonous, it has been used with advantage in surgical treatment. In med., S. A. is used as an antipyretic, and as an internal factor as antiseptic in cases of diphtheria. It is frequently dispensed in solutions of alkaline phosphates. It is used also in preserving wine, beer, cider, meat, and other articles of food, and its use has been proposed in the manufacture of glue, leather, etc., of perfumery, and as a dye in connection with iron salts, with which it gives a fine purple color.

**Salicyl**, also called (incorrectly) **Salicylic Aldehyde**, differs from salicylic acid by containing 1 equivalent less of oxygen. S. occurs naturally in the essential oil of *Spirea ulmaria* or *meadow-sweet*, in admixture with a terpene compound. It may be obtained artificially by the action of oxidizing agents, as chromic acid on salicine.

**Salida**, Col. See APPENDIX.

**Salien'tia** [from the Lat. *salio*, to "leap"], one of the names of the order of Amphibia, embracing the frogs, toads, and tree-frogs, and of which another equally expressive name, and one more generally used, is *Anura* (a privative, and *ovip*, "egg"). The frogs are the typical representatives of the order.

**Salina**, city and R. R. centre, cap. of Saline co., Kan., 185 m. W. of Kansas City, Mo. Pop. 1870, 918; 1880, 3111.

**Salinas**, on R. R., cap. of Monterey co., Cal., in the heart of Salinas Valley. Pop. 1870, 599; 1880, 1854.

**Salisbury**, saulz'berry, town of Eng., cap. of Wiltshire, on the Avon, has a magnificent cathedral, which was built

1220-58 in the form of a double cross, with a spire 400 ft. high. Pop. 14,570.

**Salisbury**, on R. R., cap. of Wicomico co., Md., at head of Wicomico River, 140 m. S. E. of Baltimore. The town is largely engaged in coasting and inland trade. Lumber and grain are the staple articles of export, but small fruits are also shipped to the N. The Wicomico River is navigable for small boats. Pop. 1870, 2064; 1880, 2581.

**Salisbury**, R. R. junc., cap. of Rowan co., N. C., 5 m. W. of Yadkin River. Pop. 1870, 168; 1880, 2723.

**Salisbury** (EDWARD E.), prof. of Arabic and Sans. in Yale Coll. 1841-54, and of Arabic alone for several yrs. later, was one of the founders of the Amer. Oriental Society, and endowed the professorship of Sans. in Yale Coll.

**Salisbury**, MARQUES OF, EARLS OF, VISCOUNTS CRANBORNE (1604), and BARONS CECIL (1608), a prominent family of the Brit. nobility. The earldom of S. was first held by William Longespée, a Norman noble (d. 1226), afterward by the Montacute family. The title was conferred upon Sir Richard Neville on his marriage to Alice Montacute (1442). Subsequently the title was borne by Margaret Plantagenet, mother of Cardinal Pole.—ROBERT CECIL (b. June 1, 1563, d. May 24, 1612), the famous sec. of state to Queen Elizabeth, was made earl of S. May 4, 1605.

**Salisbury** (ROBERT ARTHUR TALBOT GASCOYNE-CECIL), MARQUIS OF, b. at Hatfield Feb. 10, 1830, ed. at Eton, grad. at Christ's Ch., Ox.; sat in Parl. for Stamford; became sec. of state for India in Earl Derby's third administration July 1866; resigned Mar. 2, 1867, in consequence of unwillingness to support the Reform bill, and accepted the same post in Disraeli's second administration Feb. 1874; succeeded Lord Derby as minister of foreign affairs in May 1878, and was one of the Eng. plenipotentiaries at the Cong. of Berlin. He was elected chancellor of the Univ. of Ox., in succession to the late Earl Derby, Nov. 12, 1869.

**Salle, de la** (JEAN BAPTISTE). See LA SALLE, DE (JEAN BAPTISTE).

**Sal'lust** (CAIUS SALUSTIUS CRISPUS), b. in 87 B. C. at Amiternum, in the country of the Sabines, of a wealthy plebeian family; was elected *tribunus plebis* in 52; expelled from the senate in 50 by the censors on account of the scandalous life he led; reinstated in the senatorial dignity in 47 by being elected prætor, probably by the aid of Cæsar, whom he accompanied to Afr. in 46; was appointed consul of Numidia, and returned to Rome loaded with riches; formed the magnificent *Horti Sallustiani* on the Quirinalis. D. at Rome 34 B. C. Wrote *Historiarum Libri Quinque*, *Bellum Catilinæ*, and *Bellum Jugurthinum*.

**Salma'stus** (CLAUDIUS), (CLAUDE DE SAUMAISE), b. at Semur-en-Auxois, dept. of Côte-d'Or, Fr., Apr. 15, 1588; studied at Paris and Heidelberg; embraced Protestantism; was appointed prof. at the Univ. of Leyden in 1632; edited *Scriptores Historiæ Augustæ*, *Pliniana Exercitationes in Solinum*, etc.; wrote *De Cæsaribus*, *De Re Militari Romanorum*, and *Defensio Regia pro Cæsaribus*; accepted an invitation from Queen Christina of Swe., but the inhabs. of Leyden urged him to return. In 1651 he left Stockholm, but d. Sept. 3, 1653, at Spa.

**Salmon**, sam'un [Lat. *salmo*], a name given to several species of the genus *Salmo*, characterized by their ascending from the sea into fresh waters to breed, as well as to the species of the genus *Oncorhynchus*. All of these agree essentially in habits. Their natural home is the salt water, for there they obtain their food and rapidly increase in size; toward the fall, however, they are impelled by a breeding instinct to ascend the rivers, and this they do as near to the source as they can. During their sojourn in fresh water they almost entirely abstain from food and alter considerably in appearance; this divergence from the normal form is most apparent in the male, and is only approached in a slight degree by the female. The snout becomes attenuated and more or less hooked, and the lower jaw is modified in a similar manner; the body becomes emaciated, and the skin decked with glowing hectic colors. In the S. of Europe and E. Amer. this is temporary, and the males in considerable proportion descend to the sea, revive, and assume their pristine vigor and form. Some of the species of the genus *Oncorhynchus* of the Pacific coast, however, become so abnormally developed that after spawning they die, and their carcasses are left by myriads in the waters they have traversed. The most celebrated species of S., and those most interesting for Amers., are the *Salmo salar* of the E. coast and the S. or *Oncorhynchus quinnat* of the W. slope.

**Salmon-Trout**. See TROUT.

**Salmon-Salm** (FELIX), PRINCE, b. in Aus. Dec. 28, 1828, served in the U. S. A. during the c. war; was at one time in command of a regiment, and afterward post-commander at Atlanta, Ga., with the rank of brigadier; went to Mex. at the close of the war; became aide-de-camp and chief of the household to the archduke Maximilian, with whom he was captured at Querétaro; entered the Prus. service, and was killed at the battle of Gravelotte, Fr., Aug. 18, 1870.—His wife, Mlle. LE CLERCQ, of New York, played a prominent part at the court of the archduke, and acquired celebrity to her heroic efforts to procure the pardon of Maximilian or to effect his escape. She accompanied her husband during the Franco-Ger. campaign up to his death, and wrote *Ten Years of My Life*.

**Sal'omon** (FREDERICK), b. near Halberstadt, Pruss., Apr. 7, 1826, came in 1849 to the U. S.; became a land-surveyor at Manitowoc, Wis.; was 4 yrs. co. register of deeds; chief engineer on Manitowoc and Wis. R. R. 1857-59; entered the Union service in the spring of 1861 as capt. in the 5th Mo. Volunteers; was with Sigel at Wilson's Creek; became col. of the 9th Wis. Volunteers Aug. 1861, brig.-gen. July 16, 1862.—His brother WILLIAM came with him to the U. S., and became gov. of Wis. 1862-63.

**Salomon Islands**. See SOLOMON ISLANDS.

**Saloni'ca** [Tur. *Selanik*; the anc. Thessalonæ], afterward called *Thessalonica*, cap. of the Tur. eyalet of the same



name, is on the N. E. shore of a spacious gulf of the *Ægean* Sea, named after it; rises amphitheatrically on the steep slope of the mt. of Kortiasch; is narrow and irregular, but contains many interesting architectural monuments. In the Gr. quarter are found a hippodrome of great antiquity and ruins of a colonnade built under Nero. Most of the mosques have formerly been Chr. chs. The old mosque was the celebrated ch. of St. Demetrius. The ch. of St. Sophia was the prototype of the ch. of the same name in Constantinople, and another mosque is the former Rotunda, built after the model of the Rom. Pantheon. The city is fortified, has a citadel and several forts, is the seat of the gov.-gen. of the prov., a Gr. metropolitan, a Jewish grand chakam, and contains numerous chs. and schools of different denominations. Its commercial importance it derives from its geographical position, it being located at the termination of the road which, 70 m. long, crosses the peninsula of the Balkan from Belgrade on the lower Danube, thus connecting by land and water roads the valley of the Danube with Smyrna and the coasts of Asia Minor. Numerous vessels from all nations anchor in its safe and spacious harbor. The imports consist chiefly of sugar, coffee, petroleum, silk, iron, machinery, nails, and textile fabrics; the exports, of silk and silkworms, corn, cotton, wool, hides, and tobacco. Pop. about 80,000.

**Sal'pa** [Gr. *σαλπη*, a kind of fish], an interesting genus of tunicates, the type of the family Salpidae. Salpians are in the adult form separate organisms, produced by true generation from the individuals of a salpa-chain. Each single salpian gives birth, by gemmation, to a chain of salpians, each of which is an hermaphrodite. The chains swing together in water by a serpentine movement, and single salpae move by ejecting water from the mantle. The individuals are from  $\frac{1}{4}$  inch to 10 inches long.

**Sal'sify** [Fr. *salsifis*], or **Vegetable Oyster**, *Tragopogon porrifolius* and *T. pratensis*, European plants of the order Compositæ. They are cultivated for the highly nutritious roots, which have, when properly cooked, a taste somewhat like that of the oyster.

**Salt Soda.** See Soda.

**Salt**, sawlt [Lat. *sal*]. The salt of commerce is chloride of sodium, more or less contaminated with various saline admixtures. Natural solutions of pure salt are unknown; crystals of pure salt may be obtained by separating carefully individual crystals from a well-developed rock-salt. Chemically pure salt is usually produced by neutralizing pure carbonate of soda with pure hydrochloric acid, evaporating the solution to dryness, and fusing the residue. The salt of commerce is obtained from 3 sources—viz. sea-water, brines, and rock-salt.

**Sea-Water.**—The water of the ocean is a weak and, comparatively speaking, impure brine. It contains from  $\frac{3}{4}$  to 4 per cent. of saline matter, of which about  $\frac{3}{4}$  is chloride of sodium, or salt, and about  $\frac{1}{4}$  impurities. Its chief impurities consist of chloride of magnesium and the sulphates of lime, magnesia, soda, and potassa. Sea-water represents the main source of supply for the manufacture of salt in Fr., Port., Sp., It., the W. I., and Central S. Amer.; it is also largely used for the production of salt in Hol., Belg., and Eng. In the U. S. it has been turned to advantage but to a very limited extent.

**Rock-Salt.**—Whenever, during the various geological epochs, a larger or a smaller body of salt water was cut off from the main ocean, and was subsequently placed under favorable climatic conditions for its evaporation and for saline preservation, either in whole or in part, of its saline residue, then a salt deposit was produced. Such saline residues, commonly known as rock-salt, have been found in almost every geological horizon from the Silurian upward, and in many localities they are still forming at the present time. The rock-salt occurs either in densely aggregated masses of distinctly cubical crystals, or in compact masses having a conchoidal fracture. It is in some instances colorless and transparent, yet more frequently either red, yellow, or blue—rarely green. Its most common admixtures are either sulphate of lime and the chlorides of calcium and magnesium, or the sulphates of lime, magnesia, and soda and the chloride of magnesium. Rock-salt deposits consist usually of alternating layers of salt and gypsum, or sulphate of lime, and sometimes also of clay. These various layers may differ in thickness from a few inches to many feet. They are due to successive periods of evaporation. Colorless and dry rock-salt deposits, when easy of access, are directly mined with advantage, and the salt obtained by that process is subsequently brought into a desirable form for domestic application. Colored salt deposits, or those which suffer from an access of water, or which contain a large percentage of the above-mentioned foreign admixtures or clay, or, finally, those which are located at great depths, if otherwise practicable, are usually dissolved while in the mine, and their solutions treated like brines for the manufacture of salt. Rock-salt deposits have been noticed quite frequently in every part of the globe.

**Brines.**—Brines are either artificial or natural—i. e. they are prepared either by dissolving rock-salt, or they are the natural or chance solutions of saline deposits by means of subterranean currents of water. All known brines may be divided, like the rock-salt, into 2 classes—viz. those which contain beside salt the chlorides of calcium and magnesium and sulphate of lime, and those which contain only the chloride of magnesium and the sulphates of lime, magnesia, and soda. The value of a brine for the manufacture of salt does not entirely depend on either concentration or relative proportion of pure salt and of foreign saline admixtures, but on the kind of the impurities. The gen. character and the value of the various brines depend on the relative proportion and the kind of the foreign saline substances present. The same is true, to some extent at least, in regard to the salt. As the peculiar fitness of any kind of salt for the different domestic applications—for instance, meat-packing,

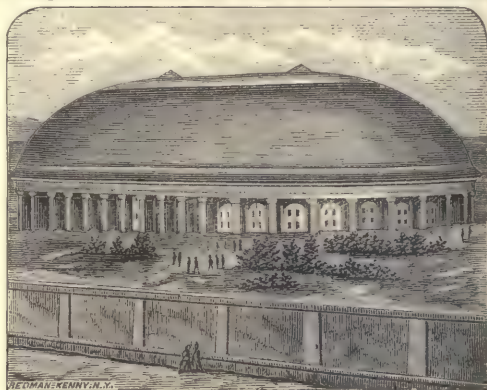
dairy or table use—depends not only on a fair chemical composition, but also, in some degree, on its suitable phys. or mechanical condition, it is quite obvious that the selection of the mode of manufacturing salt has to be made with reference to both—viz. the quality and the general character of the brine on hand, and the kind of salt desired. The process of saltmaking is quite naturally an operation which aims at the separation of the salt or chloride of sodium from its accompanying foreign saline admixtures.

So far as the form is concerned, there are 2 kinds of salt in commerce—(1) *coarse salt*, including salt made by solar heat and rock-salt crushed to suitable size, and (2) *common fine salt* or *boiled salt*, obtained by artificial heat, and thus by a more rapid evaporation. Both kinds have their special commercial value. [From orig. art. in *J. s. Univ. Cyc.*, by Prof. CHARLES A. GOESSMANN.]

**Salt** (Sir Titus), BART., b. at Morley, Eng., in 1803, ed. at Wakefield; commenced business in a small way as a woolen manufacturer at Bradford 1834; rapidly acquired a fortune, and in 1853 began near Shipley, on the banks of the Aire (since called Saltaire—i. e. Salt-Aire), the erection of a model manufacturing v. on a colossal scale, which has been truly called a "palace of industry." Sir Titus was for many yrs. a magistrate and deputy lieut. of the W. Riding of Yorkshire; served as mayor of Bradford and pres. of the chamber of commerce; sat in Parl. for Bradford as an advanced Liberal 1859-61, and was made a baronet Oct. 1869. He was the head of the great house of Titus Salt, Sons & Co. D. Dec. 29, 1876.

**Salt Lake.** See GREAT SALT LAKE AND LAKE.

**Salt Lake City**, city and R. R. centre, cap. of Salt Lake co. and of Ut. Terr., 11 m. from Great Salt Lake, at the base of the Wahsatch Mts. It is in every sense the metropolis of Ut. and of the Mormons, who founded it in 1847. The streets are 137 ft. wide, and the blocks are 40 rods square. Water is conveyed along the streets for irrigation and other uses, and the shade and fruit trees render the city a conspicuous contrast with the country at large. The city



Tabernacle, Salt Lake City.

has several graded schools, inclusive of the Univ. of Deseret, a Territorial, a city, and a Masonic library, and a museum of the productions and curiosities of the region. The city hall cost \$70,000; the Tabernacle, the Mormon place of assembly for worship, contains an organ second in size only to the big organ of Boston, cost \$500,000, and will seat 8000 people. The Mormon Temple, 100 x 200 ft. in progress 30 yrs., with new granite walls 85 ft. high, is  $\frac{3}{4}$  done. Until recently the city suffered from the exclusive policy of the Mormons, but with the advent of R. R. its city is entering on growth and progress. Pop. 1880, 20,768; 1885, 25,000. [From orig. art. in *J. s. Univ. Cyc.*, by O. J. HOLLISTER.]

**Salt-Mines of Louisiana.**—An extraordinary deposit of salt was discovered in 1861 in sinking a well on the estate of Judge Daniel Avery on Petite Anse Island, on the sea-coast of La. The discovery served the Confederacy with a supply of salt during the latter yrs. of the war. Petite Anse is an island of some 5000 acres, rising 160 ft. out of the sea-marsh that lies along the coast 30 m. in width. It was covered with a forest, and has been long inhabited and cultivated. The mine was an amorphous mass of rock-salt, its crest about 20 ft. under ground and some 50 ft. below the summit of the island. The salt was a pure muriate of soda. Its solidity was complete, without seams or cleavage, or any evidence of crystalline structure. Blocks of crystal were, however, found upon the surface of the mass. The mine is in the parish of Iberia, La., about 10 m. S. of Iberia, the parish-seat, upon the river or Bayou Teche.

**Geological Position.**—Fossil remains of the Quaternary period are found thickly strewn upon and beneath the surface of the island. In sinking the shaft of the mine the remains of pottery were found in great quantities, and human bones, with darts and stone axes of various kinds, and with and above them the bones of mammoths, mastodons, elk, and deer, that seem to have frequented the salt-licks, as cattle and horses do now. From the vast amount of human remains and rude weapons, it would appear that men had been attracted thither by the great amount of game that frequented the spot. All seem to have beenwhelmed in one catastrophe, and the dispositions since made by nature have not borne them far from their original sepulture. The salt-springs of La. were somewhat noted as early as the war of 1812. They are 20 and 30 m. E. along the valley of the Saline Creek, nearly at the level of the Red River alluvion. They are copious, and were again worked during the c. war.



**Sal'tonstall** (GURDON), son of Col. Nathan and great-grandson of Sir Richard, b. at Haverhill, Mass., Mar. 27, 1666, grad. at Harvard 1684; was ordained minister of New London, Conn., Nov. 25, 1691; was distinguished as an orator, and took so active a part in politics that he was made gov. of Conn. 1707, and held that post until his death, Oct. 1, 1724. He bequeathed £1000 to Harvard Coll. to educate students for the ministry.

**Saltontall** (LEVERETT), LL.D., son of Dr. Nathaniel and grandson of Richard, b. at Haverhill, Mass., June 13, 1783; studied at Phillips Acad., Exeter, N. H., grad. at Harvard 1802; commenced the practice of law at Salem 1805; attained eminence in his profession; was a member of the Mass. Historical Society, to whose *Collections* he contributed an *Historical Sketch of Haverhill*; was a State senator 1831; chosen Presidential elector 1836; was mayor of Salem 1836-38, and M. C. 1838-43. D. May 3, 1845.

**Saltontall** (Sir RICHARD), b. at Halifax, Eng., in 1586, son of Sir Richard, who became lord mayor of Lond. 1597; came to Mass. as assistant gov. to Winthrop 1630; was associated with Mr. Phillips in the foundation of Watertown 1630, but went back to Eng. the following yr. In 1651 he wrote a letter to the Mass. ministers Cotton and Wilson remonstrating against the persecution of men for their religious opinions. D. in Eng. about 1658.—**RICHARD**, b. at Woodsome, Yorkshire, Eng., in 1610, was an early settler of Ipswich; was assistant gov. 1637, befriended the regicides Goffe and Whalley, and protested against the introduction of negro slavery into the colony. D. Apr. 29, 1694.

**Saltpetre**. See NITRE, NITRATES, and NITRIC ACID.

**Salt Range, or Kalabagh Mountains**, a mt.-group of the Panjab, India, extends from the N. E. boundary of Afghanistan to the Jhylum, a distance of about 200 m. It is only 2500 ft. high, but its bold peaks and steep, wild precipices present a barren and forbidding aspect.

**Salt Rheum**. See ECZEMA.

**Saltburgh**, Pa. See APPENDIX.

**Salute'** [Lat. *salus*, *salutis*, "health"] originally signified the expression of a wish for the health of another. It now denotes a complimentary notice of an officer or a ship-of-war by the military or naval authorities. S. are offered by the presenting of arms, the dipping of colors, the rolling of drums, the firing of guns, the manning of yards, etc.

**Salvator Rosa**. See ROSA.

**Salvia**. See SAGE.

**Salvini**, sahl-vee'ne (TOMMASO), b. in Milan in 1829. His father was a prof. of lit., and gave him an excellent education. A precocious talent took him at the age of 14 to the stage; was connected with the royal theatre at Naples, and different It. theatres, several times with Ristori; in 1874 came to Amer. and visited Havana, playing his chief parts, Othello, Hamlet, Saul, and Orosmanes. In tragedy he ranks with the greatest artists of his time.

**Salzburg**, town of AUS., cap. of the duchy of Salzburg, is most picturesquely situated at the foot of the Noric Alps, on both sides of the Salza. The city is old, with crooked and narrow streets, but it contains many elegant monuments and edifices built of white marble. It is surrounded with walls pierced by 20 gates, of which the most remarkable is the Sigismund Thor, 425 ft. long, hewn through the Mönchsberg. It is the see of an abb., has a fine cathedral, and many educational and benevolent insts. It has manufactures of paper-hangings, musical instruments, lead-pencils, mirrors, and type, several oil-mills and cotton-spinning and weaving factories, and carries on a very lively trade with Vienna and Bavaria. Pop. 23,499.

**Samar**, one of the Philippine Islands, E. I., comprises an area of 13,020 sq. m., with 110,103 inhabs. The mts. of this island are higher and wilder than those of the other islands. The chief town is Catbalogan. The prin. articles in which trade is carried on are wax, cabinet woods, palm oil, and mat-work.

**Samarand', or Samarkand**, cap. of a prov. of the same name, comprising the S. part of Rus. Toorkistan, is situated at an elevation of 2154 ft. above the sea, 8 m. S. of the river Serafshan. By the Mohammedans of Central Asia the city is still considered the prin. seat of Mohammedan learning, and its 86 mosques and 23 colls. attract numerous pilgrims and students. In 1868 it was seized by Rus., with the whole dist. of the Serafshan. Pop. about 30,000.

**Sama'ria** [Heb. שְׁמֶרֶן, *Shomerôn*, "watch-height"].

(1) An anc. city of Central Pal., some 6 m. N. W. of Shechem, and about half way between the Mediterranean and the Jordan. It was founded 923 b. c. by Omri, the sixth of the 19 kings of the N. kingdom of Israel, who made it his cap., and called it after the name of the man (Shemer) of whom he bought the hill on which the city was built (1 Kings xvi. 24). The Mediterranean is in full view from the top of the hill. The modern v., on the S. E. shoulder of the hill, contains about 60 houses, with a pop. of 400 to 500. The people are noted for their insolence to travellers. (2) The name also of one of the 3 provs. into which W. Pal. was divided by the Romans. R. D. HITCHCOCK.

**Samar'itans**. After the destruction of the kingdom of Israel, and the removal of its inhabs. into captivity in 722 b. c., Central Pal. was left desolate and uninhabited except by a remnant of the poorer classes and fugitives until the removal thither of colonists from Babylon, Syria, Ar., and other E. lands. Hence the people (called Samaritans from Samaria, the capital) became an exceedingly mixed race, the main body, however, being of the Aramaic stock. They at first worshipped every tribe its own god, but being plagued by the wild beasts, they united in the worship of the God of the land. When the Jews returned to Jerusalem (536 b. c.), the S. desired to unite with them in their work, but were rejected by Zerubbabel. Henceforth, the Jews and S. entertained the most bitter hatred of each other. This was intensified by the secession of one of the sons of Joiada, the son of Ellashib, the high priest. Under the leadership of

this priest and others of the Jews, who with him were expelled on account of their refusal to separate themselves from their heathen wives, the worship was reorganized (409 b. c.) on the basis of a copy of the Pentateuch. Gerizim was made the centre of worship, and a temple was erected there, destroyed by John Hyrcanus (129 b. c.; Josephus, *Ant.* xiii. 9, 1). The S. shared the fortunes of Pal. during the constant wars between Egypt and Syria, and also under the Rom. dominion. They were severely chastised by Pilate for their rebellious spirit, then again by Vespasian and others, until finally, in the reigns of Zeno and Justinian, on account of outrages against Chrs., they were almost totally destroyed. A remnant, however, clung to their holy place, dwelling in Nablus, the successor of the ancient Shechem.

**The Samaritan Pentateuch**.—The original MS. is in the synagogue at Nablus. This they claim to have received by tradition from Abisha, the great-grandson of Aaron, whose name is inscribed upon it.

**The Samaritan religion** is based on the Pentateuch, and differs from that of the Jews in the rejection of the rest of the O. T., and in their regarding as the tenth commandment the obligation to worship God on Mt. Gerizim. Their religion is monotheistic. They believe in the existence of good and evil spirits. They believe in the Messiah as a prophet, who is like Moses, but not greater than Moses, who remains for all time the greatest. The Messiah will appear 6000 yrs. after the creation, and enter into judgment of the world on Mt. Gerizim. Here they find all the sacred places of the past and future. They offer no sacrifices on account of the destruction of the temple, but keep the feasts of the Pentateuch, circumcise their boys on the 8th day, and observe the Sabbath in their synagogues like the Jews.

**The Samaritan language** is a mixture of the Aramaic and Heb., in many cases having side by side the 2 forms. The vocabulary is essentially the same as the Heb. and Chaldee, although many words have been introduced from Arabic, Lat., and Gr.

**The Samaritan literature** is quite limited in extent. (1) *The Samaritan Targum* is ascribed by tradition to Nathanael the high priest, who died 30 b. c. (2) *Chronicles*.—First in importance is the Samaritan Chronicle, or book of Joshua, composed probably in the 13th century, taking some of its material from the Heb. book of Joshua, but adding thereto much of a legendary character, showing that the Jews were from the time of Eli apostates and their oppressors, continuing the narrative until about 350 A. D., where it concludes abruptly. There is also the chronicle *El Tholadoth* ("The Generations"), professedly by Eleazar ben Amram (1142 A. D.), and then continued by many others until 1859, giving the calculation of sacred times, the age of patriarchs, list of high priests until the present. Then comes the Chronicle of Abuluth, in the middle of the 14th century, a digest of the 2 previous works, with fresh legendary material. Other minor works, corresponding with the Jewish Hagada literature are found. (3) Liturgies and hymns. (4) There are also commentaries, theological tracts, and a few quite recent grammatical works, written in Arabic. [From orig. art. in *J.'s Univ. Cyc.*, by Prof. C. A. BRIGGS, D. D.]

**Sambalpur'**, the most E. dist. of the Central Provs., Brit. India. Its area is 4200 sq. m. The greater part of this country is an undulating plain, with rugged hills rising in every direction, the underlying rock being, as a rule, highly siliceous and indurated; the soil is light and sandy. The prin. river is the Mahanadi; the climate is very unhealthy. Iron ore of the best description is found in nearly every subdivision. The chief exports are rice, oil-seeds, stick-lac, silk, cotton, and iron; in ordinary yrs. a very high profit is made on these exports. The imperial lines of road run from Raipur to Cattak; wooden bridges are thrown over the prin. rivulets; a railway connects S. with Nagpur, as well as Cattak. The total pop. was, in 1866, 812,348. Among the Hindoos are excellent weavers and goldsmiths; the Mohammedans are chiefly merchants and govt. servants. Education has made wonderful progress; there are not less than 442 schools in the dist. The chief town of the same name is situated on the N. bank of the Mahanadi, which is here nearly 1 m. broad. The native town with formerly narrow streets has of late been much improved; 2 large streets have been opened; of the 1500 houses, most are tiled. The fort is N. W. of the town proper. Pop. 9450.

**Sam'nites** [Lat. *Samnites*, plu. of *Samniti*], the people of anc. Samnium, a region of Central It. The S. were a brave, frugal, and religious people, who were often at war. The first Samnite war with Rome (343-341 b. c.) resulted in favor of the Romans, and secured a Samnite alliance during the Lat. war (340-338 b. c.). The second Samnite war (326-304 b. c.) was a terrible contest, in which the Romans (321 b. c.) were shamefully defeated at the Caudine Forks, but were finally successful. The third Samnite war (298-290 b. c.) saw the overthrow of the S. and Gauls by Fabius at Sentinum. The S. took the part of Pyrrhus, of Hannibal, of the Socii, and of Marius; and at last Sulla undertook their complete extirpation.

**Samoan Islands**. See NAVIGATOR'S ISLANDS.

**Sa'mos**, an island of the Ægean Sea, near the coast of Asia Minor, with an area of about 165 sq. m. and a pop. of about 50,000, is one of the finest islands in the Ægean Sea. It is mountainous, but its high, picturesque mts. are rich in marble, silver, lead, and copper, covered with forests of oak and pine, and inclosing beautiful valleys, where wheat, olives, grapes, and fruits are produced in abundance and of superior quality. Chief town, Khoran.

**Samoyedes**, a people of N. Rus., both in Europe and Asia. They are mostly heathens or nominal Chrs., small, filthy, indolent, and much addicted to intoxication, but peaceable and harmless. The herding of reindeer and the collection of fish and furs afford them subsistence. They speak several dialects. Their country is one of the coldest and most desolate of inhabited lands.



**Sam'phire** [a corruption of *St. Pierre*], the *Crithmum maritimum*, an umbelliferous plant growing on cliffs near the sea in Europe; used for salads and pickles. Marsh S. is *Salicornia herbacea*, a chenopodiaceous salt-marsh plant of Europe and N. Amer. It is marketed for pickling.

**Samp'son** (DEBORAH), b. at Plympton, Mass., Dec. 17, 1760; adopted male attire; enlisted under the name of ROBERT SHURTLEFF in the 4th Mass. regiment during the war of the Revolution; was wounded in a skirmish near Tarrytown, N. Y., and served through the campaign of Yorktown. She married Benjamin Garnett, a farmer of Sharon, Mass., received a pension, and d. there Apr. 23, 1827. See *The Female Review*.

**Sam'son**, one of the Heb. judges; time, 1116-1096 B. C. He judged Israel 20 yrs., falling within the 40 yrs. of Philistine dominion, terminated by Samuel's victory at Ebenezer, and commencing shortly before the capture of the Ark.

**History.**—Son of the Danite Manoah of Corah, living in Mahaneh-Dan. To his mother, long barren, the birth of a son is announced by an angel. He is a Nazirite from the womb, the first of whom mention is made in the O. T. He is first inspired in his own home to the performance of some deed now lost to us. His subsequent recorded hist. may be arranged in 3 periods: (1) His connection with the Philistine maiden of Timnath, and the consequent complications with the Philistines; (2) his visit to Gaza; (3) his connection with the harlot, her treachery and his loss of strength, imprisonment, and death.

**Character.**—He does not appear as delivering the people from the oppression of the enemy, so much as avenging on the Philistines his personal wrongs. His working was entirely confined to the narrow limits of the hill-country along the border between Judah and Dan; only twice do we find any mention of him away from here. We have no proof of his general recognition as judge, and in one instance we find him rejected by the tribe of Judah. Shut out by his Nazirite vow from the use of wine, his passions find another outlet, and his weakness toward women furnishes the key to his wasted life and strength. Throughout all his actions and words runs a fine vein of humor, and reckless carelessness of his God-bestowed strength. [From orig. art. in *J. s. Univ. Cyc.*, by PROF. T. C. MURRAY.]

**Samson** (GEORGE WHITEFIELD), D. D., b. at Harvard, Mass., Sept. 29, 1819, grad. at Brown Univ. 1839, at Newton Theological Inst. 1843; was for many yrs. pastor of a Bap. ch. at Wash., D. C., and pres. of Columbian Coll., D. C., 1850-71, when he became pres. of Rutgers Female Coll., New York. Has written a series of letters and essays on It., Egypt, Pal., and Sinai, several theological pamphlets and critical essays on art, *Spiritualism Tested*, *Outlines of the Hist. of Ethics*, *Elements of Art Criticism*, and *Physical Media in Spiritual Manifestations*.

**Sam'uel** [Heb. *Shemuel*, "heard of God"], a Heb. judge, lawgiver, and prophet, b. at Ramathaim Zophim in Mount Ephraim, probably in the 12th century B. C.; was consecrated by his mother, Hannah, to the service of Jehovah as a Nazirite before his birth; brought up in the household of the chief priest, Eli, at Shiloh; received in childhood a divine message foreboding the downfall of the family of Eli; assumed the judgeship of Israel about 20 yrs. after the death of Eli, at which time he headed a successful expedition against the Philistines; resided at Ramah; visited annually the 3 prin. sanctuaries, Bethel, Gilgal, and Mizpah, and made his sons deputy judges, but in consequence of their misconduct was commissioned by Jehovah to accede to the popular clamor for a king; to which end he anointed Saul as first monarch of Israel, and on his disobedience to a divine command anointed the youthful shepherd, David, in his place. He d. shortly before the close of the reign of Saul, and his spirit was invoked by the "witch of Endor" to announce to Saul the fatal result of the battle in which he lost his life.

**Sam'uel, The Books of**, in the O. T., are 2 in number in the modern eds. of the Heb. text, but this arrangement only dates from the 16th century. The books are said in the Talmud to have been written by Samuel, but the work begins with his time and ends at a point many yrs. after his death. Its real authorship and date are quite unknown.

**San Angelo**, Tex. See APPENDIX.

**San Antonio**, city and R. R. centre, cap. of Bexar co., Tex., on San Antonio and San Pedro rivers, was founded in 1714 as the fortress of San Fernando, and in 1718 as the mission of the Alamo, both on the right bank of San Pedro River. The chief settlement, with the fort and the mission, was soon removed to the left bank of the San Pedro, to what is now the "old town" of San Antonio de Bexar, situated between the 2 rivers. This is still the business centre, containing the plaza and the public buildings, but the most elegant residences are at Alamo, the suburb E. of San Antonio River. The city stands in the midst of a level and fertile plain, bounded on one side at a distance of a mile by a range of limestone hills, affording the materials from which it has been built. The fortress of the Alamo, celebrated in Texan hist., is situated within the plaza and the suburb, which both bear the same name. The city was incorporated in 1873. Pop. 1870, 12,256; 1880, 20,550; 1884, 32,000.

**San Bernardino**, on R. R. cap. of San Bernardino co., Cal., 80 m. from the coast. Pop. tp. 1870, 3064; 1880, 4061, including 1673 in v.

**Sanborn**, Ia. See APPENDIX.

**San Buenaventura**, cap. of Ventura co., Cal., on the coast, 30 m. S. E. from Santa Barbara, has an excellent harbor. It is a favorite place of resort for tourists and invalids, owing to its climate and the presence of hot springs. Pop. 1880, 1370.

**Sanchon'athon** [Gr. *Σανχουνάθων*], a Phœnician historian or theologian and cosmologist, said by Philo Byblus to have been a native of Berytus (Athens and Suidas make him a Tyrian). He is supposed by Father Martin to have flourished as early as the 14th century B. C.; by others, as Creuzer, 1250 B. C. (Suidas makes him contem-

porary with Semiramis). He is said to have been chief hierophant among the Phœnicians and sec. to Adonilabnas, the reigning king of Byblus. Three works are ascribed to him: one, on the phys. system of Hermes (Thoth or Taout); a second, on Egyptian theol.; a third, upon the hist. of Phœnicia. Philo Byblus is the reputed translator of the original into Gr. in the 2d century A. D. His translation was in 9 books, and is believed to have included the 3 works mentioned.

**Sand** [A.-S. *sand*; Ger. *Sand*; Dutch, *zand*], a term which is applied to include any granulated mineral material destitute of coherence when dry. Thus, in this broad sense any known mineral may form a sand, and we have silicious sand, calcareous sand, magnetic iron sand, coral sand, and other varieties highly diverse in nature and origin. This unfortunate vagueness extends to *sandstones*. A familiar example in Amer. is the brown "sandstone" from the Conn. Valley and from N. J., so extensively used for building purposes. Rocks are converted into sands by the forces of moving water, moving ice, the wind, the freezing of water in crevices, the disinfecting action of vegetation, decomposition by chemical action, and other agencies.

**Sand** (GEORGE), the pseudonym of AMANTINE LUCILE AURORE DUPRE (MADAME DUDEVANT), b. at Paris in 1804, and ed. in an Augustinian convent in Paris. In 1822 she married Baron Dudevant, to whom she bore 2 children, but in 1831 separated from him, removed to Paris with her daughter, and assumed male dress. In connection with Jules Sandeau she wrote *Roset Blanche*, and the reception it found offered her an opportunity of publishing immediately after a novel written by her alone, *Indiana*. In 1832 *Valentine* made her name celebrated, and in 1833 her celebrity rose to sensation with *Lélia*. In company with Alfred de Musset she then made a journey to It., but at Venice they parted, and in 1836 he pub. *Confessions d'un Enfant du Siècle*, to which she answered in 1850 with *Elle et Lui*, which produced an immense sensation. In 1836 she was divorced from Baron Dudevant, and both her children came to live with her. About the same time began her intimate friendship with Chopin, which lasted until 1847. To this period of her life (1835-41) belong *Lavinia*, *Mauvrat*, *La Dernière Aldini*, *Pau-line*, etc. She in the mean time had made the acquaintance of Lamennais, Michel the republican, Pierre Leroux the Socialist, and she now burst upon the world as the spokesman of very advanced views: *Horace* and *Consuelo*, *La Comtesse de Rudolstadt*, *Le Méanier d'Angibault*, *Le Pêche de Monsieur Antoine*, etc. With Jeanne she again returned to the purely artistic novel without any tendency, and now followed (1844-48) some of her most beautiful productions: *La Petite Fadette*, *La Mare au Diable*, *François le Champi*, etc.—but in 1848 she plunged with all her passionate enthusiasm into the very midst of the revolution. She came out unhurt, and her latest books, *Mlle. la Quintinie*, *La Confession d'une Jeune Fille*, *Cadio*, etc., are brilliant and powerful productions. Her *Histoire de ma Vie* (1854) disappointed people. D. June 8, 1876. CLEMENS PETERSEN.

**Sand'al-Wood** [Sans. *chandana*, whence *sandalum* in the earliest European accounts and the *Santalum* of botanists], the agreeably aromatic and precious wood of several species of *Santalum* and of one or two other trees. That of India is yielded by *Santalum album*. After the discovery of the S. I. a large part of the supply of the S.-W. of commerce came from 2 or 3 species peculiar to those islands, and later from *S. Yasi* of the Feejee Islands. The high price which this wood brings has caused the reckless extirpation of the tree from the more accessible stations, but in India the original S.-W. tree is now protected by govt. It is employed as a perfume and for the fabrication of small articles—glove-boxes, caskets, etc. Much is consumed in India in the celebration of sepulchral rites and for medicinal purposes, where the powder, made into a paste with water, is used for making the caste-mark. But the prin. market is Chi., for incense in temples, etc. The wood yields 1 per cent. of a peculiar essential oil, on which the characteristic fragrance depends. The famous and richly carved gates of the temple of Somnauth, supposed to be 1000 yrs. old, are of S.-W.

**Sand'arach** [Gr. *σανδράκη*], a gum-resin from the *Thuja articulata*, a small coniferous tree which grows in Barbary. It occurs in pale-yellow oblong grains or tears, covered with a fine dust, is transparent and brittle, with a vitreous lustre on the fracture. It consists of 3 resinous acids. The  $\alpha$ -resin forms a white or yellow powder, slightly soluble in alcohol and not easily fusible, and is present in but small quantities. The  $\beta$ -resin forms about  $\frac{3}{4}$  of the whole, is light yellow, softens at 212° F., and is readily soluble in cold alcohol. The  $\gamma$ -resin is a light-yellow powder, soluble in boiling alcohol, and melts with difficulty, decomposing at the same time. S. is chiefly used as an incense and in varnishes.

**Sand-Blast**. The term "sand-blast process" is applied to a method devised by Gen. Benjamin C. Tilghman of Phila. for cutting, boring, grinding, dressing, pulverizing, and engraving stone, metal, glass, wood, and other hard or solid substances by means of a stream of sand or grains of quartz, or of other suitable material, artificially driven as projectiles rapidly against them by any suitable method of propulsion. The abrading power of sand is well known. It is seen frequently on a grand scale in nature, and man has successfully utilized it in the arts. When carried by running water, sand has played an important part in the erosion of rocks, and when driven by the wind it depolishes the glass in the windows of the fisherman's hut upon the sea-shore and destroys the transparency of the glass in the lanterns of sea-coast light-houses. It was a gen. idea of the cutting power of sand when driven by water or air against hard substances that led Gen. Tilghman to make his first experiments. A simple form of air-blast, producing a few ounces of pressure only, was fitted up, and by means of an extemporized concentric jet of glass this air was made to drive the sand against the object to be cut. In this way holes were bored through ordinary window-glass in a few seconds. It was but a step now to improve the apparatus so as to get



increased efficiency; and the preliminary trials having demonstrated the great practical utility of the process, a patent from the U. S. was applied for and granted on Oct. 18, 1870. [From orig. art. in *J's Univ. Cyc.*, by PROR. G. F. BARKER, M. D.]

**Sand'crack**, a crack in the hoof of a horse. It constitutes an unsoundness, since it springs from a constitutional brittleness of the hoof and leads to serious lameness. It may be treated by paring, firing, and blistering the coronet.

**Sand-Eel**, or **Sand-Lance**, fishes of the family Amodytidae and genus *Ammodytes*. They are elongated, nearly rectilinear species, with an elongated, pointed snout, forked caudal, and silvery body; they burrow in the sand, and are of little or no use except as bait for other fishes, for which they are sometimes extensively employed.

**Sand'man** (ROBERT), b. at Perth, Scot., in 1718 or 1723, studied at Edinburgh; became a linen-draper; married a daughter of Rev. John Glas (or Glass), the founder of a sect called the Glasites; became an elder in the congregation; established in 1762 a congregation of the new sect at Lond., where they became known under the title of Sandemans; came to Amer. and established a society 1764, and settled in the following yr. at Danbury, Conn., where he d. Apr. 2, 1771. Glas, the real founder of the sect, was b. at Dundee, Scot., Sept. 21, 1698; became minister of a country parish; pub. *The Testimony of the King of Martyrs*, directed against the alliance of Ch. and State; was thereupon deposed from his ministry by the Scot. Gen. Assembly, and formed his adherents into a separate society. D. in 1773.

**Sandemansians**. See SANDEMAN.

**Sand'erling**, a name given to species of *Callidria*, a genus of the family Scolopacidae. The bill is straight, rather longer than the head, and widened toward the end; the color above is light ashy, interspersed with elongated spots of brownish-black on the head, back, scapulars, and shorter quills; that on rump and upper tail coverts is black, in fine transverse lines; beneath it is white; total length, 8 inches.

**Sanders**. See SANDAL-WOOD and SANDAL-WOOD.

**Sanders** (DANIEL CLARKE), D. D., b. at Strubridge, Mass., May 3, 1768, grad. at Harvard 1788; taught the Cambridge gram. school while studying theology; was licensed to preach 1790; was Unit. minister at Vergennes, Vt., from June 12, 1794, to 1799, when he removed to Burlington; was the first pres. of the Univ. of Vt. from Oct. 17, 1801, to Mar. 24, 1814, and pastor of the Unit. ch. at Medfield, Mass., from May 24, 1815, to May 17, 1829, and was a member of the Mass. constitutional convention of 1820. Wrote *A Hist. of the Indian Wars with the First Settlers of the U. S.*, particularly in *N. Eng.* D. Oct. 18, 1850.

**Sanders** (GEORGE NICHOLAS), b. at Lexington, Ky., Feb. 21, 1812, grandson of Col. George Nicholas, the proposer of the "Kentucky resolutions" of 1798; became at an early age an efficient Dem. orator and politician; appointed U. S. consul at Liverpool, and navy agent at New York; supporter of Douglas in the campaign of 1860; resided in Europe during the c. war as a com. of the Confed. States; took part with Messrs. C. C. Clay and James P. Holcomb in the peace conference with Horace Greeley at Niagara Falls July 1864, and after the war settled at New York. D. Aug. 12, 1873.

**Sanders** (WILLIAM P.), b. in Ky. in 1833, grad. at the U. S. Military Acad. in 1856; appointed brevet second lieut. of dragoons; served in Cal. and Kan. 1856-57, and on the Ut. expedition 1857-61. In May 1861 was appointed capt. in the 6th U. S. Cav.; served with his co. in the defenses of Wash. until the opening of the Va. Peninsular campaign of 1862; engaged before Yorktown, in the battles of Williamsburg, Mechanicsville, etc., and in the Md. campaign of that yr. In Mar. 1863 accepted the colonelcy of the 5th Ky. Cav., which he led in the pursuit of Morgan through Ind. and O. In Sept. was appointed chief of cav., dept. of the Ohio, but the following month was promoted to be brig.-gen. of volunteers, and assigned to the 23d corps. He participated in the engagements of Blue Lick Springs, Lenoir, and Campbell's Station, and was mortally wounded before Knoxville, Tenn., Nov. 17. D. Nov. 19, 1863.

**Sand'erson** (JOHN P.), b. Feb. 13, 1818, in Lebanon co., Pa., admitted to the bar in 1839; elected to the lower house of the legislature of Pa. in 1845, and to the State senate in 1847; ed. of the *Daily News* of Phila. from 1848 to 1856; appointed chief clerk of the war dept. Mar. 4, 1861; lieut.-col. 15th U. S. Inf.; col. 13th U. S. Inf. July 4, 1863; in Feb. 1864 provost-marshal-gen. dept. of the Mo. Made a full exposition of the secret political organization in the N. and W. States known as the "Knights of the Golden Circle," or "Order of American Knights," causing the disruption of the order. D. Oct. 14, 1864.

**Sanderson** (JOHN SCOTT BURDON), M. D., F. R. S., b. at Newcastle-on-Tyne, Eng., Dec. 1828, ed. at the Univ. of Edinburgh; was med. officer of health for Paddington 1855-56; became phys. to the Middlesex Hospital; was employed by the royal coms. to make investigations respecting the cattle-plague 1865-66, the epidemic of cerebro-spinal meningitis in N. Ger. 1865, and the sanitary condition of the Cornwall mines 1869; introduced the sphymograph into Eng.; wrote the *Handbook of the Sphymograph*, and became prof. of physiology in Univ. Coll., Lond., 1874.

**Sanderson** (ROBERT), D. D., b. at Rotherham, Yorkshire, Eng., Sept. 19, 1857, ed. at Lincoln Coll., Ox., where he became fellow 1606 and reader in logic in 1698; pub. lectures upon that subject; took orders in the Ch. of Eng. 1611; became in 1619 rector of Boothby Pennell, Lincolnshire; became prebend of Lincoln 1629 and rector of Muston 1633; appointed chaplain to Charles I. 1631, made D. D. 1636, regius prof. of divinity at Ox. and canon of Christ Ch. 1643; was named by Parl. one of the "Assembly of Divines" convoked at Westminster 1643, but refused to sign the Covenant, and had his living sequestered; attended the king as ecclesiastical councillor at Ox., at Hampton Court, and in the Isle of Wight; was ejected from his professorship 1648, but restored

1660, and shortly after made bp. of Lincoln, and took part in the Savoy Conference 1661. D. Jan. 29, 1663.

**Sand'ford** (LEWIS H.), b. in Onondaga co., N. Y., about 1805; studied law at Syracuse; settled in New York 1833; became assistant vice-chancellor of the first circuit Mar. 1843, vice-chancellor 1846, and associate justice of the superior court 1847. Author of *N. Y. Chancery Reports* from Apr. 1843 to June 1847, and *N. Y. Superior Court Reports*. D. at Toledo, O., in 1852.

**Sandhill Crane** (*Grus Canadensis*), a rather large bird, characterized by the plumbeous plumage of the adult; length about 48 inches. The species is quite common, and found in W. U. S. and in Fla.

**Sand'hopper**, or **Beach Flea**, names given in the U. S. to *Talitrus quadrifidus* and *Orchestia longicornis*, and in G. Brit. to *T. locusta* and *scutellator*, small amphipod crustaceans found under sea-weeds and stones at low tide. They have marvellous powers of leaping, and of burrowing in wet sand.

**Sand'hurst**, town of Australia, colony of Victoria, 82 m. N. W. of Melbourne, is the centre of a rich gold-mining dist., and has 33,497 inhabs.

**Sandhurst** (RIGHT HON. WILLIAM ROSE MANSFIELD), BARON, b. in 1819, ed. at the Royal Military Coll., and entered into the army as ensign in 1835; served in the Sutlej campaign of 1846 as capt.; major in 1847, in the Punjab campaign 1849, lieut.-col. 1851; attached to the Brit. embassy at Constantinople with the rank of brig.-gen., and as such proceeded to the Crimea; consul-gen. at Warsaw at the close of the war, but on the outbreak of the mutiny in India was nominated chief of staff; participated in all the operations of that campaign; in 1863 sent to India as commander-in-chief; lieut.-gen. in 1864; transferred to Ire. as commander-in-chief in 1870; created a peer in 1871 with the title of Lord Sandhurst. The order of knight of the Star of India was bestowed upon him in 1866; in 1862 obtained the colonelcy of the 38th regiment. D. June 23, 1876.

**San Diego**, de-a-go, city, seaport, and port of entry, on R. R., cap. of San Diego co., Cal., 480 m. S. E. of San Francisco. Next to that of San Francisco, no harbor on Pacific coast of U. S. approximates in excellence the Bay of S. D. It was discovered by Cabrillo Sept. 1542. The first settlement was made in May 1769 by Father Junipero Serra, who then established the mission of S. D., the earliest of the Cal. missions. The growth of the present city dates from 1867, when the new town was begun on the water-front of the bay. The prin. products of the co. are wheat, wool, honey, cattle and horses, sheep and hogs. There are gold-mines 50 m. N. of the city, where several quartz-mills are employed. Fruit-raising is becoming an important industry. S. D. is the prin. honey-producing co. in Cal. The climate is very mild and equable. The city is a popular resort for invalids from all parts of the U. S. Pop. 1870, 2300; 1880, 2657.

**Sand-Lance**. See SAND-LEEL.

**San Domingo**. See SANTO DOMINGO.

**San'doval**, de (PRUDENCIO), b. in Sp. about 1560, became a Benedictine monk at Naxera; devoted himself to the study of the antiquities of Sp.; was made an abbot at Valladolid and historiographer to Philip III.; pub. *Historia de la Vida y Hechos del Emperador Carlos V.* and *Historia de los Reyes de Castilla y de Leon*. S. became bp. of Tuy 1608, and of Pamplona 1612. D. Mar. 17, 1621.

**Sand-piper**, a name given to many species of snipe-like birds belonging to the family Scolopacidae. They have little in common, except as members of the same family, but a short and straight bill and a comparatively small size. They associate together in flocks, especially on the beaches of the ocean and lakes. Allied species are known by other names, and the word *sand-piper* is not strictly synonymous with any scientific designation.

**Sands** (BENJAMIN FRANKLIN), U. S. N., b. Feb. 11, 1812, in Md.; entered the navy as a midpn. Apr. 1, 1828; became a lieut. in 1840, commander in 1855, capt. in 1862, com. in 1866, rear-admiral in 1871; retired in 1874; served on the W. coast of Mex. during our war with that country, and was in both the Ft. Fisher fights. D. June 30, 1883.

**Sand Star**, a name sometimes given to species of star-fishes, of the orders Asteroidea and Ophiuroidea.

**Sandstone**. See GEOLOGY and STONE, BUILDING.

**Sandus'ky**, city, port, and R. R. centre, on Lake Erie, cap. of Erie co., O., at the mouth of Sandusky River, on a bay 15 m. long and 4 wide, one of the best harbors on the lake, 61 m. W. of Cleveland. Lines of steamers run to Detroit, Toledo, Cleveland, and the islands of Lake Erie. It is one of the largest fresh-fish markets in the world. Its trade is in fish, lumber, limestone, manufactured woodwork, grapes and native wine, steel-works, engine and boiler and threshing-machine works. Its coal-business is large. Its receipts by water are chiefly iron ore, lumber, and fish. Portland tp. has been added since 1870. Pop. 1870, 13,000; 1880, 15,838.

**Sand-Wasp**. See HYMENOPTERA and SPHEGIDE.

**Sand'wich**, municipal borough of Kent, Eng., on the coast of the N. Sea, at the mouth of the Stour, 4 m. N. of Deal, on the S. E. Railway, is one of the Cinque Ports, is surrounded by anc. fortifications, is irregularly built, but has several notable mediæval edifices, and was once the prin. seaport of Lond. The prin. imports are coals; exports, agricultural products. It forms with Deal a parliamentary borough. Pop. 3096.

**Sandwich**, city, on R. R., De Kalb co., Ill., 58 m. S. W. of Chicago. Pop. 1870, 1844; 1880, 2352.

**Sandwich**, Mass. See APPENDIX.

**Sandwich Islands**, the name given by Capt. Cook, after Lord Sandwich, to the group whose proper name is HAWAIIAN ISLANDS (which see).

**Sandy Hill**, on R. R., Washington co., N. Y. Lumbering is extensively carried on. Pop. 1870, 2347; 1880, 2487.

**Sandy Hook**, a low sandy peninsula, near the N. extremity of which all transatlantic navigation to or from



New York passes. The great beacons by which approaching vessels make the entrance—the Navesink lights—stand on highlands of that name at the very origin of S. H., whence, continuing the sandy beach-line, it projects northward 5 m., with a width varying from a few hundred feet to  $\frac{3}{4}$  m. The S. H. light is  $\frac{3}{4}$  m. S. from the N. end, at which very extreme there is a beacon-light. N. J. Southern R. R., to Long Branch, Camden, etc., has its terminus on the bay side of S. H.

**Sandys** (EDWIN), D. D., b. at Hawkshead, Lancashire, Eng., in 1519, grad. from St. John's Coll., Cambridge, 1539; took orders in the Ch. of Eng.; embraced the principles of the Ref.; became vicar of Haversham and master of St. Catherine's Coll. 1547, prebendary of Peterboro' 1549 and of Carlisle 1552; vice-chancellor of Cambridge Univ. 1553; preached a sermon in favor of the royal claims of Lady Jane Grey; was deprived of the vice-chancellorship and imprisoned in the Tower; was allowed to proceed to the Continent May 1554; returned at the coronation of Elizabeth 1558; was made bp. of Worcester Dec. 21, 1559, of Lond. 1570, and abp. of York 1576; was one of the translators of the "Bishops' Bible" 1568. D. July 10, 1588.

**Sandys** (Sir EDWIN), son of Abp. Sandys, b. at Worcester, Eng., about 1561, studied at Christ Ch., Ox.; obtained a fellowship 1579, and a prebend in York minster 1581; was a supporter of the dynastic claims of King James I.; associated with Bacon in drawing up the "Remonstrance" of 1604; a leading member of the second Va. Co., of which he became treas. 1619; was instrumental in securing a charter for the Pilgrims of the Mayflower and in planting representative govt. in the colony of Va., thereby becoming obnoxious to the "Spanish party" at court, and was imprisoned, along with Seiden, 1621, for having opposed the royal projects in Parl. Wrote *Europa Speculum, or a View on Survey of the State of Religion in the W. Part of the World*. D. at Northborne, Kent. Oct. 1629.

**Sandys** (GEORGE), son of Abp. Edwin, b. at the palace of Bishopsthorpe, York, in 1577, ed. at St. Mary's Hall and Corpus Christi Coll., Ox.; travelled through Gr., Asia Minor, Pal., and Egypt, 1610-12; pub. a *Relation* of his journey; went to Va. as colonial treas. 1621; completed at Jamestown a translation of Ovid's *Metamorphoses*; built the first water-mill, the first iron-works, and the first ship in Va.; returned to Eng. 1624; printed poetical paraphrases of the Psalms, Job, the Song of Solomon, etc., and translated from the Lat. of Grotius the tragedy of *Christ's Passion*; was gentleman of the privy chamber to the king. D. Mar. 1644.

**Sanford**, Fla. See APPENDIX.

**Sanford** (EDWARD), son of Chancellor Nathan, b. in New York in 1805, grad. at Union Coll. 1824; studied law; was ed. of a newspaper in Brooklyn, afterward of the *New York Standard*, of the *Times* (1836-37), and associate ed. of the *Wash. Globe*, organ of the Van Buren administration; returned to New York 1838; became assistant naval officer at that port; was elected in 1843 to the N. Y. senate, in which he was a Dem. leader, and was a frequent contributor of poems and essays to the *New York Mirror*, *Spirit of the Times*, and *Knickerbocker Magazine*.

**Sanford** (NATHAN), b. at Bridgehampton, L. I., N. Y., Nov. 5, 1779, studied law, and began practice in New York 1799; appointed dist. atty. for New York 1803; was elected to the N. Y. assembly 1811; became speaker of that body, and afterward State senator; was a member of the State constitutional convention 1821; served 2 terms in the U. S. Senate (1815-21 and 1825-31), and was the successor of Kent in the chancellorship of N. Y. (1823-25). D. Oct. 17, 1838.

**San Francisco**, important R. R. and commercial centre, is the chief city and seaport of Cal. and of W. coast of N. Amer., lat. 37° 48' 26.6" N., lon. 122° 24' 39.6" W., on the end of a peninsula 6 m. wide, separating the S. arm of the bay of the same name from the Pacific Ocean. In law it is designated as "the city and county of San Francisco," the functions of city and co. govt. being consolidated.

**Original Site, Etc.**—Its area is 42 sq. m., including some islands. Nearly half the area consists of high rocky hills, rising in several points to 800 ft. above the sea, and about 4 sq. m. in the N. W. are sand-dunes. The site now has much level land, but a large part of this has been supplied by art, the original inequalities of the surface having been graded away.

**The climate** is salubrious, the city having almost unbroken coolness of temperature by breezes fresh from the ocean every day. The annual death-rate for each 1000 inhabs. is 20, a proportion exceeded in all other seaport cities of equal size. The heavy fogs in summer are pernicious to asthmatics, and consumptives find better climates in other parts of the State.

**Commerce, Etc.**—The aggregate value of the property owned by its residents and business-men has been estimated to be \$1,000,000,000. The millionaires number nearly 100. Business is wonderfully active, and statistics show that in proportion to the tributary pop. no city on the shore of the Atlantic has commercial or financial transactions so extensive. The imports direct from foreign countries (considerable quantities of imported merchandise are brought by rail, steamer, and sail from New York) amount annually to about \$35,000,000, and include usually large quantities of tea and coffee to be sent across the continent. The leading articles of exportation are wheat, flour, gold, silver, canned fruit, canned and salted salmon, quicksilver, wool, hides, leather, lumber, silver ore, and borax. The commercial statistics of Cal. belong almost exclusively to S. F., and the annual value of the exports, which vary much from yr. to yr., is from \$70,000,000 to \$90,000,000. The port has 1,600,000 tons of shipping entrances annually, and 50 steamers ply from it in regular ocean lines. It is the chief terminus for all the main routes of travel, including R. Rs., in Cal.

**Manufactures** are extensive, employing 25,000 persons, and turning out products worth \$50,000,000 annually. Among them are cigars, shoes, blankets, flannels, woolen cloths,

canned fruit, vegetables, and salmon, clothing, under-clothing, lumber planed and fitted for use in building, dynamite, rolled iron, silk thread, silk ribbons, etc.

**Buildings, Etc.**—The prevalent style of arch. is highly ornamental. Four-fifths of the houses are of wood, and the remainder mostly brick, stone being very rare. Some of the buildings, especially the leading hotels, are very large and costly, the Palace, the largest hotel in the world, having cost \$3,000,000. A public park of 1050 acres, 3 m. long, leading from the business part of the city, has a beautiful drive to the ocean beach. The accumulation of wealth, the activity of business, the excitement of speculation in the mining stock market, the excellence of the hotels, the elegance of the private dwellings, the luxurious mode of living, the numerous opportunities for spending time pleasantly, the variety, multitude, and merit of the insts. for amusement and instruction, and the throng of visitors from all parts of the world, have made S. F. a favorite pleasure resort. The city is supplied with numerous newspapers, public libraries, schools, scientific associations, charitable insts., and secret societies for mutual aid and other purposes. Six European langs. beside Eng. are used in regular Chr. worship, and in half a dozen buildings occupied by Chl. there are rooms set apart for Buddhist worship. An Epis. bp. and a R. Cath. abp. have their residences in S. F.

**History.**—The first white settlement was made in Oct. 1776, by the establishment of a Sp. military post and a mission of Franciscan friars to convert the Indians. The latter was maintained till 1835. The next yr. a town called *Yerba Buena* was laid out, and the first house in it was built by an Amer. The name was changed to *San Francisco* in 1847, when it had 450 inhabs.; in June of the next yr. it lost most of its male residents on account of the attraction of the gold-diggings, and in 1849 it had become a world-famous seaport city. The harbor was filled with ships deserted by their crews, a large part of the pop. lived in tents, and the prices of many of the comforts of life were enormous. Within 14 months after Dec. 20, 1849, the town was devastated by 5 great fires, which swept away every building in the business dist. and destroyed property worth \$16,000,000. Every fire was immediately followed by the erection of much better buildings, but for yrs. the merchants stored many of their goods in ships anchored beyond the reach of any extensive conflagration. The increase of \$10,000,000 annually in the gold production for the first 5 yrs. after the mines were opened led the people to suppose that the same ratio would continue; but in 1854 the gold yield began to decline, wages fell, the importations decreased, and many dwellings and business-houses were left vacant. After the lapse of 5 yrs. more, the development of the agricultural resources of the State, the discovery of the Comstock Lode, and various other favorable circumstances brought in new elements of prosperity, upon the flood-tide of which the city rode till 1869, when land speculation, overcalculating the benefits to be derived from the completion of the transcontinental R. R., led to a panic, the pernicious effects of which were felt for several yrs. Another panic was caused in 1877 by a communistic agitation, which for more than a yr. seriously threatened the peace of the city. Notwithstanding seasons of depression in certain occupations, general business has always been active and wages high. In 1851 extra-constitutional organizations took control of the city to purge it of scoundrels, and most of their proceedings were governed by prudence and justice. During the greater part of the time from 1856 to 1876 the city govt. was in the hands of independent political parties, which excluded the national political parties, as far as possible, from influence over the nominations for office, and the administration was exceptionally good. Pop. 1860, 56,802; 1870, 149,473; 1880, 233,959, one tenth of the inhabs. in the latter yr. being Chinamen. (See HITTELL's *Resources of Cal. and Commerce and Industries of the Pacific Coast*.) JOHN S. HITTELL.

**San Francisco Mountain**, the loftiest mt. in Ari., is between 12,124 and 12,561 ft. above the sea. It stands on the Col. Plateau, near its S. edge, and rising abruptly from the plain to a height of 5000 ft., is a conspicuous landmark from all directions. Its base is 10 m. across, and its form is irregularly conical. Its crest takes the form of a crescent, with the concavity turned to the E. Geologically, S. F. is partly a mt. of eruption and partly a mt. of circumdenudation. Its upper part is composed of dark trachyte, which was extended before the plain had been degraded to its present level. The strata which are preserved under the trachyte are of Triassic age; the bed which now constitutes the surface of the plain is the upper member of the Carboniferous formation. So the mt. is an insular table of Triassic sandstone, standing on a Carboniferous floor, and capped by a cone of trachyte. Since the removal of the Triassic strata new fissures have opened in the plain, and basaltic lava has flowed out, spreading over the surface in broad black sheets and throwing up hundreds of low cones. From the summit of S. F. one can look into the throats of more than a hundred volcanoes.

**Sangir Islands**, a group of 50 islands, most of which are inhabited, between Celebes and Mindanao. They are high, volcanic, and produce maize, rice, sago, cocoa, sugar, tobacco, and timber. They are inhabited by about 30,000 Chr. Malays.

**Sangkol, Songea, or Tonquin**, river of Farther India, rises in Yunnan, a prov. of Chl., and falls, after a course of about 600 m., into the Gulf of Tonquin.

**Sangor**, town of Brit. India, presidency of Agra, near the Nerbudda, at an elevation of 1458 ft. above the sea. It is a military station, and a large, lively, but somewhat unhealthy place. Pop. estimated at 50,000.

**San'greal** (i. e. the *Holy Grail*, or "cup," or, according to others, the *Sang Real*, the "real blood" of Christ), according to mediæval legends, the cup of emerald which held the wine at the first celebration of the Lord's Supper. St. Joseph of Arimathea, it is related, received some of the



blood of the Lord in this cup at the crucifixion. When the Holy Grail was carried away and hidden by the angels, a quest for it was instituted, it being revealed that no one who was not perfectly pure in thought, word, and act could ever find it. King Arthur's knights of the Round Table were prominent participants in the quest.

**Sanguinaria.** See Blood-Roor.

**Sanhedrim**, correctly **Sanhedrin**, a corruption of *Gr. συνέδριον*, "assembly." There are 2 classes to be distinguished.

**A. The Great Sanhedrin.**—Most probably it was formed at some period subsequent to the Captivity, on the model of the council of the 70 councillors appointed by Moses. Confirmatory of this is the *Gr.* name, which points to the period of the Seleucideæ. The earliest reliable trace of its existence is under the Maccabees. It was in full activity at the time of Herod. And we find constant mention of it in the *N. T.*

**Jurisdiction.**—It was the supreme "privy council" of the Jews; not only their court of final appeal and last resort, but also an executive and legislative assembly, shaping the gen. polity of the nation. Its power in matters civil and religious was practically unlimited. It decided all cases brought upon appeal from the lower courts; it had authority over kings and high priests; in it was vested the trial of heresy, idolatry, false prophets (hence the active part they took against our Lord); and it alone had power to pronounce sentence of death.

**Constitution.**—It had 71 members. In the *N. T.* are mentioned—(1) Priests, chiefs of different orders of priests; (2) elders, those venerable from age or position; (3) scribes, those learned in the law and tradition. It officers were—pres., first vice-pres., second vice, beside a force of secs. and court officers.

**Place of meeting.** In Jerusalem, in a room immediately adjoining the temple.

**B. The Lesser Sanhedrim.**—A court of 23 members appointed by the Great S., sitting in all towns of over 120 households, with jurisdiction over local civil and criminal matters. [From orig. art. in *J.'s Unte. Cyc.*, by PROF. T. C. MURRAY.]

**Sanitary Commission, The U. S.** On Apr. 15, 1861, the day on which the President's call appeared for 75,000 men, the women of Bridgeport, Conn., organized a society with the idea of affording relief and comfort to the volunteers. In Charlestown, Mass., and at Lowell, the women of those cities formed similar societies. On Apr. 19 the ladies of Cleveland, O., organized an association for the care of the families of volunteers. On Apr. 29 a public meeting, called at the Cooper Union, New York, by 21 of the best known ladies of New York, formed the Women's Central Relief Association of New York. The objects of this association were to systematize the efforts of the women of the country, so as to make effective, with the least waste of time and money, the desire to help the young army with such supplies and protection as it was feared the govt. could not afford. The Women's Central sent a committee to Wash. to confer with the med. bureau and the war dept. in order to learn more definitely in what way, with least embarrassment to the govt. and most help to the army, the women could serve the volunteers. They presented their plan to the govt., asking for the appointment of a scientific board, to be commissioned with ample powers for visiting all camps and hospitals, advising, recommending, and, if need be, enforcing the best known and most approved sanitary regulations in the army. But after great difficulties, this was all the committee gained—the appointment of a doubtful semi-official commission, with the privilege of advising with the med. bureau, of visiting the army in the field, and of recommending to the war dept. such sanitary regulations and reforms as it might deem useful. A few things became soon obvious, and guided their course:

1. The great object of the Commission must be to develop, strengthen, and support the regular med. and military authorities and methods—to stimulate the depts. having the supply of food, transportation, camp equipage, drainage, and incite them by kind and wholesome criticism and counsel, and by the force of public opinion, to do their utmost for the prevention of pestilence and the spread of scurvy, and the lessening of needless exposures of every kind. The Commission was the soldier's abiest and most constant friend.

2. The S. C. became very early in its hist. thoroughly convinced that to prevent evils to the health of the army was more important than to attempt to cure them after they appeared. It accordingly gave its attention chiefly, from first to last, to prevention, by a system of camp inspection and the promulgation of counsels touching the choice of camp sites, the importance of drainage and police, and the character and cooking of food. By the appointment of skilled med. inspectors it established at once an advisory and tolerably friendly relation with the surgeons of all the regiments in the field, and by supplying them with short med. and sanitary essays, and engaging them by direct personal appeal and co-inspection in the practical enforcement of hygienic and sanitary regulations, it aroused and maintained a gen. zeal in this all-important plan of prevention. Among the services of the S. C. was the prevention of incompetency, inefficiency, and contracted ideas in the med. bureau; the erection of pavilion hospitals from its own models, designed to make contagion and pestilence less easy and fatal; the establishment of soldiers' homes at the chief places where new regiments were concentrating, to take care of the sick and supply the defects in the arrangements of the quartermaster's bureau for receiving them; the organization of hospital steamers, supplied with every comfort, with surgeons and nurses, plying between the ports nearest to the seats of war and the nearest gen. hospitals, and transporting in comparative comfort tens of

thousands of sick and wounded men to the places where their cure was to be attempted or their sufferings made tolerable to the end; the invention of a hospital car, in which the common stretcher upon which the wounded man was carried from the field could be converted into a hanging bed in the car.

**Supplemental Hospital Supplies.**—The wants of the hospitals and camps very early in 1861 had exhausted 60,000 articles which the spontaneous sympathy of the homes of the country had forwarded to the Commission. By Sept. of that yr. it became plain that a demand for extra food and extra clothing was going to exceed anything that the unorganized and intermittent beneficence of the people would furnish. The success the Commission had in organizing over 7000 aid societies, which offered opportunities to millions of Amer. women to take some active share in the war, to do something personally for the comfort of the men in the field, and to feel themselves part and parcel of the national struggle, was one of its best services. It united the women in a common array, helped to federalize and nationalize public sentiment, made the war popular at home, beguiled the impatience of mothers, wives, and sisters to recall their husbands and brothers and sons, and filled up the weary yrs. and months with active duty instead of idle tears. When the system of the Commission was fully explained and its pretensions and plans verified by many witnesses, the various aid societies began to fall in with its plan. Women's councils were convened at Wash. from time to time, composed of representative women from the various centres of supplies, to agree upon plans for collecting, and to explain and make acceptable plans for distributing supplies. A large body of associate members, selected men of weight and influence, was added to the Commission from the home fields to give the women the aid of their counsel, to collect money for the purchase of materials for hospital clothing, etc. On Sept. 5, 1861, depots of supplies were established at New York, Boston, Phila., Wash., Cin., and Wheeling. Already central aid associations existed at Boston for N. Eng., at New York for the State and part of N. J., at Phila. for Pa., Del., and W. N. J.; in Cin., Columbus, Cleveland, in Chicago, in Ia., and Wis., for the great W. States. These and other centres had each hundreds of town and v. tribunes steadily pouring into their depots supplies of food and clothing.

**Battle-field Relief.**—The unexpected circumstances under which great battles take place necessarily expose the wounded to sufferings which no foresight of the regular authorities can fully provide against. It was one of the main purposes and constant efforts of the S. C. to place their own stores and relief corps where in case of change of strategy or accident they might be ready to supply the wants of the wounded or supplement the deficient preparations of the med. and the quartermaster's bureaus. The S. C. as one of its chief means of usefulness, had wagons and horses of its own—often forty 4-horse teams at a time—and this enabled it at periods when transportation of med. stores was most embarrassed to forward med. and sanitary supplies to the seats of immediate battle far in advance of the med. dept.

**Special Relief Service.**—Beside an elaborate machinery of hospital visitors, field relief corps, and auxiliary relief corps, there was required a very large ministrition to men, without any fault of their own, in what may be called "irregular circumstances," put beyond the reach of ordinary govt. or army care. Early in the war new regiments, often under incompetent officers, arrived at Wash. and other centres with sick men and exhausted soldiers, compelled to walk many miles to their camps, with no govt. provision of food for them at the depots. The S. C. at once established near the prin. depots "soldiers' homes," where weak and sick men could be temporarily received, restored to health, and forwarded to camp. This was the beginning of what became a great and costly service of special relief.

**The Hospital Directory** was an organized effort to tabulate and keep the run of the names of all private soldiers who passed through the gen. hospitals, so that the soldier's friends could follow him, know where he lay, if he lived or died, and what became of him when out of hospital. The central office at Wash. was opened to the public Nov. 27, 1862; branches were soon established at Phila., Louisville, and New York.

**Financial History of the Commission.**—The earliest call for aid published by the Commission was June 21, 1861, in 2 brief papers—one addressed to the people at large, the other to life insurance cos. It received from all sources up to Sept. 1, \$13,630, a sum soon exhausted, and with grave uncertainty whether it could be renewed. Up to Mar. 28, 1862, the Commission had received only \$53,730. In Mar. 1862 it looked as if the S. C. must disband for want of funds. The services of the Commission in its hospital transport system, which cost it \$20,000 per month, began to tell upon the public, and at the darkest moment money came flowing in, in comparatively small sums, but from a wide number of contributors. The financial infancy of the Commission ended in Sept. 1862. The first contribution from Cal. of \$100,000, by telegraph dated San Francisco Sept. 19, 1862, was the making and saving of the S. C. Only 14 days later Cal. sent another donation of equal amount, and from that date its donations to the S. C. became systematic, and averaged probably \$30,000 per month while the war lasted! From that date, after every great battle, money and supplies came pouring in from other quarters. About this time (the beginning of 1864) a series of great fairs was inaugurated. The total amount in money received from the people by the S. C. up to May 1, 1866, was \$4,962,014.36. The aggregate value of the services rendered by the public to the Commission has been estimated at \$25,000,000. [From orig. art. in *J.'s Unte. Cyc.*, by HENRY W. BELLOWES, D. D., LL.D.]

**Sanitary Science**, a term of recent origin, defined by a high authority, Dr. Mapother, as "an application of the



laws of physiology and gen. pathology to the maintenance of the health and life of communities by means of those agencies which are common and in constant use." It is therefore nearly a synonym of "preventive medicine" and "state medicine," and in many of its practical aspects has been treated under the head of **HYGIENE**.

**San Jacin'to, Battle of.** This closing battle of the war of Tex. independence was fought Apr. 21, 1836, in S. E. Texas, 2 m. S. W. of the junction of San Jacinto River and Buffalo Bayou, near the bay of the same name. Gen. Houston was in command of the Tex. forces, Gen. Antonio Lopez de Santa Anna of the Mex. army. At the expiration of a single hour Santa Anna had fled, and the whole of his army not slaughtered in the action had surrendered. The force of the Mex. was 1536, that of the Tex. about 700.

**San Joaquin** (ho-ah-keen') **River** rises in Fresno co., Cal., and after a S. W. course to the Tulare Slough it turns N. W., and, joining with the Sacramento, falls into Suisun Bay. At high water the outflow of the Tulare system of lakes is discharged by the S. J., which is navigable to Stockton for large steamers for a good part of the yr. The river is some 350 m. long.

**San José**, ho-sá', city, cap. of the republic of Costa Rica, in the prov. of the same name, about midway between the Pacific and the Caribbean Sea, 15 m. N. W. from Cartago, the anc. cap., with which it is connected by a railway, is in a picturesque and fertile valley at the base of the Barba and Cartago volcanoes, 4500 ft. above the sea; is regularly laid out, but ill built. It has several educational insts., including a univ., to which are attached a medical dept., a museum, and a chemical laboratory. It exports large quantities of coffee by way of the steamers of the Panamá and San Francisco lines. Pop. 26,000.

**San José**, city and P. R. centre, cap. of Santa Clara co., Cal., in the heart of the Santa Clara Valley, is 50 m. due S. from San Francisco, and 30 m. from the Pacific. The city contains a public library, the coll. of Notre Dame for young ladies, with buildings and grounds valued at \$500,000; the San José Institute and Business Coll., the State Normal School, and a fine c-h., costing \$200,000. The city owns a beautiful park of 400 acres, 6 m. distant, containing numerous mineral springs, with which it is connected by a magnificent avenue lined with 4 rows of trees, the avenue alone costing over \$90,000. Staple products of the city and valley, wheat, wine, dried and canned fruits, tobacco, etc. Pop. 1870, 9069; 1880, 12,567.

**San Juan**, hoo-ahn', a river of Central Amer., 120 m. in length, forming the outlet of Lake Nicaragua into the Caribbean Sea, and in the lower half of its course the boundary between the republics of Nicaragua and Costa Rica. Its navigation is rendered difficult by 5 rapids; but small steamers have ascended through its whole course, which forms a part of the contemplated Nicaraguan interoceanic ship-canal. The best entrance is in the terr. of Costa Rica.

**San Juan de Puerto Rico**, cap. of the Sp. island of Porto Rico, W. I., on a small island off the N. coast of the main island, with which it is connected by a bridge. It has a good harbor, a fine cathedral, a handsome theatre, and is strongly fortified by walls, bastions, and a detached fort. Pop. 30,000.

**San'key** (IRA DAVID), b. at Edinburg, Lawrence co., Pa., Aug. 28, 1840; in business at New Castle, Pa., 1855-71, when he joined Mr. Moody in evangelistic work in Chicago, Ill. Mr. S. is the author of several popular sacred tunes, which he sings with remarkable effect.

**Sankhya**, the name of the chief system of philos. in India. The word signifies "numerical" or "rational," referring to its 25 principles, and not, as some have supposed, to a system of numerical symbolism like that of Pythagoras. Its doctrines are attributed to the venerable sage Kapila, who delivered them in the form of memorial verses (*Kārikā*). They owe their preservation to Ishvara Krishna, who reduced them to writing. The S. *Kārikā* was translated into Eng. by Colebrooke, and pub. in 1837, accompanied with the commentary of Gaurapāda. The S. philos. is supposed to date from a period anterior to the 8th century B. C., and its reaction against Brahmanism became a popular movement in the 6th century in the Buddhistic reformation of Sakyamuni, who taught the *Yoga* system with little change, and named its "deliverance of the soul from pain and illusion" the *Nirvāṇa*. WILLIAM T. HARRIS.

**San Luis Obis'po**, on R. R., cap. of San Luis Obispo co., Cal., 9 m. inland from the bay of the same name, has a female coll. and R. R. connection with one of the best harbors from San Francisco to San Diego. Pop. tp. 1870, 1579; 1880, 3754, including 2243 in v.

**San Luis Park** is partly in Col. and partly in N. M. It is the largest of the great Rocky Mt. parks, and has the San Juan Mts. on the W. and the main chain of mts. on the E. It is traversed by the Rio Grande. Gold, silver, iron, and copper abound.

**San Luis Potosi**, po-to-see', state of the Mex. confederation, bounded by New Leon, Tamaulipas, Vera Cruz, Querétaro, Guanajuato, and Zacatecas, and comprising an area of 27,500 sq. m., with 516,488 inhabs. It is traversed by several mt.-ranges, which to the N. W. inclose large plateaux, while to the S. E. they gradually slope down into low plains. The mts. are rich in precious metals, and are covered with forests of oak, pine, and cedar. The plateaux afford excellent pastures. The soil is fertile. Agriculture and the rearing of sheep and cattle are the prin. occupations.

**San Luis Potosi**, town of the Mex. confederation, cap. of the state of the same name, on an elevated plain 6350 ft. above the level of the sea, near the sources of the river Tampico. It is well built, and carries on a lively trade in wines and manufactured goods, and in the rich products of its surroundings. Pop. 35,000.

**San Marcos**, Tex. See APPENDIX.

**San Marino**, mah-ree'no, the oldest and smallest republic in the world, is situated in E. Central It., and is gov-

erned by a senate of 60 members elected for life, an executive council of 12, two thirds of whom go out every yr., and 2 pres. elected for 6 months. This has been the form of gov. since 1847. The terr. of the republic is 30 sq. m. in extent, and embraces 5 small v., with a pop. of about 8000. The cap., of the same name, is perched on the crest of a mt. 2635 ft. above the sea.

**San Rafael**, R. R. junc., cap. of Marin co., Cal., 15 m. N. of San Francisco. It is a favorite resort for consumptives and asthmatics. Pop. 1870, 841; 1880, 2376.

**San Salvador**, or **Banza Congo**, in terr. of Congo, W. Afr., on the river Lelunda, 50 m. from its mouth, was in the 16th and the beginning of the 17th century a large and flourishing place, but is now only a heap of ruins.

**San Salvador**, city of Brazil. See **BAHIA**.

**San Salvador**, the smallest of the Central Amer. republics, is bounded W. by Guatemala, from which it is separated by the river Paza, N. by Honduras, E. by the Bay of Conchagua or Fonseca, and S. by the Pacific. Area, 7225 sq. m. Pop. 554,785. Between the coast-land, which consists of a belt of low, level ground of an average breadth of 15 m., and the lofty Cordilleras on the frontier of Honduras, there runs through the whole length of the country, and forming with the Cordilleras a broad inland valley, a range of volcanic mts. The valley and the coast-land are exceedingly fertile, well watered by a number of short but copious streams, generally navigable and well adapted to irrigation. Agriculture is the chief occupation. Cattle-rearing and dairy-farming are only pursued to a limited extent, though the country possesses a good breed of cattle; mining and fishing are of subordinate importance. Indigo is the staple crop, being extensively cultivated and of superior quality. The extensive forests yield excellent timber, especially cedar. Every v. of 50 inhabs. is compelled by law to maintain a school. Cap. San Salvador.

**San Salvador**, cap. of the republic of San Salvador, Central America, in an elevated valley 2100 ft. above the sea, 5 m. from its port, La Libertad, at the foot of the volcano San Salvador, which rises 7100 ft. The climate is healthy, the situation beautiful, and the surroundings very fertile. Pop. 14,059.

**San Salvador**. See **BAHAMA ISLANDS**.

**Sans Culottes** [Fr. "without breeches"], a name bestowed early in the first Fr. Revolution by the royalists upon the lower classes of the populace. The latter accepted the name with much pride.

**Sanskrit Language and Literature.** The word *Sanskrit* or *Sanscrit*, derived from *sam* (Gr. *σύν*), "together," and *kṛita*, "done," with an epenthetic *s*, and signifying "perfected" or "refined," was applied by Hindoo grammarians to the literary lang. of their race, and now designates also the same lang. in its earliest discoverable form. Recent advances in ethnological and philological research have revealed the primitive S. as a sister-tongue of the anc. Aryan and Iranian, from which latter sprang the old Bactrian and old Per. langs., while the former gave rise not only to the polished S., but to the Pali and the numerous Prakrit langs. The abundance of the lit. and the enormous amount of critical apparatus supplied by the plodding industry of the grammarians, render S. the most important of langs. for the comparative philologist. The knowledge of S. by Europeans dates only from the close of the 18th century, and its rapid spread through the univs. of Europe is one of the distinctive features of the 19th century. The usual written character of the S. is the so-called *Devanagari* ("divine city") alphabet. The Devanagari is written from left to right, an extremely complete, expressing with perfect clearness nearly every syllabic combination of letters by single characters, a letter *s* being supposed to be inherent in every consonantal character, when no other vowel-sign is subjoined, while the anc. alphabet was notably deficient in vowels and spirants. Notwithstanding the vast number of rules invented by S. grammarians, word-building and syntax are extremely simple, and in fact consist of nothing but a process of mere aggregation, in which the original words, roots, affixes, and terminations may be discriminated with the greatest ease.

**Literature.** The classical Sanskrit contains no historical works in the ordinary acceptation of the term. Hence, the whole literary as well as political chronology of India is involved in the utmost uncertainty. The authorship of S. writings is involved in scarcely less uncertainty. They are all essentially anonymous. The chief religious, philosophical and poetical books are treated in separate articles. (See **MAHABHARATA**, **RAMAYANA**, and **HINDU PHILOSOPHY**.) Upon the substructure of the Vedas and the 2 great *epic* poems a vast edifice of comment and mystical interpretation has been reared by the different sects and schools of philos. under the names of Puranas, Tantras, and Upanishads. The Puranas (Sans. *pura*, "past"; *i. e.* "ancient") are works which stand to the modern Hindoo religions in a relation somewhat resembling that of the N. to the O. T. Like the Vedas and the Mahabharata the 18 Puranas are all ascribed to the mythical Vyasa (*i. e.* "the compiler or arranger"), who is at once the Indian Homer and Plato. They consist of dialogues upon almost every subject, but their chief purpose is to establish the supremacy and inculcate the ritual either of Vishnu or of Siva, the 2 gods who have replaced as objects of popular worship the pantheon of the Vedas. The Tantras are the sacred books of the Saktas, or worshippers of the female power of Siva, who constitute a numerous and important class of modern Hindoos. They are in the form of dialogues between Siva and his wife, who is variously called Durga, Uma, or Parvati, and consist chiefly of rituals and *mantras*, and prayers containing incantations of supreme efficacy. The *Upanishads*, or works containing the mystical doctrines of the nature of God and his relations to the earth and man, are a branch of the later Vedic lit., though some of them are confessedly of quite modern date, written for the purpose of reconciling philos. with the



sectarian worship of Vishnu and Siva. The celebrated "code of laws" of Manu or Menu is in reality a religious and ethical treatise. The *Yajñavalkya* and *Parasara* are later "codes" of similar character. In poetry the modern epics are mere variations upon the themes of the 2 great poems; it will be sufficient to name as the best the works attributed to Kalidasa—viz. the *Raghuvansa*, the *Kumara-Sambhava*, and the *Nalodaya*, the *Siṃhpalatibāha* by Magha, and the *Raghava-Pandavīya* by Kaviṛaja. In lyric poetry the palm is again to be assigned to Kalidasa for his *Ritū-saṃhara* and *Meghadūta*, of which the only rival in popularity is the *Gita-Govinda* by Jayadeva. Dramatic lit. is comparatively rare, and the structure of the plays extremely artificial, the hero and chief persons speaking S., while the women and servants speak Prakrit. We here again meet with Kalidasa as author of the celebrated dramas *Abhijñāna-Sakuntala*, "The Fatal Ring," *Vikramorvasi*, and *Malavikā-gnimitra*. The earliest drama is supposed to be the *Mrichhakatī*, "The Toy Cart." The collections of fables known as *Panchatantra* and *Hitopadesa* are undoubtedly of extreme antiquity, since they became known to the W. world under various disguises many centuries since. The large collection of tales known as the *Kathasaritsagara*, "The Ocean for the Rivers of Tales," by Somadeva of Kashmir, is the S. equivalent, and perhaps the prototype, of the *Arabian Nights' Entertainments*. The immense grammatical lit. of the S. lang. is chiefly based upon the labors of a single writer, Panini. More than 4000 rules are laid down in his work, of which the phraseology is technical in the extreme. Works upon astron., math., music, med., arch., etc. are quite numerous. In lexicography the foremost places belong to Yaska, author of the *Nirukta*, the oldest known glossary of Vedic words, and to Amarasiṃha, author of the *Amarakoṣa*, the earliest glossary of classical S., believed to date from the 3d century A. D. PORTER C. BLISS.

**Santa Anna**, Cal. See APPENDIX.

**Santa Anna, de** (ANTONIO LOPEZ), b. at Jalapa, Mex., Feb. 21, 1798, served in the Sp. ranks against the insurgents during the first war of independence; placed himself in 1821 at the head of the movement in Vera Cruz for the achievement of Mex. independence; succeeded in expelling the Spaniards from Vera Cruz; was made a gen. by Iturbide, whom he recognized as emp. in June 1822, but proclaimed the republic Dec. 2, 1822; in the struggle between the rival presidential candidates, Gómez Pedraza and Guerrero, he pronounced in favor of the latter, and after his triumph was appointed to a high command in the army; was sent against the expedition of Gen. Barradas, and forced that officer to capitulate with his whole army at Tampico Sept. 11, 1829; in 1832 took up arms against V.-P. Bustamante, and after many sanguinary battles negotiated at Puebla terms of peace involving the resignation of Bustamante and the return of the legally elected pres., Gómez Pedraza. In 1838 S. A. was elected pres. for 4 yrs., and inaugurated, but soon retired on plea of ill-health to Jalapa, leaving to the v.-p., Dr. Valentín Gómez Farias, the task of attempting the ecclesiastical reforms which had been promised, and which soon led to a revolution headed by the Ch. party. S. A. banished the v.-p., and governed thenceforth in the interest of the reactionary spirit of the Ch. and the army; established a practical dictatorship by the overthrow of the const. of 1824 and the substitution of the "organic bases" of 1835. The numerous insurrections which attended this change of system afforded a pretext to the Tex. colonists to declare their independence, and S. A. having marched against them won the victory (or massacre) of the Alamo, Mar. 6, but was taken prisoner at the battle of San Jacinto, Apr. 21-22, 1836; recognized the independence of Tex., which covered his name with obloquy; was sent to the U. S. 1837; returned to Mex. and relapsed into obscurity at Jalapa until the Fr. attack upon the fortress of San Juan de Ulloa in Dec. 1838 brought him again into prominence as the heroic defender of Vera Cruz. In 1839 he was made acting pres. for some months, was placed at the head of a successful revolution which in 1841 overthrew the existing system of govt., and was dictator until Dec. 1844, when, being taken prisoner, he was tried for treason (Jan. 1845), banished for 10 yrs., and took up his residence at Havana. The war with the U. S. again directed attention to him, and he was again made pres. Defeated by Gen. Taylor at Buena Vista, Feb. 22, and by Gen. Scott in the battles from Vera Cruz to the Valley of Mex., Mar.-Sept. 1847, he was forced to flee from the country (1848) until 1853, when a conservative revolution once more placed him at the head of the govt. as dictator. His despotic instincts now took free range, and he arrogated the title of "serene highness" as pres. for life, with power to name his successor, and sold the Mesilla Valley to the U. S. for \$10,000,000. The impending triumph of the "plan of Ayutla" under Alvarez and Comonfort led to his flight from the country Aug. 1855, and he was in his absence again tried for treason, and his vast landed property confiscated. During the Fr. intervention he proceeded to Vera Cruz (1864) and offered his services to Gen. Bazaine, but was immediately expelled from the country. Soon afterward he recognized Maximilian, and was created a "grand marshal" by that prince, but was not allowed to return. After the fall of Maximilian he once more proceeded to Mex. with revolutionary intentions, but was taken prisoner and condemned to death, but his sentence was commuted to banishment for 8 yrs. At the beginning of 1874 he took advantage of the amnesty to return to the city of Mex., where he passed his last years in poverty and obscurity. D. June 20, 1876. PORTER C. BLISS.

**Santa Barbara**, cap. of Santa Barbara co., Cal., on the Pacific, about 260 m. S. of San Francisco. Its hot springs are becoming very popular with invalids. Pop. tp. 1870, 4255; 1880, 3460.

**Santa Clara**, R. R. centre, Santa Clara co., Cal., 48 m. S. E. of San Francisco, contains Santa Clara Coll. and St. Mary's Acad. Pop. tp. 1870, 3469; 1880, 4785, with 2416 in v.

**San'ta Cruz**, an island of the W. I., the largest and southernmost of the Virgin group, comprises an area of 74 sq. m., with 18,430 inhabs., and belongs to the Danes. The N. coast is hilly; the rest of the surface is flat; the soil is exceedingly fertile. Nearly the whole island is under cultivation; sugar and rum, both of excellent quality, are the prin. products. Cap. Christiansted.

**Santa Cruz**, R. R. junc., cap. of Santa Cruz co., Cal., 75 m. S. of San Francisco, on Monterey Bay, at the mouth of Lorenzo River. Pop. 1870, 2561; 1880, 3898.

**Santa Cruz** (ANDRÉS), b. in Upper Peru (now Bolivia) in 1794, took part in the war of independence, rising to the rank of field-marshal; became Peruvian minister to Chili 1828; was elected pres. of Bolivia after the overthrow of Gen. Sucre 1829; placed himself at the head of the "Unitarian" movement in Bolivia and Peru, which countries he succeeded, partly by force, in uniting as the "Peru-Bolivian Confederation" (1836). In 1837-39 he carried on a disastrous war with Chili, but his anomalous system of govt. was overthrown in 1839 by the combined efforts of Gens. Velasco and Ballivian, and S. C. took refuge in Europe. D. at Saint-Nazaire, Fr., Sept. 1865.

**Santa Cruz de Santa'go**, cap. of the Canary Islands, on the N. E. coast of Tenerife, in a somewhat unfertile and even unhealthy dist. But it has an excellent harbor. Wine, brandy, and cochineal are exported. The town and harbor are strongly fortified. Pop. about 11,000.

**Santa Fé**, on R. R., city and cap. of the Terr. of N. M. and of Santa Fé co., the commercial centre, an archiepiscopal see of the R. Cath. Ch., and head-quarters of the military dist., is 20 m. E. of the Rio Grande del Norte, on Santa Fé Creek. The climate is dry and moderate in temperature the yr. round. It had long been occupied as an Indian pueblo at the discovery and occupation by the Spaniards in the latter part of the 16th century; fragments of gold and silver ores are found in the edge of the foot-hills, indicating the existence of reduction-works in days gone by. Mines of the precious and grosser metals in varying quantities, and extensive quarries of fine marble, gypsum, and limestone, are known in the surrounding mountains. The Pueblo (or Village) Indians, having been subjected to slavery, arose in 1680, and drove the Spaniards out of S. F. and the terr.; they then erected in the plaza a stone inclosure, into which the public records and fixtures and decorations of the chs. were cast and burned, and also filled up and obliterated all traces of mines developed. According to public records in the office of the sec. of the Terr., the Indians held possession of the country for 14 yrs. to a day, when they were finally reconquered by the Spaniards, who with their descendants continued successively, under the authorities of Sp. and Mex., to occupy and govern the country until the Amer. occupation by Gen. S. W. Kearny, Aug. 18, 1846. Pop. 1870, 4765; 1880, 6635.

**Santa Fé de Bogotá**. See BOGOTÁ.

**Santal**. See SANDAL-WOOD and SANTAL-WOOD.

**Santalaceæ** [from the prin. genus, *Santalum*, sandal-wood], a small order of apetalous dicotyledonous plants widely distributed over the world, most nearly related to Loranthaceæ, but incompletely, if at all, parasitic, according with that order in having its ovules and seeds destitute of integuments.

**Santaline**. See SANTAL-WOOD.

**Santal-Wood**, **Sanders**, or **Saunders**, etc., from the *Pterocarpus santalinus*. It occurs in large billets, compact, hard, and of a dull murky-red color. Its coloring-matter is supposed to be similar to, if not identical with, that of bar and cam wood. It is only developed by age, and, while it is abundant in the trunks, is not found in the young branches. S.-W. is used chiefly on the Continent, to give a bottom to woollen cloth to be subsequently dyed with indigo, yielding by this combination a fine blue (*bleu de Nemours*), which is purple-blue by reflected light. It also imparts a dark red to woollen and cotton goods, which assumes a brick brown on passing through a bath of bichromate of potash.

**Santa Marta**, city of Colombia, cap. of the state of Magdalena, on the Bay of Santa Marta, in the Caribbean Sea, near the mouth of Magdalena River, has monthly communication by steamer with New York and the W. I. ports, and maintains a considerable coasting-trade. The port is commodious, and defended by 3 fortresses. The S. M. mt.-range rises in some peaks to 17,000 ft., and is not connected with the Andes. Pop. 3500.

**Santander**, one of the 9 confed. states of the U. S. of Colombia into which that country was divided by the const. of 1858. Area, 16,409 sq. m. Pop. 555,600. Cap. Socorro.

**Santander** (FRANCISCO DE PAULÍN), b. at Rosario de Bucuta, New Granada. Apr. 2, 1792, ed. at the college of Bogotá; served under Bolívar in the war of independence as incol.; became provisional v.-p. of Cundinamarca; was instrumental in assembling at his native place in Jan. 1821 the constituent cong. of delegates from Venezuela and New Granada, by which the 2 countries were united as the republic of Colombia, of which Bolívar was chosen pres. and S. v.-p. (Oct. 1821); was in charge of the executive power from Dec. 1821 to Sept. 1827; re-elected v.-p. 1827, but was disson banished from the country; was recalled after the dissolution of the centralized republic of Colombia, and first constitutional pres. of the republic of New Granada (1833-37). D. at Cartagena May 6, 1840.

**Santa Ro'sa**, on R. R., cap. of Sonoma co., Cal., 60 m. N. W. of San Francisco. The manufacture of wine is extensively carried on. Pop. tp. 1870, 2898; 1880, 5761, including 3616 in v.

**Santee' River** is formed in S. C. by the union of Wateree and Congaree rivers. It is navigable throughout for steamboats, and its length is 150 m.

**Santerre**, son-tair' (ANTOINE JOSEPH), b. at Paris Mar. 16, 1752, led the mob against the Bastille July 14, 1789; played



a conspicuous part in the riots of the Champ de Mars, the attack on the Tuileries (June 20, 1792), and the insurrection of Aug. 10; was appointed commander-in-chief of the national guard of Paris, and gov. of the Temple during the imprisonment of the king, whom he escorted to the scaffold; was sent to the Vendée, but was beaten at Coron Sept. 18, 1793; recalled, arrested as an Orleanist, but liberated after the fall of Robespierre. D. Feb. 6, 1809.

**Santiago**, city, cap. of the republic of Chili and of the prov. of the same name, on both sides of Mapocho River, which is crossed by several fine bridges, near the W. base of the Andes, at a height of about 1800 ft. above the sea, is regularly laid out with wide and well-shaded streets, and has several creditable public edifices; is defended by 2 fortresses, which crown the hill of Santa Lucia in the centre of the city; has numerous educational, religious, and benevolent insts., a magnificent *paseo* or drive extending along the banks of the Mapocho for 2 m., and considerable internal commerce; maintains 3 banks, 2 insurance cos., and a number of manufactures. S. was founded in 1541 by Pedro de Valdivia. Pop. 193,517.

**Santiago de Cuba**, town and formerly cap. of the island of Cuba, on the southern coast, near the mouth of the river Santiago. It has a spacious, safe, and strongly defended harbor, is well built, and contains a fine cathedral and many other handsome public buildings, but its climate is hot and unhealthy. Its commerce is very large. Pop. of city and dist. 96,000.

**San'to Domin'go**, or the **Dominican Republic**, comprises the E. and larger part of the island of Hayti in the W. I. Its phys. geog. and hist. are given in the article on HAYTI. Its area is estimated at 18,000 sq. m., its pop. at 200,000. The prevailing religion is the R. Cath. Other denominations are tolerated, and the Meths. and Baps. have chs. and schools. The republic is divided into 5 provs.—Santo Domingo, Azua de Compostela, Concepcion de la Vega, Santiago de las Caballeros, and Santa Cruz del Seybo. The gov't. consists of a pres., who is elected for 6 yrs. and holds the executive power, and a senate, which has the legislative power and is composed of 9 members, elected also for 6 yrs. The present pres., proclaimed Oct. 12, 1880, is M. Marino, priest in holy orders. The finances are in bad order. The rich natural resources of the country are very little developed. Prin. exports are tobacco, coffee, cotton, sugar, cacao, ginger, hides, wax, mahogany, and dyewoods. The prin. ports are Puerto Plata and Santo Domingo.

**Santo Domingo**, cap. of the republic of Santo Domingo, at the mouth of the river Ozama, is surrounded with a wall 10 ft. high, and has a good harbor. It was founded in 1494, and was the first city built by white men in the New World. Several of the old buildings—e. g. the cathedral, 1512-40—are still standing. The city has a coil, and some trade in cabinet and dyewoods. Pop. 15,000.

**Santonine**, or **Santoninic Acid**, a crystallizable principle obtained from the drug *Santonica* or "Levant wormseed." S. occurs in flat, quadrilateral, colorless prisms, is inodorous and nearly tasteless, and practically insoluble in water. It is poisonous in overdose to the animal system.

**Santorin**. See **Thera**.

**São Francisco**, or **San Francisco**, river of Brazil, rises in the prov. of Minas Geraes, flows first N., then E., forming the boundary between the provs. of Pernambuco and Bahia, and falls into the Atlantic; length, 1632 m.

**Saône**, sôn, river of Fr., rises in the dept. of Vosges at an elevation of 1476 ft. above the sea, flows S., and joins the Rhone at Lyons. Its length is 316 m.; it is navigable for a distance of 170 m. below the city of Gray, dept. of Haute-Saône. It receives from the left side the Doubs.

**São Salvador**, or **San Salvador**, city. See **Bahia**.

**Sap** [Lat. *sapa*, "must," or "new wine boiled thick"], the juice of plants. It is probable that the water of the sap and its ash constituents are taken up only by the roots. This dilute solution of inorganic matter is carried to the green tissue of the plant, where it is exposed to the air and concentrated by evaporation. From the atmosphere carbonic acid is taken up. Under the influence of sunlight the dissolved matters are assimilated, and the *crude sap* becomes *elaborated sap*. The prepared sap is fit to be used in growth or any kind of work in the plant, and it is carried to all points where it is needed.

**Sapajou**, a name applied to New World monkeys of the family Cebidae, having a prehensile tail whose under surface is naked and callous toward the tip; the throat is not dilated. They are better known under the name *Ateles*, and constitute one of the most characteristic forms of Amer. monkeys.

**Sapan'-Wood**, from the *Cesalpina sappan*, a variety of BRAZIL-WOOD (which see), imported from Siam, Japan, the E. I., etc.

**Sap-Green**, a coloring-matter obtained by boiling down the juice of the berries of the buckthorn, after adding lime to prevent change by acid fermentation, which would turn the color red; used chiefly as a water-color pigment.

**Sapinda'ceæ** [from *Sapindus*, one of the genera], a large and important natural order of polypetalous exogenous trees and shrubs. As at present constituted, it includes the Staphyleaceæ, or bladder-nuts; the true S., mostly tropical, but embracing the horse-chestnuts; and the Acerineæ, or maples.

**Sapodilla**, the fruit of *Achras sapota*, a W. I. tree of the order Sapotaceæ. It is highly valued as a dessert fruit.

**Sap'online**, also called **Struthline** [Lat. *sapo*, "soap"], a singular uncrystallizable substance obtained from the plant called soapwort or bouncing bet. It is also contained in *Gypsophila struthium* and many other plants.

**Sapota'ceæ** [from *Sapota*, one of the genera], a natural order of gamopetalous exogenous trees and shrubs, mainly tropical, but the S. U. S. have a few species, chiefly of the genus *Bumelia*, none industrially important. But the

tropical S. include many useful trees. Sapodilla plums (see **SAPODILLA**), star-apples (from *Chrysophyllum Catinio*), marmalade (*Achras marmosa*), and the bully-tree fruit of Surinam (*Mimusops*) are among the prized tropical fruits of the order. The butter trees—so called from the bland thick oil they yield—are species of *Bassia*, and the milky juice of several species, notably of *Isandra gutta*, is the source of gutta-percha. ASA GRAY.

**Sappers, Miners, and Pontoniers**. Among the great improvements in the attack and defence of fortifications introduced by Vauban, not the least was the establishment of regularly organized companies of S. and of M. The duties of these troops had previously been performed in a desultory manner by soldiers detailed from the artil. and inf. The first company of S. was organized about 1690 as a free company, under the command of Vauban himself. It was armed and drilled as inf., and was instructed in all the works appertaining to sieges. The men were taught to make gabions, fascines, hurdles, etc., to trace lines and trenches, to drive the various kinds of saps, to descend into and pass the ditch, to destroy the enemy's obstacles, to drain the trenches, to take care of the tools, to put up the various kinds of revetments, to post and superintend working-parties, and were expected also to serve in the mines when required. In the defence they were taught to adjust and sod the slopes, to place the various obstacles, such as pallsades, fraises, etc., and to repair the defences when injured by the enemy's artil. All of these duties are still performed by S. Three engineers, Goulon, Esprit, and Mesgrigny, organized in 1679, 1695, and 1705, respectively, each a company of miners, whose duties were the construction and service of mines and countermines. By the yr. 1705 these cos., as well as the S., had been attached to the artil. They naturally belonged to the engineer service, but convenience of transportation and personal influence kept them with the artillery until 1759, when they were placed under the engineers. In the following yr., however, they were returned to the artil., where they remained until 1793, when they were finally attached to the engineers. The duties of pontoniers, or constructing temporary military bridges, had up to this time (1793) been performed by "artillery-workmen." The necessity of a better organization was evident, and companies of pontoniers were organized, continuing, however, to form part of the artil. [From orig. art. in *J.'s Univ. Cyc.*, by CAPT. O. H. ERNST.]

**Sapp'hire** [Gr. *sάπφειρος* [Lat. *sapphirus*], a gem, among the purest forms of the mineral species corundum, which is crystallized alumina or sesquioxide of the metal aluminium. These are not usually called S. by dealers in gems unless blue in color, the red stones being called *rubies*, the yellow ones often *topaz*, and the green *emeralds*.

**Sapp'ho** [Σαπφώ], b. in the island of Lesbos, at Mytilene or Eresos, a contemporary of Alceus, Semonides, and Pittacus, founded a school of poetesses at Mytilene, about 600 B. C., and enjoyed a great reputation herself among her countrymen for her poems. The details of her life and character are uncertain. She is said to have lived for some time in Sic. in exile. The story of the leap from the Leucadian rock on account of an unhappy passion for a young man, Phaon, is a fable. Her poems, comprising 9 books, were mostly erotic; some, however, were satirical. They were written in the Æolic dialect, and in a great variety of metres, of which one, the Sapphic strophe, is said to have been invented by her.

**Sarac'ens**, a name which with classical writers denotes a particular Ar. tribe, but which afterward was applied to the followers of Mohammed or to those Mohammedan nations which invaded Europe.

**Saragossa**, town of Sp., cap. of the prov. of Saragossa, on the Ebro, was founded by the Phenicians. Under the Romans it became a flourishing city, rose still higher under the Moors, and reached the culmination of its prosperity when (in 1118) it became the cap. of the kingdom of Aragon. After the union of Aragon and Castile, when Madrid became the royal residence, S. lost some of its splendor. It is still a splendid city, well built, containing many excellent edifices and establishments, and situated in a fertile, densely peopled, and carefully cultivated dist. Of its 2 cathedrals, the one is an old building in Gothic style, the other a perfectly modern edifice of the 17th century. Its univ. was founded in the 15th century, and enjoys still a high reputation. It has also many other educational and benevolent insts. Its former flourishing manufactures have declined, yet linen, cloth, silk, soap, hat, and saltpetre factories are in operation, and quite a lively trade is carried on. Pop. 84,575.

**Saragossa**, Maid of. See **AGUSTINA**.

**Saratoga**, **Battle of**. The forced abandonment of Ft. Ticonderoga by St. Clair in July 1777, and the retreat of Schuyler from Ft. Edward to Saratoga, had produced a profound feeling throughout the country. Schuyler was superseded in command of the N. dept. by Gen. Gates. But before the latter's arrival great changes had taken place. Stark had gained a splendid victory at Bennington, Arnold had forced St. Leger to raise the siege of Ft. Schuyler, the militia were rapidly assembling, and Morgan with his rifle-men, 500 strong, had arrived when Gen. Gates assumed command. Burgoyne, in command of the Brit. forces, pressing on, crossed the Hudson Sept. 13 and 14, and encamped his army on the heights and plains of Saratoga. Gates meantime had moved his army up to Stillwater, and taken possession of Bemis's Heights, to the S. of Saratoga. On Sept. 19 Burgoyne moved out, and was soon engaged with the left wing of the Amer. army under Benedict Arnold. The battle, which began about 4 P. M., was continued until dark; the Brit. held the field, having sustained a loss of over 500, that of the Amers. falling below 300. Burgoyne now discovered that he had a dangerous foe in his front. He determined to risk a battle, and on Oct. 7 advanced at the head of 1500 men, with 6 pieces of artil. His right was



at once attacked by a N. H. brigade and Morgan's riflemen. Arnold placed himself at the head of the troops, and with great daring led them into action. The Brit. lines were repeatedly broken, and Burgoyne with difficulty regained his camp. Gen. Arnold was also severely wounded in the leg. Renewing the assault, the Amers. gained a lodgment in the camp, when darkness put an end to the conflict. During the night Burgoyne retreated, and continued his retreat next day to Saratoga; it was decided in council to propose a cessation of hostilities while terms of capitulation were being negotiated. On the 17th terms were agreed upon—the Brit. to march out with the honors of war, and be permitted to embark for Eng., on condition of not serving against the U. S. again during the war. The terms of the surrender were not ratified by Cong., Burgoyne's army being retained as prisoners until the close of the war. Burgoyne and other officers were permitted to depart.

**Saratoga Springs**, R. R. centre, Saratoga co., N. Y., 36 m. N. of Albany and 186 from New York, is the leading and fashionable watering-place of Amer., noted for numerous mineral springs, the waters from some of which have been bottled and exported to all parts of the world for over 50 yrs. The prin. are the Congress, Hathorn, Empire, Geyser, High Rock, Excelsior, Star, Columbian, Washington, and White Sulphur. To accommodate the great assembly who annually visit the place, numerous large hotels have been erected, and during the winter of 1875-76 Congress Spring Park was laid out in walks, lakes, etc. Large sums are spent annually in laying out and keeping up roads for rides and drives, the prin. ones leading to Saratoga Lake. The great battle-ground, where Burgoyne was beaten by Gates in 1777, is 12 m. S. E. of the place, on Hudson River, and accessible by good roads. Pop. 1870, 7516; 1880, 8421.

**Saratov**, a large and rich city of Rus., cap. of the govt. of Saratov, on the Volga, is for the greater part built of wood, but has many fine public buildings of stone. It manufactures cloth, linen, tobacco, leather, earthenware, rope, etc., has large breweries, distilleries, vinegar-factories, and foundries, and carries on an extensive trade in corn, cattle, and fish. Pop. 86,418.

**Sarawak**. See BORNEO.

**Sarcophagus** [Gr. *σαρκοφάγος*, "flesh-eating"], a kind of stone formerly obtained at Assos in Mysia. It was much used for making stone coffins, which were believed to have the property of destroying the corpse within 40 days.

**Sarcosine** [Gr. *σαρπ*, "flesh"], an alkaloid product of the decomposition of creatine, the crystalline constituent of the juice of flesh, discovered by Chevreul. S. results together with urea, on boiling creatine with baryta-water. S. forms colorless crystals, soluble in water with ease, but insoluble in ether and with difficulty in alcohol.

**Sard** [Lat. *sarda*; Gr. *σαρδών*, from *Sardis*, in Lydia], a rich and rare variety of carnelian, deep red, and when seen by transmitted light, of a fine blood-red. It commands a high price.

**Sardanapalus**, a voluptuous and effeminate king of Assyria, whose name has become a byword, but whose exact place in Assyrian hist. is undetermined. Lenormant, Oppert, and Hincks identify him with the Asshur-lik-hish of the monuments, assigning 800 a. c. as the date of his accession, and 789 as the date of his death and of what may be called the first destruction of Nineveh. This first destruction of Nineveh is denied by the Rawlinsons, who identify S. with the Asshur-bani-pal of the monuments, who d. 636 a. c., after a reign of 42 yrs., and was succeeded by his son Saracus, whose name on the monuments is Asshur-emed-ilin. Saracus, perhaps, burned himself in his palace when Nineveh fell (625 a. c.). R. D. HUTCHCOCK.

**Sardine**, *sard'in* [Gr. *σαρδίνη*, the "Sardinian fish"], a name applied to a number of fishes belonging to the family Clupeidae, and especially to those preserved in oils and inclosed in tin boxes. The true S. of the Mediterranean and contiguous ocean is the *Pomolobus* or *Clupea pilchardus*, and a very near relative of this species is found on the Cal. coast. The S. of the Mediterranean is dressed, salted, and partly dried, then scalded in hot oil, and finally hermetically sealed in tin boxes with hot salted oil or oil and butter.

**Sardinia**, *sar-din'e-a*, an island in the Mediterranean, nearly midway between Sp. and It., and between Europe and Afr., just S. of Corsica, from which it is separated by a channel 7 m. wide, called the Strait of Bonifacio. Area, 9205 sq. m. Pop. 671,772. The surface is mountainous, and the mts. are in some places completely naked and barren, but in others they are covered with forests or with fine pastures, and almost everywhere they contain marble, alabaster, lead, copper, iron, rock-crystal, etc. Between the offshoots of the central range lie large table-lands or slightly sloping valleys, in which sandy and stony dists. alternate with fertile soil. Along the coasts are found extensive salt marshes and lagoons, to which the remarkable insalubrity of these places is generally ascribed. Wheat, maize, beans, wine, olives, figs, oranges, tobacco, linseed, cotton, and madder are raised in larger quantities than demanded by home consumption. The fisheries along the coasts, especially of tunny, anchovies, and sardines, are very valuable, but are mostly in the hands of foreigners. Salt and gunpowder are the only manufactures of any importance, and both of them are monopolies of the govt.

**Sardinia, Kingdom of**, was formed Aug. 24, 1730. The house of Savoy began to make itself felt in the hist. of Europe as early as the 11th century. In the war of the Sp. Succession (1700-13) Duke Victor Amadeus II. (1675-1730) was a claimant for the Sp. throne, and by the treaty of peace at Utrecht (1713) he received the island of Sic. and the title of king. Sic. he was compelled to yield to Aus. in 1730, but as a compensation he received the island of S., from which he took his title of king, and thus was formed the kingdom of S., consisting of Savoy, Piedmont, and S. In 1831 the elder line of the house of Savoy failed, and the younger line ascended the throne with Charles Albert (1821-49). In 1848

he gave a free const., and declared war against Aus., but on Mar. 13, 1849, was thoroughly defeated at Novara, and compelled to resign the crown to his son, Victor Emmanuel II., who succeeded in fulfilling the task of uniting the scattered It. nation into one free state.

**Sardis**, or **Sardes**, an anc. city of Asia Minor, the cap. of Lydia, was at the foot of Mt. Tmolus, on the river Pactolus, near its influx in the Hermus. Under Cressus it was one of the wealthiest, most magnificent, and most luxurious cities of the E. Under the Romans it declined, and in the time of Tiberius it was destroyed by an earthquake.

**Sardou**, *sar-doo'* (VICTORIEN), b. at Paris Sept. 7, 1831, studied med., afterward hist.; gained his livelihood as a teacher and by writing for papers, magazines, cyclopedias, etc.; tried his fortune as a dramatist in 1854 with the *Taverne des Etudiants*, which failed; tried again in 1860 with *Candide* and *Monsieur Garai*, which succeeded, and burst then upon the public with a productiveness almost unparalleled: *Les Pailles de Mouche*, *Les Vieux Garçons*, *La Famille Benoiton*, *Nos Bons Villagesois*, etc.

**Sargasso Sea**, a name applied to certain great areas in the ocean which are often found almost covered with floating Gulf-weed (*Sargassum vulgare* and *bacciferum*). The prin. S. S. is to the W. and S. W. of the Azores, reaching to the Bahamas westward. In the Pacific there is a S. S. some 500 m. E. S. E. of New Zealand, and another about 1000 m. W. of San Francisco.

**Sargent** (AARON A.), b. in Newburyport, Mass., Sept. 28, 1827, was in early life a printer and editor; emigrated to Cal. in 1849; studied law; was admitted to the bar 1854; was dist. atty. of Nevada co. 1855-56, v.-p. of the Rep. national convention at Chicago 1860, M. C. 1861-63 and 1869-73, and U. S. Senator for the term 1873-79. U. S. minister to Ger. 1882-84.

**Sargent** (EPES), b. at Gloucester, Mass., Sept. 27, 1812, was ed. at the Boston Lat. School; was 2 or 3 yrs. a student at Harvard, but did not graduate; wrote for Miss Josephine Clifton *The Bride of Genoa*, a five-act play, and for Miss Ellen Tree a tragedy, *Velasco*; became one of the eds. of the Boston *Atlas* (1837); removed to New York 1839; wrote a comedy, *Change makes Change*, produced at Niblo's Theatre; 2 juvenile tales, *Wealth and Worth* and *What's to be Done?* or *the Will and the Way*; a *Life of Henry Clay*, a novel, *Fleetwood, or Stain of Birth*, etc.; settled at Roxbury, near Boston, about 1847; edited for several yrs. the Boston *Transcript*; edited the *Select Works of Benjamin Franklin*, with *Memoir and Notes* (1852); produced a tragedy, *The Priestess*, at the new Boston Theatre; wrote *Planchette, or the Despair of Science*, an *Account of Modern Spiritualism*; *The Woman who Dared*, a Poem; *School Manual of Eng. Etymology*, etc.; contributed largely to the *Knickerbocker*, the *Atlantic*, and other magazines; has been a favorite lecturer before lyceums. Among his poems, several have been set to music and become popular favorites, especially the song, *A Life on the Ocean Wave*. D. Dec. 30, 1880.

**Sargent** (HENRY), brother of Lucius M., b. at Gloucester, Mass., Nov. 25, 1770, studied art for several yrs. at Lond. under Benjamin West; became a distinguished painter at Boston; was adjutant-gen. of Mass. 1814, and afterward aide to Govs. Brooks and Strong, and invented an elevated railway. His best-known painting is *The Landing of the Pilgrims*. D. Feb. 21, 1845.

**Sargent** (JOHN OSBORNE), brother of Epes, b. at Gloucester, Mass., in 1810, ed. at the Boston Lat. School and at Harvard Coll.; grad. 1830; aided S. G. Goodrich in the preparation of his *Pictorial Geog. of the World*; studied law; practised several yrs. at Boston; sat in the Mass. legislature 1835-36; was an editorial writer for the Boston *Atlas* 1834-37; practised law in New York 1840-48; took part in the political contest of 1848 by conducting the *Battery*, a Whig campaign paper; established at Wash. (1849) the *Republic*, a successful Whig newspaper; pub. in 1844 an essay on modern *Improvements in Steam Navigation and the Arts of Naval Warfare*.

**Sargent** (NATHAN), b. at Putney, Vt., May 5, 1794, studied law; settled at Cahawba, Ala., 1816, where he became co. and probate judge; resided at Buffalo, N. Y., 1826-30; established a Whig newspaper at Phila. 1830; was afterward Wash. correspondent of the *U. S. Gazette*, becoming widely known under his *nom de plume* of "Oliver Oldschool"; was sergeant-at-arms of the U. S. House of Reps. 1849-51, register of the treas. 1851-53, com. of customs 1861-71, and was for some yrs. pres. of the Wash. Reform School. D. at Wash. Feb. 2, 1875. Author of a *Life of Henry Clay and Public Men and Events*.

**Sargent** (WINTHROP), b. at Gloucester, Mass., May 1, 1753, grad. at Harvard 1771; became capt. of one of his father's ships 1775; navy agent at Gloucester Jan. 1, 1776; served at the siege of Boston as capt. of artill., and subsequently in the L. I., N. J., and Pa. campaigns, attaining the rank of major; was connected with Gen. Rufus Putnam's Ohio Co.; was made by Cong. surveyor-gen. of the N. W. Terr. 1796; became its sec. 1797; was adjutant-gen. of St. Clair's expedition against the Miami Indians 1791, and in Wayne's expedition 1794-95; was an original member of the Society of Cincinnati as delegate from Mass.; aided Dr. R. S. Smith in preparing his *Papers Relative to certain Amer. Antiquities* (1796); was gov. of Miss. Terr. 1790, and again 1801. D. June 3, 1820.

**Sargent** (WINTHROP), grandson of Major Winthrop, b. at Phila. Sept. 23, 1825, grad. at the Univ. of Pa. 1845 and at Cambridge Law School 1849; practised his profession at Phila., and subsequently at New York; edited from original MSS., with a valuable introductory memoir, *The Hist. of Braddock's Expedition against Ft. Duquesne*; edited *The Loyalist Poetry of the Revolution*, and wrote *The Life and Career of Major John André*, Adjutant-Gen. of the Brit. Army in Amer. He wrote largely for the *N. Amer. Review* and other magazines. D. May 18, 1870.

**Sarmatia**, the anc. name for the vast region extending



from the Baltic to the Black Sea, and from the Vistula to the Volga.

**Sarmiento** (DOMINGO FAUSTINO), b. at San Juan de la Frontera, in the vicerealty of Buenos Ayres, Feb. 15, 1811; became a teacher at San Luis; took part in politics as an opponent of Rosas; was exiled to Chill in 1831, and again in 1840, and devoted himself to the cause of popular education. In 1845 the Chilean govt. sent him on an educational tour of inspection to Europe and the U. S. In 1851 he returned to the La Plata; served as col. and military sec. to Urquiza in the campaign against Rosas, after whose fall he aided in framing the const. of 1853; held several important ministries in the govt. of Buenos Ayres; became supt. of public instruction, gov. of the prov. of San Juan, and minister to the U. S. 1864-68. While holding the latter position he was chosen pres. of the Argentine Republic. During his term of office the Paraguayan war was successfully terminated, 2 insurrections were quelled, and rupture with Brazil was averted without any sacrifice of the national honor. Educational insts. of various kinds were founded in all the provs., an astronomical observatory was created at Córdoba, R. Rs. and telegraphs were built, a vast European immigration was fostered, commerce was multiplied, lawlessness was repressed, justice effectively administered, and the national finances managed with strict integrity. He has written *Viages por Europa, Africa y America, Civilizacion y Barbarie*, and *Vida de Lincoln*.

**Sarracenia**, a remarkable genus of E. N. Amer. herbs of the natural order Sarracenaceae, remarkable for the expanded petal-like style, and especially for the hollow pitcher-shaped leaves, usually half full of water, and containing many drowned insects. Of the 6 species, *S. purpurea* is the commonest.

**Sarraceniacae**, the natural order of pitcher-plants, of which the above is the prin. genus and the type. (See PITCHER-PLANTS.)

**Sarsaparilla**, the roots of certain species of smilax, indigenous in the N. part of S. Amer. and in Central Amer. The medicinal species of smilax are climbing plants, growing from a large woody root-stock, from which long fleshy roots grow horizontally in all directions. It is these roots that constitute the drug S. It contains a crystallizable principle called *pariline*, upon which such medicinal virtues as the drug possesses most probably depend.

**Sarsfield** (PATRICK), earl of Lucan, b. in Ire. about 1645, served on the Continent in the Eng. life-guards under the duke of Monmouth, and against him at Sedgemoor 1685; was at the Revolution one of the most influential Irish R. Caths.; offered his services to King James in 1689; fought at the battle of the Boyne, July 1, 1690; compelled William III. to raise the siege of Limerick Aug. 1690; commanded the Irish reserve at the battle of Aughrim, July 12, 1691; exhibited great gallantry in the second defence of Limerick; obtained honorable conditions of surrender Oct. 1691; retired to Fr. with a corps of Irish volunteers; distinguished himself at Steenkerke, Aug. 1692, and was killed at the battle of Landen, July 10, 1693.

**Sartain** (JOHN), b. in Lond., Eng., in 1808, became an engraver; came to the U. S. 1830 and settled in Phila.; introduced mezzotint engraving into Amer.; also practised oil-painting; was ed. and proprietor of the *Foreign Semi-monthly Magazine*; founder of *Sartain's Union Magazine*; pub. *Poetical and Prose Illustrations of Celebrated Amer. Painters*, and was the designer of public monuments, among which is that to Washington and Lafayette in Monument Cemetery, Phila.

**Sarto, del** (ANDREA), (real name ANDREA VANNUCHI, called DEL SARTO from his father's trade), b. in Florence in 1487, studied wood and metal engraving, and became a disciple of Pietro di Cosimo, but gained his best instruction from the works of Ghirlandajo, Leonardo da Vinci, Michael Angelo, and Raphael. His genius was of the sweet, gracious type. The easel pictures of Andrea—*Madonnas*, *Holy Families*, altar-pieces, and such-like—are familiar to the visitors at foreign galleries. The story of his private life is one of the tragedies of biography. D. in Florence in 1530.

**Saskatchewan** (or **Nelson River**), one of the chief rivers of N. Amer. The basin it drains is about 482,000 sq. m. in area, and is 1300 m. in extreme length from the most westerly source of the N. branch of the S. in the heart of the Rocky Mts., to the source of the Winnipeg, with an extreme width of 790 m. from the most S. source of Red River in Minn. to the mouth of Nelson River, on Hudson's Bay. Length of the S. by south branch from source to sea, in straight courses of 10 m., 1545 m.; with requisite addition for sinuosities, 1732 m. at least by its channel. For 300 m. N. N. W. from lat. 49° N. (the U. S. boundary) the summit watershed of the Rocky Mts. is the W. boundary of the valley of the S. Its S. boundary, the watershed between it and the Mo. declines to 1500 and 1700 ft. above the sea. The watershed between it and the river Athabasca on the N. W. rises in steps to 2500 ft. That between it and the river Churchill or Beaver, on the N., is much lower and less continuous. On the S. E. and N. E. it is bounded by the summit-ridges of the Laurentian ranges that divide it from Lake Superior and from the other rivers falling into Hudson's Bay. The sources of the N. and E. branches of the S. are stated by Dr. Hector to be but a few miles apart, in a grand nucleus of lofty summit-glaciers about lat. 51° 40' N., lon. 117° W. Thence diverging 300 m. apart midway, they unite at 550 m. in direct distance eastward, the course of the N. branch being about 830 m., the S. branch about 903 m. At 260 m. up the latter it receives Red Deer River, about 445 m. long, on the left. About 177 m. up the N. branch it receives on the right Battle River, nearly 400 m. long. At 333 m. farther it enters Cedar Lake, 30 m. long; at 20 m. from which it enters Lake Winnipeg. The S. is narrow, varying from 220 to 660 yards in width below the forks. In the N. or lesser branch the navigation is obstructed at low water by shoals and shifting sandbars. About 446 m. from its entrance to Lake

Winnipeg, traversing the N. end of it for 50 m., and Play Green Lake adjoining, 30 m., with its volume of water more than doubled by the large tributary of Lake Winnipeg, obstructed in its course by many rapids and falls, with 710 ft. of descent, it enters Hudson's Bay at York Factory, lat. 57° 06' N., lon. 98° 35' W. [From orig. art. in *J.'s Univ. Cyc.*, by A. J. RUSSELL.]

**Sasnett** (WILLIAM JEREMIAH), D. D., b. in Ga. Apr. 29, 1820, grad. at Oglethorpe Univ. in 1839; studied law, but abandoned it for the ministry; wrote much in favor of the paramount importance of developing and cultivating the sensibilities in female education; filled the chair of Eng. lit. in Emory Coll., Ga., the presidential chair of Lagrange Female Coll., and that of the E. Ala. Male Coll. at Auburn, Ala.; beside writing largely for periodicals, pub. *Progress and Discussions in Lit. and Religion*. D. Nov. 3, 1865.

**Sassafras** [from the Sp. *sassafras*], the *Sassafras officinale*, a tree of the laurel family; its leaves are aromatic and mucilaginous, and the bark of the root is a powerful stimulant, with a pleasant taste and smell; is employed principally for flavoring purposes, usually in the form of the volatile oil. The wood is soft and brittle, but is sometimes employed for making boxes and drawers on account of its pleasant smell.

**Sassafras, Oil of**, a highly fragrant essential oil, obtained from the root of the sassafras tree, which contains from 1 to 2 per cent. of it. It is heavier than water, and boils at 430° F.

**Sassanidæ**, the name of a celebrated dynasty which reigned in Per. from 226 A. D. to 651. It ascended the throne with Ardashir, a son of Sassan, and was overthrown with Yezdegerd III. (632-651), who was murdered in that yr. The reign of the S. was an epoch of great prosperity. The boundaries of the empire were extended, and time after time the Roman legions retired, defeated and humiliated, from the frontiers. Internally, the state of the country was very flourishing. The reign of the S. was the blossom of the Per. nationality in religion and poetry. Magnificent cities, of which only the names and some ruins are left, were built and flourished, and by the aid of costly and ingenious aqueducts, canals, and other means of irrigation, large tracts were covered with fields and orchards.

**Satan** [Heb. *שָׂטָן*, "adversary"]. It has been stated that the idea of S. as the origin of all evil and the ruler of a realm of evil was introduced among the Jews during the Babylonian captivity through their acquaintance with the religion of Zoroaster. But the S. of the O. T. is not the Per. Ahirman, and he appears not only in the Books of Zechariah and I. Chronicles (written after the exile), but also in the Book of Job written in the time of Solomon. In the period between the close of the Apocrypha and the appearance of Jesus the idea of S. developed into a comprehensive demonology. This demonology passed directly into Christianity. To many of the early Fathers the universe seemed to be divided between God and S. The Middle Ages still clung to this view, and although in modern times it has faded away before the purer conception of God as the One, the idea of S. as the personal representative of evil still forms a part of the creeds of most Chr. denominations.

**Satellites**. See ASTRONOMY, EARTH, MOON, JUPITER, SATURN, URANUS, NEPTUNE, and SOLAR SYSTEM.

**Satin**, a smooth and lustrous fabric of silk, of Chi. invention. Of the warp threads only one in every 5 or 10 is raised to allow the shuttle to be passed, but each thread is raised in regular succession as the shuttle is thrown.

**Satin Bower-Bird**. See BOWER-BIRD.

**Satinet**, a coarse fabric, of which the warp is cotton and the weft woollen.

**Satin Spar**, a fibrous variety of carbonate of lime, found of snowy whiteness in Eng., Scot., and elsewhere, which when polished has a lustre resembling that of satin. A fibrous kind of gypsum is also called satin spar.

**Satin-Wood**, a name given to several kinds of ornamental wood. The best is from Guiana, and is the wood of *Ferolia Guianensis*. That of India comes from *Chloroxylon Swietenia*, a cedrelaceous tree yielding a sort of wood-oil.

**Satire** is the name of a peculiar species of poetry which originated with the Romans, and died out with the Lat. lit. The name *satira* was originally written *satura*, which, derived from the root *sat*, "enough," denoted a dish of different kinds of fruit mixed together, then a stew; with the satyr of the Gr. mythology and the satyric drama of the Gr. theatre it had nothing to do. The prin. writers of S. were Lucilius, Horace, Persius, and Juvenal.

**Satisfaction** [Lat. *satisfactio*], in law, denotes, when used in a gen. sense, the acquittance of a legal claim, the legal compensation and settlement for injuries done, or the discharge of a debt or demand, as by the payment of the money due upon any obligation. In a more special and restricted sense the term is applied to the discharge of an obligation which is a matter of record—a judgment or a mortgage—where the discharge itself is also of record.

**Satrap** (Gr. *σατράπης*; anc. Per. *kshatrapāvan*; modern Per. *sātrāp*) the ruler of a satrapy or prov. of anc. Per. The old S. imitated the absolutism and the tyranny of their royal masters, and on the decline of the old kingdom some of the satrapies became independent monarchies.

**Sattherthwaite** (THOMAS EDWARD), M. D., b. at Spuyten Duyvil, N. Y. Mar. 26, 1843, grad. at Yale 1864 at the Coll. of Phys. and Surgeons, N. Y. 1867; served as commissioned surgeon in the Franco-Gr. war; is surgeon to Demilt Dispensary, microscopist to St. Luke's Hospital, and pathologist to the Presb. Hospital, N. Y., and has pub. *Bacteria, their Nature and Relation to Disease*, and *On the Structure and Development of Connective Substances*, to which was awarded the alumni prize of the Coll. of Phys. and Surgeons.

**Saturday** [with the Romans *Dies Saturni*, "Saturn's day"], the 7th and last day of the week, is the Jewish Sabbath, and is called *Dies Sabbati* in the R. Cath. breviary.



**Sat'urn.** The planet Saturn is the 6th in order of distance from the sun, and the 3d of the superior planets. It travels at a mean distance of 872,137,000 m. from the sun, but the greatest and least distances differ from the mean distance by nearly 49,000,000 m., being respectively 920,973,000 m. and 823,301,000 m. He revolves in his orbit in a period of 10,759.2198 days, or 29 yrs. 167.2 days. His synodical period, or the interval between successive oppositions, exceeds a yr. by about 12½ days on the average. His volume exceeds the earth's about 700 times, but his mean density is so small that his mass only exceeds hers about 90 times. His mean diameter is about 70,000 m., his compression about  $\frac{1}{10}$ , so that the polar diameter is about 3500 m. less, and the equatorial diameter about 3500 m. greater.

S. is distinguished among all the planets by the remarkable complexity of his structure and the number of subordinate bodies over which he bears sway. His gigantic orb is girt about by a mighty system of flat rings, the span of which from outside to outside amounts to 167,000 m., or more than 6 times the circumference of the earth. There are 2 chief bright rings, the outermost nearly 10,000 m. in width, the innermost about 17,500 m. in width, while between them there is a gap about 1500 m. across. Thus, the entire breadth of the system of bright rings amounts to nearly 28,910 m. Inside the system of bright rings there is a dark ring (discovered by the elder Bond of Harvard Observatory, Cambridge, U. S.), which has a breadth of about 8700 m. Between this ring and the planet intervenes a space more than 10,000 m. in breadth. The planet is attended by 8 satellites, travelling at distances ranging from 3.96 to 64,359 radii of S., so that the actual span of the orbit traversed by the outermost satellite amounts to more than 4,500,000 m. This is the largest subordinate scheme within the planetary system. The 6th satellite, in order of distance from S., is about 3000 m. in diameter, so that it is nearly as large as Mercury. The outermost is about as large as the least of Jupiter's satellites; the rest are smaller; and, somewhat singularly, the satellite which travels between the 6th and the outermost is the least of all, and can scarcely be discerned save in the most powerful telescopes. The globe of S. is marked, like that of Jupiter, by belts, but they are less distinct. The tint of the planet as a whole is yellowish, but the belts show considerable variety of color. An equatorial belt, nearly always seen, has a creamy-white color; the dark belts on either side are commonly cinnamon-colored; while the polar regions show a faint tinge of azure. [From orig. art. in *J.'s Univ. Cyc.*, by R. A. PROCTOR, F. R. A. S.]

**Saturn,** a mythical king of It., settled on the Capitoline Hill, which was also called the Saturnian Hill; introduced agriculture and social order among the aboriginal inhabs., and instituted the Golden Age.

**Saturnalia** [Lat.], the old It. festival of the god Saturn, celebrated in anc. Rome with feasting and mirth. Slaves were permitted freedom of speech and act, and all classes threw off care and toil. The festivities of the old Christmas, of Twelfth Night, and of the Carnival seem to have borrowed much from the Rom. S.

**Saturninus** (LUCIUS APFLEPIUS), one of the most violent demagogues of anc. Rome, was quaestor in 104 B. C.; stationed at Ostia to superintend the provision of Rome with corn; filled the position so badly that he was superseded by the senate; immediately joined the party of Marius. In 100 B. C. he was tribune for the second time, securing his election by murdering his competitor; made the most extravagant propositions of distribution of lands in Gaul, of the establishment of colonies, of a fixed price for corn, etc. In the election campaign of the following yr. new murders and frauds were committed by him and his party; he was stoned to death by a mob.

**Sat'yr** [Gr. *Σάτυρος*], one of a class of imaginary beings in the Gr. mythology, rough and rude woodland divinities, much dreaded by the simple rustics. They were bristly and uncouth, lustful and drunken beings. Silenus was the leader of the S., themselves often called Sileni.

**Sauerkraut**, sour'kraut [Ger. "sour cabbage"], an article of food prepared by shredding cabbages, adding some salt, pepper-corns, cloves, caraway, etc., and allowing the whole to ferment under pressure. The juice is poured off from time to time, and strong brine is added.

**Sau'gerties**, Ulster co., N. Y., on R. R. and Hudson River at the mouth of Esopus Creek, has extensive manufacturing of quicklime, cement, and bricks; ships agricultural products largely. Pop. 1870, 3731; 1880, 3923.

**Sauk Centre**, Minn. See APPENDIX.

**Saul**, the first king of Israel, a son of Kish, of the tribe of Benjamin, was anointed by Samuel; fought with great success against the Philistines, Moabites, Ammonites, Edomites, and Amalekites; became possessed of an evil spirit; fell, together with 3 of his sons, in the battles of Mt. Gilboa against the Philistines, about 1055 B. C.

**Saulsbury** (WILLARD), b. in Kent co., Del., June 2, 1830, was admitted to the bar 1845; was atty.-gen. of Del. 1850-55, and U. S. Senator 1859 to 1871, when he was succeeded by his brother Ezra (b. Dec. 29, 1817), who was re-elected 1883 for 3d term; another brother, Govt., was gov. of Del. 1865-71.

**Sault de St. Marie**, Mich. See APPENDIX.

**Saunders**. See SANDAL-WOOD and SANDAL-WOOD.

**Saunders** (EPHRAIM DOD), D. D., b. in Morris co., N. J., Oct. 31, 1809, grad. at Yale 1831, in theol. at Princeton; was pastor of a Presb. ch. in Goochland co., Va., for 16 yrs., and afterward for a short time at Pottstown, Pa.; founded at W. Phila., about 1857, the Saunders Inst., a highly efficient classical school for boys. Among the teachers was his only son, COURTLAND, b. in Va. in 1841, author of *A New System of Latin Paradigms*, with a *Synopsis of Declensions*; entered the Union service as capt. in the Corn Exchange regiment, and was killed at Antietam 1862. Dr. S. gave in 1870 the building and grounds of the inst. to found the Presb. Hospital of Phila. as a memorial of his son. D. Sept. 13, 1872.

**Saunders** (PRINCE), b. at Thetford, Vt., about 1775, a

negro, who received an excellent education; taught school at Colchester, Conn., and at Boston; went to Hayti 1807; became supt. of education; was the author of the criminal code of Hayti; visited Eng. in an official capacity. Returning to the U. S., he studied theol., became minister of a colored ch. in Phila., and pub. *Documents relative to Hayti, A Memoir on Slavery, and Haytian Papers*. He ultimately went back to Hayti, where he was atty.-gen. at his death, Feb. 12, 1839 (or 1840).

**Saunders** (ROMULEUS M.), b. in Caswell co., N. C., in Mar. 1791, studied at the Univ. of N. C., but did not graduate; admitted to the bar in Tenn. 1812; returned to N. C.; was a member of the legislature 1815-20, and speaker of that body 2 yrs.; M. C. 1821-27 and 1841-45; atty.-gen. of N. C. 1828, pres. of the board of coms. on claims against Fr. 1835, judge of the supreme court of the State 1835, minister to Sp. 1846-50. D. Apr. 21, 1867.

**Sau'ry Pike**, or **Skipper** (*Scomberesca saurus*), a European marine fish of the family Scomberesocidae, represented on our Atlantic coast by *S. storeri*, one of the so called bill-fishes. These fishes go in great shoals, and leap far above the surface of the water. Although small, they are esteemed for the table.

**Saussure**, sô-sûr, de (HORACE BÉNÉDICT), b. at Conches, near Geneva, Feb. 17, 1740, appointed prof. of physics and philos. at the Univ. of Geneva in 1782; commenced a series of scientific mt.-excursions, crossing the Alps 14 times by 8 different routes, ascending Mont Blanc in 1787, Monte Rosa in 1789, and visiting the Jura, Vosges, and Auvergne mts. The result of these voyages was a multitude of the most valuable observations. Afterward appointed prof. of nat. hist. at the central school of the dept. of Léman. D. at Geneva Jan. 23, 1799.

**Savage** (JAMES), LL.D., b. at Boston, Mass., July 13, 1784, grad. at Harvard 1803, commenced the practice of law 1807; sat in both houses of the Mass. legislature, in the executive council, and in the constitutional convention of 1820; filled several municipal posts at Boston; was official orator July 4, 1811; contributed to the *N. Amer. Review* and the *N. Eng. Magazine*; conducted for 5 yrs. the *Monthly Anthology*; edited Paley's *Works*, several vols. of *Amer. State Papers*, etc.; issued several genealogical, historical, political, and controversial pamphlets, and pub. Gov. John Winthrop's *Hist. of N. Eng.*; was influential in procuring the publication of Gov. Hutchinson's *Hist. of Mass.*, and compiled a *Genealogical Dict. of the First Settlers of N. Eng.*, showing Three Generations of those who came before May 1692. D. Mar. 8, 1873.

**Savan'nah**, Ill. See APPENDIX.

**Savannah** [Sp. *sabana*, a "sheet"], a grassy plain in a tropical region, yielding pasture in the wet season, and often having a growth of under-shrubs. It corresponds to the prairie of more N. lats.

**Savannah**, important R. R. and commercial centre, cap. of Chatham co., Ga., is one of the prin. cities in the State. It is on a level plain on the S. bank of Savannah River, 50 ft. above the sea and 18 m. from it by river.

**Modern Changes**.—Since the close of the c. war a system of drainage has converted a great area of waste land into valuable property. From the Ga. Central R. R. grew the ocean steamship co. which converted a useless marsh on the W. extremity of the city into magnificent docks and wharves, with a capacious steam elevator. The Savannah, Florida and W. R. R., in E. end of S., affords fine facilities for storage and forwarding of lumber and naval stores. The Savannah River can accommodate vessels of almost any draught.

**Streets, Buildings, Etc.**—The streets are generally wide, with rows of large water-oaks lining the sides of each. The most prominent public buildings are the U. S. custom house, the city hall, and the Masonic temple. S. has 3 noted monuments—Pulaski, Greene, and Confed.—also a fine park on the S. border, and many smaller parks and squares.

**Public Free Schools**.—S. has a very superior free school system, which includes the colored pop.

**Commerce and Finances**.—S. is second among the cotton-exporting cities, being next to New Orleans. Steamship lines connect the city with New York, Baltimore, Phila., and Boston, while European freight steamers are frequent visitors. S. also ships quantities of lumber, timber, and naval stores. The foreign exports for the yr. ending Aug. 31, 1882, were 336,486 bales upland cotton, valued at \$18,117,831; 2137 bales sea-land cotton, valued at \$178,560; 168,406 barrels rosin, valued at \$408,418; 1,635,250 gals. spirits turpentine, valued at \$736,593; 14,675,579 ft. lumber and 2,083,737 ft. timber, beside other merchandise. The coastwise exports (to points in U. S.) for the same period were in part as follows: Upland cotton, 394,833 bales; sea-land, 15,404 bales; lumber, 57,368,627 ft.; timber, 8,735,854 ft. The total receipts of cotton at S. for the yr. ending Sept. 1, 1882, were 738,867 bales of upland and 17,607 bales of sea-land. S. has 1 national and 3 private banks, 3 daily and 2 weekly newspapers, and 1 monthly agricultural journal.

S. was settled in 1733 by the Eng. under Gen. James Oglethorpe, who found here the Yamacraw tribe of Indians. Pop. 1880, 30,709; 1885, about 38,000. JAMES A. DOYLE.

**Savannah**, on R. R., cap. of Andrew co., Mo., 14 m. N. of St. Joseph. Prin. business, farming and stock-raising. Pop. 1870, 1257; 1880, 1206.

**Savannah River** forms the boundary-line between Ga. and S. C. From its source, at the junction of the Tugaloo and Keowee rivers, to its mouth on Tybee Roads it has a channel length of 450 m., while the distance in a direct line is only 250 m. With its tributaries it drains an area of over 8000 sq. m. At Savannah the mean rise and fall of tide is 6½ ft. The river is now navigable to Savannah for vessels drawing 18 ft. of water, and by small vessels to Augusta, 231 m.

**Savary**, sah-vah-re' (ANNE JEAN MARIE RENÉ), duke of Rovigo, b. at Marçq, dept. of Ardennes, Apr. 26, 1774; entered the army in 1789; fought on the Rhine, and in Egypt; became aide-de-camp to Nap.; was used by him as much in diplomatic as in military affairs. In 1802 he was placed at



the head of the secret police, and discovered the conspiracy of Cadoudal. In 1804 he presided over the execution of the duke of Enghien. His greatest exploit was the victory at Ostrolenka (Feb. 16, 1807) over the Russ., for which the emp. made him duke of Rovigo. His greatest diplomatic success was the negotiation in 1806 with Charles IV. of Sp. From 1810 to 1814 he was minister of police. In 1823 he left Fr., having fallen out with the Fr. court on account of his *Sur la Catatrophe de Mgr. le Duc d'Enghien*. Louis Philippe recalled him, and made him commander-in-chief of Algeria Dec. 1, 1831. Wrote *Mémoires*. D. June 2, 1833.

**Save**, *sahv*, a river of Aus., rises in the prov. of Carniola, flows through Croatia, forms the boundary between Slavonia and Tur., and joins the Danube at Belgrade after a course of 550 m.; navigable 200 m. from mouth.

**Savigny**, *sah-vén-yé'*, **VON** (KARL FRIEDRICH), b. at Frankfort Feb. 21, 1779; studied jurisprudence at Marburg, Göttingen, Leipzig, Halle, and Jena; was appointed prof. at Marburg in 1800, at Landshut in 1808, at Berlin in 1810; minister of justice in 1840; retired in 1848. He was the leader of the historical school in jurisprudence. Wrote *Traité de Possession, Vom Beruf unserer Zeit für Gesetzgebung und Rechtswissenschaft, Geschichte des römischen Rechts im Mittelalter*, etc. D. Oct. 25, 1861.

**Saville**, *sav'il* (Sir HENRY), b. at Over Bradley, near Halifax, Eng., Nov. 30, 1549; became Gr. and mathematical tutor to Queen Elizabeth 1573, warden of Merton 1585, provost of Eton 1596; knighted 1604; founded at Ox. the Savilian professorships of geom. and astron. 1619. He edited the *Lat. Chronicles of Eng. hist.* D. Feb. 19, 1622.

**Sav'in**, the *Juniperus sabina*, a berry-bearing, almost prostrate shrub of the order Coniferae, growing in N. regions, common in Canada, but scarcely so in the U. S. The young red cedar is sometimes called savin. It has a strong, almost fetid scent, which frequently causes headache. Its leaves abound in an acrid essential oil isomeric with turpentine oil. S. oil and tops are sometimes used by abortionists, but if effectual it is only so at the utmost peril of the patient's life.

**Savings Banks**, insts. devised by philanthropists for receiving and securely investing the moderate savings of industry, under provisions for their repayment on demand or at short notice managed by persons having no interest in the profits of the business, which are divided at stated intervals among the depositors. Their ultimate purpose was to abate the evils of extreme poverty.

**Origin and Early History**.—The earliest exposition of a practicable scheme, embracing the distinctive features of the modern S. B., was made by Jeremy Bentham, who in 1797 proposed a system of "frugality banks," to constitute a branch of the pauper system of the govt. His plan failed to receive favorable consideration from Parl. Malthus in 1803 advocated a system of county banks to facilitate the saving of small sums. A more pronounced movement for the establishment of S. B. was made in Parl. in 1807 by Mr. Samuel Whitbread. His bill provided for a "fund and assurance office for investing the savings of the poor." This was to be, in fact, a national S. B., under the direction of govt. officers, to which small sums of money might be transmitted free through the P.-O. from any part of the kingdom. These were to be invested in govt. securities, and repayment by the sale of securities when required was provided for. The measure was devised and formulated by Patrick Colquhoun, a local police magistrate of Lond. While these discussions were in progress, an active philanthropy had given form to the distinctive S. B. idea. For the suggestion and practical inception of this the credit unquestionably belongs to the Rev. Henry Duncan of Ruthwell, Scot. He organized a S. B. in his own parish of Ruthwell in 1810. The Edinburgh S. B. appears to have been established in 1814. It adopted a more popular form of organization than that of Dr. Duncan, and this became the model upon which S. B. were organized thereafter.

**Inception and Course of Legislation**.—In 1817 two acts were passed by Parl. designed to regulate these insts. in Ire. and Eng. There was no legislation affecting this interest in Scot. until 1835. These acts were repealed in 1823 by a new act. This statute was amended from time to time until 1863, when an entire revision of the laws relating to S. B. was effected. The course of the legislation affecting this interest may be outlined as follows: Trustees have at all times been prohibited from deriving any profit from the transactions. The moneys received were to be deposited in the Bank of Eng. or of Ire. to the credit of the coms. for the reduction of the national debt, and by them were to be invested in 3 per cent. bank annuities. The govt. guaranteed to the trustees a specific rate of interest on the moneys deposited by them to the credit of the coms. This rate, under the acts of 1817, was £4 11s. 3d. per cent., but was subsequently reduced to £3 16s. 10d., and finally to £3 5s. per cent., per annum. The rate of interest to be paid to depositors was at first left to the discretion of the trustees, but was afterward limited at not exceeding £3 6s. 10d. per cent. Deposits were limited originally to £100 the first yr., and £50 in any yr. thereafter; this was afterward changed, and the limit fixed at £20 in any yr. and £150 in all, or £200 including interest. Depositors were also prohibited from keeping an account in more than one S. B., but might transfer an account from one bank to another.

**The internal administration of S. B. in G. Brit.** in respect to methods of business and the facilities afforded to depositors in their dealings is far from uniform. Out of 638 S. B. doing business in 1861, only 20 were open daily, and some of these allowed moneys to be withdrawn on only 2 days in the week; others open new accounts only on certain days. In nearly all S. B. outside of Scot. notice is invariably required before any part of a deposit can be withdrawn.

**Post-Office Savings Banks**.—A system of P.-O. S. B. was established in 1861. Certain P.-O. throughout the United Kingdom are designated at which sums of not less than 1s. will

be received for transmission to the central office in Lond. Not exceeding £30 in one yr., or £150 in all, or £200 including interest, is received from any one person. The depositor receives a book in which his deposits are entered, and a receipt for each deposit is also forwarded to him in due course from the central office. The moneys are invested in the public funds, and deposits of not less than £1 receive interest at the rate of 2½ per cent. per annum. The govt. is responsible for the repayment of all moneys received. A depositor may apply at any P.-O. S. B. in the kingdom for the purpose of withdrawing money, and may direct payment of the same to be made to him at that or at any other P.-O. S. B. His order is forwarded to the P. M.-gen., by whom a warrant for the designated amount is drawn upon the P. M. where payment is to be made, which is forwarded to the depositor, who presents the same, together with his book, and receives his money.

**Penny savings banks, military savings banks, and savings banks for seamen** have been established as auxiliaries of the gen. system, for the purpose of meeting the special needs of classes for which the ordinary S. B. did not hold out adequate inducements or facilities. The penny S. B. have quite commonly been tributary to the larger insts., making them the depositories of their aggregate accumulations. The military and seamen's S. B. have been conducted independently.

**SAVINGS BANKS IN THE UNITED STATES**.—The first organization of which we have record was effected in the city of New York Nov. 23, 1816. The first to go into practical operation was in Phila., which as a purely voluntary association commenced receiving deposits Dec. 2, 1816, which would indicate an organization effected prior to that in New York. The first to be organized and commenced business in Boston Dec. 13, 1816, and it organized and commenced business in Apr. following. The S. B. of Baltimore opened as a voluntary association for receiving deposits on Mar. 16, 1818, and was incorporated in Dec. of that yr. The Phila. Saving Fund Society was incorporated Feb. 25, 1819, and the Bank for Savings in New York, which never received deposits under its voluntary organization, was incorporated Mar. 26, 1819, and commenced business on the 3d of July following. The following were also incorporated in 1819: Society for Savings, Hartford, Conn.; S. B. of Newport, Providence Inst. for Savings, Bristol Institution for Savings, all in R. I.; and the S. B. of Portland, Me. The subject was also considered in the legislature of N. H. in this yr., but no result was reached until 1823, when the Portsmouth S. B. was chartered. The foregoing all are in existence at the present time except the Bristol, which did not organize, and the Portland, which failed in 1838.

**The facilities afforded to depositors** are greatly superior to those of Eng. S. B. under the old system. With rare exceptions, S. B. in this country are open 4 or 5 hours daily, and very many of them on one or more evenings in each week. When open it is for the transaction of any kind of business. Deposits are practically payable on demand, though the right to require notice is reserved.

**The plan of organization of S. B.** is not altogether uniform. In some States there is a large body of incorporators, empowered to enlarge their number indefinitely, who elect from their number annually a board of trustees or directors, to whom the management of the inst. is committed. In others the incorporators are a defined and limited number, who are themselves the trustees and responsible for the management. These are commonly empowered to fill vacancies that occur, though in some cases this is done by designated authority outside of the board. In the States outside of N. Eng., N. Y., and N. J., S. B. are commonly organized with a capital stock. In Md. and Pa. both the mutual and stock systems prevail. In whatever else they have differed, S. B. in the U. S. have been alike in being conducted upon a plan of independent self-support. They have not been the recipients of private nor of govt. bounty. The interest they have received and disbursed has been earned, not awarded. They have conferred great and lasting benefits.

**Investments**.—While there is much diversity among the several States in their policy concerning investments, the best-approved securities are the stocks of the U. S. or of States in undoubted credit, the bonded obligations of cities and counties, and mortgages of real estate. [From orig. art. in *J. of the Univ. Cyc.*, by E. W. KEYES.]

**Savonarola** (GIROLAMO), b. at Ferrara Sept. 21, 1452. Before the age of 20 he had become saddened by the vices of the court of Ferrara, and by the degraded state of morals and religion around him, and in 1475 he entered the Dominican convent in Bologna. In 1482 he was sent to preach in Tuscany, where Lorenzo de' Medici was then at the height of his power. It was not likely that a conscience too sensitive to endure the immorality of Ferrara would be more tolerant of the state of things then existing in Florence; the voice of Fra Girolamo was soon heard in condemnation of her vices and those of her rulers, and he was listened to by thousands of citizens who thronged the chs. where he preached. In 1491 he was elected prior of San Marco. His unsparing rebukes did not fail to rouse hostility against him. He launched denunciations against the corruption then scarcely less conspicuous in the higher ecclesiastics than in their head, Pope Alexander VI. His followers in Florence (known as *Piagnoni*) multiplied, his enemies (the *Arrabbiati*) grew bitter and fiercer. In 1495 he was summoned to Rome, but evaded the summons. Finally, an order from the Vatican forbade him to preach. He submitted at first, then disobeyed. The sentence of excommunication followed. The *Arrabbiati* got possession of Florence, Fra Girolamo's letters to foreign sovereigns, urging them to call a council to dethrone the Borgia and elect a new pope, fell into the hands of his enemies. On Apr. 7, 1498, occurred the attempt at a "trial by fire," and on the night of the following day he, with 2 of his brethren, was conveyed to



the dungeons of the Bargello, and brutally tortured the same night. The pope threatened Florence with every form of vengeance if she spared the friar. Sentence of death was pronounced on May 22, 1498, and the next day he and his 2 friends were publicly hanged and burned in the Piazza della Signoria and their ashes thrown into the Arno.

**Savory**, the name of *Satureja horensis* (summer S.) and of *Satureja montana* (winter S.), labiate sweet-herbs of Old-World origin.

**Savoy**, formerly a political division of the kingdom of Sardinia, and originally the family possession of the dynasty now reigning in it. In 1860 it was ceded to Fr., and is now divided into the 2 depts. of Savole and Haute-Savole. S. is the loftiest mt.-region of Europe, containing the highest peak, Mont Blanc. Bounded N. by the Lake of Geneva and E. by Piedmont, it is covered by the Graian Alps. It contains very little cultivable land, but that which it contains is planted with vines and mulberry trees, and produces wheat enough for home consumption. Coal, lead, iron, etc. are found, and the pastures which cover the mts. are very important, and feed large herds of cattle and sheep; dairy-farming is the prin. occupation. The area of the 2 depts. is Savole, 2282 sq. m., with 266,498 inhabs.; Haute-Savole, 1319 sq. m., with 274,087 inhabs. Cap. of Savole, Chambéry; of Haute-Savoy, Annecy.

**Savoy, The**, in the Strand, Lond., is a spot remarkable for its anc. buildings and its historical associations. The Palace of the Savoy, on the side of the river Thames, was built in the yr. 1245 by Peter, earl of Savoy, and Richmond, uncle to Eleanor, queen of Henry III. It was burned in Wat Tyler's insurrection. The building remained a heap of ruins until the close of the reign of Henry VII., who determined to erect on the site a house "to harbor 100 poor people, sick, or lame, or travellers to be furnished with lodging, food, firing, and attendance for a certain time." It was made, in fact, a sort of casual ward, and became a refuge for all sorts of vagabonds. This circumstance led to the suppression of the establishment in the reign of Edward VI., but it was restored under Queen Mary. The chapel of the palace became a ch. in the reign of Queen Elizabeth, and the dist. of the S. was constituted a distinct parish. The hospital suffered great abuse at that period, but it continued to exist until the commencement of the reign of Queen Anne, when it was finally dissolved and the offices of master and chaplains extinguished. The buildings were then left to fall into decay, and upon the erection of Waterloo bridge, the first stone of which was laid in 1811, the walls of the edifice were swept away, and the chapel remained the only relic of the anc. pile of buildings. The chapel of the S. was burned in 1860, and beautifully restored at the cost of Queen Victoria. It consists of a nave without aisles or chancel. In the S. chapel many distinguished personages are buried.

**Savoy Conference, The**, was held soon after the Restoration, and arose out of the state of parties after the dissolution of the commonwealth. The Episcopalians were determined to restore the Ch. of Eng. to what it was before the c. war, but the Presbys., who mainly had been in possession of ch. benefices and ch. power for many yrs., contended for some modification of the former system. A royal commission was issued on Mar. 25, 1661, appointing certain divines to confer together. The commission gave authority to review the Book of Common Prayer, to compare it with anc. liturgies, to consult respecting exceptions made to it, and by agreement to make alterations such as would satisfy tender consciences and restore unity to the Ch. The instrument appointed "the master's lodgings in the Savoy" as the place of meeting. As the terms of the commission specified advice and consultation as purposes of the meeting, friendly conference seemed necessary, but the Epis. party manifested no disposition for anything of that kind. The Conference lasted 4 months, and the parties finally separated without arriving at any conclusion.

**Savoy, Declaration, The**, an ecclesiastical document, so called from its having been framed by a number of ministers who met in the Savoy hospital for the purpose, Sept. 29, 1658. As to doctrine, the declaration is substantially the same as the Westminster Confession. Its specialty consists in its outline of ecclesiastical order.

**Saw-Fly**. See HYMENOPTERA.

**Sawyer** (FREDERICK A.), b. in Boston, Mass., Dec. 12, 1832, grad. at Harvard 1844; became prin. of the normal school at Charleston, S. C., 1859; returned to N. Eng. during the c. war; was appointed collector of internal revenue at Charleston 1865; took an active part in the reconstruction of S. C.; was U. S. Senator from that State 1867-73, and assistant sec. of the treas. 1873-74.

**Sawyer** (LEICESTER AMBROSE), b. at Pinckney, N. Y., July 28, 1807, grad. at Hamilton Coll. 1828; studied theol.; was ordained as a Presb. minister 1832; from 1840 to 1847 was teacher in Central Coll., O., after which he preached in several places; subsequently resided at Whitesboro', Oneida co., N. Y., and was editorially connected with the *Utica Morning Herald*. Author of *Elements of Biblical Interpretation*, *Mental Philos.*, *Moral Philos.*, etc. In 1838 he began a new translation of the entire Bible, which he completed about 1862.

**Sawyer** (THOMAS JEFFERSON), D. D., b. at Reading, Vt., Jan. 9, 1804, grad. at Middlebury Coll. 1829; was pastor of a Univt. ch. in New York 1830-45, and again 1852-61, having in the interval been prin. of the Liberal Inst. at Clinton, Oneida co., N. Y.; taught theol. in the same inst.; resided on a farm at Clinton 1861-69, after which he became prof. of theol. in Tufts Coll., Medford, Mass., an inst. which he had been instrumental in founding (1852), as he had also been in the establishment of the theological dept. of St. Lawrence Univ. (1856). Wrote *The Doctrine of Eternal Salvation and Who is our God? the Son or the Father?*

**Saxe** (JOHN GODFREY), LL.D., b. at Highgate, Vt., June 2, 1816, grad. at Middlebury Coll. 1839; was admitted to the bar

at St. Alban's 1843; practised law in Franklin co. 1843-50; was ed. of the Burlington *Sentinel* 1850-56; was State atty. of Vt. 1 yr.; was Dem. candidate for gov. 1860 and 1860; became a resident of Brooklyn, N. Y. Author of several vols. of humorous poems.

**Saxe** (MAURICE). See MAURICE, count of Saxony.

**Saxe-Altenburg**, duchy; area, 509 sq. m.; pop. 155,036; budget of 1883, 2,418,177 marks; public debt, 1,663,773 marks; situated N. E. of the Thüringian Forest, and consists of 2 separate parts, called the E. and W. dist. Cap. Altenburg.

**Saxe-Coburg-Gotha**, duchies; area, 816 sq. m.; pop. 194,716, of which 230 sq. m. with 56,728 inhabs., belong to Coburg; 586 sq. m., with 137,988 inhabs., to Gotha; separated from each other by the Thüringwald—Coburg to the S. and Gotha to the N. Caps. Coburg and Gotha. Although standing under one govt., the administration is separate. Coburg has a budget of 986,200 marks, with a debt of 4,016,000; Gotha, a budget of 2,584,121, and a debt of 7,489,684. Since the accession of Duke Ernst II. in 1844, these 2 small duchies have formed the starting-point for much intellectual progress. The union of the 2 countries dates from 1836.

**Saxe-Lauenburg**. See LAUENBURG.

**Saxe-Melningen-Hildburghausen**, duchy; area, 933 sq. m.; pop. 207,075; budget, 16,528,100 marks; public debt amounted, on Jan. 1, 1883, to 12,940,817 marks; is situated S. of the Thüringerwald. Cap. Meiningen.

**Saxe-Weimar-Eisenach**, grand duchy; area, 1421 sq. m.; pop. 309,577; budget—receipts, 6,049,690 marks; expenses, 5,962,410; the public debt amounted to 6,543,442 marks on Jan. 1, 1883; consists of 3 dists.—Weimar, Neustadt, and Eisenach—situated along the Rhön and the Thüringerwald. Caps. Weimar and Eisenach; univ. at Jena.

**Saxifraga**, *see*, a rather large natural order of exogenous herbs and shrubs, comprising the true saxifragas, hydrangeas, gooseberries, currants, *Philadelphus*, and numerous other plants, many ornamental and some useful.

**Saxifrage** [Lat. *saxifraga*, "the stone-breaker," applied to some plants as growing in clefts of rocks; to others as supposed solvents of stone in the bladder] comprises many alpine and high N. species, some of them highly ornamental.

**Saxons** [Lat. *Saxones*; Celtic, *Sassenach*, *Saisnaig*, perhaps from *Sachs*, a "battle-knife"], a Low-Ger. tribe first mentioned in hist. in 287 A. D., when they appear off the coast of Gaul. Their name survives in Sax., Prus. Sax., the minor Sax. states, etc. We find them early colonists of Normandy and Fr. There is now a large number of so-called S. in Transylvania, descendants of the Low-Ger. colonists introduced in 1148 and 1247 by the Hungarian kings.

**Saxony, Kingdom of**, a part of the Ger. empire, comprising an area of 6777 sq. m., with 2,972,806 inhabs., lies hemmed in between Prus. and Aus. It belongs to the N. Ger. mt.-region,  $\frac{2}{3}$  of the surface being mountainous,  $\frac{1}{3}$  hilly, and  $\frac{1}{6}$  lowland. The prin. river is the Elbe with its affluents, the Black and the White Elster, the Mulde, and the Pleisse. The pop. is very dense. Agriculture is carried on with a high degree of perfection. Wheat, rye, oats, barley, millet, flax, etc. are cultivated. The vine is grown along the Elbe. Cattle-breeding is important; sheep especially are very numerous. The arboriculture is excellent;  $\frac{30}{100}$  per cent. of the total area is covered with forest. Mining is very flourishing. Silver, iron, gold, lead, sulphur, arsenic, zinc, etc. are produced; 52,000,000 cwt. of coal and about 10,000,000 cwt. of brown coal are annually raised. Manufacturing industry is much developed. Linen, cotton, and woollen goods, paper, chemicals, metal ware and machinery, straw goods, porcelain, musical and mathematical instruments are manufactured. Leipzig has large type-foundries and printing establishments. The commerce is also very comprehensive; its prin. centre is Leipzig, which is also the seat of the highest commercial court of Ger. The most important money insts. are the Bank of Leipzig, the Saxon Bank in Dresden, and the Agricultural Bank of Bautzen. The country is better provided with railways than any other part of Ger. Public education stands very high; the numerous educational insts. comprise a univ. in Leipzig, a mining acad. in Freiberg, an acad. of arboriculture at Tharand, a polytechnic school in Dresden, an industrial school at Chemnitz, etc. The govt. is a constitutional monarchy. The reigning king is Albert, who ascended the throne Oct. 29, 1873; the representation of the people is composed of 2 chambers. The finances are in good order. The ordinary revenue for each of the yrs. 1880 and 1881 was returned at 63,759,587 marks, and was balanced by the expenditure; the extraordinary revenue for each yr., likewise balanced by the expenditure, was returned at 1,091,200 marks. At the end of 1883 the public debt amounted to 663,482,550 marks. The army forms the 12th corps of the Ger. imperial army.

In the long period of peace from 1815 up to 1866, S. became very prosperous, though a narrow and short-sighted govt. presented many obstacles to its development. The revolutionary yrs. of 1848-49 brought many great and beneficial reforms. Aug. 9, 1854, King Johann ascended the throne, and both he and his minister, Beust, made a most stubborn opposition to the Prus. policy, and showed a decided partiality for Aus. as the leader of the small states. But the war of 1866 brought the independence of S. in imminent danger, and the king, Johann, saved his crown only by entering the N. Ger. confederacy, over which Prus. presided, by paying 10,000,000 thalers in war indemnity, and by dismissing Beust. The liberal party in S. hailed this event with enthusiasm, but the party consisting of the court, the nobility, and the army officers fought under the leadership of the crown prince, afterward King Albert, as true allies by the side of the Prus., and the interior development of the country has not only kept pace with, but in some respects even advanced beyond that of the rest of N. Ger. [From orig. art. in *J.'s Univ. Cyc.*, by AUGUST NIEMANN.]



**Sax'ton** (JOSEPH), b. in Huntingdon co., Pa., Mar. 22, 1799, received a common-school education. At 18 he went to Phila., and there invented a machine for cutting the teeth of chronometer wheels, an original escapement with a compensating pendulum, and made the clock which still marks the time from the belfry of Independence Hall. He subsequently went to Lond., where he was placed as chief assistant in the Adelaide Gallery, then the great scientific repository, and while there constructed a magneto-electric machine by which the first magnetic spark was produced. He also constructed the apparatus used by Mr. Wheatstone in his experiments on the velocity of electricity in its passage through a wire. He next invented a locomotive differential pulley, by means of which high speed may be given to vehicles by horses travelling at a slow rate, and a medal-ruling machine for tracing lines on metal or glass, representing by an engraving the design on the face of the medal. He returned to Amer. to superintend the construction of the machinery and balances for the Phila. mint, and was placed in charge of the construction of the standard weights and measures for the U. S. He was one of the original corporators of the National Acad. of Sciences. Among his many inventions, the mirror-comparator for comparing and the tracing-machine for dividing standard measures, his deep-sea thermometer, used in the exploration of the Gulf Stream by the U. S. Coast Survey, his self-registering tide-gauge, and his immersed hydrometer deserve especial mention. D. Oct. 26, 1873.

**Saxton** (RUFUS), b. in Deerfield, Mass., Oct. 19, 1824, grad. from the U. S. Military Acad. July 1, 1849, as brevet second lieutenant of artill.; his first service being in Fla. against the hostile Seminoles; from 1855 to 1859 was on Coast-Survey duty, and for a yr. was assistant instructor of artill. tactics at W. Pt. On the outbreak of the war he was stationed at St. Louis, and participated in dispersing the Confed. force at Camp Jackson May 10, 1861; appointed assistant quartermaster U. S. A. May 13, 1861. In Sept. he accompanied the expedition to Pt. Royal, S. C.; appointed brig.-gen. U. S. volunteers in Apr. 1862, he commanded at Harper's Ferry when threatened by Jackson; military gov. of the dept. of the South July, 1862; brevet major, lieutenant-col., col., and brig.-gen. In 1872 he became deputy quartermaster-gen. U. S. A., with rank of lieutenant-col.

**Say** (JEAN BAPTISTE). See APPENDIX.

**Say** (JEAN BAPTISTE LÉON). See APPENDIX.

**Say** (THOMAS), b. at Phila. July 27, 1787, devoted himself to nat. hist.; was one of the founders of the Phila. Acad. of Natural Sciences Mar. 21, 1812; was one of the leading contributors to the *Journal* pub. by the acad.; accompanied Messrs. Macleure, Peale, and Ord in their scientific exploration of the islands and coasts of Ga. and E. Fla. 1818; was chief zoologist to Major Long's expeditions to the Rocky Mts. 1819-20, and to the sources of St. Peter's River 1823; pub. *Astronomical and Meteorological Records and Vocabularies of Indian Languages*; supplied material for James's and Keating's accounts of Major Long's two expeditions, and wrote the zoology for the latter book; issued his prin. work, *Amer. Entomology*, in 3 vrs. vols.; contributed numerous articles to the *Transactions* of the Philosophical Society, to the publications of other scientific bodies, and to *Silliman's Journal*; removed with Macleure and Owen to New Harmony, Ind., 1825; remained there after the separation of his associates, acting as agent of the property; pub. at New Harmony 7 numbers of a great work on *Amer. Conchology*, with colored plates by Mrs. Say. D. Oct. 10, 1834.

**Sayce** (REV. ARCHIBALD HENRY). See APPENDIX.

**Sayre** (LEWIS AUSTEN), M. D., b. in Madison, N. J., Feb. 29, 1820; at the age of 10 was taken to Lexington, Ky., where he was adopted by an uncle; entered the Univ. of Transylvania; grad. there in 1837; in 1839 he entered the office of Dr. David Green in New York; in 1842 took the degree of M. D. in the Coll. of Phys. and Surgeons; appointed resident phys. in 1859 by the mayor of New York, and soon after was elected prof. of orthopedic surgery in the Bellevue Hospital Med. Coll.; in 1832 first excised the head of the os femoris and part of the acetabulum with success; wrote several monographs on orthopedic surgery.

**Sayre** (NATHANIEL C.), b. and ed. in N. J., was admitted to the bar; moved to Sparta, Ga., in 1830; was elected solicitor-gen. of the N. circuit; for a number of yrs. was elected to the legislature, either to the house or senate; was promoted to the bench in his circuit 1845. D. in 1854.

**Scab** [Lat. *scabies*], a disease of sheep much resembling the itch which sometimes afflicts the human species. Like that disease, it is caused by the presence of a minute acarous or spider-like mite. Sulphur ointment, arsenical washes, tobacco-water, and mercurial ointments are all useful.

**Scabiaritic Disease**. See SCABIES.

**Scab/bard-Fish**, a name given to the *Lepidopus argyreus*, a species of the family Trichluridae, distinguished by the elongated, ribbon-like body, pointed head, formidable armed mouth, elongated dorsal and anal, and well-developed and forked caudal fin.

**Scabies**, ska'bi-éts [Lat.], or **Itch**, is a parasitic disease of the skin. It affects chiefly the hands, more especially the webs of the fingers, their inner surfaces, and the back of the hand. Less frequently it extends to the arms, and rarely the feet, legs, and abdomen are affected. The scalp may be invaded, but the face is exempt. This disorder infests children, who receive the peculiar insect from person to person by contact in school or play, and its lodgment is facilitated by neglect to wash perspiration and dirt from the hands. Persistent and annoying itching is experienced. The treatment of S. is to kill the parasites. Remedies producing this end are termed parasiticides. Chief among these is sulphur, in ointment, powder, or vapor. Sulphurous acid is a convenient application. Carbolic acid, kerosene, petroleum, strong alkalies, solution of corrosive sublimate are also efficacious.

**Scad**, a name given in some parts of Eng. to the *Trachurus*

*trachurus* (otherwise called horse-mackerel), a fish of the family Carangidae, distinguished by its elongated, fusiform body, completely plated lateral line, and silvery color. When pickled it is good.

**Scævola**, sev'-o-la, a cognomen common among the members of the plebeian family of the Mucii in anc. Rome, signifying an "amulet." The 2 most prominent members of the family were QUINTUS MUCIUS SCÆVOLA THE AUGUR and QUINTUS MUCIUS SCÆVOLA THE PONTIFEX, both celebrated as jurists, and nearly contemporary. The former, the augur, was *tribunus plebis* in 128 b. c., prætor in 121, consul in 117, and d. soon after the outbreak of the war between Marius and Sulla. The latter, the pontifex, was *tribunus plebis* in 106 b. c., and consul in 95. He was afterward *pontifex maximus*, and during a riot in Rome in 82 between the parties of Sulla and Marius sought refuge in the temple, but was slain by the Marians before the altar.—The surname *Scævola* was also given to a legendary hero in Rom. hist., CAIUS MUCIUS, a patrician, at the close of the 6th century b. c. When Porsenna besieged Rome, S. penetrated his camp and killed one of his attendants, whom he mistook for the king. Seized and brought before Porsenna, he confessed that he was one of 300 young Roms. who had sworn to free Rome from its dangerous enemy by killing him; and when Porsenna threatened to burn him alive if he did not mention the names of the other conspirators, he thrust his right hand into the fire and held it there till it was consumed. Hence the surname *Scævola*, "the left-handed."

**Scaglio'la** [It. dim. of *scaglia*, a "scale"], an imitation of marble, made by mixing ground gypsum with glue, coloring it, applying it to the surface to be marbled, and setting into the soft mass, if it be desired, bits of various ornamental stones. When hard the surface is smoothed and polished.

**Scal'la** [Lat. *Scaligeri*], the name of a celebrated Italian family which reigned in Verona from 1260 to 1387. The name first occurs in the hist. of Verona in the middle of the 11th century, and after a long series of internal disturbances, tyranny alternating with anarchy, MASTINO DELLA SCALA succeeded in 1260 in making himself master of the city. Under Cangrande (1311-29) the fortune of the family culminated. At his court lived Dante, and many of the most magnificent architectural monuments of the city were erected during his reign. But most of his successors were infamous tyrants, and in 1387 Galeazzo Visconti of Milan expelled Antonio della Scala.

**Scald**. See BURNS AND SCALDS.

**Scald Head**. See FAVUS.

**Scale**, in music, the name applied to the regular series of sounds, or degrees on the stave which form the gamut. The S. in its simplest form consists of 7 steps, counted upward in regular order from a root or prime, to which series the 8th is added to complete the octave. By reverse motion the same notes form the descending S. The *diatonic S.* is that which consists of the tones and semitones of the octave in their natural order and relation. Of the diatonic S., only 2 varieties are in use in modern music—viz. the *major S.*, commencing on C, and the *minor S.*, commencing on A. The word *SCALE* means also the entire range or compass of sounds producible by any given instrument, as the S. of the violin, flute, organ, or pianoforte.

**Scale of Numbers**, a conventional expression of the law of relation between units of different orders. There are two kinds of S.—*uniform* and *varying*. In the uniform S. a unit of any order is equal to a unit of the next lower order multiplied by a fixed number, called the *modulus*. In the *varying S.* the law which connects the successive units varies in passing from order to order. The uniform S. is used in writing abstract numbers, and, subordinately, in writing compound numbers; the *varying S.* is employed exclusively in compound numbers. The scales of compound numbers in the *metric system* are essentially decimal.

**Scales**. See BALANCE AND WEIGHING-MACHINES.

**Scaliger**, ska'l'i-ger, the name of 2 famous scholars, father and son. (1) JULIUS CÆSAR, b. Apr. 23, 1484, at Padua, attained a great reputation both as a scholar and as a poet, and wrote commentaries on Hippocrates, *De Insomniis*; Aristotle, *De Plantis*; Theophrastus, *De Causis Plantarum*; and a grammatical work, *De Causis Linguae Latine* (1540). D. Oct. 21, 1558.—(2) JOSEPH JESUS, the tenth son of Julius Cæsar, b. at Agen Aug. 4, 1540. His learning was immense. He spoke 13 languages, and read many others with facility; the Gr. poets he knew by heart. Wrote *De Emendatione Temporum* and *Theosophia Temporum*. D. Jan. 21, 1609.

**Scallop**, skol'lop [O. Fr. *escalope*], a name given to various species of the family Pectinidae, all of which agree in having a suborbicular shell, which is more or less equivalent and provided with ear-like expansions from the enlarged hinge, which is itself nearly straight. The species are numerous, and the animals of many are used to a greater or less extent as food.

**Scam'mony** [Gr. *σκαμνία*], a cathartic drug obtained from *Convolvulus scammonia*, a twining plant of the natural order Convolvulaceæ, indigenous in Gr., Syria, Anatolia, and S. Rus. The root of this convolvulus contains a milky juice, which, collected from the cut surface of a fresh root, dries into a slate-colored lump, hard and brittle, and constitutes the drug in question.

**Scand'erbeg**, whose true name was GEORGE CASTRIOT, was b. at Croia about 1410, the youngest of the 4 brothers, who were all delivered up as hostages to Amurath II. in 1423 when he invaded Epirus. The 3 elder brothers d. by poison, but the sultan became so fond of George on account of his beauty that he had him ed. in Islamism as his own son, and gave him the name of ISKANDER BEG ("Prince Alexander"). When in 1432 Amurath II. incorporated Epirus as a Tur. province, the young man began to dream of vengeance. In 1443 he invaded Hungary as second in command of a great Tur. army. In the first battle S. fled with a few followers to Croia, where he abjured Islamism



and called his countrymen to revolt against the Turks. The whole country arose; with an army of 15,000 men he marched out to meet the Tur. army of 40,000, and gained brilliant victories; Amurath was defeated, and Mohammed II., who succeeded him in 1450, had no better luck. By the truce of 1461 he kept his paternal heritage. In the following yr. he went to It. to aid the pope against John of Anjou, and here he gained the great battle of Troja (1462). But the pope persuaded him to break the truce with the Turks, and the war against Mohammed recommenced. But Jan. 17, 1467, he d., and the country was subjugated by Mohammed II.

**Scandia, Kan.** See APPENDIX.

**Scandinavia** consists of Nor., Swe., and Finland. An arm of the White Sea, running through to the Gulf of Finland, formerly separated Finland from the plains of Rus. Political circumstances have connected Finland with Rus., and the name *Scandinavia* now generally means simply the peninsula comprising Swe. and Nor. The isthmus which connects S. with Finland is 70 geographical m. broad; at all other points the country is surrounded by the sea—N. by the Arctic Ocean, W. by the Atlantic, S. by the N. Sea, which communicates with the Baltic through Skagerrak, Kattegat, and the Sound, and E. by the Baltic. The area amounts to 1500 geographical sq. m. The coast formation presents great varieties. The N. and W. coasts are rocky and steep. The mts. which traverse the peninsula rise nearly perpendicularly out of the sea, which enters the long, narrow valleys (*fjorde*). The entrances to these fjords are generally girded by a multitude of rock-islands (*Skärgeard*). Sognefjord and Hardangerfjord are the 2 largest and most beautiful fjords of the whole coast; the N. Cape, a steep wall of rock 1800 ft. high, one of the most striking points, and Lofoden, a group of islands, noticeable as the prin. scene of the Nor. fishery. The climate is mild on account of the presence of the Gulf Stream. The S. coast, from Stavanger to Christianiafjord, shows a similar formation; on the other side of Christianiafjord the fjord formation ceases, but the steepness and the Skärgeard continue on a smaller scale. The E. coast stretches for 160 geographical m. to the N. nearly in a straight line, and here the harbors are generally situated at the mouths of the rivers. With respect to its surface formation, the peninsula consists of 2 divisions, of which the one comprises that part of Swe. which stretches to the S. of a line drawn between the lakes of Mälär and Venern. This region contains in its centre a low mt. or hill land, rich in iron. The plains which extend to all sides are fertile, though in many places the bottom rock looks through the thin layer of vegetable earth. Extensive forests and lakes occupy the rest of the surface. The other division comprises the mightiest mts. of Europe, not equalling the Alps in elevation, but covering nearly double the area. The Scandinavian mountains form a continuous plateau. To the W. this plateau breaks off so abruptly that no large river could be formed; while to the E. it slopes down gradually through a number of terraces to the coast-plains of the Bothnian Gulf. Here the rivers generally expand into long lakes, and then pass on in falls and rapids. The watershed is everywhere elevated far above the tree-line, and especially around Hardangerfjord and Sognefjord it bears extensive snow-fields, from which magnificent glaciers descend, often close to the Atlantic. It consists of vast plateaux (*fjeld*, *heid*, or *vidda*), covered with meagre pastures or swamps. The valleys are narrow and deep, often cut into the plateau like glacier-fissures, and entirely without lateral depressions or passes. In consequence of this surface formation the pop. is not gathered into v., but scattered in single houses throughout the narrow valleys. The average elevation of the Scandinavian mts. ranges in the N. between 1000 and 2000 ft. Farther to the S. the elevation increases. In the Dovrefjeld, the highest peak, Sneehattan, rises 7099 ft. S. W. of Dovrefjeld stretch Jötunfjeld and Hardangerfjeld, where the highest peaks rise close to the sea, such as Store Galdhøpiggen, 8017 ft. Farther to the S. the mts. gradually decrease. The Scandinavian mts. are rich in useful minerals. There is very little coal, but the iron ore is inexhaustible. Copper and silver are found. The main body of the rock consists of granite, the upper layer often of mica-schist. On the S. coast of Nor. zircon-syenite appears in considerable extension, beside various kinds of porphyry. On the N. W. and S. coasts of Nor. graywacke, lime, clay, and flint-slate are found; Tertiary rocks appear only in Skone, and here alone coals are found. The water-supply of the country is extraordinarily rich. The S. E. slope of the mts. sends numerous parallel rivers to the sea. The Torneä-Elv, with the Muonio, communicating with the Kalix; the Luleä, Piteä, Umeä, and Angermann Elv; also the Dal-Elv run in a S. E. direction to the Baltic. From the S. slope of the mts. comes the Klara-Elv, entering the Venern Lake. After leaving this lake it receives the name of Göta-Elv, and on its way to the Kattegat it forms several falls, of which the Trollhättan is the most remarkable. The Glommen forms the largest river-system of S. Between the Dovrefjeld and the plateaux around Sognefjord is situated the small lake of Lessö, at an elevation of 1930 ft. From it issue to the W. the Rannea, which falls into the Moldefjord, and to the S. E. the Longen, which rushes down into the deep Guldbrand's Valley, expands into the Mjösen, the largest lake of Nor., and assumes the name of Vörmen. The largest lakes of Swe. are the Venern (94.78 geographical sq. m.), the Wetter (33.68), and the Mälär (22.28). The climate presents great differences.

The oldest part of the pop. consists of Lapps and Finns. Later, a Germanic immigration took place. Under violent struggles the Lapps and Finns were driven back. In the rough climate the Germanic tribes developed into audacious warriors and pirates, governed by petty kings. The Nor. tribes, the Normans, became famous in hist. by their conquests in the period from the 9th to the 11th century. The Swe. pirates were called Wäringar or Warägen; they appeared in Constantinople in 1043. Christianity was first

preached among the Swedes in 829 by a Dan. monk, Ansgar. In Nor. it was thoroughly established under Olaf Trygvesson and St. Olaf, who died in 1033. Contemporary with the introduction of Christianity the union of the many petty kingdoms began to take place, and 2 empires, Nor. and Swe., were established. The lang. of the people was originally one, represented by a most remarkable lit., and still living in Iceland, but it afterward branched off into 2, Swe. and Dan. [From orig. art. in *J. S. Univ. Cyc.*, by AUGUST NIEMANN.]

**Scandinavian Mythology** found its earliest and most authentic representations in the 2 Eddas, of which the elder consists of weird old songs compiled by Sæmund Sigfusson Frode (1054-1133); the younger, of prose pieces, generally ascribed to Snorre Sturleson (1178-1241). Both of these 2 sources originated in Iceland. With Odin (A.-S. *Wodan*, whence Wednesday) and his wife Frigg (whence Friday) in Asgaard there lived Thor (whence Thursday), the god of the thunder, who had a girdle around his loins which doubled his strength when he tightened it, a hammer in his hand with which he cleft the mts. and crushed the Jotuns, and a carriage which was heard through the whole world when he drove it over the sky; Tyr (whence Tuesday), the god of war, with an artificial hand of iron, having lost the natural one in a wager with Loki; Heimdal, who stood on the rainbow watching the entrance to Asgaard, and who could hear the grass grow and see a thousand miles into the depth of the night; Freya, the goddess of beauty and love, who drove a span of doves and made all plants blossom when she looked at them; Ægir, the god of the sea; Bragi, the god of poetry; Frey, the god of the winds; and others. Loki, the principle of evil, was by descent a Jötun, but on account of some mysterious transactions with Odin at the beginning of time he had access to Walhalla, where he did all the mischief he could; he was the cause of its fall. It was foretold that if Baldur, the son of Odin and Frigg, died, the Æsir would perish. Warned by bad dreams, Frigg went around and asked everything to swear that it would do Baldur no harm. The rocks, the sea, the clouds swore; all things, living and lifeless, took the oath. Only the mistletoe was forgotten. Loki knew it, grasped the tree, and made a spear of it. Meanwhile, in Walhalla the gods determined to try the power of the oath. Thor threw his hammer against Baldur, Tyr hit him with his sword, but Baldur was invulnerable. Then Loki asked Hödur, Baldur's blind brother, to thrust a spear after Baldur, and reached him that made of the mistletoe. Hödur threw it, and Baldur fell dead on the floor. Immediately the Jotuns and all the monsters of nature arose against the gods, and a war began between Nifheim and Walhalla. The suns and the stars took fire and burned up; the earth sank to the bottom of the ocean, and all living beings on it perished; the Æsir were killed, and the end of the world had come. But out of the sea a new heaven and a new earth would arise, in which the All-father should reign, and he would pass a new judgment upon men—not according as they were brave or cowardly, but according as they were good or bad. (Thorpe, *Northern Mythology*, 3 vols.)

**Scansores** [Lat. from *scandere*, "to climb"], an artificial group of birds known as climbers, distinguished by having the toes in pairs, 2 before and 2 behind. The most important members of this are parrots, toucans, cuckoos, and woodpeckers.

**Scapular** [Lat. *scapularis*], (1) a garment worn by lay brethren and professed monastics of various R. Cath. orders; (2) a small concealed emblem worn by many R. Caths., who bind themselves to a certain round of religious exercises called the "Devotion of the Scapular."

**Scarabæus** [Lat. "beetle"], in anc. art, a figure of a beetle, often worn as a charm or seal. Egyptians, Phœnicians, Etruscans, and Romans revered the S. The Egyptians frequently made scarabæi 3 or 4 ft. long. They were made of gold, precious gems, granite, porphyry, and many other materials. Some of the Gnostics also revered the SCARABÆUS.

**Scarborough** (JOHN). See APPENDIX.

**Scarlatina**, skar-la-tē'na [N. Lat.], or **Scarlet Fever**, one of the acute eruptive or exanthematic fevers. Chiefly a disease of childhood with immunity for adults, increasing as the period beyond puberty lengthens. It is an infectious disease, but propagated often by contagion or close aggregation of children. Phys. recognize 3 marked varieties: (1) *S. simplex*, simple scarlet fever, in which the "rash" or eruption is fairly developed, the patient comfortable, and complications do not exist; (2) *S. anginosa*, where an unusual soreness of the throat, with formation of pseudo-membrane, resembling diphtheria, is present; (3) *S. latens*, a latent form, where the eruption may be absent or doubtful, but grave injury is done by the scarlatinal poison in the blood to the nerve-centres or the kidneys. At the end of 24 hours of fever the eruption appears—an efflorescence composed at first of minute red points upon a flushed surface, and later of a uniform scarlet hue. It develops upon the body and neck before the face, being especially developed over the upper half of the body, the face and lower extremities are soon involved, and the cuticle, destroyed by the high temperature of the surface, may begin to fall by the fifth day. Scarlet fever is a grave disease. The mortality is very variable, from 1 in 5 to 1 in 25, according to class of patients and type of epidemics. The chief causes of death are early convulsions, diphtheritic throat complications, and uræmic poison and dropsy from implication of the kidneys. The treatment is by aconite, diaphoretic drinks, blanket, frequent sponging, the wet pack, the luncheon of lard and of butter of cacao, quinine and tincture of iron, in free and frequent doses, sulphite and sulpho-carbolate of soda, liberal liquid diet throughout, and mild alcoholic stimulus when convalescing. The throat may require cold gargles, cold and disinfecting sprays. Secondary kidney disorder—dropsy and scanty urine—calls for dry cups over



the kidneys, the hot-air bath, elaterium as a purge, digitalis, and alkaline diuretics.

E. DARWIN HUDSON, JR.

**Scarlatti** (ALESSANDRO), b. at Trapani, Sicily, in 1649, brought his first opera on the stage in 1680 in Rome in the palace of Queen Christina of Swe.; lived afterward alternately in Rome and Naples as chapel-master; composed 118 operas, 200 masses, 3000 cantatas, etc. D. Oct. 24, 1725.—His son, DOMENICO SCARLATTI, b. 1683, d. 1759, was considered the greatest pianist of his time.

**Scarlett Fever.** See SCARLATINA.

**Scarlett** (Sir JAMES). See ABINGER, LORD.

**Scarlett** (Sir JAMES YORK), b. in Eng. Feb. 1, 1799, ed. at Eton and at Trinity Coll., Cambridge; entered the army in 1818; col. 1851; maj.-gen. of cav., and distinguished himself at Balaklava; obtained command of the entire cav., and was knighted 1855; adjutant-gen. 1860, lieut.-gen. 1862. D. at Burnley Dec. 6, 1871.

**Scarpa** (ANTONIO), b. at Castello-Motta, Friuli, June 13, 1747, studied med. at Padua; was appointed prof. of anat. at Modena in 1772, and in 1783 at Pavia, where he d. Oct. 31, 1832. He was one of the greatest anatomists of his time.

**Scep'ticism**, in philos. [*σκεπτικισμός*], "to look about carefully," is the doctrine which sets up, as its highest principle, doubt or suspense of judgment in view of the contradictory nature of phenomena. It endeavors to establish the subjectivity of all cognitions, and to show their incompatibility with each other; it infers, as a consequence, the impossibility of knowing truth, and takes its stand simply and solely upon its own individuality. S. therefore deepens and intensifies mental independence, and is regarded as a necessary clearing up preparatory to philosophic thinking. Sextus Empiricus has left us a complete account of anc. S., and himself sums up the whole as follows: Nothing is certain in itself, as is proved by the diversity of opinion, and nothing can be made certain by proof, since it derives no certainty from itself, and, if based on other proof, leads us either to the *regressus ad infinitum* or to a vicious circle. Hume is the greatest modern sceptic. He saps all dogmatism by making habit or "invariable sequence" the origin of the idea of causality, and gives rise to the Kantian system and its derived schools, which "criticise the faculty of cognition" and build their structures upon insight into method, and thus eliminate S. by making its partial view (of method) a complete one. W. T. HARRIS.

**Schaff** (PHILIP), S. T. D., LL.D., b. at Coire, Switz., Jan. 1, 1819, studied at Coire, Stuttgart, Tübingen, Halle, and Berlin; took the degree of B. D. and passed the examination for a professorship in Berlin 1841; travelled through several countries of Europe; returned to Berlin and lectured in the univ. on exegesis and ch. hist. 1842-44; was called to a professorship in the theological sem. of the Ger. Reformed Ch. of the U. S. at Mercersburg, Pa.; removed to New York Dec. 1863; made a first visit to Europe in 1864, a second in 1865; was sec. of the New York Sabbath committee 1864-69; in 1870 accepted a call to professorship of sacred lit. in the Union Theological Sem., New York; received the honorary degree of D. D. from the Univ. of Berlin 1864; is one of the founders and honorary secs. of the Amer. branch of the Evangelical Alliance, and was sent 3 times as com. to Europe to make arrangements for the gen. conference of the Alliance, which was held in New York Oct. 1873; was one of the Alliance delegates to the emp. of Rus. in 1871, to intercede with him in behalf of the religious liberty of his subjects in the Baltic prov.; is pres. of the Amer. Bible revision committee, which he organized in 1871. He was one of the associate eds. of *J.'s Univ. Cyc.* He wrote *Hist. of the Apostolic Ch., Hist. of the Chr. Ch. from A. D. 1-590*, revised 1862 sqq.; *Hist. and Collection of the Creeds of Christendom*, 3d ed. 1881, 3 vols. He is ed. of the Anglo-Amer. reproduction and adaptation of Lange's *Critical, Theological, and Homiletical Commentary on the Bible* (25 vols.), and of an *International Revision Commentary* (1882 sqq.). Of his minor books we mention *Sin against the Holy Ghost*, *James and the Brethren of our Lord*, *The Principle of Protestantism*, *Person of Christ*, *Bible Lands*, *Christ in Song*, etc. He founded and edited the *Kirchenfreund*, 1848-53; *Evangelische Zeugnisse*, 1863-66; edited, with Prof. Henry B. Smith, the *Philosophical and Theological Library*; contributed to Amer. and foreign reviews, to Herzog's, Smith's, and other encyclopedic works, and edits a *Religious Encyc.* (based on Herzog), N. Y. 1882 sqq., in 3 vols.

**Schaghticoke**, N. Y. See APPENDIX.

**Schaffner** (WILLIAM GOTTLIEB), D.D., LL.D., b. at Stuttgart, Ger., Aug. 22, 1798, studied theol.; went to Tur. as an independent missionary 1825; came to U. S. in 1827; grad. at Andover 1830; was ordained Nov. 14, 1831; was missionary to Jews in Constantinople 1831-55, and then to Moslems; pub. *Essay on the Right Use of Property*. D. Jan. 26, 1888.

**Schaumburg-Lippe**, a principality and state of the Ger. empire, between Hanover and Westphalia, comprises an area of 212 sq. m., with 35,374 inhabs. The S. part is hilly and well wooded; the N. is flat, and here is found the large lake, Steinhuder-meer. The budget for 1884 was 555,698 marks; pub. debt, 1,625,000 marks. Cap. Bückeburg.

**Scheele**, sheel (KARL WILHELM), b. at Strasund, Pomerania, Dec. 19, 1742, studied chem. in Stockholm and Upsala, and settled in 1777 as apothecary at Köping, near Stockholm, where he d. May 21, 1786.

**Scheele's Green**, also called **Swedish Green**. In this country the common name is **Paris Green**, a name which is now applied in Fr. to a special *arsenic-green* product. The correct name above proceeds from its discovery by the great Swe. chemist, Scheele. It is a compound of the poisonous arsenious acid and cupric oxide, which has come into use throughout the world.

**Schef'er** (ARY), b. at Dordrecht, Hol., 1795, was taken to Paris by his mother in 1811; acquired eminence in 1822 by the well-known picture of *Francesca di Rimini*. This was followed by the *Gaston de Foix* and the *Sublime Women*. D. June 15, 1858, at Argenteuil, near Paris. S. is best known

by his *Mignon*, *Faust* and *Marguerite*, *Temptation*, *St. Augustine* and *Monica*.

**Scheldt**, skelt, the most important river of Belg., has its rise in a small lake in the dept. of Aisne, Fr.; enters Belg. near Tournay; thence moves N. N. W. past Tournay, prov. of Hainault, and becomes the boundary of this prov. and E. Flanders, and at Escamaffes becomes the common boundary between W. and E. Flanders; thence N. N. E., past Oudenarde, to Ghent, where it receives the Lys on the left; thence E. S. E. to Dendermonde and N. N. E. to Antwerp, becomes a noble stream, with a fine harbor. Thence its course is N. W. The island of S. Beveland divides it into 2 arms; the left, or S., known as W. Scheldt, enters the N. Sea near Flushing. The right, or N., the E. Scheldt, is divided by the island of N. Beveland. It has an entire length of 210 m., and is navigable to Condé, near its source. Among its affluents, the Scarpe, Lys, and Darne from the left, and the Dender and Rupel from the right, are the most important. A system of canals connects this stream with the prin. cities of Belg. The entrance to the river is rendered difficult by sand-banks which form at its mouth.

**Schelling**, von (FRIEDRICH WILHELM JOSEPH), third of the 4 greatest Ger. philos., b. at Leonberg, a. v. near Stuttgart, Württemberg, Jan. 27, 1775, d. Aug. 20, 1854. In 1796 he went to Leipzig, and there remained for 2 yrs. He had already published his essay *On the Ego as Principle of Philosophy*, in which he had repudiated the Kantian dualism. His attitude toward Fichte's system was at first that of an expounder, afterward that of a critic. He put forth his *Ideas on the Philos. of Nature* (1797) and *Concerning the World-Soul* (1798), indicating his departure from his first standpoint. He remained almost entirely silent from 1812 to 1834, during the period of the activity of Hegel, and after the death of the latter (1831) developed his system from an amended basis. He called his earlier system, which lays so much emphasis on nature-philos. and art, his negative system, and his later one, in which he endeavored to make freedom the highest ideal, his positive system. From Leipzig he was called to Jena in 1779. In 1800-01 he edited the *Journal of Speculative Physics*, and set forth the doctrine of polarity as the principle of nature and morals, showing how the giant mind of the world develops from its sleep in nature ("petrified in nature") to consciousness in man. In 1802 appeared his dialogue, *Bruno, or on the Natural and Divine Principle of Things*. In the same yr. he associated himself with Hegel for the publication of the *Critical Journal of Philos.* (Tübingen, 1802-03). In his *Lectures on the Method of Academic Study*, delivered in 1802 and pub. the next yr., he gives the outlines of his entire system in a popular form. In his *Philos. and Religion* (1804) he makes finiteness and materiality to be the result of a lapse from the Absolute, to recover from which lapse is the object and goal of human hist. Theosophic doctrines appear in his essays *On the Philos. of Nature* (1806) and *On the Relation of the Plastic Arts to Nature* (1807). The influence of Franz Baader upon S. belongs to this period, and is manifested in the noteworthy treatise, *Philosophical Inquiries into the Nature of Human Freedom* (1809). In 1808 he had gone to Munich as sec. of the Acad. of Arts and Design. When in 1826 the Univ. of Munich was founded, after the removal of that at Landshut, S. became prof., and for a time formed the chief attraction of the univ. At Erlangen in 1820 he wrote the *Philos. of Mythology* and the *Philos. of Revelation*, mythology, according to his view, being an imperfect revelation. In 1841 he was called to the chair of philos. in Berlin. The 2 sons of S. pub. a complete collection of his writings.

WILLIAM T. HARRIS.

**Schem**, shem (ALEXANDER J.), b. at Wiedenbrück, Ger., in 1826, studied at the gymnasium of Paderborn 1839-43, at the univ. of Bonn 1843-45, and of Tübingen 1845-46; edited Westphalian newspapers 1849-51; came to the U. S. 1851; was prof. of Heb. and of modern langs. at Dickinson Coll., Carlisle, Pa., 1854-60; edited ecclesiastical almanacs for 1860 and 1868-69; wrote for religious and political newspapers; was a contributor to Appletons', McClintock & Strong's, and Johnson's *Cycs.*, and prepared different lexicons. D. May 21, 1881.

**Schenck**, shenk (NOAH HUNT), D. D., b. at Pennington, N. J., in 1825, grad. at Princeton 1844, and at Gambier Theological Sem. 1853; ordained in P. E. Ch.; rector of Emanuel ch., Baltimore, and became in 1867 rector of St. Ann's ch., Brooklyn, N. Y.; founded *Western Churchman*; was co-editor of *Prot. Churchman*.

**Schenck**, skenk (ROBERT CUMMING), b. at Franklin, O., Oct. 4, 1809, grad. at Miami Univ. in 1827; studied law and was admitted to the bar; member of State legislature 1841 and 1842, and M. C. 1843-51; U. S. minister to Brazil, and employed on diplomatic missions to Buenos Ayres, Montevideo, and Paraguay, 1851-54; brig.-gen. of volunteers in May 1861; commanded a brigade at the battle of Bull Run July 21; engaged at the battle of Cross Keys Apr. 1862; maj.-gen. Aug. 30; placed in command of the 8th army corps and Middle dept. Resigned from the army Dec. 1863, and resumed his seat in Cong.; appointed minister to Eng. in 1871; resigned 1876.

**Schenectady**, city and R. R. centre, cap. of Schenectady co., N. Y., on Mohawk River, in the valley of that name, about 17 m. by R. R. and 30 m. by canal or river W. of Albany. It was patented Nov. 4, 1684, created a borough Oct. 23, 1765, incorporated a city Mar. 1798. Erie Canal passes through the city. It is the seat of Union Coll., incorporated in 1795. It is one of the oldest settlements in the State; was burned and nearly all its inhabs. massacred by Fr. and Indians in winter of 1690. Pop. 1870, 11,026; 1880, 13,635.

**Schenkel** (DANIEL), b. at Dögerlin, canton of Zurich, Switz., Dec. 21, 1813; studied theol. in Bale and in Göttingen; was appointed pastor at Schaffhausen in 1841, prof. of theol. at Bale in 1849, and in 1851 at Heidelberg. He edited *Allgemeine Kirchenzeitung* and *Allgemeine Kirchliche Zeitschrift*, and *Bibel-Lexicon*; wrote *Das Wesen des Protestantismus*, *Das Charakterbild Jesu*, etc.



**Schiedam**, ske-dahm', town of the Netherlands, prov. of S. Hol., on the Schie, is a neat and well-built place, and has fine buildings. Its prin. industry is gin manufacturing. Large herds of cattle and swine are fed from the refuse of the distilleries, and it has an extensive trade. Pop. 23,035.

**Schiller**, shil'ler, von (JOHANN CHRISTOPH FRIEDRICH), the renowned Ger. poet, b. in Marbach, Württemberg, Nov. 10, 1759. His childish ambition was to become a clergyman. But duke Karl of Württemberg insisted on having the boy ed. in a new acad.—the Karl's School—which he had founded according to the most approved plan of military discipline. The soulless discipline to which he was subjected for 7 yrs. was one cause of the rebellious spirit which breathes through his earliest works. Even before leaving the acad. he had written *The Robbers*, and after his graduation and appointment as military surgeon to a regiment in Stuttgart, he pub. it at his own expense. The impression it made was universal. Baron Dalberg, then director of the theatre at Mannheim, announced *The Robbers* for representation on the stage, and S., being refused leave of absence, went to Mannheim without it, and witnessed its first performance Jan. 13, 1782. On his return to Stuttgart he was temporarily imprisoned, but in Sept. of the same yr. he left Stuttgart, and for nearly a yr. afterward remained in concealment. During this time he completed his plays of *Fiesco* and *Intrigue and Love*. The first of these was produced at Mannheim, and the author was offered the post of dramatic poet to the theatre there. He remained in Mannheim until the spring of 1785, when a cordial invitation from Körner (the father of Theodore Körner) drew him to Leipsic. He followed Körner to Dresden, and was supported by that friend while writing his tragedy of *Don Carlos*, his historical sketch *The Revolt of the Netherlands*, the romantic fragment *The Ghost-Seer*, and a number of lyrical poems. In the summer of 1787 S. visited Weimar for the first time. He met here his future wife, Charlotte von Lengefeld, and Goethe. Through Goethe's influence S. early in 1789 was offered the place of prof. of hist. at the Univ. of Jena. He married Charlotte von Lengefeld early in 1790. His *Hist. of the Thirty Years' War* was pub. in 1793, and he returned to Württemberg with his family. A literary periodical called *The Hours* was projected. Goethe's co-operation was too important to be overlooked: the 2 poets met again, and soon became united in personal and literary friendship. S. wrote his finest ballads and lyrics, and his plan for a great drama based on the hist. of Wallenstein was resumed, and the completion of the work as a trilogy or triple drama in the yr. 1799 placed him at once in the first rank of authors. In the year 1800 he removed to Weimar. His friendship with Goethe drew upon both the bitter hostility of most of the secondary authors of Ger. The splendid rhythm, rhetoric, and artistic completeness of form of S.'s *Song of the Bell* and *The Diver* secured his fame as a poet in the universal judgment of the Ger. people. His *Marie Stuart* appeared in 1800, and *The Maid of Orleans* in 1801. In the year 1802 S. was ennobled by the emp., Francis II. His next work, *The Bride of Messina* (1803), was an attempt to unite the formalism of the Gr. chorus with the romantic element of modern dramatic art. *William Tell* appeared in 1804. He began a new play, *Demetrius*, and was well advanced in the work when he d. May 9, 1805. [From orig. art. in *J.'s Univ. Cyc.*, by BAYARD TAYLOR.]

**Schism**, sizm (Gr. *σχίσμα*, to "split,"), a division in the Ch. on points of worship and discipline. Some of the chief divisions are the Ebionite (2d and 3d centuries), Novatian (251 A. D.), Miletian (306), Donatian (311), Arian (first under Damasus, 355; second under Miletian, 361), Nestorian (428), Monophysite (482). The great S. between the E. and W. (c. 880) arose from hierarchical rivalry. Their mutual excommunication dates 1054. The papal S. concerning the election of popes were 963, 1159, 1164, 1168, 1178, and the great S. with rival courts at Rome and Avignon, 1378-1418.

**Schist**, shist (Gr. *σχίστος*, "split," "cleften"), a somewhat flaky rock, usually less perfectly laminated and harder than the shales and slates, and generally metamorphic.

**Schlagintweit** (HERMANN), b. May 13, 1826; ADOLF, b. Jan. 9, 1829, killed at Kashgar Aug. 30, 1857; ROBERT, b. Oct. 27, 1833; explored the Alps and wrote *Untersuchungen über die physikalische Geographie der Alpen und Neue Untersuchungen*. From 1854 to 1858 they undertook explorations of the Himalayas, Thibet, Hindostan, and Deccan, and wrote *Results of a Scientific Mission to India and High Asia*, while *Reisen in Indien und Hochasien* was written by Hermann alone, who d. Jan. 1882. Robert also travelled on the Amer. continent, and wrote *Die Pacific Eisenbahn in Nordamerika, and Californien, Land und Leute*.—A fourth brother, EMIL, b. July 7, 1835, pub. *Buddhism in Tibet, Die Gottesurtheile der Indier, Die Könige von Tibet*.

**Schlat'ter** (MICHAEL), b. at St. Gall, Switz., July 14, 1716, studied divinity; came to Pa. in 1746 as a missionary to the Ger. Reformed immigrants; was pastor of chs. in Phila. and Germantown 1746-51; visited the Ger. settlers scattered in the colonies of Pa., N. J., Md., and Va., organizing chs.; took the preliminary steps in the formation of the first Amer. synod of the Ger. Reformed Ch. Sept. 1747; became supt. of the Ger. charity schools in Pa. 1755; accompanied the expedition against N. S. as chaplain of the Royal Amer. regiment 1757, and suffered imprisonment by the Brit. authorities at Phila. D. Oct. 1790.

**Schlegel**, shla'gel, von (AUGUST WILHELM AND FRIEDRICH), 2 brothers, b. at Hanover—the former in 1767, the latter in 1772; became the founders and leaders of the romantic school in Ger. lit. AUGUST WILHELM lectured in Jena from 1797 to 1802, and in Berlin from 1802 to 1805; travelled for several yrs. with Madame de Staël through Fr., Switz., It., Sp., and Aus.; accompanied Bernadotte in 1812 as private sec.; settled down in 1815 as prof. at the Univ. of Bonn, where he d. in 1845. He wrote ballads, tragedies, and literary satires, but his most valuable works are his translations of Shakspeare, of Calderon, from Sans.,

and his *Lectures on Dramatic Art and Lit.*—FRIEDRICH lectured in Jena 1800, in Dresden 1802, in Paris 1803; joined the R. Cath. Ch. in 1808, and lived after that time mostly in Vienna, writing and lecturing. D. on a lecturing-tour to Dresden in 1829. Wrote poems and tragedies, etc., but his prin. works are his *Philos. of Life, Philos. of Hist., Philos. of Lang.*, and his romance *Lucinde*.

**Schleiden**, shly'den (MATTHIAS JAKOB), b. in Hamburg Apr. 5, 1804, studied bot. at Jena, where he was appointed prof. in 1839. In 1862 he resigned his office, and after a short stay at Dorpat (1863-64) as prof. of vegetable chem., he settled at Dresden. Wrote *Grundzüge der wissenschaftlichen Botanik, Die Pflanze und ihr Leben, Baum und Wald, Die Rose*, etc. D. 1881.

**Schleiermacher**, shly'er-mah-er (FRIEDRICH ERNST DANIEL), b. at Breslau Nov. 21, 1768, was the son of a Reformed clergyman, and was brought up in the community of Moravian Brethren, receiving a profound religious impulse from them. He completed his theological course at Halle, and after filling many other positions became in 1810 prof. (*ordinarius*) of theol. at the new Univ. of Berlin, which position he retained till his death, Feb. 12, 1834. He translated Plato, and did much by his lectures to encourage the study of the remains of the early Gr. philos. He labored to effect a union of the Lutheran and Reformed chs. on the broad basis that demanded unity in the spirit of Protestantism and allowed diversity as to doctrines and modes of worship. Corresponding to the 4 provinces of his system of ethics are the 4 insts.: (a) state, in which each is for the whole; (b) civil society, organized for the benefit of the individual; (c) school (college, etc.), for community of culture; (d) church, "for individual symbolic activity." According to Zeller, S. is the greatest theologian of the Prot. Ch. since the Ref. The most important of his works are: *Discourses on Religion* (1799), *Monologues* (1800), *Confidential Letters on F. Schlegel's Lucinde* (1800), *Four Collections of Sermons* (1801-30), *Outlines of a Criticism of Previous Systems of Ethics* (1803), etc. WILLIAM T. HARRIS.

**Schleswig-Holstein**, prov. of Prus., bounded N. by Den., S. by the Elbe, E. by the Baltic, and W. by the N. Sea, comprises an area of 8324 sq. m., with 1,127,149 inhabs. Several islands—Römö, Sylt, and Föhr in the N. Sea, Alsen and Femern in the Baltic—belong to the prov. A slightly elevated ridge stretches through the centre of the country, sandy, gravelly, and covered with heath in S.; swampy, marshy, and covered with forests in H. To the E. of this ridge the surface is diversified by hills, and the coast indented by long, narrow fiords. The soil affords excellent arable land, and forests of oak and beech are numerous. To the W. the ground is so low that the country must be protected against the N. Sea by dikes, but the soil affords excellent pasture. The chief occupations are agriculture in the E. part, cattle-breeding in the W. Wheat, hops, and fruit are raised in great quantities, and thousands of fat oxen are sold in Hamburg and Lond. The fisheries in the N. Sea are considerable, the manufactures insignificant. The prov. is of vital importance to Prus. for the formation of a Ger. fleet, partly on account of the harbor of Kiel.

**Schleusner** (JOHANN FRIEDRICH), b. in Leipsic Jan. 16, 1756, studied theol. and philology in the Univ. of that city, appointed prof. of theol. in Göttingen 1784, and in 1795 prof. of theol. and provost of the collegiate ch. in Wittenberg; devoted himself principally to the lexicography of the Gr. Scripts. His chief works were *Lexicon Græco-Lat. in Novum Testamentum* and *Thesaurus sive Lexicon in LXX.* D. Feb. 21, 1831.

**Schley** (WINFIELD SCOTT). See APPENDIX.

**Schlie'mann** (HEINRICH), b. in 1822 at Kalkhorst, Mecklenberg-Schwerin; established a business of his own in St. Petersburg in 1847; travelled much, and retired in 1863 from business. Undertook excavations on the plateau of Hissarlik, and wrote *Ithaque, Péloponnèse et Troie, and Trojanische Alterthümer*. In 1875 commenced excavations at Athens and Mycenæ. Wrote also *Ilios and Mycenæ*.

**Schmid** (CHRISTIAN FRIEDRICH), son of a clergyman, b. at Bickelsberg, in Württemberg, in 1794, was prof. extraordinary at Tübingen 1821, prof. ordinary 1826, and d. Mar. 28, 1852. His *Biblische Theologie des Neuen Testaments* was pub. posthumously.

**Schmidt** (HENRY I.), S. T. D., b. at Nazareth, Pa., Dec. 21, 1806, ed. at the Moravian pedagogium and theological sem. of his native town; was a teacher in the former inst. 1826-29; pastor of Lutheran chs. in Bergen co., N. J., 1831-33; prof. at Hartwick Sem., Otsego co., N. Y., 1833-36; pastor of a Ger. Lutheran ch. at Boston, Mass., 1836-38; prof. in Pa. Coll. and Theological Sem. at Gettysburg, Pa., 1838-43; pastor of Lutheran chs. in Montgomery co., N. Y., 1844; prin. of Hartwick Sem. 1845-47; became prof. of Ger. lang. and lit. in Columbia Coll., N. Y., 1848. Resigned 1880. Wrote many theological articles in the *Evangelical Review, Hist. of Education*, etc.

**Schmuck'er** (SAMUEL S.), D. D., b. at Hagerstown, Md., Feb. 28, 1790, studied at Princeton, but did not graduate; was ordained in the Lutheran Ch. 1818; was pastor of a ch. at Newmarket, Va., 1820-36; prof. of didactic theol. in the Gettysburg Theological Sem. from its foundation (Sept. 1826 to Aug. 1864); pres. of the inst. and emeritus prof. from 1864 to his death, at Gettysburg July 26, 1873.

**Schöf'fer** (or **Schoff'er**) (PETER), b. at Gernshelm, near Darmstadt, in 1430, became in 1450 assistant in the printing establishment of Gutenberg and Faust in Mentz, and introduced many improvements in printing. D. 1503.

**Scho'field** (JOHN M.), b. in Chautauque co., N. Y., Sept. 29, 1831, grad. at the U. S. Military Acad., and promoted brevet second lieut. of art. July 1, 1853; capt. May 14, 1861. From 1855 to 1860 he was prof. at W. Ft., and at the outbreak of c. war was filling the chair of physics in Wash. Univ., St. Louis, Mo. Appointed major 1st Mo. volunteers Apr. 26, he served with Gen. Lyon as chief of staff in the operations in Mo. Commissioned brig.-gen. of U. S. volun-



teers and of Mo. militia Nov. 1861, he commanded the State troops and the dist. of St. Louis, and in Oct. 1862 was placed in command of the Army of the Frontier; promoted to be maj.-gen. U. S. volunteers Nov. 29, 1862, he commanded the dist. and dept. of Mo. until Jan. 1864; was in immediate command of the 23d corps in Sherman's Ga. campaign, participating in the fighting ending with the capture of Atlanta Sept. 2, 1864. In Nov. 1864 he was engaged with Hood's army invading Tenn., and defeated it at the battle of Franklin, Nov. 30, 1864; appointed brig.-gen. in the regular army; occupied Wilmington Feb. 23, 1865; fought the battle of Kinston Mar. 8-10, and joined Gen. Sherman at Goldsboro' Mar. 22, 1865. Upon the surrender of Gen. Johnston's army (Apr. 26) he was appointed to execute the terms of the convention; in command of the dept. of N. C. until June 1865, and of the first military dist. of Va. 1866-67; sec. of war *ad interim* May 1868-Mar. 1869; maj.-gen. U. S. A., assigned to command of dept. of Mo. In May 1870 he assumed command of division of Pacific. Became supt. of the U. S. Military Acad. at W. Pt. 1876. In command of Military div. of Pac. 1882-83; transferred to div. of Mo. 1883.

**Schoharie**, sko-har'ee, on R. R., cap. of Schoharie co., N. Y., 40 m. W. from Albany. Pop. 1870, 1200; 1880, 1188.

**Scholasticism**. See SCHOOLMEN.

**Scholten'** (JOHANNES HENDRIK), b. at Vleuten, near Utrecht, Netherlands, Aug. 17, 1811, studied theol. and philos. at the Univ. of Utrecht; appointed prof. of theol. in 1843 at the Univ. of Leyden, and became the founder and leader of a liberal movement in Dutch theol. Wrote *Geschiedenis der Godsdienst en wysgeerte, De leer der hervormde kerk in hare grondbegin selen, De orye wil*, etc.

**Schomburgk** (FREDERICK HERMANN), DUKE OF, b. in Heidelberg, Ger., about 1616, served in the army of the United Provs., afterward in the Fr. army; acquired reputation as a strategist and tactician; visited Eng. 1660; went to Port. and compelled Sp. to recognize the independence of that country (1668); was again in the Fr. service in Catalonia 1675; at Maestricht (1676) and Charleroi (1677); was appointed by William, prince of Orange, his second in command in the expedition to Eng. 1688; was made duke of Schomburgk in the Eng. peerage, knight of the Garter, and master of the ordnance 1689; took a leading part in the expedition against Ire., and was killed at the battle of the Boyne, July 12, 1690.

**Schomburgk**, shom'burbk (Sir ROBERT HERMANN), Ph. D., b. at Freiburg-on-the-Unstrut, Prus., June 5, 1804, settled in the island of St. Thomas in the W. I. 1829; devoted himself to bot. and nat. hist.; made a scientific examination of Anegada, one of the Virgin Islands, 1830; spent 4 yrs. in the exploration of Brit. Guiana, where he discovered the great water-lily named by him *Victoria regia*; pub. *Description of Brit. Guiana, Geographical and Statistical, a series of Views in the Interior of Guiana, Researches in Guyana*; was at the head of the commission for surveying the frontier between British Guiana and Brazil 1841-44; pub. *Nat. Hist. of the Fishes of Guiana*; was knighted 1845; pub. *Hist. of Barbadoes and The Discovery of the Empire of Guiana by Sir Walter Raleigh*; was Brit. consul and *chargé d'affaires* in the Dominican republic 1848-57, and consul-gen. in Siam 1857-64. D. at Schöneberg, near Berlin, Mar. 11, 1865.

**Schönbein** (CHRISTIAN FRIEDRICH), b. at Metzingen, Württemberg, Oct. 18, 1799, studied natural science; was appointed prof. of chem. at Bäle in 1828; discovered ozone in 1839; invented gun-cotton in 1845. Wrote *Das Verhalten des Eisens zum Sauerstoff, Beiträge zur physikalischen Chemie, Ueber die Erzeugung des Ozons*, etc. D. Aug. 28, 1868.

**Schönbrunn**, an imperial palace situated a few m. from Vienna, on the river Wien, built in 1744 by Maria Theresa, contains 1441 rooms, and is surrounded with a large and beautiful park, having a botanical garden, a menagerie, etc. The Peace of Vienna (Oct. 14, 1806) was signed here.

**School Brothers and School Sisters**, the collective name of a large number of educational orders or fraternities in the R. Cath. Ch.

**Schoolcraft** (HENRY ROWE), LL.D., b. at Watervliet (now Guilderland), Albany co., N. Y., Mar. 28, 1793; studied at Union and Middlebury colls., but did not graduate; devoted himself to a scientific study of the art of glass-making, his father being a manager of extensive glass-works; commenced the publication at Utica in 1817 of a work on *Vitreology*; pub. *A View of the Lead-mines of Mo.* (1819); obtained in 1820 an appointment as geologist to an exploring expedition sent under Gen. Cass to the upper Miss. and Lake Superior copper-region, and pub. a *Journal* (1821); became in 1822 Indian agent for the tribes of the Lake Superior; resided nearly 20 yrs. in vicinity of Michilimackinack and Sault Ste. Marie, where in 1823 he married Miss Jane Johnston, an educated lady partially of Indian blood, being daughter of an Irish gentleman and granddaughter of a Chippewa chief; devoted thenceforth much of his time to the investigation of Indian langs., customs, and traditions; was in 1828 and 1832 a member of the Territorial legislature of Mich.; was at the head of a scientific expedition which in 1832 explored for the first time Lake Itasca and the sources of the Miss.; negotiated in 1836 a treaty by which the U. S. purchased from the Chippewas a tract of 16,000,000 acres on the upper lakes, after which he became supt. of Indian affairs for the N. dept., and in 1839 chief disbursing agent for the same dept.; pub. *Algie Researches*, a collection of Indian tales and legends; removed to New York 1841; issued the prospectus of an *Indian Cyclopaedia*; was com. to take a census of the N. Y. Indians 1845; obtained from Cong. the passage of an act (Mar. 3, 1847) authorizing the collection through the Indian bureau of an extensive series of reports upon all the Indian tribes of the U. S. D. Dec. 10, 1864.

**Schoolmen**, a name applied to the philos. of the Middle Ages, whose labors were directed chiefly to adjusting the relations of the Chr. religion to philos. The teachers of the 7 liberal arts (*trivium* and *quadrivium*) in the cloister schools founded by Charlemagne were called *doctores scho-*

*lastici*, whence the name "scholasticism" as applied to the system of philos. that arose in those schools and flourished in the univs. that were founded subsequently. The first period of scholasticism is characterized by the accommodation of Neo-Platonic principles and the Aristotelian logic to the doctrine of the Ch., and it extends from the time of Johannes Scotus Erigena (A. D. 843) to Abelard (d. 1142). The second period extends from Alexander of Hales (d. 1245) to the 14th century, and is characterized by the thorough mastery of Aristotle and the ascendancy of his authority in matters of philos. The prominent S. of the first period were the nominalists Roscellinus and Abelard (who was a moderate nominalist), and the realists Anselm and William of Champeaux. Beside these, there were Eric and Remigius of Auxerre, Gerbert, Fulbert, Berengarius of Tours, and later, Bernard of Clairvaux, Bernard of Chartres, William of Conches, Walter of Mortaigne, Gilbertus Porretanus, Petrus Lombardus (famous author of *Sentences* compiled from the Ch. Fathers), the St. Victorians (Hugo, Richard, and Walter), John of Salisbury, Alanus, Amalrich of Bena, David of Dinant. After the end of the 12th century scholasticism changed very materially, by reason of the influence of the Arabs, who had cultivated to a high degree the Aristotelian philos., and skilfully interpreted it in the interest of pantheism. There arose a series of great minds who made it their work to master Aristotle and to interpret him in the interest of Christianity—Alexander of Hales, Bonaventura, Albertus Magnus, his pupil Thomas Aquinas, Duns Scotus—and beside these greatest the following deserve mention: William of Auvergne, Robert Greathead, Michael Scotus (translator of Aristotle), Vincentius of Beauvais, Henry of Ghent, Richard of Middleton, Petrus Hispanus, Roger Bacon, Raymond Lully, Petrus Aureolus, Durand de St. Pourcain, John Buridan, Pierre d'Ally. William of Occam, a pupil of Duns Scotus, gave the death-blow to scholasticism, which had already begun to decline. W. T. HARRIS.

**Schools**. See COLLEGE, COMMON SCHOOLS, EDUCATION, INFANT SCHOOLS, NORMAL SCHOOL, AND SCHOOL SYSTEM OF BOSTON.

**School System of Boston**. The seed out of which the whole public-school system of Boston has sprung is found in an order adopted by the freemen of the town 5 yrs. after its settlement, in these words: "The 13<sup>th</sup> of y<sup>e</sup> 2<sup>d</sup> month, 1635; Likewise it was then generally agreed upon y<sup>t</sup> o' brother Philemon Pormont shall be entreated to become schoolmaster for y<sup>e</sup> teaching and nourishing of children w<sup>th</sup> vs." This was the beginning of the present Lat. School of the city. In 1682 two elementary schools were set up, to which is traced the origin of what are now known as the gram. schools. It was not until 1789 that girls were permitted to attend the public schools. Children were not admitted to the gram. schools until 7 yrs. of age. In 1818 primary schools were established for children from 4 to 7 yrs. of age. In 1821 the Eng. High School was established, affording to boys who had finished the gram.-school course the advantages of a 3 years' course in Eng. and Fr. as a preparation for a business career. A normal school to fit female teachers for public schools was established in 1862.

The schools are supported by a tax on the personal and real property of the city, and the tuition in them all is gratuitous; stationery, drawing-books and writing-books, and text-books for indigent children, are furnished at the public expense. There is no separate school-tax, but the funds for school purposes are appropriated by the city council out of the general tax levy. The school board has authority to determine the salaries of teachers, and the city is liable to pay them without regard to amount appropriated for schools. School-houses are built by the city council on request from the school board, by which the plans must be approved. The present system of supervision, which went into operation in Jan. 1876, comprises a school board consisting of the mayor and 24 persons elected at large for 3 yrs., a board of 6 supervisors elected by the school board for 2 yrs., and a supt. elected for 2 yrs. The office of supt. was established in 1861. Vocal music and drawing are thoroughly taught in all grades of the schools. The boys in the high schools are regularly instructed in military drill. The girls in the lower classes in the gram. schools are taught sewing 2 hours a week by special teachers. Fourteen truant officers are employed to enforce the laws relating to school attendance; "absentees" and truant are sent to the reformatory on Deer Island.

JOHN D. PHILBRICK.

**Schopenhauer**, sho'pen-how-er (ARTHUR), b. in Dantzic Feb. 22, 1788. His father was a banker; his mother, Johanna, a writer of novels and books of travels. In his youth he travelled through Fr. and Eng.; entered the Univ. of Göttingen in 1809; studied philos. under Schulze the sceptic, and gave especial attention to Kant and Plato; in 1811 heard the lectures of Fichte at Berlin; wrote his famous essay, *On the Fourfold Root of the Principle of Sufficient Reason*, for his degree at Jena in 1813; adopted Goethe's theory of colors, and wrote in 1816 an essay *On Seeing and Color*. His prin. work, on *The World as Will and Representation*, was pub. in 1819. He settled at Berlin Univ. as *Docent*, and remained there in this capacity until 1851, when want of success as a lecturer caused his withdrawal to Frankfurt, where he spent the rest of his life in seclusion. D. Sept. 21, 1860. His characteristic doctrine is pessimism. The world is the worst of possible worlds. We can alleviate our lot in it by sympathizing with the suffering, and in a still more effectual way by an asceticism which destroys our will to live. Other works of his were pub.: *Upon the Will in Nature, The Freedom of the Human Will, The Basis of Morals, and The Penetration and Paradoxism*. WILLIAM T. HARRIS.

**Schouler**, sko'ler (WILLIAM), b. at Kilbarchan, Renfrewshire, Scot., Dec. 13, 1814, came to the U. S. in childhood; was ed. of the *Lowell Courier* 1841-47; undertook the management of the Boston *Atlas*, the leading Whig paper of N. Eng., 1847-53; represented Boston 4 yrs. in the



legislature; was a member of the constitutional convention of 1853; editorially connected with the *Cin. Gazette* 1853-56 and the *Ohio State Journal* 1856-58, after which he returned to the *Atlas* 1858; was appointed adjutant-gen. of Mass. 1860; rendered important service during the c. war. Wrote *History of Mass. in the C. War*. D. Oct. 24, 1872.

**Schriever**, shriv'er (EDMUND), b. in Pa. in Nov. 1812, grad. at U. S. Military Acad., and promoted brevet second lieut. of artill. July 1, 1833, capt. 1842; resigned July 31, 1846. From 1847 to 1861 he was treas. of Saratoga and Schenectady and of Rensselaer and Saratoga R. R. Cos., and pres. of the latter co. 1851-61. In Apr. 1861 he accepted an appointment on the staff of Gov. Morgan of N. Y., with the rank of col. and A. D. C., and May 14 was appointed lieut.-col. of the 11th Inf. U. S. A.; col. and A. D. C. May 1862, and served as chief of staff to Gens. McDowell and Fremont (1st corps), participating in the battles of Cedar Mountain, Second Bull Run, and Chantilly; appointed inspector-gen. U. S. A. (rank of col.) Mar. 1863, and assigned to the Army of the Potomac; was engaged at Chancellorsville and Gettysburg 1863, and in the Richmond campaign of 1864; inspector of the Military Acad. 1867-70. Brevet brig. and maj.-gen. U. S. A. Retired, 1881.

**Schröder** (FRIEDRICH LUDWIG), b. at Schwerin Nov. 3, 1744; raised the stage of Hamburg to a literary and artistic influence in Ger. by his grand impersonations of some of the prin. Shakspearian characters, such as Lear, which he first introduced on the Ger. stage. D. Sept. 3, 1816.

**Schröder** (SOPHIE), b. at Paderborn, Westphalia, Feb. 28, 1781, entered upon the stage at 12; acquired great fame by her impersonations of Phædra, Medea, Merope, Lady Macbeth, Sappho, etc. In 1840 she retired from the stage. D. Feb. 25, 1868.—Her daughter, WILHELMINE SCHRÖDER-DEVRIENT, b. at Hamburg Dec. 6, 1804, entered upon the stage in 1821; was acknowledged as the first singer of Ger.; received with great enthusiasm in Paris, Lond., and St. Petersburg; retired from the stage in 1847. D. Jan. 26, 1860.

**Schroeder** (JOHN FREDERICK), D. D. b. at Baltimore, Md., Apr. 8, 1800, grad. at Princeton 1819; studied at the Epis. Theological Sem., New Haven; was ordained 1823; was assistant minister of Trinity ch., New York, 1824-28, afterward rector of the ch. of the Crucifixion, New York, and of St. Thomas's ch., Brooklyn; established St. Ann's Hall, a sem. for young ladies, at Flushing, L. I., 1839; obtained popularity as a preacher and lecturer, and pub. a vol. of essays on biblical topics and Oriental lit., and *The Maxims of Washington*. D. Feb. 26, 1887.

**Schubert** (FRANZ), b. in Vienna Jan. 31, 1797, d. there Nov. 19, 1828, is best known by his songs. His symphony in C is a favorite in instrumental concerts. His compositions for the pianoforte, trios, etc. are skilfully wrought and imaginative.

**Schultze Powder**. The conversion of wood-fibre into an explosive was attempted by Capt. Schultze, acting for the Prus. govt. His method consisted in soaking the wood in water, to give it toughness; cutting it by fine saws into a kind of cross-grained veneering, and subsequently punching it into small cubes. The grains thus produced were boiled in a solution of soda, and afterward alternately exposed to steam and washed in a solution of chlorine. They were next treated for several hours with mixed nitric and sulphuric acids, kept cool by constant stirring, and thoroughly washed and dried. In this state the powder is but slightly explosive. For use, the grains must be submerged in a solution of nitrate of potassa and baryta, dried and sifted. The necessary oxygen having been now supplied, the powder has a high explosive power.

**Schumann** (ROBERT), b. at Zwickau, Sax., Jan. 8, 1810, composed symphonies, cantatas, sonatas, quartets, quintets, an opera, and songs; was learned, ingenious, imaginative, and gifted with much poetic feeling. D. July 29, 1856.—His wife, ULARA (WIECK), b. at Leipzig in 1819, an eminent pianist and teacher, introduced to the Ger. public the works of Chopin and Henselt.

**Schurz**, shoorts (CARL), LL.D., b. at Liblar, near Cologne, Rhensish Prus., Mar. 2, 1829, ed. at gymnasium of Cologne and at Univ. of Bonn 1846-48; was engaged in an unsuccessful attempt to excite an insurrection at Bonn in the spring of 1849; fought in the Palatinate; went to Switz.; returned to Ger. 1850; gave private lessons in Paris 1851-52; came to the U. S. toward the close of 1852, and lived at Phila. until 1855, when he settled at Madison, Wis.; entered with great zeal into national politics; made his first speech in Eng. in Ill. during the Senatorial contest between Lincoln and Douglas 1858; settled at Milwaukee as a lawyer 1859; attracted attention by a series of lectures in N. Eng. in the winter of 1859-60; was prominent in the Rep. national convention at Chicago 1860; was appointed by Pres. Lincoln minister to Sp. Mar. 1861; was appointed brig.-gen. of volunteers Apr. 1862; became maj.-gen. Mar. 14, 1863; commanded a division in the second battle of Bull Run and in the battle of Chancellorsville; was temporarily in charge of the 11th army corps at Gettysburg; took part in the battle of Chattanooga; was Wash. correspondent of the *New York Tribune* 1865-66; visited the S. States as special com. appointed by Pres. Johnson 1866; was an active member of the Chicago convention of 1868; was U. S. Senator from Mo. 1869-75; became involved in antagonism with Pres. Grant's administration; presided over the "Liberal" convention at Cin. which nominated Horace Greeley for the Presidency 1872; took part in the political campaign of 1875 in O., advocating the election of Gov. Hayes on a "hard-money" platform; sec. of the Interior 1877-81; was ed.-in-chief of *New York Evening Post* 1881-83.

**Schuyler**, skil'er, cap. of Colfax co., Neb., on R. R. and Platte River, has an extensive trade. Pop. 1880, 1017.

**Schuyler** (PETER), b. about 1650, was mayor of Albany (1686-90) and col. of N. Y. militia; commanded upon an expedition against the Fr. on Lake Champlain 1691; enjoyed great influence with the Five Nations of N. Y.; took to

Eng., at his own expense in 1710, 5 of their chiefs, in order to promote vigorous measures against the Fr. in Canada; was many yrs. a member and chairman of the executive council, and became acting gov. of N. Y. in 1719.

**Schuyler** (PHILIP), b. at Albany Nov. 30, 1733. In June 1755 was appointed capt. of N. Y. volunteers, and was engaged in the expedition against the Fr. at Crown Point; was associated with Washington in June 1775 to prepare rules and regulations for the govt. of the army. In the expedition against Canada S. commanded that by way of Lake Champlain, but was compelled, owing to ill-health, to relinquish his command to Montgomery in Sept. and return to Albany, after having taken possession of Isle au Noix on Sorel River. At Albany his influence among the Indians was of great value. The forced abandonment of Ticonderoga by St. Clair and his retreat to Ft. Edward compelled S. to fall back to Saratoga, after using every means to obstruct the advance of Burgoyne. The losses thus sustained in stores, ammunition, etc. caused a widespread consternation throughout the country, and Cong. ordered his superseding by Gates. At the time of the latter's arrival (Sept.) to assume command S. occupied a fortified position at the mouth of the Mohawk. He obediently turned over his command, placed his successor in possession of full information of the situation, remained with the army to aid in any capacity, and was present at the surrender of Burgoyne. A court of inquiry approved his management. In Apr. 1779 he resigned. From 1778 to 1781 he was a member of the Continental Cong., and in 1789 was appointed U. S. Senator from N. Y., and again in 1797. D. Nov. 18, 1804.

**Schuykill**, skool'kil, a river which rises in Schuylkill co., Pa., and after a S. E. course of 125 m. flows into the Del. at Phila., which city it traverses. Its lower portion affords extensive wharfage. It enters the Del. between *League Island*, on which is the new navy-yard, and *Mud Island*, on which is Ft. Mifflin.

**Schuylkill Haven**, Pa. See APPENDIX.

**Schwalber** [better known as CHELIDONIOS, the Græco-Lat. translation of the Ger. *Schwalber*, a "swallow,"] Gr. *χελιδών*, a friend of Albert Dürer, and who wrote the text in Lat. verse to his 3 series of wood-cuts, *The Apocalypse*, *The Passion of Christ*, and *The Life of the Virgin Mary*. He was a monk of the abbey of St. Egidius, and in 1515 S. left Nuremberg to become abbot in the Schotten Kloster, near Vienna. D. there Sept. 8, 1521.

**Schwanthaler**, shwan'tah-ler (LUDWIG MICHAEL), b. in Munich Aug. 28, 1802, the son of sculptor; studied in Rome, but wrought in Munich. His statues, decorations, and models are seen in the great cities of Ger., but chiefly in Munich. S. was the chief representative of the so called "romantic" style, and was the founder of the school to which Schaller, Widman, Brugger, and Zumbusch belonged. D. Nov. 15, 1848.

**Schwartz** (CHRISTIAN FREDERICK), b. at Sonnenburg, Prus., Oct. 26, 1736, studied in the Univ. of Halle 1746-49; was ordained at Copenhagen 1749; embarked at Lond. for India, where he arrived July 1750; transferred his services to the Eng. Society for Promoting Chr. Knowledge 1766; was sent as ambassador to Hyder Ali at Seringapatam to negotiate a peace, and succeeded in relieving the city of Tanjore from imminent danger of famine by his influence with the native farmers. D. at Tanjore Feb. 13, 1798.

**Schwartz** (BERTHOLD), according to legend, invented gunpowder in 1390, and in Freiburg, his reputed birthplace, a monument was raised in his honor in 1853.

**Schwartzburg-Rudolstadt**, principality and state of the Ger. empire, between the Sax. duchies; area, 340 sq. m.; pop. 80,396. It is covered with well-wooded spurs of the Thüringerwald, and mining and cattle-rearing are the prin. branches of industry. Flax is very extensively grown, and some linen manufactures are carried on. For the period 1883-85 the annual budget (revenues and expenditure) was fixed at 1,988,735 marks. There is a public debt of 4,365,000 marks. Cap. Rudolstadt.

**Schwartzburg-Sondershausen**, principality and state of the Ger. empire, in the Prus. prov. of Sax.; area, 318 sq. m.; pop. 71,107. Cap. Sondershausen.

**Schwartzenberg**, a princely family of Ger., descended from Erkingen von Seinsheim, who was ennobled in 1417, and in 1420 bought the estate of Schwarzenberg in Franconia. In 1670 the head of the family was made a prince of the empire, and in 1746 this dignity was conferred on all members of the house.—(1) KARL PHILIPP, b. at Vienna Apr. 15, 1771, d. at Leipzig Oct. 15, 1820, distinguished himself in the battles of Würzburg, Ulm, Hohenlinden, and Wagram. After the peace of Vienna (Oct. 14, 1809) he went to Paris as Aus. ambassador; negotiated the marriage between Nap. and Maria Louisa; commanded the Aus. contingent in the Rus. campaign of 1812; appointed Aus. field-marshal; commanded the Aus. army of observation in Bohemia, and when Aus. joined Rus. and Prus. he was made commander-in-chief of the allied army; gained the battle of Leipzig (Oct. 16-18, 1813), and led the army victoriously into Paris.—(2) FELIX LUDWIG JOHANN FRIEDRICH, b. at Kruman, Bohemia, Oct. 2, 1800, d. at Vienna Apr. 3, 1862, was made a field-marshal-lieut. in 1848; was employed in diplomatic missions to St. Petersburg, Lond., Brazil, and Naples; Nov. 22, 1848, was placed at the head of the Aus. govt. as chancellor of the empire. He found the state nearly dissolved, Vienna, Prague, Hungary, and the It. provs. in open insurrection, the treas. on the very verge of bankruptcy, the Aus. influence in Ger. almost annihilated, and the Ger. states about to reorganize their union under the leadership of Prus., etc. By the aid of Rus. he put down the revolution in Hungary, and succeeded in uniting the discordant members of the Aus. empire by means of a military and bureaucratic govt. He raised the credit of the state, and succeeded in drawing the S. and middle states over to the Aus. side.

**Schwarzwald**. See BLACK FOREST.



**Schwein'furt Green**, or **Mountain Green**, a compound of *cupric arsenite* and *cupric acetate*, 3 equivalents of the former to one of the latter. It is prepared by boiling together arsenious acid and acetate of copper, and is but little used in this country.

**Schweinitz, von** (LEWIS DAVID), PH. D., b. at Bethlehem, Pa., Feb. 13, 1780, was ed. in Ger.; went in 1812 as Moravian minister to Salem, N. C.; settled in his native town 1821, and resided there until his death, Feb. 8, 1834. He added by his own researches more than 1400 new species to the catalogues of Amer. flora. Author of several botanical monographs.—His son, EDMUND ALEXANDER, b. at Bethlehem in 1825, studied theol. in his native town and at the Univ. of Berlin; became a clergyman; author of *The Moravian Manual, being an Account of the Moravian Ch.; The Moravian Episcopate*, etc.

**Schwenk'feld, von** (KASPAR), b. about 1490 in Silesia, employed in the service of the duke of Liegnitz; embraced the Ref., but his conception of the deification of the body of Christ and of the Lord's Supper, and his demands for the establishment of a Ch. in which only the *holy* should be admitted, brought him in conflict with the Reformers. D. in Ulm about 1561. Wrote *Bekannthut und Rechenschaft von den Hauptpunkten des christlichen Glaubens*. A sect, the Schwenkfelders, was organized in Silesia, but most of them emigrated in 1734 to N. Amer. and settled in Pa.

**Schwenkfelders**. See SCHWENK'FELD.

**Schwerin**, town of Ger., cap. of the grand duchy of Mecklenburg-Schwerin, on the W. side of Lake Schwerin, is beautifully situated, surrounded with old walls, is generally well built, and contains many magnificent buildings; has many good educational insts. and numerous manufacturing establishments. Pop. 30,147.

**Schwerin, von** (KURT CHRISTOPH), COUNT, b. in Swe. Pomerania, Oct. 16, 1684, entered the Dut. army in 1700, and fought at Ramillies and Malplaquet; took service with the grand duke of Mecklenburg in 1706, and distinguished himself by repelling the Hanoverians, who invaded the country; removed afterward to Prus., as that part of Pomerania in which his estates were situated was ceded to that country; won the battle of Mollwitz Apr. 10, 1741, in the first Silesian war; stormed Prague Sept. 16, 1743, in the second, and fell in the battle of Prague, May 6, 1757, in Seven Years' war.

**Sciaccia**, shahk'kah, town of Sic., prov. of Girgenti, on the S. coast of the island, at the foot of Monte S. Calogero, near the ruins of anc. *Therme Sciniundina*. The rocky sides of Monte S. Calogero present innumerable natural caverns, many of which are now filled with mephitic exhalations, and medicinal springs everywhere abound. Everything indicates the immediate neighborhood of volcanic fires, and in July 1831, just off this shore, there arose a new island from the bed of the sea, and not long after it totally disappeared. The natural beauty of the scenery is heightened by the picturesque old castles and other ruins.—Gr., Rom., Saracenic, and Norman. There is some industry and commerce here. Pop. 21,348.

**Sciatica**, slat'e-ka [L. Lat. *neuralgia ischiadica*], a neuralgia of the great sciatic nerve, the sacral plexus, or any of the nerves of the thigh and hip. According to Niemeyer, the cutaneous nerve of the thigh, the superficial branches of the peroneal nerve, and the sural nerve are the principal seats of what is called sciatica. Exposure, rheumatism, gout, tumors near the nerve, fecal masses, hemorrhoids, diseased vertebrae, metritis, and perimetritis are reckoned among the causes. It sometimes follows a severe labor in childbed. Laxatives, cupping, leeching, the moxa blisters, hot baths, and local or general anodynes are frequently palliative, and sometimes curative. Periodic S. may often be relieved by quinine. Salicylic acid, iodide of potassium, and turpentine are sometimes extremely useful, and so is the constant electric current. It is, however, a most obstinate and distressing complaint.

**Science**, sl'enss [Lat. *scientia*, from *scio*, to "know"]. In a general sense, science means knowledge reduced to order; that is, knowledge so classified and arranged as to be easily remembered, readily referred to, and advantageously applied. Strictly speaking, it is a knowledge of laws, principles, and relations. All S. is based on the assumption that the laws of nature are immutable. From this point of view S. may be regarded as a knowledge of the laws of nature, embracing the processes of observation and deduction by which they are discovered, and the modes of reasoning by which their operation in the production of phenomena are made known. Pure S. is based on self-evident truths, and from these, as premises, laws of relation are deduced by a regular course of logical deduction. Of this nature is mathematical S. Natural S. is based on experiment and observation; its fundamental laws are deduced by induction. Knowledge of the relations of quantity is *abstract S.*; knowledge of causes and effects is *physical S.* W. G. PECK.

**Scientific Schools**. *Nomenclature*.—Under this head reference will be made to some of the insts. of the higher grade founded in this country within the present century for giving instruction in the various branches of mathematical, physical, and natural science, and their applications to the useful arts.

*Historic Sketch*.—Soon after the Revolutionary war the need of professional instruction from collegiate education was felt in the new republic, and efforts were made to establish schools of law, med., and theol. The need of training for the officers of the army was also appreciated. During Jefferson's administration (Mar. 16, 1802) the U. S. Military Acad. at W. Pt. was instituted by Cong. The graduates of this Acad. were for a long time the prin. civil as well as military engineers; many of them became renowned as explorers of "the Far West," and many more as teachers of mathematical science in the colls., E. and W. In 1845, while Polk was Pres. and George Bancroft sec. of the navy, an Acad. for the preparation of navy officers was instituted by Cong. at Annapolis, Md. Nearly a quarter of a century after

the beginning of the U. S. Military Acad. the first civil school of science in this country was created at Troy. In 1826 the plans of Stephen Van Rensselaer took form in the incorporation of the Rensselaer Polytechnic Inst. Its object was declared to be the application of science to the common purposes of life, and especially the qualification of teachers to instruct in the application of chem., philos., and nat. hist. to agriculture, domestic economy, and the arts and manufactures. Under the lead of Amos Eaton the school at once became a success. Twenty yrs. later, and again by private munificence, an impulse was given to scientific education by the foundation in 1847 of the Lawrence S. S. as a dept. of the univ. at Cambridge, for the purpose of providing instruction in chem., engineering, zoology, geol., etc. The recipient of this gift was Harvard, the oldest classical coll. in the U. S. The S. S. of Yale Coll. was projected quite as early as that of Harvard. The return from Europe of a young agricultural chemist, John P. Norton, led in 1847 to the beginning of a school in which agricultural and technical chem. were to be taught. It became a school of mathematical as well as of chemical science, and afterward of nat. hist. and geol. Five yrs. later, in 1852, at Dartmouth Coll., one was founded under the name of Chandler S. S. During the period from 1830 to 1860 the importance of scientific education was discussed in every part of the Union. Organized efforts were put forth in N. Y., Ill., and elsewhere for the promotion of agricultural colls. In 1855 the State of Mich. provided for such a coll., which was opened in 1857. Attention was early directed to the possibility of securing from Cong. a grant of public lands for the promotion of scientific education. In Dec. 1857, and afterward in 1862, Hon. Justin S. Morrill, Rep. from Vt., advocated bills bestowing a grant of public lands for this purpose. Having received the approval of the Pres., it became a law July 2, 1862. From the bestowal of that grant until now the progress of S. S. in the U. S. has been rapid.

*Schools of Science in the Older Colleges*.—The older colls. have now, most of them, established special courses of study, leading to special degrees. Thus, at Cambridge there is the Lawrence School, the Museum of Comparative Zoology, and the Bussey Inst., and there was the School of Mining. In Yale Coll. the Sheffield School has grown to be a second coll., side by side with the original coll., under the same trustees, with a different body of profs., who are united with the college profs. in one faculty, called the "philosophical." The Sheffield School teaches chiefly the mathematical, phys., and natural sciences, pure and applied. Brown Univ., under Dr. Wayland, early took steps tending toward the modern scientific courses. Union Coll. claims to have been the first to introduce the system of scientific education by the substitution of modern langs. and mathematical and phys. science for Gr. and Lat. Wesleyan Univ. at Middletown also claims to have been among the first of Amer. colls. to provide special courses of instruction in science. Columbia, like Yale, maintains the old classical curriculum, and simultaneously promotes with vigor a scientific dept. under the name of the School of Mines. Dartmouth retains the Chandler School, and has affiliated with it the school endowed by the N. H. portion of the grant of 1862; and it also has a special endowment for advanced instruction in engineering. Princeton has received from John C. Green a liberal foundation for the establishment of a school of science which bears his name. Lafayette Coll. at Easton, Pa., has received a special gift for the endowment of a S. S. Rutgers received the national grant of 1862, and with it maintains a S. S. in which agriculture has been given prominence. Two technical schools have rapidly attained to positions of great influence—the Mass. Inst. of Technology in Boston and the Stevens Inst. of Technology, a school of mechanical engineering, in Hoboken, N. J. The first mentioned of these was founded by an association of which Prof. W. B. Rogers was long pres. Degrees are conferred in either of 10 depts.—civil engineering, mechanical engineering, mining, arch., chem., metallurgy, nat. hist., physics, science and lit., and philos. The building and collections of this inst. are noteworthy. A third inst. deserves mention here—the Thayer School of Civil Engineering, founded, in connection with Dartmouth Coll., for the advanced professional training of civil engineers. [From orig. art. in *J. s. Univ. Cyc.*, by PRES. D. C. GILMAN.]

**Scilla**, shill'lah [anc. *Scylla*], town of S. It., prov. of Calabria, on the famous rock mentioned by the anc. poets as so perilous to the mariner, was a strong fortress, and has been the scene of severe fighting between the Eng. and Fr.; is a place of some industry and commerce. Pop. 7448.

**Scilly** (sil'le) **Islands**, a group of islands belonging to G. Brit., situated 30 m. W. of Land's End, Cornwall. It consists of 140 isles and rocks, of which only 6 are inhabited. Total area, 5770 acres. Pop. 2627, of whom about 1500 live on St. Mary, where Hugh Town, the cap., is situated. On St. Agnes is a light-house; and on Bishop Rock, 6 m. westward, is one of the finest "rock" light-houses existing. All the islands are rocky—granite with a thin layer of light sandy soil. Agriculture and fishing are the prin. occupations; good crops of barley, oats, and potatoes are raised.

**Scimitar**, sim'e-tar [a word probably of Basque origin], a curved sword, of which the convex edge is sharp. It is generally employed in Asia.

**Scinde**. See SINDE.

**Scintillation of the Stars** [Lat. *scintillatio*]. When the spectroscopie is applied to a star near the horizon, as seen by a telescope of moderate power, its spectrum is seen to be crossed by moving dark and bright bands of various breadth and intensity. If the spectrum be horizontal and the star near the horizon, these bands are transversal to the spectrum, but form an angle with the vertical as the star's altitude increases, which becomes a right angle at an altitude of about 40°; and beyond this the bands are longitudinal, faint and ill-defined. When the prism is turned into a vertical direction, the bands are transversal, whatever be the



star's altitude, if less than 90°, but less well defined; they are less numerous and rapid in their motion for low stars than for high, and their inclination to the vertical is always from the zenith toward the violet end of the spectrum. Their motion is generally from the violet to the red end of the spectrum for a star E. of the meridian, and *vice versa* for a star W.; but for one on the meridian they are sometimes stationary, and sometimes vibrate backward and forward from one color to another. The explanation of these phenomena depends upon atmospheric dispersion; the existence of strata of air which have a different index of refraction; and lastly upon the various motions of these strata with respect to the rays which reach the telescope. [From *orig. art. in J.'s Univ. Cyc.*, by PROF. T. H. SAFFORD.]

**Scio**, s'vō. **Chios**, or **Khio** [Tur. *Sikiz Adasi*], a rough and rocky but very beautiful and fertile island in the Ægean, in the lat. of Smyrna, separated from the W. extremity of Asia Minor by a strait only 5 m. wide at the narrowest point. It is 32 m. from N. to S., from 18 to 8 from E. to W., 110 m. in circuit, and has an area of about 400 sq. m. The oldest inhab. were Ionians. Homer was said to have been born there. In Feb. 1822 there was a pop. of at least 100,000, and in Aug. after the infamous Tur. massacre there remained not more than 30,000, some say not more than 16,000. The island is now flourishing again, with a pop. of 50,000 or 60,000, most of whom are Turks. R. D. HITCHCOCK.

**Scio'to River** rises in Anglaize co., O. Its course to Columbus is S. E., and from that city it flows S. to Portsmouth, where its waters are discharged into the Ohio. It is 200 m. long, and for 130 m. may be navigated in good stages of water.

**Selpio**, sip'e-o, the name of one of the most illustrious patrician families in anc. Rome, belonging to the Cornelia gens. The first member of the family mentioned in hist. is PUBLIUS CORNELIUS SCIPIO, who was *magister equitum* to the dictator Marcus Furius Camillus in 396 B. C.; the last is PUBLIUS CORNELIUS SCIPIO, who was consul under Nero in 56 A. D. The 2 most famous members of the family are: SCIPIO AFRICANUS THE ELDER, b. 234, d. 183 B. C., who defeated Hannibal in the battle of Zama 202, and thereby ended the second Punic war; and SCIPIO AFRICANUS THE YOUNGER, b. 185, d. 129 B. C., who took Carthage in 146 B. C., and thereby ended the third Punic war. The family tomb, situated on the left of the Via Appia, near the Porta Capena, about 400 paces from the modern Porta S. Sebastiano, was discovered and excavated in 1780, and has been described in full by Visconti. *Monumenti degli Scipioni* (1785).

**Scio'pas** [Σκίόρας], b. in the island of Paros, flourished between 390 and 350 B. C. He worked mostly in marble, and chose his favorite subjects from the myths of Dionysus and Aphrodite. With Praxiteles, he formed the character of the second or later Attic school of sculpture. He was celebrated also as an arch. Among the noted works ascribed to S. were the group of Niobe and her children and the group of sea-deities escorting Achilles to the island of Leuce.

**Scores'by** (WILLIAM), D. D., F. R. S., son of Capt. William, b. at Cropton, Eng., Oct. 5, 1790, went to sea in one of his father's ships when 10 yrs. old; became chief mate at 16; spent the intervals between his annual voyages in scientific studies at Edinburgh; reached the highest N. lat. that had then been attained May 1806; became capt. of his father's ship 1811; made important observations on the electrical phenomena of the arctic regions. After 17 voyages to the Greenland and Spitzbergen regions, he pub. *Account of the Arctic Regions and Journal of a Voyage*. When above 40 Capt. S. passed through a course of literary and theological study, graduating in divinity at Cambridge; filled several pastorates; received the degree of D. D.; was noted for philanthropic labors; visited the U. S. 1847, and made a voyage around the world for magnetic research 1855-56. D. at Torquay Mar. 21, 1857.

**Scorpio**, in astronomy. See ZODIAC.

**Scorpions**, or **Scorpiones**, a group of articulates belonging to the class of Arachnoids. They are provided with 8 pulmonary sacs, with which are connected as many spiracles opening on the latero-abdominal surface; the abdomen is not separated by decided constriction from the cephalo-thorax, and the 6 caudal segments are narrow and elongated, and the last one provided with a poison-sac and terminal hook-like sting; the maxillae are developed as long forceps, and simulate the anterior legs of crabs; beneath and behind the last pair of legs from the abdomen are developed 2 laminated or comb-like appendages; the integuments are coriaceous, consisting chiefly of chitine; 6 or more eyes are developed toward the front on the surface of the cephalo-thorax. Representatives of the order are found in all tropical and warm regions, to which they are mostly confined. They frequent dark places, and conceal themselves for the most part under stones, logs, etc., and are wont to frequent ruined houses. They run with considerable rapidity, keeping then the tail elevated. Like crustaceans, they shed their skin. They feed chiefly on insects, which they catch and convey to the mouth by the forceps-like maxillae, and then suck their blood. They are viviparous, and gestation is said to last for the greater part of the yr. They are rather dangerous animals, and their sting is very painful, although rarely fatal.

**Scotch Confession of Faith**. It was drawn up by John Knox and his coopeers at the request of the Scotch Parl., which assembled at Edinburgh in Aug. 1560, after the death of the queen-regent, Mary of Guise (June), and the close of the c. war. It consists of a preface and 25 articles on the chief doctrines of religion, which are briefly, tersely, and vigorously stated. It agrees with the other Reformed confessions of the 16th century, but is more pronounced in its opposition to the R. Cath. Ch. than most of them. Seven yrs. later (1567), after the abdication of Queen Mary, the confession was readopted, and the Reformed Kirk of Scot. formally acknowledged and established. In 1580 the confession was signed by King James II., and a supplementary confession

(sometimes called the *second* Scotch confession) added to it. It continued to be the only doctrinal standard of Scot. recognized by the civil govt. till the Revolution of 1688, but it was practically superseded by the Westminster Confession, which is more logical and complete, and was adopted by the covenanters and the General Assembly during the Commonwealth, (1647). The S. C. is in Dunlop's *Collection of Scotch Confessions* (vol. ii.), and in Schaff's *Hist. of the Creeds of Christendom*, vol. I. 690 *sqq.* and iii. 437-438. PHILIP SCHAFF.

**Scoter**, a name by which are designated species of sea-ducks, distinguished by the bill being much swollen at the base, with the terminal part depressed and broad, and the extension of the feathers of the chin forward as far as the nostrils; the color is, to a great extent, black.

**Scot'tists**, among the SCHOOLMEN (which see), the followers of John Duns Scotus, adversaries to the Thomists; held to freedom of the will and the immaculate conception of the Virgin.

**Scot'land** [Lat. *Scotia*] was originally the name of Ireland, and the inhabs. of that island, a Celtic tribe, were called *Scots*. To the N. part of the island of G. Brit., the present Scot., the name was not applied until the 10th century, when an invasion from Ire. succeeded in consolidating a Scotch empire there. The country was then, and for several subsequent centuries, designated as *Nova Scotia*. The Romans called it *Caledonia*, and its inhabs. also a Celtic tribe, *Caledonians* or *Picti*. In the reign of Titus (79-81) Julius Agricola penetrated to the Firth of Tay, and constructed a line of forts from the Forth to the Clyde, but beyond this limit the Romans never extended their dominion. When, in 420, the Romans entirely abandoned Britannia, the free Picts again swept down over the Lowlands and far into Eng., ravaging and devastating the country with savage but irresistible valor. The Britons now called the A.-S. to their aid, and the Picts were once more confined to their Highlands; in 449 a Sax. chieftain, Edwin, founded Edinburgh. In 503 the Scots—that is, the Celts from Ire.—crossed over to Brit. and founded, under the leadership of Fergus, a Scotch kingdom along the W. coast of Caledonia, from the Firth of Clyde to the present Ross-shire. In 836 Kenneth, a lineal descendant of Fergus, became king of the Scots, and in 843 he also became king of the Picts, transferring his residence to Forteviot in Strathern, the old cap. of the Picts. Thus, the Scots and the Picts, 2 tribes of the Celtic race and speaking 2 dialects of the Celtic lang., coalesced and formed one empire, which soon began to be designated *Scotia*, *Nova Scotia*, *Scotland*, though the Celts of Ire. continued for centuries to protest against this application of the name. But while thus the Scotch kingdom was externally much extended, the Scotch people underwent an internal change by which the Celtic character almost disappeared. So many Teutonic elements were absorbed that in the course of a couple of centuries a new national type was developed, in which the Celtic element was hardly more than recognizable. Teutonic lang., ideas, and blood poured into S. both from the N. and the S. The Nors. and the Danes held the islands before the time of Kenneth, and afterward, at times, also, large tracts of the mainland, and a lively intercourse took place between the Scots and the Scandinavians, both as friends and as foes. The Hebrides and the Isle of Man were not united to S. until the reign of Alexander III. (1249-86), who defeated Haco, king of Nor., at Largs, on the coast of Ayr; and the islands of Orkney and Shetland not until the reign of James III. (1460-88), who married Margaret, daughter of King Christian of Den., and received them as her dowry. Still greater was the Teutonic influence coming from the S.—first A.-S., then Norman. Various A.-S. provs. were incorporated with the Scots-Pictish kingdom—Cumberland in 950, Strathclyde in 970, Lothian in 1018—and Malcolm III., who slew and succeeded Macbeth in 1057, was ed. at the Eng. court and married an Eng. princess. Her brother, Edgar Atheling, and many A.-S. nobles sought refuge and support with Malcolm during the Norman invasion of Eng., but in 1072 William the Conqueror penetrated into S. and compelled Malcolm to submit and do homage to him. What this homage meant became a question of much contention between the Scotch and Eng. kings, and was not settled until the reign of William the Lion (1165-1214). He was captured by Henry II. of Eng., and regained his liberty in 1174 only by declaring himself a vassal of the Eng. king; but in 1189 Henry's successor, Richard Cœur de Lion, who wanted money for his campaign to the Holy Land, ceded his right of supremacy for 10,000 marks. Once more, however, the question arose of Scotch allegiance to Eng. When Margaret, the so called "Maiden of Norway," daughter of King Eric of Nor., granddaughter of Alexander III., and heiress to the Scotch crown, died on her voyage from Nor. to S., several pretenders appeared, and finally John Balliol obtained the crown by the aid of Edward I., to whom he swore allegiance. But another party of the Scotch people arose and made the fiercest resistance to Balliol and the Eng.—first under William Wallace, who fell into the hands of Edward I. and was put to death in Lond. 1305; then under the younger Robert Bruce, who routed the Eng. under Edward II. at Bannockburn June 24, 1314, invaded Eng. 12 times in 14 yrs., and ravaged the country so fearfully that Edward III. was glad to buy peace of him by resigning all his claims to supremacy over S. With Robert II. (1371-90) the house of Stuart ascended the throne, and the hist. of S. from this time to the establishment of the union with Eng. is given in the articles on ROBERT II.—III., JAMES I.—VI., MARY STUART, KNOX, etc.

The hist. of S. has been written by William Robertson (1759), P. F. Tytler (1823-43), John Hill Burton (1867-70). See also *Domestic Annals of Scot.*, by R. Chambers (1859-61).

CLEMENS PETERSEN.

**Scotland, Reformed Church of**. From about 563 A. D.—as St. Columba founded his monastery on the Isle of Iona, and extended his missionary work all over Scot.—down to the middle of the 10th century, the Culdees



continued to propagate Christianity. Meanwhile another stream of Chr. influence was poured into Scot. from the S., representing the Rom. form of ecclesiasticism; and the Culdee worship with its simpler ritual came into conflict with the Rom. observances and modes of worship. After the Scot. and Pictish monarchies were united in one king during the reign of Malcolm III., and largely through the influence of Margaret, his Sax. queen, many of the Culdees yielded to the powerful influence of the Rom. Ch. From this time, the middle of the 12th century, till the dawn of the Ref., the hist. of the Ch. in Scot. is one of constantly increasing power and wealth, and of growing corruption. To this period the parochial system of Scot. owes its establishment, and the Scot. ecclesiastics maintained a struggle for independence against the primacies of Canterbury and York. During the 4 centuries preceding the Ref.  $\frac{1}{2}$  of the wealth of the nation had passed into the hands of the Rom. Ch. In the end of the 15th century the feudal power of the greater nobles was greatly weakened by the absorption of the wealth of the country by the Ch. and by the rising up of a middle class of lesser landholders and burghers. In the beginning of the 16th century the writings of the continental Prot. divines were introduced into Scot. Persecutions followed for 30 yrs., but they resulted in the triumph of the Ref. in Scot.

The peculiar features of the Reformed Ch. of Scot., beside the profession of the evangelical faith common to all the chs. of the Ref., were—(1) The govt. of the Ch. by that order of men which is indicated in the N. T. by the terms presbyters and bps. or overseers; (2) the subjection of the Ch. in all things spiritual to Christ as her only Head, and to his word as her only rule. The first General Assembly of the Reformed Ch. of Scot. was held in 1560, and from this date the Assembly "took order for God's glory and the weal of his Kirk in the realm of Scot." At this Assembly "the Book of Discipline of the Church was allowed and approved." It was rejected by the state, but the Ch. proceeded at once to carry it into execution. It is especially worthy of note that in this "first Book of Discipline" it is maintained that the Kirk possesses an independent and exclusive jurisdiction, "which flows directly from God and the Mediator, Jesus Christ, and is spiritual, not having a temporal head on earth, but only Christ, the only King and Governor of his Church." For 7 yrs., from the death of the regent Mary of Guise (1560) till the abdication of Mary Queen of Scots, the Kirk was without state endowment. At a very early period lay patronage was introduced into Scot. Laymen who had endowed chs. and monasteries reserved the right of presenting incumbents to the benefices thus founded. At a later period these rights of presentation were to a large extent annexed to bishoprics, priories, abbacies, and other religious houses. The rights of presentation which belonged to the religious houses were after the Ref. a continual subject of contention between the Assembly and the queen. Immediately after the queen's abdication the Parl. met on Dec. 15, 1567, and passed an act in favor of the Reformed Kirk, ratifying the act of 1560 by which the Confession of Faith was sanctioned and adopted, and among other statutes one for the examination and admission of ministers by the Kirk, reserving, however, the right of presentation to the lay patrons. This Parl. also "declared and granted the jurisdiction of the Kirk anent preaching of the true word of God, correction of manners, and administration of the holy sacraments."

In 1603 James ascended the Eng. throne, and this was immediately followed by a tyrannical invasion of the Ch.'s independence by the civil power. After a long and bitter struggle, both in Eng. and in Scot., against the royal encroachments on the civil and religious liberties of the people, an ordinance of the Eng. Lords and Commons in Parl. was passed on June 12, 1643, calling the Westminster Assembly. The General Assembly of the Kirk met in Edinburgh on Aug. 2 in the same yr. The Confession of Faith of the Westminster divines was finished in 1646, and on Aug. 4, 1647, it was adopted by the Scot. General Assembly, with 2 modifications; and 2 yrs. later the Estates of Parl. ratified this decision. During the 12 yrs. of Cromwell's govt. the Ch. was left to carry out her discipline and instruction of the people, though the General Assembly was not allowed to meet. Charles II. was restored to the throne in 1660, and in the following yr. the Scot. Parl. declared the ecclesiastical as well as civil supremacy of the king. An attempt was then made to conform the Scot. Ch. to that of Eng. by the establishment of the episcopal form of govt. But the great body of the Scot. people steadfastly resisted the attempt to enforce conformity. In the yr. 1688, soon after William of Orange landed, the Estates of Scot. presented to him a claim of rights, declaring that the superiority of any office in the Ch. above that of presbyters is and hath been an intolerable grievance. In Apr. 1689 the Scot. Parl. met and passed an act abolishing prelacy. In 1690 the Parl. again met and passed acts rescinding the statute of 1669, which had declared the king's supremacy, and ratifying the Confession of Faith and settling Presb. ch. govt. The same Parl. passed an act abolishing lay patronage, though the new monarch was known to be strenuously opposed to its abolition. In 1693 the Parl. passed an act for "settling the quiet and peace of the Ch.," but this act expressly provided for summoning the General Assembly by royal authority. So far from settling the peace and quiet of the Ch., the consequence of this act was that a fresh storm of ecclesiastical trouble swept over Scot. The General Assembly met in May 1694, prepared to assert the freedom of the Kirk and her intrinsic power to meet in synods and assemblies.

With the beginning of the 18th century came the union of the 2 kingdoms of Eng. and Scot. In the article on the FREE CHURCH will be found a statement of the struggles between the 2 parties in the Ch., which resulted in the first secession in 1723, in a second secession in 1752, and ultimately in the formation of the Free Ch. of Scot. in 1843.

During the last 30 yrs. there has been a remarkable development of spiritual and intellectual life among the clergy of the Scot. Ch. and a corresponding growth of religious power in the congregations. The law of patronage has been abolished, so that each parish as it becomes vacant, on the payment of a small sum to the patron, has now the right of electing its own minister, subject to the assent of the presbytery. [From orig. art. in *J.'s Univ. Cyc.*, by DAVID INGLIS, LL.D.]

**Scott (CHARLES)**, b. in Cumberland co., Va., in 1733, served in Braddock's campaign 1755; raised the first company S. of James River for service in the war of the Revolution; became col. of the 3d Va. battalion Aug. 12, 1776; brig.-gen. Apr. 2, 1777; distinguished at Trenton, Germantown, Monmouth, and Stony Point; taken prisoner at the surrender of Charleston 1780; brig.-gen. of Ky. volunteers in St. Clair's unfortunate expedition against the Miami Indians 1791, but made a successful incursion to the Wabash, defeating the Indians; commanded a portion of Wayne's army at the battle of Fallen Timbers, 1794; was gov. of Ky. 1808-12. D. Oct. 22, 1820.

**Scott (DAVID)**, b. at Edinburgh Oct. 30, 1806, son of a landscape engraver, ed. at the High School; showed precocious talent for designing and engraving; visited It. in 1832. He was a man of powerful originality. He was an author too; wrote an able series of papers on art in *Blackwood*. D. Mar. 5, 1849.

**Scott (DRED)**. See DRED SCOTT CASE.

**Scott (Sir GEORGE GILBERT)**, R. A., F. S. A., b. at Gawcott, Buckinghamshire, Eng., in 1811, grandson of Thomas Scott; became an arch. and a prominent member of the school which effected the "Gothic revival." Among his recent works are the univ. buildings at Glasgow, the Indian, foreign, home, and colonial offices, Lond., and the national memorial to Prince Albert in Kensington Gardens, for which he was knighted Aug. 9, 1872. D. Mar. 1878.

**Scott (GUSTAVUS H.)**, U. S. N., b. in Va. June 13, 1812; lieut. in 1841, commander in 1856, capt. in 1863, com. in 1869, rear-admiral in 1873; retired in 1874. Served afloat during the c. war. D. Mar. 23, 1882.

**Scott (HENRY L.)**, b. in N. C. Nov. 1814, grad. at the U. S. Military Acad., and entered the army as brevet second lieut. of inf. July 1, 1833; capt. 1847. From 1842 to 1848 he served as A. D. C. on the staff of his father-in-law, Gen. Winfield Scott, and in the war with Mex. as his chief of staff, gaining the brevets of major and lieut.-col.; was acting judge-advocate 1848-50; again on the staff of Gen. Scott 1850-61; became lieut.-col. in 1855. In May 1861 was appointed an inspector-gen. U. S. A.; retired from active service Oct. 1861; resigned Oct. 31, 1862. Wrote a *Military Dict.*

**Scott (JOHN MORIN)**, b. in New York in 1730, descended from the baronial family of the Scotts of Ancrum; grad. at Yale 1746; became a prominent and wealthy lawyer in New York; was an early and vigorous opponent of the oppressive measures of the Brit. ministry; was perhaps the most influential member of the gen. committee of New York, appointed in 1775, and of the provincial Cong. 1775-76; aided in drawing up the const. of N. Y. 1776; was chosen by the Continental Cong. as one of the first brig.-gens. of N. Y. troops June 9, 1776; served at the battle of L. I. and in Westchester co. until Mar. 1777, when he became sec. of state of N. Y.; was delegate in the Continental Cong. 1780-83, and chosen an honorary member of the Society of Cincinnati 1784. D. Sept. 14, 1784.

**Scott (LEVI)**, D. D., b. at Cantwill's Bridge (now Odessa, Newcastle co.), Del., Oct. 11, 1802, mainly self-taught; received the degree of A. M. from the Wesleyan Univ., Middletown, Conn., and D. D. at Del. Coll., Newark, Del.; was prin. of Dickinson gram. school, Carlisle, Pa., 1840-43; also bp. of M. E. Ch. from 1852 till his death, July 13, 1882.

**Scott (ROBERT)**, D. D., b. in Devonshire, Eng., in 1811, grad. at Christ Ch., Oxford, 1833; became a fellow of Balliol and coll. tutor; took orders in the Ch. of Eng.; was rector of Duloe, Cornwall, and of S. Luffenham, Rutlandshire; in 1845 was one of the compilers of Liddell and Scott's *Greek Lexicon*; became master of Balliol 1854, prof. of exegesis 1861, and dean of Rochester 1870.

**Scott (ROBERT KINGSTON)**, b. in Armstrong co., Pa., July 8, 1826, became lieut.-col. of O. volunteers Oct. 1861, col. July 5, 1862; was at Ft. Donelson, Shiloh, and Corinth; commanded a brigade under Hurlbut in Tenn., in Miss. under Logan, and in Ga. under Sherman; was in the "march to the sea;" assistant commissary Freedmen's Bureau in S. C. 1865-68, and gov. of S. C. 1868-71.

**Scott (ROBERT N.)**, b. Jan. 21, 1838, at Winchester, Tenn., appointed second lieut. of 4th U. S. Inf. Jan. 21, 1857, adjutant July 1861, and capt. Sept. 1861; served on the Pacific coast until 1861, being in command of U. S. steamer Massachusetts during the San Juan difficulties in 1859; was with the Army of the Potomac as acting adjutant-gen. 1st brigade regular inf. Mar.-June 1862; was engaged in the siege of Yorktown and the battle of Gaines's Mill, and as acting adjutant-gen. of Casey's division Aug. 1862 to June 1863. From June 1863 to Sept. 1864 he was senior aide-de-camp to Maj.-Gen. Halleck; assistant adjutant-gen. of volunteers Sept. 1864 to Jan. 1867; at head-quarters of the army and military division of the James to July 1865, and adjutant-gen. military division of the Pacific July 1865 to Dec. 1866; aide-de-camp to Gen. Halleck from Jan. 1867 till 1872, except for a part of 1870, when in command of posts in Miss. and Ky.; assigned to the 16th Inf. in 1870; transferred to 3d Art. Jan. 1871; prof. of military science at Fairbault, Minn., 1872-73; Ft. Ontario, N. Y., 1873-77; maj. 3d art. 1879; since 1877 at War Dept., Washington, D. C. Wrote *Digest of the Military Laws of the U. S.*

**Scott (THOMAS)**, D. D., b. at Baytoft, Lancashire, Eng., Feb. 16, 1747, was ordained 1772; became in 1780 curate of Olney, in 1785 chaplain to the Lock Hospital, and in 1801 vicar of Aston Sandford, Buckinghamshire. Pub. a popular *Family Bible*, with Notes. D. Apr. 16, 1821.



**Scott** (THOMAS A.), b. in Loudon, Franklin co., Pa., in 1824; placed in several different positions until 1850, when he entered the employ of the Pa. R. R. Co. as gen. agent of the E. division. In 1859 he was elected v.-p. of the co., and in 1874 its pres. Three yrs. before he had been made pres. of the Pa. Co. He was also pres. of the Texas Pacific R. R. from its organization in 1871, and was controlling director of the Southern Railway Security Co. In 1861 he was assistant sec. of war. D. May 21, 1881.

**Scott** (Sir WALTER), b. in Edinburgh Aug. 15, 1771, was a strong and healthy child until about 18 months old, when he became incurably lame in his right leg. At 8 he was placed in the High School of Edinburgh, where he remained 4 yrs., giving evidence of his love of knowledge, of a strong memory for whatever pleased him, and of special delight in hist., poetry, fairy-tales, and romances. In 1788 he entered the univ., and for a yr. or more attended the classes in Gr., Lat., logic, and ethics, giving some attention also to hist. and law. In the anc. langs. he made but little progress, although more successful in other studies. In 1792 he was called to the bar. During these and the succeeding yrs. he was crowding his mind with vast accumulations of "ponderous and miscellaneous" knowledge of poetry and archæology, fiction, and hist., not easy to condense or reduce to system and order. He had begun to collect books and articles of antiquarian interest. His mind was turning toward letters, and in 1796 he made his first considerable publication, being translations from the Ger. of Bürger. In the mean time, in 1797, he was married to Charlotte Margaret Carpenter, a young lady of French birth and parentage, but a resident in Eng. Two yrs. later, through the influence of his friends, he obtained the appointment of sheriff-depute of Selkirkshire. In 1802 he pub. *Minstrelsy of the Scottish Border*. It was received with great favor. From this time onward to the yr. 1831 there was but one yr. (1807) which was not marked by some independent work in verse or prose. In 1805 was pub. *The Lay of the Last Minstrel*. It took the world by surprise, and was received with unbounded delight. This was followed in 1806 by *Marmion*, perhaps the strongest and boldest of his poems, and in 1810 by *The Lady of the Lake*, in some respects more pleasing than any. In these his poetic power culminated.

On the decline of his popularity as a poet his fertile mind turned to another form of lit. In 1814 appeared, anonymously, a novel under the title of *Waverley*. The next yr. *Guy Rannering* was pub.; in 1816, *The Antiquary* and the first series of the *Tales of My Landlord*; in 1817, *Rob Roy*; in 1818, *The Heart of Midlothian*; in 1819, *Ivanhoe*. This series of novels marks the high tide of his genius. Those which follow are on a somewhat lower level. In 1830 alarming symptoms which had appeared the preceding yr. were followed by a paralytic attack, from which he partially recovered. In Apr. 1831 the shock was renewed, and in Sept. he left his home for the Continent. The admiralty furnished him a ship of war, on which he proceeded to the Mediterranean, touching at Malta, and thence going to Naples. Here his mind almost entirely gave way, and he hurried homeward as rapidly as possible, stopping for a few weeks in Lond., and reaching Abbotsford in July. He d. Sept. 21, 1832. [From *orig. art. in J.'s Univ. Cyc.*, by PRES. S. G. BROWN, D. D., LL.D.]

**Scott** (WINFIELD), b. in Dinwiddie co., near Petersburg, Va., June 13, 1786, studied law, and admitted to the bar. In 1808 he accepted an appointment as capt. of light artill., and was ordered to New Orleans. Promoted to be lieutenant-col. June 1812, he was sent to the Niagara frontier, reporting to Gen. Smyth Oct. 4, near Buffalo. The attack on Queenstown occurred Oct. 13; Col. Van Rensselaer being wounded, the battle was fought by S.; he was overpowered, and obliged to surrender with his command. Reporting to Gen. Dearborn on the Niagara frontier, he led the advance in the assault on Ft. George, May 27, 1813. In June he commanded the rear-guard in the retreat from Stony Creek to Ft. George, and in connection with the navy made the descent on Burlington and York in Sept. Reporting to Gen. Brown at Buffalo, he established a camp of instruction. The battle of Chippewa was fought July 5, 1814, in which S. greatly distinguished himself; the battle of Lundy's Lane next followed (July 25), where S. was severely wounded. He was now (July 26) promoted to be maj.-gen., and Cong. voted him a gold medal. He sailed for Europe in July 1815, returning the following yr. In 1818 he commenced the preparation of *Gen. Regulations of the Army*, and in 1826 his *System of Inf. and Rifle Tactics*. During the nullification troubles (1829-33) S. was ordered to S. C., where a collision between the "nullifiers" and the U. S. troops was prevented. His next service was in Fla. and the Creek Nation against the Indians. The Canada border troubles (1837-38) next demanded his attention, followed in 1838 by the duty of emigrating the Cherokee Indians to the upper Ark., and in 1840-41 he was engaged in Me. during the disputed terr. controversy. In June 1841 he succeeded to the command of the army as gen.-in-chief. In the war with Mex. he was ordered, in Nov. 1846, to take command. A landing was effected (Mar. 9) at Vera Cruz. The place was at once invested on the land side, and surrendered Mar. 29. The battle of Cerro Gordo was fought Apr. 18, and Jalapa occupied next day; Worth's division, in advance, occupied Puebla, where it was joined by S. with the reserve by the end of May. The battles of Contreras, Churubusco, and San Antonio were fought Aug. 19-20, and on the 24th an armistice was concluded. Failing to agree upon terms, operations were resumed Sept. 7, and on the 8th the battle of Molino del Rey was fought; the heights of Chapultepec were carried Sept. 13, as well as the San Cosme and Belen gates of the City of Mex., the army entering the next day (Sept. 14). The Guadalupe-Hidalgo treaty of peace, signed by the coms. Feb. 2, 1848, was ratified by Cong. Declining the proffered presidency of the Mex. republic, S., having been superseded by Gen. W. O. Butler, and a court of inquiry ordered in his case, arrived

in New York May 1848. Cong. in Mar. had extended to him a vote of thanks and authorized a gold medal. In June he was a candidate for nomination in the Whig convention which nominated Gen. Taylor for the Presidency. In 1852 he received the nomination from the Whig party, but was signally defeated by Franklin Pierce. In 1855 the rank of lieutenant-gen. by brevet was conferred upon him. In 1859 he was sent to Puget's Sound to arrange the difficulty caused by the occupation of San Juan Island by Gen. Harney. S. was too infirm to command the army in the great c. war. On Nov. 1, 1861, he was retired from active service. He pub. his *Autobiography* in 1864. D. May 29, 1866.

**Scottdale**, Pa. See APPENDIX.

**Scottish Language and Literature.** See ENGLISH LANGUAGE AND LITERATURE.

**Scotus** (DUNS). See DUNS SCOTUS.

**Scotus** (JOHANNES). See ERIGENA.

**Seranton**, city and important R. R. centre, cap. of Lackawanna co., Pa., in Lackawanna Valley, 150 m. W. of New York. It was founded in 1840 by the Scrantons, and derives its thrift from numerous collieries within its borders, from its immense rolling-mills and steel-works, its furnaces, and its iron-works for manufacturing rails, locomotives, and mining machinery. Pop. 1870, 35,092; 1880, 45,850.

**Seranton** (JOSEPH H.), b. at Madison, Conn., June 27, 1813, settled in the coal-region of the Lackawanna Valley 1847, and with others of his family built up the vast iron and coal interest which has converted a country hamlet into the large city which bears his name; was successively for 20 yrs. manager, supt., and pres. of Lackawanna Iron and Coal Co., and pres. of R. Rs., manufacturing and banking insts. D. June 6, 1872.—His brother, GEORGE W., b. at Madison, Conn., May 23, 1811, was one of the founders of Seranton, Pa., pres. of Lackawanna and W. and Cayuga and Susquehanna R. Rs., and M. C. 1859-61. D. Mar. 24, 1861.

**Screw-Pine.** See PANDANACEÆ.

**Scribe**, skrêb (AUGUSTIN EUGÈNE), b. at Paris Dec. 24, 1791, achieved his first success in 1816 with *Une Nuit de la Garde nationale*; provided from 1816 to 1820 the Théâtre de Vaudeville and the Théâtre des Variétés with as many vaudevilles as they could perform; wrote for the Gymnase between 1820 and 1830 about 150 plays, mostly one-act comedies of a sentimental or satirical character; composed, finally, from 1830 to his death, more than 100 plays in 3 or 5 acts, historical, satirical, and even tragical, beside a similar number of opera librettos for Boieldieu, Auber, Meyerbeer, and other composers, and some novels and romances. His dramatic works number about 400 plays. Most of these he produced in connection with some other play-writer. For nearly 40 yrs. he reigned supreme in all the theatres of the world. D. Feb. 30, 1861.

**Scribes** (Heb. *shofrim*, "writers"), officers already in existence among the Israelites in Egypt (Ex. v. 6-19) and in the desert (Num. xl. 16), whose business apparently it was to keep the genealogical registers, serve processes and the like. In Pal. they appear to have been chosen from the Levites (1 Chron. xliii. 4; 2 Chron. xix. 11; xxxiv. 13). From the time of Ezra (5th century a. c.) they were expounders of the Law.

**Scriptures, Holy.** See BIBLE, THE.

**Scrivener**, skriv'ner (FREDERICK HENRY AMBROSE), LL.D., b. at Bermondsey, Eng. Sept. 29, 1813, grad. at Trinity Coll., Cambridge, 1835. He has taken a high rank in the philological criticism of the N. T.; has pub. valuable eds. of the *Gr. Testament*, of *Codex Beza*, a *Full Collation of the Codex Sinaiticus with the Received Text of the N. T.*, and other works of kindred character; was appointed one of the company of revision of the authorized version of the N. T. 1870.

**Scrivener's Pal'sy, or Writer's Cramp**, a derangement of the motor nerves of the fingers and thumb, usually of the right hand, caused by over-exercise with the pen, combined with inattention to the mechanism of the arm. It may also attack musicians, milkers, seamstresses, shoemakers, and others who employ to excess the same nerves, but is then generally known by other special names, such as "cobblers' spasm." It is frequently attended with spasmodic and uncontrollable movements of the fingers. Discontinuance of the causative vocation is essential. It should be treated with tonics, particularly iron, and galvanism has been employed with good effect.

**Scrof'ula** [Lat. *scrofula*, "a breeding sow," swine being affected by a similar disease]; also known as **Struma** (from Lat. *struere*, to "build"), since the lymphatic glands are enlarged in this condition. S. is hereditary in many families. In many other persons it arises *de novo* from bad hygiene and regimen, especially in children when rapidly developing. Disordered digestion, uncleanly skin, deficient clothing, foul air, are its causes. Eczema, though often an exponent of struma, is as often due to other causes—nervous influences, rheumatic taint, gastric and intestinal derangements. The chief characteristic of S. is the susceptibility of the glandular system. Either persistently or with every slight impairment of health the glands of the neck, groin, abdomen, etc. become indurated and enlarged. Such swellings may be evanescent or leave permanent indurations. The glands of the neck frequently are so engorged with "scrofulous" matter that they actually suppurate, producing scrofulous abscess. Enlarged glands develop diseases, superficial abscesses, unsymmetrical developments of the teeth, nails, and bones are some of its manifestations. Inherited scrofulous taint may remain latent until developed by depressing sickness.

Thus, measles, a harmless disorder in robust children, is hazardous when struma lurks in the system. The relation of S. and the pulmonary tuberculosis of adults is disputed. Simon terms S. the soil for tubercle. A majority of cases of pulmonary consumption are, however, disconnected with S. or struma. The treatment of S. is hygienic and nutritive—warm clothing, bathing, friction to the skin, pure air, correct rich diet, special



articles of diet, as the hydrocarbons or fats and preparations of phosphates. Iron, iodine, and arsenical preparations act as alteratives to reduce glandular enlargements.

E. DARWIN HUDSON, JR.

**Scrophulariæ** [from *Scrophularia*, one of the genera, an important natural order of gamopetalous exogenous plants, of nearly 160 genera and 2000 species, mainly herbs, natives of nearly all parts of the world. Bitterish, somewhat acrid, emetic, or narcotic and sedative properties prevail, but the only plant of medicinal importance is foxglove (*Digitalis purpurea*), commonly cultivated for ornament. Other plants of the order largely cultivated for ornament are snapdragon, *Cathartaria*, *Pentstemon*, *Mimulus*, *Veronica*, and one tree—namely, *Paulownia* of Japan.

**Seruple** [Lat. *serupulus*, a "small stone"], in apothecaries' weight, is  $\frac{1}{8}$  of a drachm, 20 grains, the  $\frac{1}{256}$ th part of the pound troy.

**Scudder** (JOHN) (HENRY MARTYN), M. D., D. D., an Amer. clergyman and missionary, b. at Panditeripo, dist. of Jaffna, Ceylon, Feb. 5, 1822, came to the U. S. in 1832; grad. from Univ. of City of New York in 1840, and from Union Theol. Sem. in 1843; was ordained same yr., and sailed for Madras as a missionary of the A. B. C. F. M. to that city. In addition to his missionary work he studied med. in the med. coll. of Madras, grad., opened a hospital and dispensary for gratuitous treatment of the poor, and received an honorary M. D. from the New York Coll. of Phys. and Surgeons. Returned to the U. S. in 1858; became a pastor in N. J. in 1862; from 1865 to 1871 was in charge of a Presb. ch. in San Francisco, and from 1871 to Nov. 1882 was pastor of the Central Congl. ch. in Brooklyn, N. Y.; became pastor of Plymouth Congl. ch., Chicago, Ill., 1882. Dr. S. is author of a critical commentary on the Book of Job.

L. P. BROCKETT.

**Scudder** (JOHN), M. D., b. at New Brunswick, N. J., Sept. 3, 1793, grad. at Princeton 1811; became a phys. in New York, where he was house-surgeon to the city hospital; studied theol.; was ordained 1819 in the Dutch Reformed Ch.; was a missionary phys. of the A. B. C. F. M. at Tillypally, Ceylon, 1820-39, after which he was transferred to the Madras mission; spent several yrs. (1842-46) in the U. S., visited the Cape of Good Hope for his health 1854, and d. at Wynberg, S. Afr., Jan. 13, 1855.

**Scudder** (SAMUEL HUBBARD). See APPENDIX.

**Scudo** [It. for "shield"], a coin of It., now equal to 5 lire or francs, and nearly equivalent to our dollar.

**Sculpin**, a name having reference to the spines of the skull, and given to various species of acanthopterygian fishes belonging to the family Cottidae. They are distinguished by the rather stout, club-shaped body and large head, the spines with which the head is armed, and the naked or simply rough body; the mouth is quite large. They are destructive to other fishes.

**Sculpture**, skulpt'yur [Gr. *σκαλπεῖν*; Lat. *sculptura*; It. *scultura*; Fr. *sculpture*; Ger. *Bildhauerkunst*], the art of carving in stone, marble, or wood, or of casting in metal, figures of men and animals, whether in the round or in relief. It is believed that the statues of the sheik Ra-em-ké, of Schafta (or Chephren), and of Ra-hotep and his wife or sister, Nefer-t, are the oldest statues in existence. The first of these is of cedar-wood, the second is of diorite, and the other 2 are of limestone. The statue of the sheik Ra-em-ké is the least anc. of the 4. It is ascribed to the 5th dynasty (b. c. 3951). Next above it in antiquity is the statue of Chephren (4th dynasty, a. c. 4235). The oldest are the figures of Ra-hotep and Nefer-t from the pyramid of Maidoum (3d dynasty, a. c. 4449). In these statues the bodies have much of the stiffness and immobility familiar to us in Egyptian S., although in the modelling of the limbs, in a certain warmth of the contours, and in the expression of the faces there is much to praise. The S. of Egypt with which we are more familiar belongs to a much later period than that of the anc. empire or Memphian Egypt. After the order of her hist. settled down into the hieratic rule the art of Egypt may be briefly dismissed as presenting only work interesting to the archaeologist and to the historian. The S. of the Egyptians is almost entirely unideal, and consists of figures of the gods and in portraits of kings and heroes. The priests dictated everything, and the result was a despotic uniformity for a long time. The Egyptians worked but little in marble, preferring almost any other material.

Next in antiquity to the Egyptian is the Assyrian S. But the art of Assyria is rude and unideal. The finest specimen of Assyrian S. is the bas-relief of the wounded Ilioness, transfixed with darts, dragging herself along. But in the portrayal of man the Assyrian failed. In Gr. the oldest statues seem to have been of wood, and Dædalus is the generic name given to all the early workers in this kind. About the yrs. 575 and 525 b. c. we begin to hear of carvers of stone, of modellers in clay, of engraving on metal, and even on gems, and of casting statues in bronze. Soon the Parian marble began to be worked, and once the discovery made of this most beautiful of all the materials in which the sculptor can work, the progress toward perfection was rapid. But progress was not limited to one material. The Grs. sought perfection in all directions; and this universality of skill is another reason for the perfection they attained in S. The statues from the pediment of the temple at Aegina, now in Munich, the later found marbles from Selinus, now in Palermo, enable us to trace the progress of the Gr.-speaking peoples from the infancy of art to a point where a higher flight was possible. That higher flight in which the last perfection was reached is found in the S. of the Parthenon, in the Venus of Milo, and in a half dozen other pieces. The most famous Gr. sculptor of the great era was Phidias, b. at Athens about 483 b. c. He made statues in bronze, in ivory, in marble. To him are ascribed the S. of the Parthenon, the statues of the pediment, the high relief of the *metopes* and the low relief of the frieze, and a statue of the Olympian Jove at Elis, made

of ivory and gold. The yrs. immediately following Phidias produced a swarm of sculptors. Certain names have come down to us of this golden time—Polykletus of Sicyon; Myron of Eleuthera in Boeotia, famous for his brazen heifer; Scopas of Paros; the Athenian Praxiteles; Lysippus of Sicyon.

The Roms. did not produce a single sculptor of eminence; but they filled their temples, palaces, private houses, and public squares with statues brought from Gr. or wrought in It. by Gr. workmen. The Roman soil has been a quarry whence all the states of modern Europe have drawn the cloud of Olympian gods and goddesses and statues and busts of famous men that make their galleries places of pilgrimage. After the break-up of the Rom. empire, and in the confusion that followed, there was no S. worth mentioning produced. The statues of the gods and heroes that still remained were utilized in ornamenting the new buildings which were being constructed out of the ruined structures of old Rome; and the same use was made of the ornamental carvings, the capitals, and the friezes. The S. belonging to the early centuries of our era, even so late as the 13th century, show only a steady decline from even the debased standard of art that prevailed under the later Rom. emps. But in the first yrs. of the 13th century a certain Nicola was b. in Pisa who was the first to bring S. back to life again. He is credited perhaps with a greater number of works than he really accomplished, but the pulpits in the cathedrals of Siena and Pisa and the tomb of St. Dominic at Bologna are sufficient to prove his power to have accomplished all that has been attributed to him. He was followed by a long line of sculptors—by his son Giovanni di Pisa (d. 1320), his pupil Arnolfo di Lapo (1292-1310), by Andrea Pisano, Andrea Orcagna, Lorenzo Ghiberti, Donatello. These notable names, with a crowd of others less distinguished, took their light from Nicola's torch. The influence of these artists continued very late; and when Ghiberti in 1402 began his first gate for the Baptistery of Florence, we find him following closely the spirit and the arrangement of the gate which Andrea Pisano had made in 1330 from designs attributed to Giotto. By the time that Ghiberti was ready to begin the second gate, however, there had been such a change produced in the spirit of the time, and classicism had gained such a mastery, that the next period in the hist. of It. S. takes a new departure, and looks back to Ghiberti and Donatello as its founders. The greatest sculptor of the new time was Michael Angelo (1474-1564). The statues of the chapel of the Medici, the *Captives* of the Louvre, the *David*, the *Moses*, and the *Madonna* of Bruges make an inheritance such as no one other man ever left to the world. Other sculptors of this late time are Andrea Verrocchio (1432-88), Benvenuto Cellini, Sansovino, and Luca della Robbia. But the works of these men (excepting Verrocchio), who belong to the times immediately preceding Michael Angelo, were the works of a decline that went forward with such rapidity that the art of S. in It. expired at the end of the 16th century. Bernini (1598-1680), Algardi (1583-1654), and Canova (1747-1822) each in his turn attempted to restore life to the dead, but neither of these had skill to accomplish more than a galvanic resuscitation. Canova had a great influence, a most unhappy one, on modern S. Thorwaldsen, a man of independent genius, was shorn of much of his strength by his admiration of Canova, and the modern Its. and the Englishmen of the last age are all imitators of the same sculptor. Canova's prin. works are the *Bacchus*, *Perseus*, *Cupid and Psyche*, and the *Graces*.

Contemporary with the new birth of art in It. was the growth of the art of S. in the countries north of the Alps, where, but chiefly in Fr., the building of cathedrals and chs. gave an opportunity for S. such as has never been enjoyed before anywhere out of India. The Fr. sculptors of the 13th and 14th centuries were freer even than the Its. of the same date from classic influence, and succeeded better than they in creating an original school. In Ger., in the 15th century, some interesting works were executed in stone and metal, chiefly by artists of Nuremberg: the tomb of St. Sebald, the masterpiece of Peter Vischer, the *Beautiful Fountain* with its statues by Schönhofer, the *Sacrament-house* of Adam Kraft, are works of a peculiar character, in which the art is more curious than beautiful. In Eng., S., having remained dormant for over 2 centuries, at last, after some feeble effort at revival, did, as it were, smile in her sleep when John Flaxman came. There was hardly power enough in him, however, to rouse her to full life, and what he could not do was surely not to be done by Banks or Nollekens, or even in our own day by Gibson, by Westmacott, by Foley, or by McDowell. In Fr. things have been better; and indeed Fr. is the only country where the spirit of the Renaissance survived in art. John of Bologna, b. at Douai in the 15th century, left the greater part of his work in It., but Jean Goujon (1530-72), Jean Cousin, and Germain Pilon, his contemporaries, gave an accent to Fr. S. which they themselves learned from It. art. These artists and their pupils and followers found employment in the decoration of the châteaux and palaces which in their time were rising all over Fr., and in the erection of sculptured architectural tombs. They were followed after a long interval by men who made statues only, without reference to where they are to be placed. In the 17th century we have Puget, Coysevox, Girardon, the brothers Coustou, whose work is their own, alike in its defects and its excellences, but it never rises to the highest level nor gives any essential reason for being. Later in the 18th century we have the name of Houdon, whose statues of Voltaire and Washington, with his busts of Molière and Rousseau, have given him immortality as a portrayeur of character. The *Voltaire* is indisputably one of the finest and most original of modern works. Another famous name is that of Rude, the author of the bas-relief on the Arch of Triumph, *The Departure*; and Barye, the sculptor of animals, made himself the greatest fame that has yet been achieved in that field. The hist. in



Ger. has been the same as in Fr., except that Ger. never had so much life nor such fullness of life in her artistic world as were in Fr., and her list of great men is thin and poor compared with that of her W. neighbor. Rauch and Rietschel are distinguished names.

In Amer. it has been little better, but we have yet at the end of 50 yrs.—for it is about 50 yrs. since the first statue was cut in marble by an Amer.—produced a few names that deserve not to be wholly forgotten, such as Horatio Greenough, Hiram Powers, Thomas Crawford, Henry Brown, Erastus Palmer, Thomas Ball, Quincy Ward, Augustus St. Gaudens, and Olin L. Warner. CLARENCE COOK.

**Scup.** See PORGY.

**Scuppaug.** See PORGY.

**Scurvy** (Lat. *scorbutus*, a hybrid word from a Scandinavian root, *scorb*, and the Lat. termination *-utus*), a diseased blood-state, induced chiefly by prolonged privation of fresh vegetable and animal food. Although not exclusively a sailor's malady, its ravages have been most disastrous at sea, devastating, previous to this century, the navies and merchant marine of all nations. Pizarro's squadron included 2700 men, of whom but 100 survived. Anson's Eng. fleet in 1742 in 9 months lost 826 out of 961 men. The chief cause of this pest of the marine was the exclusive diet—salt meat and hard, dry bread, with impure and deficient drinking-water—upon which sailors subsisted during prolonged voyages. To-day S. is almost unknown at sea, but it occurs occasionally on land, in garrisons and prisons, and in communities suffering from starvation. All parts of the body are ill-nourished. The face is cachectic and sunken, the body emaciated, the limbs are feeble and seem unduly heavy. The gums become dark, bloody, relaxed, and spongy; mulberry-colored, purple spots of variable size appear on the legs, later on the body; later, larger purple spots or diffused patches appear upon a tough, indurated, leathery base. Such patches are painful to touch; they may become the site of bloody blebs or of ulcers. Death occurs from exhaustion. Critical cases may rapidly change for the better, and mild cases quickly recover, when put upon supporting and vegetable diet. Onions, cabbage, radishes, horse-radish, "scurvy-grass" or spoonwort, water-cresses—the entire class of the Cruciferae—are especially efficacious; all the vegetable acids, lemons, limes, oranges, cherries, currants, apples, are valuable. Animal broths, tonics, and regimen are essential adjuncts to this treatment. The improved hygiene of ships, the supply of fresh meat and vegetables prescribed by law for sailors, and the modern methods of keeping such articles hermetically sealed for long voyages have rendered S. an unknown disease.

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**Scurvy-Grass**, the *Cochlearia officinalis*, a cruciferous plant abundant upon many sea-shores (but not on those of the U. S.), and sometimes cultivated as a salad-plant or used as an antiscorbutic. It is often eaten by mariners, especially during the prevalence of scurvy. The S.-G. occasionally used for salad in the U. S. is *Barbarea praecox*.

**Scutari.** (1) [Tur. *Iskudar*; Gr. *Chrysopolis*] the largest of the suburbs of Constantinople, with a pop. of more than 60,000, on the Asiatic side of the Bosphorus, opposite the Golden Horn. On a plain near by the persecuting emp. Licinius was vanquished by Constantine Sept. 18, 323.—(2) [Tur. *Iskenderieh*; Gr. *Scodra*] in Albania, European Tur., lat. 43°, near the S. extremity of a lake of the same name 20 m. in length. The city is 17 m. from the Adriatic, has considerable trade, and a pop. of about 30,000, one third of whom are Lat. Chris. and the rest Mohammedans.—(3) (written also *Skutari*) a v. in S. Gr., near Cape Matapan, on a steep hill overlooking the sea, over against the island of Cerigo. R. D. HITCHCOCK.

**Scylla.** See SCILLA.

**Scylla and Charybdis.** See SCILLA and CHARYBDIS.

**Scythia**, *sith'-e-a*, the anc. name for the vast regions which extend N., E., and S. of the Caspian Sea and the Sea of Aral. It was not used as a geographical term; it was rather a general term by which the Roms. denoted a swarm of savage tribes living here.

**Scythopolis**, the *Beth-shean* of Josh. xvii. 11, the *Bethshan* of 1 Sam. xxxi. 10, now called *Betsan*, the most important city of the anc. Decapolis, and the only one W. of the Jordan, about 4 m. from the river, and nearly 14 m. S. of the Sea of Galilee.

**Sea.** See OCEAN, by PROF. ARNOLD GUYOT, LL.D.

**Sea-Anemone.** See ACTINIA and POLYPS.

**Seabury** (SAMUEL), D. D., b. at Groton, Conn., Nov. 30, 1729, grad. at Yale Coll. 1748; studied med. and theol. in Scot.; was ordained in the Ch. of Eng. at Lond. 1753; was pastor of chs. at New Brunswick, N. J., at Jamaica, L. I., 1756-66, and at Westchester 1766-75; was consecrated bp. of Conn. by 3 Scot. prelates at Aberdeen Nov. 14, 1784, being the first Amer. bp. of the P. E. Ch.; took part in revising the Prayer Book and framing a const. for the Amer. Ch. 1789; pub. 2 vols. of sermons; exercised the duties of his episcopal office at New London, Conn., until his death, Feb. 25, 1796.

**Seabury** (SAMUEL), D. D., grandson of Bp. Seabury, b. at New London, Conn., June 9, 1801, was ordained in the P. E. Ch. 1826; was for several yrs. a missionary at Huntington, Oyster Bay, and Hallett's Cove (now Astoria), L. I.; was ed. of the *Churchman* at New York 1831-49, rector of the ch. of the Annunciation 1839-68, and prof. of biblical learning in the Gen. Theological Sem. from June 1862 to his death, Oct. 10, 1872. Wrote *The Continuity of the Ch. of Eng. in the Sixteenth Century*, *Discourses on the Supremacy and Obligation of Conscience*, *Amer. Slavery Justified*, etc.

**Seabury Divinity School** is the property of the Bp. Seabury Mission, and is an inst. of the P. E. Ch., founded in 1880. Its buildings are of stone, situated on a beautiful domain of 80 acres in the city of Faribault, Minn. The inst. is supported by voluntary contributions.

**Sea-Cow.** See MANATEE.

**Sea-Cucumber.** See HOLOTHURIANS.

**Sea-Devil.** See ANGLER.

**Sea-Duck.** See SCOTER.

**Sea-Egg**, the sea-urchin. See ECHINIDÆ.

**Sea-Elephant.** See ELEPHANT-SEAL.

**Sea-Fans**, a name for zoophytes of the family Gorgoniidae, in which the polypoids are frequently arranged in a fan-like, branching, flat growth.

**Sea-Fox.** See FOX SHARK.

**Sea-Hog.** See PORPOISE.

**Sea-Horse.** See HIPPOCAMPIDÆ.

**Sea-Kale**, the *Crambe maritima*, a perennial cruciferous herb, a native of European sea-coasts, much cultivated in Eng. as a potherb. Its large leaves and sprouts are unfit for eating until blanched.

**Seal** [A.-S. *seol*], a name given to representatives of the order or sub-order Pinnipeds, the species of Phocidae being distinguished as true or hair S., and those of Otariidae as fur S., sea-lions, etc.

**Seal Engraving.** See GEM.

**Seal Fisheries.** See FURS and the FUR-TRADE, FUR SEAL, and OTARIIDÆ.

**Sealing-Wax.** See LAC.

**Sea-Lion**, a title under which several species of large seals of the family Otariidae have been included. They are characterized by the development of harsh hair without under-fur, and the color is yellowish brown in the mature, but in the young reddish brown. Two species occur on the Pacific coast of N. Amer., and are found together in the bay of San Francisco. One (*Eumetopias Stelleri*) is the largest species of the group and attains a length of 11 to 13 ft., while the other (*Zalophus Californianus*) is the smallest, and is only 7 or 8 ft. long. The *Zalophus* is the ordinary sea-lion of the menageries and zoological gardens. It has a slender, dog-like head and a "honking bark or howl," while the *Eumetopias* has a thick, mastiff-like muzzle and a deep bass growl and prolonged steady roar. Other species are the *Otaria Jubata* of S. Amer., the *Phocæctes Hookeri* of the Auckland Islands, and the *Zalophus lobatus* of the Australian seas.

**Seal Islands.** See LOBOS ISLANDS.

**Seal-Skins.** These now come mainly from Alaska, and when received from the hunters are merely preserved by salting. To prepare them for market the salt is washed out, and all the flesh and grease carefully removed. Then the hairs are pulled out—not broken off—and the pelts are manipulated to render them soft and pliable, any holes being neatly mended. They are then dyed to any required shade. The first coat of liquid dye is put on with a brush; when this has dried, another is put on, and then another and another—from 8 to 12 in all. Then the skins are washed clean, shaved down to the proper thickness, undergoing repeated manipulations all the while. Many skins are damaged during the processes of curing and dyeing.

**Sea-Mouse**, a popular name for annelids of the genus *Aphrodite* (family Aphroditidae), dorsibranchiate and setigerous marine worms, remarkable for the beautiful and ever-changing prismatic colors produced by the transparent hairs of the animal. Respiration is performed by means of gills concealed beneath the scales of the back.

**Sea-Nettle.** See ACALEPHS.

**Sea-Otter.** See OTTER.

**Sea-Parrot.** See AUK.

**Sea-Pie.** See OYSTER-CATCHER.

**Sea-Porcupine.** See DIDONIDÆ.

**Sea-Raven.** A kind of SCULPIN.

**Search.** See INTERNATIONAL LAW, SUMMARY.

**Search-Warrant**, a warrant issued by a duly authorized magistrate, requiring the officer to whom it is directed to search a particular place therein specified for the purpose of discovering (if possible) certain personal property alleged to have been stolen and to be secreted therein, and, if the same shall be found by such search, to bring the goods, together with the body of the person occupying the place (who must be named in the warrant), before the magistrate issuing it or before some other proper magistrate.

**Searle**, surl (JAMES), b. in the city of New York in 1730, settled in Phila. about 1762, and was one of the signers of the memorable non-importation agreement of Oct. 25, 1765. By this agreement citizens of Phila. bound themselves not to order any more goods from G. Brit., and to sell no goods or merchandise on commission, until the Stamp Act should be repealed. Aug. 19, 1778, he was elected by Cong. a member of the navy board; Nov. 20, 1778, was elected a delegate in Cong. from Pa. In July 1780, while still a delegate in Cong., he was appointed by the gov. and council of Pa. the agent of the State, with the rank of lieutenant-col., to negotiate a loan of £200,000 in Europe. He went immediately on his mission, and returned to Pa. in 1782. D. Aug. 7, 1797.

**Sea-Robin.** See GURNARD.

**Sears** (BARNAS), D. D., LL.D., b. at Sandisfield, Mass., Nov. 19, 1802, grad. at Brown Univ. 1825, and at Newton Theological Sem. 1829; was pastor of a Baptist ch. at Hartford 1830-32; afterward prof. in the Literary and Theological Inst. at Hamilton, N. Y. (now Madison Univ.); studied theol. at Ger. univs. 1833-36; prof. in Newton Sem. 1836-48, sec. of the Mass. board of education 1848-55, pres. of Brown Univ. 1855-67, and afterward gen. agent of Peabody Educational Fund. He was several yrs. ed. of the *Bap. Chr. Review*, and was author of *Classical Studies*, *The Ciceronian*, *The Life of Luther*, etc. D. July 6, 1880.

**Sears** (EDMUND HAMILTON), D. D., b. at Sandisfield, Mass., in 1810, grad. at Union Coll. 1834, and at Harvard Divinity School 1837; was pastor of a Unit. ch. at Wayland, Mass. 1839-40, and at Lancaster 1840-47; was several yrs. an ed. of the *Monthly Religious Magazine*, and became in 1865 pastor of a ch. at Weston, Mass., where he d. Jan. 14, 1876. Wrote *Regeneration*, *Pictures of the Olden Time*, *Chr. Lyrics*, etc.

**Sea-Serpent**, a marine animal said to have been seen often on the coast of Nor., especially in Moldeford, and also on the coasts of N. Eng., but which is nevertheless considered fabulous by most naturalists. That which has



contributed most to make naturalists suspicious with respect to the very existence of this marine animal is the circumstance that no remains of it have ever been found. But in his *Romance of Natural Hist.* Gosse has shown that the argument against the existence of the S.-S. taken from the non-existence of any remains of it does not hold good.

**Sea-Sickness.** A nervous affection attended with nausea and convulsive vomiting, produced by the oscillations of a ship at sea. Its origin and nature are still very imperfectly known. It may attack the strong and cautious, while the debilitated and incautious go free. It may attack in calm weather and on smooth waters, while a storm and a rough sea fail to produce it. It may pass away after the lapse of a few hours, or last during a long voyage. Dr. Chapman explains it as an undue accumulation of blood in the nervous centres along the back, and especially in those segments of the spinal cord related to the stomach and the muscles concerned in vomiting, and recommends as the best remedy against it the application of ice-bags to the spinal column. In some persons its violence is prevented by small doses of opium, or by soda-water or saline draughts in the effervescent state. Champagne will alleviate, and relief is derived from nitrite of amyl, the latter in pearls which can be crushed in the handkerchief, or a few drops in a phial can be carefully inhaled. E. D. HUDSON.

**Sea-Slug.** See BÊCHE DE MER.

**Sea-Snipe.** See SNIFE-FISH and TRUMPET-FISH.

**Seasons.** See CLIMATE, by PROF. ARNOLD GUYOT, LL.D.

**Sea-Spider, or Spider-Crab.** See CRAB.

**Sea-Squirt.** See ASCIDIA.

**Sea-Swallow.** a fish. See GURNARD.

**Seaton** (JOHN COLBORNE), BARON, b. at Lyndhurst, Hampshire, Eng., in 1779, entered the British army 1794; served in Hol. 1799, in Egypt 1801, afterward in It., Sic., and Port.; became military sec. to Gen. Fox and to Sir John Moore; joined the forces of Wellington, receiving command of a brigade; distinguished himself at the assault of Ciudad Rodrigo 1812, at Vera 1813, at Nivelle, the Nive, Bidassoa, and Orthes; contributed to the victory at Waterloo 1815; became maj.-gen. 1825; was lieut.-gov. of Canada 1828-36; made gov.-gen. and commander-in-chief 1837; suppressed the "Patriot" rebellion 1837-38; was raised to the peerage and rank of lieut.-gen. 1838; was lord high com. of the Ionian Islands 1843-49; became gen. 1854, and field-marshal Apr. 1, 1860. D. at Torquay Apr. 17, 1863.

**Seaton** (WILLIAM WINSTON), b. in King William co., Va., Jan. 11, 1785; early acquired a knowledge of printing; soon became connected with the *Register* in Raleigh; in 1812 went to Wash. City, and joined his brother-in-law, Joseph Gales, in the management of the *National Intelligencer*, with which he was most honorably identified until his death in Wash. June 16, 1866. He held a great many local offices in the Federal city; was frequently elected mayor, and was a regent of the Smithsonian Inst.

**Seatle**, on R. R., cap. of King co., Wash. Terr., on Admiralty Inlet, near the mouth of Dwamish River, is the seat of the Territorial univ., and has an active trade in coal and lumber. Pop. 1870, 1107; 1880, 3533.

**Sea-Uncorn.** See NARWHAL.

**Sea-Urchin.** See ECHINIDÆ.

**Sea-Weeds.** See PHYCOLOGY.

**Sea-Weeds, Chemistry of.** Many of this class of plants are of value as food and med., containing certain peculiar constituents not found in land-plants, and on some coasts they are cast up on the shore in such enormous masses as to be of no trifling consequence to the inhabs., being used for fuel, as fodder for cattle, and even as a highly nourishing food for man. The use of S.-W. as food is due to the prevalence therein of gelatinous and mucilaginous constituents, sometimes constituting more than half their weight. The compounds of iodine contained in these plants are conceived to give them certain virtues as food, particularly for invalids, as convalescents and others. The gelatinous portions of some S.-W. become exceedingly hard and elastic upon being dried after previous purification, and have been moulded into various forms as substitutes for horn, shell, etc. for making handles for knives, files, and other tools. In some countries "drift-weed," so called, is found to be a highly valuable manure, especially for the potato-crop, which requires much potash, a large mineral constituent of S.-W.

**Sebacic Acid** [apparently from Lat. *sebum*, an inelegant form of *sebum*, "tallow"; Ger. *Fettsäure*]; also called **Sebic** and **Pyrroleic Acid**, is formed during the destructive distillation of all fatty bodies which contain oleic acid or oleine. Nitric acid forms it also when acting upon fatty bodies, together with oxalic acid and other lower homologues of the same series. S. A. is most readily obtained by fusing together castor oil and caustic potash, 2 parts of oil being slowly mixed with 1 part of potash, fused with a little water, and heated until the mass is faintly yellow. It resembles benzoic acid in appearance. It tastes acid, reddens litmus, melts at 127°, and sublimes above this. Its salts, called *sebacates*, are bibasic.

**Sebastian**, se-bast'yan, SAINT, b. at Narbonne in Gaul about 225; ed. at Milan; was a capt. in the imperial guard when, under Diocletian, he was seized as a zealous Chr., bound to a tree, and used by the Mauritanian archers as a target. He did not die, however, but having been brought to a Chr. home and cured, he was seized again, trampled to death, and thrown into a sewer, about the yr. 287. His body was recognized by the Chr., and buried in the Catacombs. He is commemorated Jan. 20.

**Sebastian**, king of Port., known as DOM SEBASTIAN, b. in Lisbon Jan. 20, 1554, succeeded his grandfather, John III., June 11, 1557; headed an expedition which captured Tangier, Morocco, in 1574; embarked for Afr. with 15,000 soldiers June 24, 1578; landed near Arzila July 29; took part in a c. war supporting the claims of Muley Mohammed to the throne of Morocco against his uncle, Muley Malek; was

joined by the forces of the former, with whose assistance he commenced the siege of Alcazar; fought a great battle Aug. 4, in which a great part of the Port. nobility perished, as well as both the rival Moorish kings, and was himself probably killed, though his body could not be found. Port. was annexed by Philip II. of Sp., but the Port. people refused to believe in the death of Dom S., and pretenders appeared at intervals for many yrs. The belief in the future return of Dom S. finally took in Port. the form of a myth.

**Sebastiani**, sa-bahs-te-ah'ne (FRANÇOIS HORACE BASTIEN), COUNT, b. at La Porta, near Bastia, in Corsica, Nov. 11, 1775, entered the Fr. army in 1789; distinguished himself in Nap.'s It. campaigns; fulfilled several diplomatic missions to Constantinople, Syria, and Egypt; held various important commands in Sp. and during the campaigns of 1812-14. After the Restoration he lived for some time in retirement; was elected a member of the Chamber of Deputies in 1819; opposed the policy of the cabinet of Polignac; was appointed minister of foreign affairs 1830, ambassador to Naples in 1834, and to Lond. in 1835; was made a marshal in 1840. D. at Paris July 21, 1851.

**Sebastopol.** See SEVASTOPOL.

**Secchi**, set'chee (PIETRO ANGELO), b. at Reggio, It., July 29, 1818, entered the order of the Jesuits in 1833; studied mathematics, physics, and astronomy; came to the U. S. in 1848, and taught mathematics at the coll. of Georgetown, D. C.; was appointed director of the observatory of Rome in 1850, and acquired celebrity in every field of astronomical science. Wrote *Spectrum Observations on the Rotation of the Sun, Le Soleil*, etc. D. Feb. 1878.

**Secession.** This word, in the special sense of the right of a State to withdraw from the Union and set up an independent govt., became famous about 30 yrs. after Jackson had scotched the viper of nullification. (See NULLIFICATION.) It is really the right of revolution, the *ultima ratio* of any States, however connected or consolidated. The cause of the Southern S. in 1861 was the fear of opinion respecting slavery. It led to war, and war decided that the right could have no operation in this country. It is formally renounced in the cons. of as many as 11, if not of more, of the restored States. T. D. WOOLSEY.

**Sec'ond** [originally *minuta secunda*, or *sericulum secundum*, the "second minute," as distinguished from the *prime minute*, or ordinary minute], in the measurement of time and of angles, the 60th part of a minute. The term is of Rom. origin.

**Second-Adventists.** See ADVENTISTS.

**Sec'retary-Bird**, a name given to the *Serpentarius reptilivorus*, and so called on account of having feathers upon its head resembling a pen behind the ear of a scribe.

**Secretary of Legation**, the prin. assistant of foreign ministers. S. of L. assist their superiors in their official duties. In the absence of the superior officer the S. performs his duties, with the title of *chargé d'affaires ad interim*.

**Secretary of State**, an officer at the head of one of the executive depts. of the U. S. govt. and a member of the cabinet. His position is considered the most responsible and important one in that cabinet. He has charge of foreign affairs. His salary is \$8000.

**Secretary of the Interior**, an officer of the U. S. executive dept. and of the cabinet, who has charge of patents, land-offices, Indian affairs, pensions, the census, the depts. of agriculture and education, and of many other important details of the govt. His salary is \$8000.

**Secretary of the Navy**, an officer of the U. S. executive dept. and member of the cabinet. He executes the orders of the Pres. with regard to naval affairs, and has a salary of \$8000.

**Secretary of the Senate**, an officer of the U. S. Senate, who keeps its 2 journals, disburses its contingent fund, has charge of all Senate documents, reports annually concerning his disbursements, and in connection with the clerk of the lower House, makes an annual statement of all new appropriations, new offices, new salaries, and the like. He has a salary of \$3600 and fees.

**Secretary of the Treasury**, a member of the cabinet of the Pres. of the U. S., whose duties correspond to those of the ministers of finance in most constitutional govts., including control of all receipts and disbursements, the coinage of money, the printing of currency, the relations with national banks, and the collection of trade statistics. Salary, \$8000.

**Secretary of War**, an officer at the head of one of the executive depts. of the U. S. govt. and member of the cabinet, has charge, under the Pres. (who is commander-in-chief), of the affairs of the army and of the Military Acad. He receives \$8000 a yr.

**Secret Service**, a bureau of detective officers of the U. S. govt., under the solicitor of the treasury, who are employed in looking out for evasions of the revenue laws. The chief of the S. S. receives a salary of \$3000.

**Secularism.** See SCHISM.

**Sec'tor** [Lat. *secol*]. A circular S. is a part of a circle bounded by an arc and 2 radii. A spherical S. is a part of a sphere that may be generated by a circular S. revolving about a diameter lying exterior to it.

**Sec'ularism** [Lat. *secularis*, "worldly"], the belief that the duties of this life, being more clearly ascertainable than those which we call religious, and which depend on a belief in God and immortality, should have men's first, or even their entire attention. The Secularists of Eng. are an offshoot of the socialist party founded by Robert Owen. Their most prominent leader is now Mr. Charles Bradlaugh, the republican agitator.

**Sedalia**, se-da'le-a, city and R. R. centre, cap. of Pettis co., Mo., 189 m. W. of St. Louis, 100 m. E. of Kansas City, and 40 m. S. of Mo. River. It was founded in 1860 by Gen. George R. Smith. The location is a high rolling prairie, with a stream and abundant timber to the N., S., and W. within



3 m. The machine-shops and car-factories of Mo. Pacific R. R. (middle division) are here. Pop. 1870, 4560; 1880, 9561.

**Sedan**, town of Fr. dept. of Ardennes, on the Meuse, is fortified, and contains an arsenal and several magazines. Its manufactures of woollen fabrics are celebrated. Nap. and his whole army surrendered here, Sept. 2, 1870, to the king of Prus. Pop. 19,556.

**Sedan**, Kan. See APPENDIX.

**Sedg'es**, the grass-like plants of the natural order Cyperaceae. They often grow in tufts, are always herbaceous, never hollow-stalked, and have frequently triangular stems. The glumes are single, scale-like, and have a flower in the axil. There are some 120 genera and thousands of species. Many of them are coarse marsh-plants; some furnish very inferior hay. A few have edible tubers. The papyrus is one of the most interesting of these plants. Mats, baskets, etc. are made from some of the species. (See CAREX.)

**Sedg'wick** (ADAM), LL.D., F. R. S., b. at Dent, Yorkshire, Eng., in Jan. 1786, grad. at Trinity Coll., Cambridge, 1808, became fellow 1810; took orders in the Ch. of Eng. 1817; was appointed Woodwardian prof. of geol. at Cambridge 1819; was chosen F. R. S. 1819; aided in founding the Cambridge Philosophical Society; became proctor of the univ., and made a geological tour in Scot. 1827; accompanied Murchison in his geological researches in Ger., Aus., and Switz. 1829; commenced a survey of the Lower Palaeozoic strata of Eng. and Wales 1831; was pres. of the Royal Geological Society 1829-31; became involved in a bitter controversy with Murchison as to the use of the terms Cambrian and Silurian; became prebendary of Norwich 1834; was an opponent of the utilitarian school of morals and of the evolution theories. Wrote *Synopsis of the Classification of the Palaeozoic Rocks*. D. Jan. 27, 1853.

**Sedg'wick** (CATHERINE MARIA), daughter of Judge Theodore, b. at Stockbridge, Mass., Dec. 28, 1789, received an excellent education; undertook after her father's death (in 1813) the management of a private school for the education of young ladies, and continued in that employment 50 yrs. Pub. her first work of fiction, *A N. Eng. Tale*, in 1822, the success of which decided her to continue the career of authorship; brought out *Redwood* (1824); wrote *The Traveller*, *Hope Leslie*, or *Early Times in Mass.*, reputed her best work; *Clarence*, a *Tale of our Own Times*, and many others. D. July 31, 1867. (See her *Memoir*, by MARY E. DEWEY.)

**Sedg'wick** (JOHN), b. in Cornwall, Conn., Sept. 13, 1813, grad. at the U. S. Military Acad. in July 1837, and appointed second lieut. of artill., his first service being against the hostile Seminoles in Fla.; subsequently upon the frontier during the Canada border troubles; in the war with Mex. he participated in the siege of Vera Cruz, the battles of Cerro Gordo, Churubusco, Molino del Rey, Chapultepec, and the assault and capture of the City of Mexico. In 1861 he was commissioned brig.-gen. U. S. volunteers. In the Va. Peninsular campaign of 1862 he commanded a division of Sumner's corps, and engaged in the siege of Yorktown; in the battle of Fair Oaks, where he arrived, after a toilsome march, in time to decide the day, May 31; of Savage Station (June 29) and Glendale (June 30); commanded a division at Antietam, where he was severely wounded 3 times; was ordered in May 1863 to carry the heights of Fredericksburg and effect a junction with the main army at Chancellorsville. On the morning of Sunday, May 3, Fredericksburg was occupied. Continuing his march toward Chancellorsville, his further advance was checked at Salem Heights, about 4 p. m.; by great skill and hard fighting he held his ground during the day, withdrawing after dark across the Rappahannock. In the Pa. campaign of 1863 the 6th corps formed the right wing of the army following the movements of Lee, and on the evening of June 30 encamped at Manchester. The events of the 1st of July demanded the hasty concentration of the army, and before 2 p. m. of July 2 it reached the field with his corps; the corps was at once engaged, as also in the third day's fight, and pursuit of the enemy July 3. At the battle of Rappahannock Station (Nov. 7) he commanded the right wing of the army, as in the "Mine Run move" (Nov. 26-Dec. 3). In the Richmond campaign of 1864 he was conspicuous in the battles of the Wilderness (May 5-6), and of Spottsylvania, where he was killed.

**Sedg'wick** (ROBERT), b. in Eng. about 1590, an early settler at Boston, Mass.; had been a member of the Artill. Co. in Lond.; aided in founding the Anc. and Honorable Artill. Co. 1638; was its capt. 1640; became col. of the Middlesex regiment 1643, and commander of all the militia of Mass. 1652; was employed by Cromwell to expel the Fr. from Penobscot 1654; took part in the W. I. expedition 1655; was made maj.-gen. D. May 24, 1656.

**Sedg'wick** (THEODORE), LL.D., b. at W. Hartford, Conn., in May 1746, ed. at Yale, but did not graduate; began the practice of law at Great Barrington, Mass.; soon removed to Sheffield, which town he represented several yrs. in the Mass. legislature; was aide-de-camp to Gen. Thomas in the expedition against Canada 1776; was an active patriot throughout the Revolution; was a member of the Continental Cong. 1785-86; took an active part in the suppression of Shays's rebellion 1786-87; settled at Stockbridge 1787; was speaker of the Mass. house of reps. and a member of the State convention for the ratification of the Federal const. 1788; M. C. 1789-96; U. S. Senator 1796-99, serving one term as pres. *pro tem.*; again M. C. and its speaker 1799-1801, and judge of the supreme court of Mass. from 1802 to his death, Jan. 24, 1813.

**Sedg'wick** (THEODORE), eldest son of Judge Theodore, b. at Sheffield, Mass., Dec. 31, 1781, grad. at Yale 1798; studied law; was admitted to the bar 1801; practised his profession with success at Albany, N. Y., 1801-22, and at Stockbridge, Mass.; sat in the Mass. legislature 1824-25, and again 1827; was pres. of the Berkshire agricultural society 1823 and 1830; travelled in Europe 1836-37. D. Nov. 7, 1839. Author of *Hints to my Countrymen and Public and Private Economy*. — His wife, SUSAN RIDLEY, a granddaughter of

Gov. William Livingston of N. J., b. about 1789, was married 1808; wrote several works of fiction for the young, including *The Morals of Pleasure*, etc.

**Sedg'wick** (THEODORE), son of Theodore 2d, b. at Albany, N. Y., Jan. 27, 1811, grad. at Columbia Coll. 1829; was admitted to the bar May 1833; was an attaché to the U. S. legation at Paris 1833-34; practised law in New York 1835-50; was pres. of the New York Crystal Palace Association 1852, and became U. S. dist. atty. for the S. dist. of New York Jan. 1858. D. Dec. 8, 1889. Wrote a *Memoir* of his great-grandfather, Gov. William Livingston, a *Treatise on the Measure of Damages*, etc., and a *Treatise on the Rules which govern the Interpretation and Application of Common and Statutory Law*, etc.

**Seduction** [Lat. *seductio*]. According to the doctrines of the Eng. common law, the female whose chastity has been seduced had no remedy against her seducer, but the father was permitted, under certain circumstances, to maintain an action for damages against the man who debauches his infant daughter. This right of action rested solely upon the harsh and almost brutal conception that the relation of master and servant has been interfered with. For this reason the suit may be brought by any one standing *in loco parentis* where service is legally due and is actually performed. In the U. S. the statutory rule has utterly swept away the anc. notion of master and servant, and has rested both the right and the remedy where the wrong is inflicted, in the family and parental relations. The statutes of a few States have gone even farther, and permit the female who has been seduced to recover compensation for the personal injury done to herself.

**Seed-lac**. See LAC.

**Seeds** [A. S. *sead*], the result of sexual propagation in phenogamous plants, being the ovules after fertilization and the formation of the embryo, which is the germ of a new individual. A seed consists of the embryo; of the matured coats of the OVULE (which see), commonly 2, of which the outer, and generally the firmer, is technically called the *testa*, the inner, *tegmen*; and often of a stock of nourishing matter accumulated around or accompanying the embryo. The latter was named *albumen*, from a mainly fanciful analogy; the seed being likened to an egg, the albumen was supposed to answer to its white (albumen) and the embryo to its yolk. Seeds, such as those of peas, beans, and almonds, which have no albumen—that is, no stock of nourishment outside of the embryo—have always a strong and well-developed embryo, abundantly supplied with the same or similar matter stored in its own tissues. The albumen of the seed, when distinctively present, may differ greatly in abundance, consistence, and nature; as from farinaceous in wheat to cartilaginous or horny in coffee, or to the texture and appearance of ivory in the "vegetable-ivory" nuts. In many cases, as in those just referred to, it forms much the larger part of the kernel of the seed; in others the embryo is so minute as to be with difficulty discerned antecedent to germination; while sometimes the embryo is the more conspicuous, and the albumen is reduced to a thin layer.

As to the duration of vitality in seeds, there are many conflicting accounts. The story of grain found buried with Egyptian mummies having germinated after being exhumed is now generally discredited. All recent attempts under proper observation and due precautions have failed. The appearance of plants new to the station upon soil brought to the surface from excavations can usually be otherwise explained when they appear to involve a high antiquity, although there is no doubt that buried seeds have germinated after a lapse of 50 or more yrs. Experiments, conducted within the last 40 or 50 yrs. by the sowing of seeds of known age, and also by the annual sowing from a stock of a considerable variety of seeds of the same age, indicate a rapid extinction of vitality under ordinary conditions. Out of 338 species, representing 74 natural orders, only 94 kinds grew after 3 yrs., only 57 after 4 to 8 yrs., only 16 from 8 to 21 yrs., 5 from 25 to 27 yrs., 3 to 45 yrs. In ordinary cases, leguminous seeds have longed preserved germinating power, in some very well authenticated instances up to 70 or perhaps 100 yrs. Nearly uniform temperature, darkness, and either dryness or burial beyond atmospheric influences, most favor the prolongation of vitality.

ASA GRAY.

**Seeley** (JOHN ROBERT), b. in London, Eng., about 1834, grad. at Christ's Coll., Cambridge, 1857; obtained a fellowship and lectureship there 1858; became classical teacher at the City of Lond. School 1860; prof. of Lat. in Univ. Coll., Lond., 1863; prof. of modern hist. at Cambridge Oct. 9, 1869. Wrote *Eccle Homo*, or *the Life and Work of Jesus Christ*; *Life of Stein*, and *Natural Religion*.

**Seeley** (JULIUS HAWLEY), S. T. D., LL.D., b. at Bethel, Conn., Sept. 14, 1824, grad. at Amherst Coll. 1849; studied theol. at the Auburn Sem. and also in Ger.; was ordained pastor of the First Reformed Dutch ch., Schenectady, N. Y., in 1853, where he remained until 1858, when he accepted the professorship of mental and moral philos. in Amherst Coll. In 1872 he visited India, lecturing to Eng.-speaking Hindoos on the truths of Christianity. Some of these lectures were pub. under the title *The Way, The Truth, and the Life*; he also wrote *Chr. Missions*, etc. In 1874 he was elected to the 44th Cong., and in 1876 pres. of Amherst Coll. He was one of the associate eds. of *J.'s Univ. Cyc.*

**Seeley** (LAURENCE CLARK), D. D., brother of Julius H., b. at Bethel, Conn., Sept. 30, 1837, grad. at Union Coll. 1857; studied at Andover Theological Sem. 1857-59, at Berlin and Heidelberg univs. 1860-62; travelled in Europe, Egypt, and Pal.; was ordained pastor of a Congl. ch. at Springfield, Mass., 1863; was prof. of Eng. lit. and oratory at Amherst Coll. 1865-74, and became in 1874 pres. of Smith Coll. for Young Women at Northampton, Mass.

**See'mann** (BRITHOLD), PH. D., b. at Hanover, Ger., Feb. 28, 1825, ed. at the Lyceum of that city and at the Univ. of



Göttingen; was naturalist on board H. M. S. *Herald* on an exploring expedition around the world 1846-47; made 3 Arctic voyages in search of Sir John Franklin; explored the Feejee Islands and parts of N. and S. Amer. 1860-62; accompanied Capt. Bedford Pim in his travels in Central Amer.; engaged in mining enterprises in Nicaragua. Wrote *A Narrative of the Voyage of the Herald; Viti, an account of a Govt. Mission to the Fiji Islands; Dotted on the Roadside in Panama, Nicaragua, and Mosquito*, etc. D. Oct. 10, 1871.

**Seet'zen** (ULRIC JASPER), b. near Jever, Friesland, Hol., Jan. 30, 1767, undertook an extensive exploration of Asia and Afr.; reached Constantinople 1802; proceeded to Aleppo; traversed Syria and Pal. to the borders of Ar., making valuable scientific collections 1804-05; explored Lebanon and the regions E. of the Dead Sea in the costume of a Turk, discovering the sites of many towns before unknown, 1805-06; proceeded by way of Sinai to Egypt, where he procured a vast collection of MSS. and other objects for the museum of Götting; explored upper Egypt, and in the disguise of a Mohammedan pilgrim visited Mecca and Medina; set out for Mocha Mar. 1810, and reached that city, whence his last letter was written Nov. 17, 1810. Nothing certain was ever known of his subsequent history.

**Seg'ment** [segmentum]. A S. of a circle is a part of a circle included between 2 parallel chords; these chords are the bases of the S. If one chord becomes a tangent, the S. has but one base. A spherical S. is a portion of a sphere included between 2 parallel planes; the circles cut out by these planes are the bases of the S. If one of the planes is tangent to the surface of the sphere, the S. has but one base.

**Segner's Wheel.** See BARKEE'S MILL.

**Seguin** (EDOUARD), M. D., b. at Clamecy, dept. of Nièvre, Fr., Jan. 20, 1812, studied med. and surgery at the colls. of Auxerre and St. Louis in Paris; accepted the teachings of Saint-Simon in philos. and political economy; undertook the training of idiot children; produced most remarkable results by his system of training them. In 1844 a commission from the Acad. of Sciences of Paris declared that up to the time when S. commenced his labors, idiots could not be ed. or cured by any means previously known or practised, but that he had solved the problem. After the revolution of 1848 Dr. S. migrated to the U. S.; visited the school for idiotic children in S. Boston and the inst. for feeble-minded youth at Barre, Mass.; went to Albany, where Dr. Wilbur was just organizing the experimental school which has culminated since in the N. Y. State Idiot Asylum at Syracuse; returning to Fr., he came back in 1851, and settled in Portsmouth, O. In 1854-57 he was at Syracuse teaching and training idiot children, aiding in establishment of new insts. in Conn., O., and Pa., and for a time was at the head of the Pa. inst. Revisiting Fr. again in 1858, he returned in 1859, and settled in practice at Mt. Vernon, N. Y., whence he removed to New York in 1863. In 1879 he established in N. Y. the Seguin Physiological School for feeble-minded children, which still exists. In 1866 he pub. *Idiocy, and its Treatment by the Physiological Method*, an authority on the subject; wrote *Théorie et Pratique de l'Education des Idiots, Hygiène et Education des Idiots, Images graduées à l'Usage des Enfants arriérés et Idiots, More facts on Idiocy*, etc. D. Oct. 28, 1880.

**Seguin** (MARCO), b. Apr. 20, 1786, at Annonay, dept. of Ardèche, Fr., nephew of Montgolfier; studied engineering; was engaged in the construction of railways in S. E. Fr. and in the establishment of steam navigation on the Rhone; wrote *Mémoire sur le Chemin de Fer de Saint-Etienne à Lyon*, and *De l'Influence des Chemins de Fer et de l'Art de les tracer et de les construire*. D. at Annonay in 1875.

**Selditz**, sed'litz, v. of Bohemia, near Bilin, is famous for its mineral springs, whose water, containing sulphate of magnesia, sulphate of soda, and carbonic acid, is often used as an aperient.

**Selditz Powders.** See ROCHELLE SALT.

**Selditz Water.** See SEIDLITZ.

**Seigniorage**, sen'yur-aj [Fr. *seigneurage*], in finance, is the charge levied by govt. to cover the expense of coinage. In Eng. no fixed S. is levied on gold. In Fr., on the contrary, the S. on gold is heavy; and this absence of uniformity in the monetary systems of Europe is a serious loss in international trade.

**Seine**, sèn, a river of Fr., rises in the dept. of Côte d'Or at an elevation of 1420 ft. above the sea, flows in a N. W. direction, passes through Paris, where it is from 300 to 500 ft. wide, and enters the Eng. Channel at Havre by an estuary 7 m. wide. It receives from the left the Yonne, the Essonne, and the Eure, and from the right the Aube, Marne, and Oise. By canals it communicates with the Loire, Saône, Rhine, and Scheldt.

**Seiss**, seess (JOSEPH AUGUSTUS), D. D., b. in 1823 in Md., pastor of the Evangelical Lutheran ch. of the Holy Communion, Phila., and ed. of the *Lutheran*; distinguished as a preacher and as an author. He is author of the *Bap. System, Ecclesia Lutherana, the Jewelin*, etc.

**Sekunderabad** [properly *Sikanderabad*, "Alexander's town"], 3 m. due N. of Hyderabad the cap. of the Nizam's dominions in Brit. India, the head-quarters of the Hyderabad subsidiary force, and the largest cantonment of European Eng. troops in India. It is 1830 ft. above sea-level; the annual mean temperature is 77.4° F.; the climate may be set down as favorable. The hospital is a very superior building.

**Selachians**, sel-lá'shanz [Gr. *selachios*, "cartilaginous fishes"], the name of the class of ichthyoid vertebrates containing the sharks, rays, and chimaeras.

**Selborne**, BARON. See PALMER (ROUNDELL).

**Sel'den** (JOHN), b. at Salvington, near Worthing, Sussex, Eng., Dec. 16, 1584, was called to the bar; acquired great fame for his classical, Oriental, and political attainments; wrote in 1603 the *Analecton Anglo-Britannicon*, giving an account of the civil administration of G. Brit. prior to the Norman Conquest; issued his *Jani Anglorum Facies Altera*; pub. elaborate treatises on *Titles of Honor* and on Syrian

mythology, as illustrative of the O. T., *De Diis Syris Syntagma duo*; was cited before the court of high commission (Dec. 1618) for having denied the divine right of tithes in a *Hist. of Tithes*, and was compelled to sign a withdrawal; was imprisoned 5 weeks in the custody of the sheriff of Lond. (1621) for having advised the House of Commons to resist King James's claim that their privileges were derived from royal grants; was elected M. P. for Lancaster 1623; conducted the prosecution of the duke of Buckingham; defended Sir Edward Hampden for refusing to pay a forced loan 1627; opposed the royal prerogative on the questions of tonnage and ship-money, and aided in drawing up the "Petition of Right" 1628, for which conduct he was imprisoned in the Tower by order of the king Jan. 1629; was transferred to the king's bench prison in Sept., and remained there until 1634; pub. his most celebrated work, *Mare Clausum*, which defended the sovereignty of Eng. over the "narrow seas"; sat in the Long Parl. (1640) for the Univ. of Ox.; was a lay member of the Westminster Assembly of Divines; took the Covenant, and was appointed by Parl. chief keeper of the rolls and records in the Tower 1643; was one of the 12 commoners appointed coms. of the admiralty 1645; was one of the Univ. visitors 1647; spent his closing yrs. at White Friars, near Lond., as manager of the estate of Elizabeth, countess-dowager of Kent. Wrote *Marmora Arundeliana; De Jure Naturali et Gentium, juxta Disciplinam Hebræorum; A Discourse Concerning the Rights and Privileges of the Subjects*, etc. D. Nov. 30, 1654.

**Selenates.** See SELENIC ACID.

**Selen'ne**, in Gr. mythology, the goddess of the moon (Lat. *Luna*), was a daughter of Hyperion and a sister to Helios and Eos. She was also called Phœbe, and in later times she was identified with Artemis.

**Selen'ic Acid** is very interesting from its analogies with sulphuric acid and the parallelism of the compounds of the two. It is best prepared from selenious acid.

**Selen'ite** (Gr. *σεληνίτης*, "moonlight"), a mineralogical name for gypsum.

**Selenium** [Gr. *σέληνη*, the "moon"], one of the elements, thus named by Berzelius, who discovered it in 1817, because closely related to tellurium, which had been named by Klaproth after *tellus*, the "earth." S. must be considered one of the *rarer* elements, though several native mineral compounds of it are known. S. forms a series of allotropes, like sulphur, phosphorus, and indeed most of the other elements. New discoveries of the writer in molecular chem. enable him to recognize and define at least 4 distinct S. allotropes: (1) Electro-negative amorphous S.; (2) electro-positive amorphous S.; (3) lighter crystalline S.; (4) metalloidal and black S., the heavier crystalline S. S. does not kindle easily like sulphur, but when heated strongly will burn in the air; and selenides will burn before the blowpipe. A characteristic odor accompanies this combustion, compared by some to that of *horseradish*, by which the presence of S. in a mineral can be detected by those who know the odor.

**Seleucia**, sa-loo'she-a, the name of 2 anc. cities of Asia, built by Seleucus Nicator (312-280 B. C.). The first, *Seleucia Pieria*, was on the Orontes, near its mouth, and formed the port of Antioch. The second, *Seleucia on the Tigris*, rose and became the first city of the empire, surpassing Babylon in splendor and Antioch in importance. Pop. 600,000.

**Seleucus I., Nica'tor**, founder of the Syrian monarchy and of the dynasty of the Seleucidae, b. in Macedonia about 358 B. C.; accompanied Alexander on his Asiatic campaigns, several times holding superior commands; followed Perdiccas; after the disaster at Pelusium on the bank of the Nile in 321 was one of the foremost of the conspirators who assassinated Perdiccas; received the satrapy of Babylonia through the influence of Antigonus, whom he supported against Eumenes; when Antigonus had defeated Eumenes he assumed an authority over all the Asiatic provs. to which S. would not submit; in 316 B. C. he fled to Egypt, and instigated Ptolemy to join Lysimachus and Cassander against Antigonus; commanded the Egyptian fleet, and operated with great success before Tyre and at Cyprus; returned to Babylonia 312 B. C.; in 306 assumed the title of king; directed his activity toward the E.; extended his dominions to the Oxus and Indus; joined the league of Ptolemy, Lysimachus, and Cassander against Antigonus, and decided the fortunes of the battle of Ipsus (301 B. C.); received Syria and the S. half of Asia Minor; in 286 B. C. Demetrius Poliorcetes surrendered himself unconditionally to him; in 281 B. C. he routed Lysimachus at Corupedion, thus extending his dominion over all the Asiatic countries which had formerly belonged to the empire of Alexander; in the following yr. crossed the Hellespont, but at Lysimachia he was assassinated by Ptolemy Ceraunus (280 B. C.).

**Self-defence.** This generic term embraces and describes all the rights which the law confers upon the individual to protect by his own acts and agencies his property or his person against some injury unlawfully attempted to be inflicted by another. When the invasion of property is in the nature of a private trespass merely, the proprietor may use so much force as may be reasonably necessary to defend his own possession, short of taking life. When the attack is made against the person, the assailed may repel it by any force which is necessary, even to killing the assailant. If one's own life is threatened, or if some great bodily harm is about to be inflicted, or if an aggravated and forcible crime against the person is attempted, the law permits and excuses the homicide.

**Sel'm**, the name of 3 Tur. sultans. SELIM I., b. in 1467, son of Bajazet II., revolted and usurped the throne by the aid of the Janizaries Apr. 25, 1512, putting to death his father, brothers, nephews. In 1514 he began war with Per., and annexed Diabek and Koordistan to the Ottoman empire. After conquering Armenia he began war in 1516 with Egypt, conquered Syria, and subjugated Egypt. D. Sept. 22, 1520. SELIM II., b. in 1524, a son of Solymán the Magnificent and Roxolana, succeeded his father Sept. 6, 1566, and d. Dec.



12, 1574. While his gens. fought in Hungary, Per., Cyprus, Tunis, and at Lepanto (Oct. 8, 1571) he spent his days in the harem, always intoxicated.—**SELM** III., b. Dec. 24, 1761, a son of Mustapha III., succeeded his uncle, Abd-ul-Hamid, Apr. 7, 1789, and was the first Tur. sultan who tried to introduce the civilization of W. Europe into his empire. But open revolution broke out, and on May 31, 1807, S. was deposed by the Janizaries and the mufitis, and his cousin, Mustapha IV., was raised to the throne. Mustapha IV. put S. to death (July 28, 1808).

**Selinsgrove**, R. R. Junc., Snyder co., Pa., on Pa. Canal, 50 m. N. of Harrisburg. It is the prin. outlet for the produce of the co. Pop. 1870, 1453; 1880, 1431.

**Selinus**, a Gr. colony founded in the 7th century B. C. from Megara, and situated at the mouth of the Selinus, on the S. W. coast of Sic. Of its hist. very little is known, but it must at one time have been a flourishing city. It was destroyed by the Carthaginians in 409 B. C., but again rebuilt. It finally decayed, when in 249 B. C. the Carthaginians removed all the inhabs. to Lilybaeum.

**Seljuks**, or **Seljuks**, a small Tur. tribe settled in the plains on the N. E. border of the Caspian Sea. Seljuk, one of their chiefs, in the latter part of the 10th century conquered Bokhara, and embraced Mohammedanism; his successors conquered the whole of S. W. and Central Asia, and developed a marvellous energy during the course of several centuries. Seljuk's grandson, Toghrul Beg, conquered Balkh and Khwarezm in 1041, Irak-Ajemei in 1043, Kerman and Fars in 1047, Bagdad in 1055, Irak-Arabi and Mosul in 1061. Under his nephew, Alp-Arsian (1063-73), and Alp-Arsian's son, Melek Shah (1073-93), the empire still increased in power and prosperity. The latter conquered Ar., Syria and Pal., Asia Minor and Armenia, and ruled from the Mediterranean to the Chi. frontier, and from the Caspian to the Ar. Sea. At his death the Seljuk empire was divided between his 4 sons, and soon a large number of small independent sultanates was formed, which circumstance finally caused the ruin of the Seljuk dominion. The sultanate of Iconium, comprising Asia Minor, lasted until 1299. With the overthrow of the Seljuk dynasty in 1299, and on the ruins of its dominion, arose the Tur. empire.

**Selkirk**, or **Sealchraig** (ALEXANDER), b. at Largo, Fifeshire, Scot., about 1676; made several voyages to the Pacific; was sailing-master to a privateer, and having quarrelled with the capt. was put ashore, at his own request, Sept. 1704, on the uninhabited island of Juan Fernandez, off the coast of Chili, with some nautical instruments, a few books, a knife, kettle, axe, gun, and a supply of ammunition. Here he remained until Feb. 12, 1709, when he was relieved by Capt. Woodes Rogers. He lived chiefly on the flesh of wild goats. He became mate to Capt. Rogers, whom he accompanied around the world; arrived in Eng. Oct. 1, 1711. S. entered the navy, rose to the rank of lieut., and d. on board the man-of-war Weymouth in 1723. De Foë's *Robinson Crusoe* has been supposed to be based upon the adventures of S.

**Selkirk** (THOMAS DUNDAS), FIFTH EARL OF, b. in Scot. in 1774, spent several yrs. in promoting emigration to the Red River of the N. Brit. Amer., where the colony now called Manitoba was long known as "the Earl of Selkirk's Settlement." D. in 1820.

**Sel'la** (QUINTINO), b. at Biella, It., July 7, 1827, ed. at the Univ. of Turin; received a special training at the School of Mines at Paris; successfully filled the professorships of applied geom. and of math. at Turin, and was long employed in the gen. direction of the mines of N. It.; was elected to the national parl. in 1861, and was minister of finance in 1862, 1864-65, and 1869-73. Wrote *Lezioni di Cristallografia*, and *Sulle forme cristalline di alcuni sali di Platino a del Boro adamantino*.

**Sel'ma**, city and R. R. centre, cap. of Dallas co., Ala., at the head of steamboat navigation on Ala. River, was during the c. war an important military centre, having an arsenal, a navy-yard, artill.-foundries, and powder-works, and was captured by the Union forces Apr. 2, 1865, after a sharp engagement. Pop. 1870, 6484; 1880, 7529.

**Seltzer-water** [Ger. *Selterswasser*], naturally, the water of a mineral spring at Selters, in the valley of the river Ems, in Nassau, which has been known since the 9th century. It is now successfully imitated and fabricated in this country as well as throughout Europe. It is an alkaline water, containing over 6 grains of carbonate of soda to the gall., with 30 cubic inches of free carbonic acid.

**Sel'va**, or **Silva** (Sp. *selva*; Port. *silva*, "forest"), a name applied in S. Amer. to great wooded tracts, chiefly in the Amazon Valley. They are mostly very level and densely covered with trees, mixed with underwood and lianas. The area is more than 700,000 sq. m.

**Selvat'ico** (PIETRO ESTENSE), MARQUIS, b. at Padua in 1803, studied lit., phys. science, painting, and arch.; travelled through the greater part of Europe; in 1850 was appointed prof. of aesthetics and of the hist. of art in the Acad. of Fine Arts at Venice, and in 1855 was named inspector of the schools of design throughout the Venetian provs. Political considerations induced him to resign these posts in 1858 and retire to private life. He is the arch. of several chs. in Venetia, and has pub. *La Cappellina degli Serevegni in Padova ed i Freschi di Giotto, L'Architettura e la Scultura in Venezia*, etc.

**Sel'wyn** (GEORGE AUGUSTUS), D. D., b. at Richmond, Surrey, Eng., in 1809, ed. at Eton and at St. John's, Cambridge; became tutor at Eton and curate of Windsor; was consecrated first bp. of New Zealand 1841; visited many of the groups of islands in the Pacific in a small "missionary ship," was appointed bp. of Lichfield, Eng., 1867, and made a tour through the U. S. and Canada 1874. D. in London, Eng., Apr. 1878.—His brother WILLIAM, b. 1806, became prof. of divinity at Cambridge 1855; was one of the revisers of the O. T. translation. D. Apr. 24, 1875.

**Sem'ele**, in Gr. mythology, a daughter of Cadmus and loved by Zeus; was persuaded by Hera to demand of her

lover that he should visit her once in all his royal majesty. Zeus came to her with thunder and lightning, and she perished in the flames. She was the mother of Bacchus.

**Semir'amis**, according to Ctesias, the wife of Ninus, the founder of the Assyrian kingdom, a woman of extraordinary beauty, passion, and military prowess, who flourished nearly 2300 yrs. B. C., survived and eclipsed her husband, and after a reign of 42 yrs. abdicated in favor of her son, Ninyas. All this is now admitted to be mythical. The name appears to have been derived from Sammuramat, or Sammuramat, found upon the monuments. Lenormant makes her the queen of Bin-lik-his III. (857-838 B. C.). Rawlinson makes her the queen of Vul-lush (or Iva-lush) III. (810-781 B. C.). R. D. HITCHCOCK.

**Semitic Languages**. The most important and best known langs. of this family are the Aramean (including Chaldee and Syriac), Heb., Arabic, and Ethiopic. The Samaritan is a corrupt form of Aramean. The Phœnician lang. is shown by its remains to be Semitic, and the cuneiform inscriptions have established the same thing with regard to the Assyrian. The Coptic also belongs to this family. Its chief modern representative is the Arabic, to which a few unimportant local dialects may be added—e. g. the modern Syriac, the Amharic (descended from the Ethiopic), and the Maltese (a corrupt Arabic). The Semitic, like the Indo-European family, belongs to the inflective as distinguished from the agglutinative and isolating langs. The home of the Semitic tongues is bounded by the Tigris on the E., the Mediterranean Sea on the W., Mt. Taurus on the N., the Red Sea and Ar. Gulf on the S., and embracing Syria, Mesopotamia, Pal., and Ar.

**Semitic Races**. See MAN.

**Sem'ler** (JOHANN SALOMO), b. at Saalfeld, duchy of Saxe-Meiningen, Dec. 18, 1725, studied theol. at the Univ. of Halle, where he was appointed prof. in 1752 and director of the theological sem. in 1757. D. March 14, 1791. He took a prominent part in the starting of the rationalistic movement in the Ger. theol. Wrote *Apparatus ad liberalem Veteris Testamenti Interpretationem, Abhandlung von der Untersuchung des Kanons*, etc.

**Semmes**, SEMEZ (RAPHAEL), b. in Charles co., Md., Sept. 27, 1809, of Scotch-Irish parentage; became a mdpn. in the U. S. N. 1836; was a volunteer aide to Gen. Worth in the Valley of Mex. 1847; became commander 1855; was sec. of the light-house board 1859-61; obtained a commission in the Confed. navy; acquired great notoriety by his exploits as commander of the Sumter and the Alabama in capturing and burning many scores of Amer. merchant-vessels, and became after the war prof. of moral philos. in the State sem. at Alexandria, La. Author of *Service Afloat and Ashore during the Mex. War*, *Campaign of Gen. Scott in the Valley of Mex.*, and *Memoirs of Service Afloat during the War between the States*. D. Aug. 30, 1877.

**Semoll'na** (It.), a finely cracked wheat, or a very coarse meal made from hard wheat. After grinding it is separated into various grades.

**Sem'per** (GOTTFRID), b. at Hamburg 1804, studied math. at Göttingen, arch. in Munich and Paris; travelled much in It., Sic., and Gr.; was appointed prof. of arch. at Dresden in 1834; fled to Lond. in 1849 on account of participation in revolutionary movements, and taught at the Royal Acad. in Marlborough House till 1856, when he became prof. at the polytechnic inst. of Zurich. His principal buildings are the theatre and new museum of Dresden and the Polytechnicum at Zurich. He wrote *Die vier Elemente der Baukunst; Über Industrie, Wissenschaft und Kunst; Der Stil in den technischen und tektonischen Künsten*, etc. D. at Rome May 1879.—His nephew, KARL SEMPER, b. at Altona July 6, 1832, explored the Philippine Islands; was appointed prof. of zoology at the Univ. of Würzburg in 1868, and pub. *Reisen im Archipel der Philippinen*, etc.

**Sem'ple** (JAMES), b. in Ky. in 1790, became a lawyer at Louisville, and subsequently at Edwardsville, Ill., where he settled about 1827; served frequently in the legislature; was speaker several sessions; became atty.-gen. and gen. of militia 1833; was *chargé d'affaires* to New Granada 1837-41, judge of the supreme court of Ill. 1842, and U. S. Senator 1843-47. D. Dec. 1846.

**Semple** (ROBERT BAYLOR), D. D., b. at Rose Mount, Va., Jan. 20, 1769, received a classical education; studied law, and afterward theol.; became pastor of a Bap. ch. 1790; declined the presidency of Transylvania Univ. 1805; became financial agent of Columbian Coll., Wash., D. C., 1827; pub. a controversial treatise against Alexander Campbell, a *Hist. of the Baps. in Va.* (1801), etc., and was pres. of the Bap. triennial convention from 1826 to his death, Dec. 23, 1831.

**Sen'ate**. This word, borrowed from Rome, meant at first a body of elders (*senex*, "old man"; *senior*, "elder"), having certain powers by the side of the people, or an organized assembly, *comitia*. They had more or less judicial as well as qualified legislative powers. In the old Gr. and It. states the consts. of these bodies, their special duties, length of office, etc. became so various that only a minute hist. of the consts. could set them forth. T. R. D. WOOLSEY.

**Sen'eca**, cap. of Nemaha co., Kan., on R. R., 77 m. W. of St. Joseph, Mo. Prin. business, stock-raising and farming. Pop. 1880, 1203.

**Seneca** (LUCIUS ANNÆUS), b. at Corduba in Sp. about 8 B. C., belonged to a Sp.-Rom. family, but was ed. in Rome. After travelling in Gr. he began to practise as an orator in Rome, and achieved great forensic triumphs, but in 41 A. D. Messalina had him accused of entertaining an adulterous connection with Julia, the daughter of Germanicus and the wife of Vinicius, and he was banished to Corsica. Here he lived for 8 yrs., and wrote, among other works, *De Consolatione ad Helviam*, a consolatory letter to his mother, and one of the best of his writings, and *De Consolatione ad Polybium*, a similar letter to Polybius, a freedman and one of Claudius's favorites, who had lost his brother; but this letter is one of his most disagreeable productions on



account of its flattery. When Claudius married Agrippina, S. was recalled by her influence and appointed tutor to her son, Domitius, afterward the emp. Nero; for which position he showed a rather surprising adaptation. The pupil's vices grew as luxuriantly as the tutor's wealth. Most of S.'s very prolific authorship belongs to this last period of his life. He wrote moral essays, philosophical letters, phys. treatises, and tragedies. The last mentioned, 10 in number, are the best of his productions. Of his prose essays, some of the most celebrated, *De Ira*, *De Animi Tranquillitate*, etc., are inextinguishable sources of piquant quotations; others, *De Clementia ad Neronem*, *Ciceroem Libri Duo*, are rather curious on account of the personal character which the author has not been able to conceal under the flourishing representation of his ideas; but the largest portion is vague and trivial—*De Constantia Sapientis*, *De Brevitate Vita*, etc. His 124 *Epistolae ad Lucillum* have more interest, containing moral observations and aphorisms of practical value. His *Apocolocyntosis* is also worth reading. It is a satire on Claudius, of course written after the death of the emp., and it is very biting; there is, however, no indignation in it; it is merely written to please Nero. Meanwhile, the emp. began to hint at the millions which the philos. had amassed. S. became alarmed, and offered to repay the whole amount and content himself with a small annuity. Nero refused the offer, and S. now retired from the court, gave no levées, was never seen in public, and tried his utmost to sink into oblivion. But in vain. Some one mentioned him as an accomplice in the conspiracy of Piso, and Nero sent him an order to commit suicide, which he immediately obeyed, 65 A. D.

CLEMENS PETERSEN.

**Seneca Falls**, Seneca co., N. Y., on R. R. and Cayuga and Seneca Canal, at the outlet of Seneca Lake, has an acad., fine water-power, and the beautiful falls of Seneca River. Pop. 1870, 5890; 1880, 5880.

**Seneca Lake**, in W. N. Y., bounded by Seneca, Schuyler, Ontario, and Yates cos., is 35 m. long, from 1 to 4 m. broad, with an elevation of 447 ft. The lake is navigated by steamboats. Its waters reach Lake Ont. by Seneca and Oswego Rivers. Its greatest depth is 630 ft.

**Seneca Oil**, a local name for PETROLEUM (which see).

**Senefelder** (ALORS), b. at Prague Nov. 6, 1771, entered on the stage at Munich, his father being an actor; attempted afterward lit., and engaged finally in the printing business, which led to his invention of lithography. He wrote a *Lehrbuch der Lithographie*. D. Feb. 26, 1834.

**Senegal**, a river of W. Afr., rises in lat. 10° 30' N. and lon. 18° 40' W., in the Mandingo highlands; flows first N. W. then W., and enters the Atlantic in lat. 16° N., after a course of 1000 m. Its shores are generally wooded and fertile, but frequent cataracts and shoals obstruct its navigation.

**Senegal**, the collective name of the Fr. colonial settlements on the river Senegal, including the island of St. Louis, at the mouth of the river, and Gorée, off Cape Verde. A system of military colonization similar to that of Algeria is also applied here. Pop. 191,600. In the budget of 1884 France set down 11,332,797 francs for fortifications in the colony.

**Senegambia**, a large division of W. Afr., bounded N. by Sahara, E. by Soodan, S. by Guinea, and W. by the Atlantic. Its area is estimated at 400,000 sq. m., its pop. at about 9,000,000. It derived its name from the Senegal and Gambia, which together with the Rio Grande are the only streams of any importance. The surface of this country presents a belt from 100 to 200 m. wide, of low, flat coastland, generally of a swampy and marshy, though in some places of an arid and sandy character. Behind these plains the interior rises in terraces until at last it reaches the Kong Mts., whose highest peaks do not rise more than 4068 ft. S. and Nubia are the hottest places on earth. The vegetation is exceedingly luxuriant. In the forests the gigantic baobab, the Afr. teak, and other timber trees alternate with different kinds of palms, the banana, the bread-fruit tree, and the mangrove. Rice, sugar, indigo, tobacco, coffee, and cotton grow wild and are of good quality. Oranges are cultivated. The inhabs. of S. consist of a great number of different races and tribes. N. of the Senegal live the desert tribes of the Moors; S., the Yolofo; farther S., the Fohahs.

**Sen'eka**, a drug consisting of the root of an indigenous perennial plant, *Polygala senega*, natural order Polygalaceae. This plant grows throughout most parts of the U. S., frequenting open fields and rocky places. It contains a peculiar principle called *polygalic acid*, probably identical with saponine. The drug is an acrid irritant, producing vomiting and purging in overdose.

**Seneschal**, sen'e-shal [probably from the old Ger. *senescale*, "senior servant"], an officer of mediæval courts, originally of menial character, but in later times powerful magnates sought the office, which in some instances conferred upon its occupant high military and judicial trusts.

**Sen'na** [Arab. *sana*], the leaves of several species of cassia constitute the commercial S. brought from S. India and from Alexandria. Great labor has been expended by chemists in endeavoring to isolate the valuable cathartic principle of S., which has now been known since 1838 to be an acid substance called *cathartic acid*. It is believed to be a complex compound of the *glucoside* family, and, singularly, contains *sulphur*.

**Sennaar**, a state of N. E. Afr. and a part of Nubia, lies between the Bahr-el-Azrek and the Bahr-el-Abiad. The surface presents an elevated plain, consisting of a sandy soil strewn with large boulders, but occasionally broken by the presence of large, isolated rocks, rising to the height of 1200 ft. Along the Bahr-el-Azrek, the proper valley of the Nile, the soil is more productive; and it is only this tract of land which is inhabited, the whole valley being studded with v. The climate of S. is very hot. The soil often looks like a piece of parchment, bare, naked, cracked, and hard-baked. When the rain comes it is transformed into one vast sheet of mire, and then *durra* is sown without further preparation

of soil. The inhabs. are an extremely mixed race, indolent and sensual. Their houses are often well built, and they possess much skill in gold-smelting, leather-working, and pottery. They have built several cities. Cap. Sennaar.

**Sennacherib**, king of Assyria (b. c. 705-681), succeeded to the throne on the death of Sargon. He raised Nineveh to the highest pitch of splendor. In b. c. 704 he reconquered Babylon; in 702 invaded Media; in 701 attacked Lulia of Zidon, deposed him, marched along the coast of the Mediterranean, subdued the Philistines, defeated the Ethiopians and Egyptians, and overran Judah. Hezekiah, king of Judah, then submitted. In 700 S. again subdued Babylon, setting on the throne his son, Assur-nadin-sum. Subsequently he attacked Asia Minor, Elam, and Babylon, which he destroyed. S. was murdered by 2 of his sons 681.

**Sen'sitive Plant**, a name applied to *Mimosa pudica*, a low leguminous plant of tropical Amer., now widely dispersed over the world, and commonly cultivated as a curiosity, on account of the rapid movement of the leaves when brushed or jarred, appearing to shrink from the touch. This faculty is shared in a less degree by several related plants, such as the sensitive brier (*Schrankia*) of the Southern U. S.

**Sen'ter** (ISAAC), M. D., b. in N. H. about 1755, settled at Newport, R. I., where he studied med.; was surgeon in Arnold's expedition against Que. 1775, during which he kept an interesting *Journal*; practised his profession with success at Pawtucket, and afterward at Newport; contributed to the med. and scientific journals; was an honorary member of the med. societies of Lond., Edinburgh, and Mass., and for many yrs. pres. of the R. I. branch of the Society of Cincinnati. D. Dec. 20, 1799.

**Separatists**, the name of several small religious sects in Ire., the most important of which are the Walkersites dating from 1803, and the Darbyites dating from 1830. They aim at a return to primitive Christianity.

**Separatists** (Mohammedans). See MOTAZILITES.

**Sepla**, See INDIA-INK.

**Sepiidae**. See CUTTLE-FISH.

**Sepoy** [a corruption of the Indian word *sipahi*, "soldier"], a native soldier in the Brit. service in India. The S. consist of Mohammedans, Rajpoots, Brahmans, and men of other castes, beside Sikhs, Ghoorkas, and hill-men of various tribes. The officers are European.

**Septarium** [pl. *septaria*; Lat. *septum*, "partition"], concretions formed by segregations of calcareous matter diffused through clay, not uncommon in shale-beds of all formations. They are lenticular or spheroidal in form, sometimes attaining a diameter of 10 ft. or more. In many instances these concretions seem to solidify first and most completely at the surface, and subsequently the interior by shrinkage is divided into a great number of ramified cracks; later, these are filled with calc-spar or some other substance deposited from a solution that has penetrated the mass, and then, when broken or weathered, the sparry lines show septa or partitions, from which the name *septarium* comes. They are also sometimes called *turtle-stones*, the flattened concretions, the surfaces of which are divided into polygonal spaces, having somewhat the aspect of the carapace of a turtle. The material composing septaria is usually an earthy limestone, which when calcined often produces good hydraulic cement.

J. S. NEWBERRY.

**Septem'ber** [Lat. from *septem*, "seven"], the 7th month of the old Rom. yr., but the 9th of the Gregorian. It is the month of the autumnal equinox.

**Septimius Severus**. See SEVERUS.

**Septuaginta**, sept'-ua-jint, **The**, or **LXX.** [from the Lat. *Septuaginta*, "the Seventy" (translators)], the name commonly given to the earliest Gr. translation of the O. T., otherwise called the Alexandrian version. According to the legend, Ptolemy Philadelphus, king of Egypt from 283 to 247 B. C., sent an embassy to Jerusalem to procure a copy of the Jewish Law, and to make arrangements for a translation of the same into Gr. for the Alexandrian Library. Seventy-two learned men were accordingly selected by the high priest, 6 from each tribe, and sent to Egypt with a magnificent copy of the Law written on parchment in letters of gold. They retired to the island of Pharos, where they were shut up in separate cells and worked independently, and at the end of 72 days their several versions, being compared, were found to agree *verbatim*. The character of the translation proves it to have been the work of many hands. In the controversies between Jews and Chrs. in the 2d century it was found that the LXX. could not be relied on as an accurate representation of the Heb. Other translations were accordingly made—(1) that of Aquila, in the first half of the 2d century, slavishly literal; (2) of Theodotion, based on the LXX., but aiming at greater fidelity; and (3) that of Symmachus, distinguished by greater freedom and elegance.

The S. has had a wide influence. It was habitually used by Philo and Josephus, and it is very often quoted by N. T. writers, even where it differs widely from the Heb. Most of the anc. versions of the O. T. were made from it, and it has been the only representative of the O. T. to the Gr. or E. Ch. from the beginning. The text of the LXX. became early corrupted. Our existing MSS. differ considerably, and the correction of the text is difficult. [From orig. art. in *J. S. Univ. Cyc.*, by PROF. EZRA ABBOT, D. D., LL.D.]

**Sepul'chral mound**, a tumulus of earth or earth and stones thrown up over the burial-place of the dead. S. M. are among the most frequent and interesting monuments of pre-historic ages; and the name Mound-builders has been applied to the pre-historic race of the present U. S. which left such relics.

**Sequin** [It. *zecchino*, *zecca*, a "mint"; Ar. *sikkah*, "a stamp"], a name applied to various It. and Levantine coins. The original S. was a Venetian gold ducat of the 13th century. At present the gold It. S. is worth \$2.301, but it is no longer coined.



**Sequoi'a** [so called in commemoration of Sequoyah, a Cherokee Indian of mixed blood], a genus of coniferous trees of the sub-order Cupressineæ, or cypress family, remarkable for the great size which they attain, being the redwoods and big trees of Cal. They are natives of Cal. only, and of 2 species—one, *S. sempervirens*, the proper redwood, confined to the Coast Ranges; the other, *S. gigantea*, more particularly called big tree or mammoth tree in that State, restricted to the W. face of the Sierra Nevada. The Pacific forest-belt is prolific of large trees, but these surpass all their associates. They are distinguished at sight from other trees by the trunks alone, invested with a peculiar fibrous bark of a rich cinnamon-brown color, and of thickness somewhat in proportion to that of the wood. The nearest relative of the genus among existing trees is the *Taxodium*, or so called cypress (more properly bald cypress) of the S. Atlantic U. S. and Mex.; but that has deciduous foliage. In the coast redwood the bright green foliage, spreading in a two-ranked manner, is very similar to that of yew, forming a graceful spray. The wood answers to its name, being of a rich brownish-red; it is light, but firm, free and straight-grained, handsome for wainscoting and the like, although the color fades on exposure without protection, while it is fully as durable as red cedar when used for posts and palings. The tree is tenacious of life, the stumps even of the oldest trunks long retaining their vitality at the circumference, and sprouting into a circle of fresh young shoots. This tree adorns, or till recently adorned, the Coast Ranges from Monterey Bay to the Or. line, but most abounds northward of the Bay of San Francisco up to lat. 40°. Being by far the most valuable lumber-tree of Cal., and growing near the coast, the available stock is being rapidly consumed. Where this redwood abounds it naturally forms a forest almost by itself. As to size, there are well-known trees with trunks from 50 to 75 ft. in circumference and from 200 to 275 ft. in height; and credible accounts are given of still larger ones.

*S. gigantea*, the "mammoth tree" of the Sierra Nevada, now so famous, appears to have been first seen by white men in the spring of the year 1852, when a hunter named Dowd reached the Calaveras grove, and afterward led a company of miners to the spot. The earliest scientific account and name of it appeared in *The Gardener's Chronicle* (Lond.), Dec. 24, 1853, by Lindley, who pub. it as *Wellingtonia gigantea*. The Californian botanists and amateurs proposed to call it *Washingtonia Californica*, and under this name it was pub. in the *Cal. Farmer* in 1854. Meanwhile the late Dr. Torrey determined that this tree was of the same genus as the common redwood—i. e. *Sequoi'a*—notwithstanding the remarkable difference in the foliage; and this conclusion was announced by the present writer in the *Amer. Journal of Science* for Sept. 1854, but without appending the proper specific name. Although attaining in gen. a vaster size than the coast redwood, it is not so handsome a tree. The branches are short, the spray less graceful, the leaves small, awl-shaped, appressed to the branchlets, and paler. The wood is similar, but of a duller reddish hue. This species is found intermixed with other coniferous trees, mainly sugar-pines of lordly size, generally in detached patches or "groves." It is confined to a particular part of the W. slope of the Sierra Nevada; in vertical range it is restricted between 4760 ft. (at the northernmost locality) and about 7000 ft. The most N. groves known are the 2 in Calaveras co., one of which was the first discovered, and is still the most visited and most accessible. It contains some of the tallest trees known. This grove still contains 4 trees which are over 300 ft. high:

quite so tall, but its stripped trunk measures 61 ft. in circumference. The stump of a tree which was cut down was squared off, and a pavilion erected over it, has a diameter of 23 ft., and in one direction of 24 ft. Its annual rings on the section are 1255, beside a small portion in the centre which is imperfect. Its age cannot have exceeded 1300 yrs. Between this grove and the Merced River are 2 or 3 patches of big trees, but none of great note until the Mariposa grove is reached. This is 16 m. S. of the Yosemite Valley, and is in 2 patches—the lower one 5500 ft. above the sea-level. It contains about 125 trees that are over 40 ft. in circumference—one, the Grizzly Giant, which is over 93 ft. at the ground and over 64 at 11 ft. above—as well as ruins and remains of still larger trees. Many have been sadly injured or destroyed by fire. None equals those of the Calaveras grove in height, the very tallest being only 272 ft. This grove, like the Yosemite Valley, is a govt. reservation and in charge of trustees. Neither of these species will stand in the Atlantic States, although the *S. gigantea* has not rarely survived well for a certain number of yrs. But it thrives in Europe, especially in Eng., where it is much planted and grows rapidly. The most full and authentic account of these trees is to be found in Prof. J. D. Whitney's *Yosemite Book*, from which this article is largely abstracted. ASA GRAY.

**Sequoiyah.** See GUESS (GEORGE).

**Seraglio.** See CONSTANTINOPOLE.

**Serajevo, or Sarajevo.** See BOSNA-SERAI.

**Serapeum,** a temple dedicated to the god Serapis, of which there were several at Rhacotis, Alexandria, Memphis, and other places of Egypt, Babylon, and elsewhere, 42 temples having been recorded as dedicated to this god. As Serapis was the appellation of the Asar- or Hesar-Api, the Osiris or deceased bull Api, the term Serapeum was applied to the cemetery of these sacred bulls at Memphis, which lived in the Apæum close by from the 7th century B. C. It was called the Great Serapeum. This subterranean sepulchre was discovered in 1850 by Mariette-Bey N. of the pyramids of Sakkarah. The other Egyptian S. at Alexandria was erected by the Ptolemies to the god, a modified type or form of Aidoneus or Pluto, brought from Pontus. The building, of magnificent arch. and size, rose 100 ft. above the level of the city, and in it was the celebrated Alexandrian library. [From orig. art. in *J.'s Univ. Cyc.*, by S. BIRCH, LL.D.]

**Seraph, pl. Seraphim** [from *seraph*, to "burn," "consume"], creatures in human form, with 6 wings, ever worshipping at the throne of God, and performing the highest sacerdotal functions.

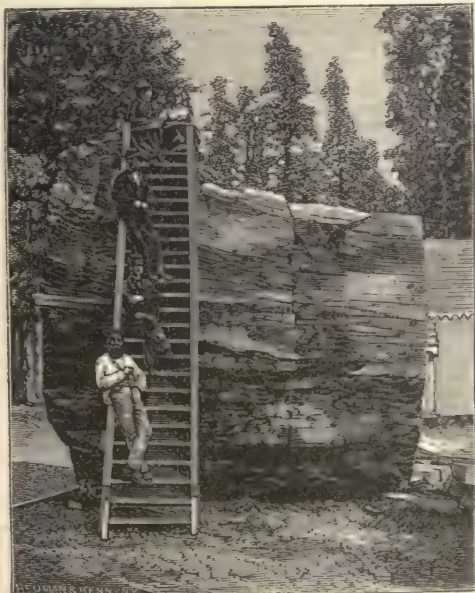
**Seraphim** [Heb.], **Order of the**, in Swe. or Nor., a knightly order founded in 1290 or 1285 by Magnus I., king of Swealand. Charles IX. abolished it about 1610, and Frederick I. restored it Feb. 11, 1748.

**Serapis**, the name of an Egyptian and Græco-Egyptian god. The Egyptian Serapis or Sarapis was the *Asar-Hapi* or Osiris-Apis, the name given to the sacred bull of Memphis, a supposed incarnation or avatar of the god Ptah, and the sepulchral or votive tablets set up in his honor bore that name, the Osor-Apis being supposed to be the son of the god Ptah, and animated by the soul of Osiris. As such he is represented under the type of a man with a bull's head. The Gr. S. was introduced into Egypt in the reign of Ptolemy Philadelphus (B. C. 284-246), in consequence of a dream of that monarch, and his statue, a form of Hades or Pluto, sent as a present by the people of Sinope. It was placed in the temple on the promontory of Rhacotis, according to one statement, or else transferred from Pontus to Alexandria. [From orig. art. in *J.'s Univ. Cyc.*, by S. BIRCH, LL.D.]

**Ser'es** [Chi. see, "silk"], the Gr. and Rom. name for a people of E. Asia, probably the Chi., who were the first manufacturers of silk.

**Serf** [Lat. *servus*, a "slave"]. Serfdom originated from the slavery of the anc. republics, and was transformed by the concurring influences of Christianity and feudalism. It received its final and legally defined organization from the absolute monarchy, and disappeared with it under the influence of modern liberalism, more especially through the agency of the Fr. revolution. The slavery of anc. Rome, on which her whole civilization depended, was not a thing entirely unknown to the barbarians who invaded her territory, and finally overthrew her empire. The Germanic nations had their thralls. Wherever they settled they employed the native pop.—that is, that part of it which was not killed and did not flee—to perform all menial labor for them, treating them nearly as we treat our domestic animals; and when they moved they generally carried along with them a multitude of such helpers, probably at the rate of ten thralls to one freeman. Such was the relation in Eng. between the A.-S. and the Celts, and in Scandinavia between the Goths and the Finns and Lapps. But in the Rom. slavery there was something absolutely unintelligible to the man of Germanic descent. In Rome the poet, the philos., the man skilled in science and art, the tutor of the children, and the ornament of the house was often, not to say generally, a slave. In the Germanic nations a man possessed of eminent wisdom or skill could never become a thrall. He might be sold, when captured, to a foreign market as a slave, but the individuals kept as thralls in the household were always inferior to their masters, both in natural capacity and in training; and whenever a thrall gave proofs of eminence in any respect, in some kind of workmanship or in noble courage, he was immediately made free. Thus, although the Germanic nations kept thralls themselves, their conquest of the Rom. empire acted as a powerful agent in breaking up and transforming the anc. inst. of slavery; and at the same time the Chr. Ch. succeeded in enforcing laws which forbade Chr. masters to keep Chr. slaves: that is, they forbade slavery. But of course it was only the form which changed: the thing itself could not be abolished.

The serfdom of the early Middle Ages was a very vague



Section of the original Big Tree, 92 feet in circumference.

the tallest, called "the Keystone State," reaches the height of 325 ft., and its girth at 6 ft. from the ground is 45 ft. The tree from which the bark was taken for exhibition (and finally consumed in the Sydenham Crystal Palace) is not



organization, and by no means regulated. But after the victory of absolute monarchy over feudalism it was defined by law in all its particulars; and however hard and repulsive it might formerly have been in many cases, on account of the arbitrariness and violence of the lords, it now became a general curse, an organized misery. The reasons why absolute monarchy thus delivered up one part of its subjects to the greediness and violence of another were different in different countries, but generally they bore the character of being a sort of compromise; the king had usurped the rights of the nobility, and, as a sort of compensation, he thus surrendered the rights of the peasants.

CLEMENS PETERSEN.

**Sergeant**, sar'jant (JOHN), LL.D., son of J. D. Sergeant, b. at Phila. Dec. 5, 1779, grad. at Princeton 1795; was admitted to the Phila. bar 1799; appointed a com. of bankruptcy 1801; subsequently deputy atty.-gen. of Pa.; sat several times in the Pa. legislature; was M. C. 1815-23, 1827-29, and 1837-42; was the leading representative of the N. States in advocating the passage of the Mo. Compromise act 1820; was minister to the Panama cong. 1826, Whig candidate for the Vice-Presidency 1832, pres. of the Pa. constitutional convention 1830; was appointed arbitrator to determine a controversy of long standing between the U. S. and the State of N. J. D. Nov. 23, 1852.

**Sergeant** (JONATHAN DICKINSON), b. at Newark, N. J., in 1746, grad. at Princeton 1762; became a lawyer; was a member of the Continental Congress 1776-77; was atty.-gen. of Pa. 1777-80; afterward an eminent member of the bar of Phila. D. Oct. 1793.

**Sergeant** (THOMAS), son of John, b. at Phila. Jan. 14, 1782, became a lawyer; sat in the legislature 1812-14; was judge of the dist. court 1814-17, sec. of state 1817-19, atty.-gen. 1819-30, P. M. of Phila. 1824-32, associate justice of the supreme court of Pa. 1834-46; was long pres. of the Historical Society of Pa. He married Sarah Bache, a granddaughter of Benjamin Franklin. D. May 5, 1860.

**Sergeant-at-Arms**, originally an officer who attends the Eng. lord chancellor and also the House of Lords. He acts as executive officer for the Lords and for the chancery court. The House of Commons has another S.-at-A. The S.-at-A. of the U. S. Senate assists in the preservation of order, serves processes, arrests persons, and holds them in custody when so directed by the Senate, etc. The S.-at-A. of the House of Reps. performs duties corresponding to the above, and also keeps the pay and mileage account of the House, etc.

**Series**, se're-ēz [Lat.], an infinite number of terms following one another in regular order, each of which is deduced from one or more of the preceding terms by a fixed law, called the law of the series. A certain number of leading terms being given, and the law of the S. being known, the S. may be written out to any number of terms. Sometimes the law of the S. is given by means of a *general* term, from which any term may be derived by making proper suppositions on the arbitrary constants that enter it. A S. is said to be *increasing* when the numerical value of each term is greater than that of the preceding term; it is *decreasing* when each term is less than the one preceding. A S. is said to be *converging* when the sum of any number of terms approximates more nearly to a fixed quantity the greater the number of terms that are taken. The fixed quantity is called the *sum of the S.*, and the operation of finding this quantity is called summation.

**Serinagar**, or **Srinagar**, cap. of Cashmere, situated in a broad, marvellously beautiful valley at an elevation of 5276 ft. It is built on both sides of the navigable river Jhylum, from which numerous canals, spanned by light wooden bridges, branch off. The most remarkable building is the palace of the maharaja. Close by the city is Lake Dal, which boasts of the far-famed isle Chinars. Vegetables are raised here on floating rafts called *gasons*. About 21 m. N. W. of the city is Wular Lake, which covers 103 sq. m.

**Serpentine**, a metamorphic rock, essentially a hydrous silicate of magnesia, which takes its name from its mottled colors, chiefly yellow and green, thought to resemble those of the skins of certain serpents. It is so soft as to be readily cut or sawed, is also susceptible of a fine polish, and is frequently manufactured into vases and other ornamental articles. "Verd-antique marble" is composed largely of S. (green) mingled with carbonate of lime (white). One variety of S. (chrysotile) is made up of flexible fibres of more than silky fineness and lustre; this is sometimes called amianthus, though that name was originally applied to the finer varieties of asbestos.

J. S. NEWBERRY.

**Serpent or Snake Bites**. See VENOM.

**Serpents**, a group of the class of reptiles, distinguished as an order under the name Ophidia. They are recognized by their very elongated and flexuous body and the absence of true external limbs; the body regularly graduates into the tail, and there is no abrupt distinction between the two; the back and sides have generally imbricated scales, while the lower surface is generally covered in front of the anus with a row of very broad plates, and behind the anus with usually two, sometimes one, row; the head is covered with plates; the lips above and below are bordered respectively by the upper and lower labials, and the chin by peculiar oblique plates; in others the scales encroach upon the head, and are little differentiated from those on the back and sides. The teeth are acute, and directed more or less backward, and are generally developed simply upon the maxillary, palatine, and dental bones. In the typical species they are in a long series on each of the bones designated; in the specialized poisonous species, however, only poison-fangs are developed on the maxillaries, but the rows on the palatines and dentaries exist as in the typical species; in an intermediate type, but containing very poisonous species, there are also rows of teeth behind the poison-fangs. The vertebrae and ribs are very numerous, and every vertebra from the head to the end of

the tail has its ribs. True limbs are wanting, and the anterior are not present in all forms, but the posterior are in some types represented by rudiments which are occasionally exerted and appear as hooks. The alimentary canal is differentiated into an oesophagus, a stomach, a small intestine, and a large intestine. A cloaca passes all the contents of the viscera. The lungs are unequal in size. The bronchus opens directly into the lung. The heart is divided into 2 auricles and a single very imperfectly separated ventricle. S. progress by sinuous flexures from side to side, and are incapable of vertical undulating movements. Though destitute of members, the typical species can progress with great rapidity upon surfaces that are rough. Many S. are also capable of ascending trees. Their habitats are various: some live in marshy regions, some in rocky, some on sandy desert plains, others among the trees, and still others burrow in the earth; again, some affect fresh waters, while a few are even modified as sea-serpents and for swimming in the ocean. Most S. are oviparous, and lay eggs whose shell is generally more or less soft and yielding, but which have, at the same time, a greater or less amount of lime; other S. are ovoviviparous. The eggs are generally excluded in a chain, being connected by a viscous substance. In most cases the mother, after laying her eggs, leaves them to be hatched by the sun or decaying vegetable matter, but some species coil themselves around the eggs, and thereby hatch them. Many species go with their young for some time after birth, and protect them from enemies.

The principal subdivisions of the order are based upon modifications of the cranium and the dentition. The generally admitted groups are (1) Solenoglyphs, (2) Proteroglyphs, (3) Asineas, (4) Tortricinas, and (5) Scolecophidia; these are enumerated in an order inverse to their evolution, the first containing the most specialized forms of the order, and the last the most generalized types. The order is represented by about 1000 living species. The geographical distribution of its members is to a large extent determined by thermometrical conditions. The representatives of the order as a whole affect hot regions, and are averse to cold. They are absent altogether in the extreme N. and S. countries, and sparingly developed and hibernating during cold weather in the temperate regions, but almost equally abundant in the tropical regions of the several quarters of the globe.

THEODORE GILL.

**Serpents, Poison of**. See POISON OF SERPENTS.

**Serpent-Worshippers**. See OPHITES.

**Serrano y Dominguez** (FRANCISCO), Duke de la Torre, b. at San Fernando, near Cadiz, Sp., Nov. 30, 1810; attained through the favor of Queen Christina the grade of gen. of division before he was 30 yrs. of age; sat in the Cortes as deputy for Malaga and v.-p. of the chamber 1843; became minister of war in the "nine days' administration" of Lopez May 11; was again minister of war for 10 days (Nov. 19-29) under Olozaga; became lieu.-gen. and senator 1845; obtained such influence over the young queen after her marriage (1846) as to give rise to much scandal; was appointed capt.-gen. of Granada 1847; took part in several short-lived ministries and in equally numerous revolutions; was exiled Feb. 1854; returned to power in July of the same yr. as an ally of Espartero and O'Donnell; became capt.-gen. of New Castile; espoused the cause of the latter at the rupture of the "Liberal Union," which culminated in the *coup d'état* of July 1856; went as ambassador to Paris 1857; became marshal and capt.-gen. of Cuba 1860-62, signaling his administration by the reannexation of Santo Domingo to Sp., which procured his elevation to a dukedom as a grandee of the first class; became capt.-gen. of Madrid June 1865; was pres. of the senate 1866; was exiled to the Canary Islands July 1868, when he took part with Prim and Topes in effecting the revolution which drove Isabella from the throne; became pres. of the council of ministers and commander-in-chief of the army; was elected regent June 16, 1869; negotiated the acceptance of the Sp. crown by Prince Amadeus, of It., by whom he was made premier Jan. 1871; resigned that post in July of the same yr.; took the field as commander-in-chief against the Carlists Apr. 1872; concluded with them the coexistent of Amorevicieta in May; was made "chief of the executive" after the *coup d'état* of Gen. Pavía Jan. 1874; again took the field against the Carlists, and arranged with Martinez Campos the restoration of the monarchy in the person of Alfonso XII., Jan. 1875.

**Serto** (QUINTUS), b. about 121 B. C. at Nursia in the country of the Sabines; distinguished himself in the battle of Aquæ Sextiæ (102 B. C.) under Marius; fought with Cinna at the Colline gate in 87 B. C. against Pompeius Strabo; surrounded and put to death a gang of about 4000 slaves whom Marius had let loose on the city; was sent to Sp. as propraetor; was outlawed as belonging to the democratic party; took up the contest against the oligarchs in Sp.; gained the favor of the natives, who became his faithful allies; Perenna joined him with 53 cohorts; in 74 B. C. he formed an alliance with Mithridates; Metellus Pius, whom Sulla first sent against him, was repeatedly defeated, and even Pompey was driven back across the Ebro; in 72 B. C. he was invited to a banquet by Perenna and treacherously assassinated at the festival.

**Ser'val**, an animal of the Felidae or cat family, having a slender body, small head, long legs, long and shaggy hair, body spotted with dark brown, the general color being ochre-yellow, and the lower parts white. It is mild and docile, and is about 3 ft. long.

**Servant**. See MASTER AND SERVANT.

**Serve'do** (MIGUEL), usually known by the Latinized form of his name, SERVETUS, b. at Villanueva, near Saragossa, Sp., in 1509; gave his attention principally to theol.; visited It., Ger., and Switz.; became acquainted with many of the Reformers, adopted their doctrines, and broached his conclusions adverse to the doctrine of the Trinity; pub. his *De Trinitatis Erroribus* and *Dialogorum de Trinitate Libri*



*duo; de Justitia Regni Christi Capitula quatuor*, works which embroiled him with both R. Caths. and Prots.; studied med.; settled at Paris 1535; took the degree of M. D. with high honors 1536; became an eloquent and popular lecturer at the univ. on med. science and math.; pub. a treatise, *Syruporum Universa Ratio*, attacking opinions of Galen and of the Paris faculty of med.; pub. at Lyons eds. of Ptolemy's *Geographia* and of the Bible with Lat. notes, which were condemned as heretical by the R. Cath. Ch.; carried on with Calvin an active theological correspondence, which resulted in a bitter quarrel; pub. anonymously *Christianismi Restitutio*, the authorship of which was discovered by Calvin and made known by him to the R. Cath. abb. of Lyons, Cardinal Tournon; imprisoned by the Inquisition at Vienne at the instance of that prelate; escaped from prison in disguise Apr. 7; was condemned for heresy, and burned in effigy at Vienne June 17, 1553; went in disguise to Geneva, was arrested, brought to trial (Aug. 14) before the municipal court on charges of heresy, sedition, insult to the Fathers of the Ch., and calumny against Calvin and other Prot. divines; was forced to discuss doctrinal points with Calvin, who appeared as prosecutor and drew up the final articles of accusation, 38 in number; was condemned to the stake, and burned alive near Geneva, Oct. 27, 1553.

**Servetus.** See SERVEDO.

**Ser'via** [Slavonian, *Serbia*; Tur. *Syrrp*], kingdom of Europe, bounded N. by the Aus. empire, from which it is separated by the Save and Danube, E. by Wallachia and Bulgaria, S. by Macedonia, from which it is separated by the Balkan Mts., and W. by Albania and Bosnia. Area, 18,800 sq. m. Pop. 1,826,000. The surface is very mountainous, being covered W. by the Dinaric Alps and S. by the Balkan Mts., which latter meet the Carpathian Mts. on the E. frontier at Orsava, separated from them by a narrow cleft, called the Iron Gate, through which the Danube rushes. The climate, though rigorous in the highlands, is generally mild and healthy. Extensive forests of oak and walnut trees cover the mts. Immense herds of swine are fed in the forests, and millions of hogs are annually exported. In the valleys and in the plains of the Danube rice, maize, and wheat, flax, hemp, and tobacco, wine and fine fruits, grow abundantly, but agriculture is as yet in a backward state. Iron, copper, lead, and coal are found, but no mines are worked; all manufactures are confined to articles for home use. Cap. Belgrade.

In the early Middle Ages S. formed an independent kingdom. In 1385 it was subjugated by the Turks, who brought it into a miserable state. The first rising of the Servians, in 1806, under Czerny, was successful, but not lasting, and the Turks took bloody revenge. The second rising, in 1814, under Milosch, proved lasting, and the country is now an hereditary monarchy. The present ruler, Milan I., succeeded to the throne by the election of the Servian national assembly, after the assassination of his uncle June 30, 1838; crowned at Belgrade, and assumed the govt. Aug. 22, 1872; accepted, Mar. 6, 1882, at the unanimous invitation of the Skupchina, the royal dignity, with the style and title of King Milan I. of Servia. The Servians are a Slavonic tribe, and belong to the Gr. Ch. They are a strong, well-built, and handsome people, enthusiastic but industrious, energetic but benevolent, and deeply devoted to their fatherland, their freedom, and their Ch. There is no nobility and no proletariat. Each family, the father, the sons with their wives, the children, etc., remains together, forming a community of which the oldest member is the chief. The estate is the property of the family, and cannot be sold.

The Servian lang., which is spoken by about 7,000,000 people, is the richest, softest, and most melodious of all Slavonian langs., and has received considerable literary development, both in S. proper and Dalmatia. It contains a great treasure in its ballads. (See W. DEXTON, *Servia and the Servians*; TALVI, *Historical View of the Langs. and Lit. of the Slavic Nations*.)

**Service-Berry.** See JUNE-BERRY.

**Service Tree,** the *Pyrus domestica*, a tree of Europe, Asia, and Afr., of the order Rosaceae, much resembling the medlar and sorb. Its fruit, when over-ripened and bletted, is soft and pleasant to eat, and the wood is used as a substitute for box. In parts of N. Amer. the shad tree is called the service.

**Servites,** a community of Augustinian friars, called Servants of the Virgin Mary, founded at Florence in 1333. They were confirmed in 1355 by the pope, and in 1493 a part received a reformed rule.

**Servitude** [Lat. *servitus*], the generic name given by the civil law to the class of rights which may be held in the lands or other things of another person. A prædial S. is a burden imposed upon one piece of land, called the servient estate, in favor of and attached to another tract, called the dominant estate. Prædial S. are divided into rural and urban. A personal S. differs from the prædial in not being appurtenant to any dominant estate.

**Ser'vius Tu'llius**, the 6th king of Rome (578-534 B. C.). His hist. is full of fables and wonderful traditions. But amid the many mythical elements which cling to his name there are several facts. He gave a new const., by which the plebeians became an independent part of the nation equally with the patricians, and part of that political influence which hitherto had been attributed to birth alone was transferred to property. He completed the city by incorporating with it the Quirinal, Viminal, and Esquiline hills, and surrounding the whole with a wall 5 miles in circumference. Finally, he formed an alliance with the Lats., by which Rome and the cities of Latium became the members of one great league.

**Sesame**, ses'-a-me [Gr. *σισάμη*; Ar. *simsim*], the **Benne-Plant** of our S. States (*Sesamum Indicum*), belonging to the order Pedalinee, an annual herb, originally from India and Afr. S. was probably brought to the U. S. by slaves from Afr. Its rich oily seeds are prized by the negroes,

who also make a thick gelatinous drink of the leaves, which is very bland and useful in diarrhoeas. The oil is called oil of Benne and Gingilie oil.

**Sesame-Grass**, the *Tripsacum dactyloides*, a large grass of the Atlantic U. S., from N. J. southward, with broad leaves and a solid stem, like that of Indian corn or sugarcane, which it resembles. It is very coarse, and in the N. is not valued, but in parts of the S. is used as fodder.

**Ses'ia**, an interesting genus of hawk-moth (Sphingidae) of a mimetic type, resembling the bees in form.

**Sesos'tris**, the name of a king of Egypt. According to popular tradition, all the boys born on the same day as S. were brought up with him, and became afterward his most devoted friends and ministers. On his accession to the throne he divided Egypt into 36 nomes, and then departed with a vast army for the conquest of the world, and is said in 9 years to have conquered the whole of Asia and Europe as far as Thrace. In the S., Libya, Ethiopia, and Ar. were subdued by his arms. To record his exploits he placed *stelæ* or tablets to mark his power. After his wars he devoted his attention to the protection and improvement of Egypt, which he intersected with canals to prevent the incursions of cav., partitioned the country into fields, and imposed a land-tax on all except those belonging to the temples. He also raised the great wall on the E. of Egypt, along the edge of the desert by Heliopolis, 1500 stadia, or 187 Rom. m. It was built of sun-dried bricks. S. is also said to have had a fleet of 400 sail in the Mediterranean and the Ar. Gulf. The temples of Egypt, 100 in number, he is said to have built, and to have erected obelisks about 180 ft. high, and made a boat 280 cubits long to the god of Thebes. His public works were said to have been executed by prisoners of war reduced to slavery for the purpose. His triumphs were signalized by making the captive monarchs drag his car, but his life was embittered by the treason of his brothers, who endeavored to burn him in a house, from the blazing chambers of which he only escaped by the sacrifice of two of his children thrown on the burning embers, and by walking over their bodies. In his old age he became blind, and finally, in disgust of life, put an end to his existence, and was honored by the priests as second only to Osiris. The name of Sesostris is that of no Egyptian monarch hitherto discovered. It is, however, evident that the monarch most like him was Ramesses II. [From orig. art. in *J.'s Univ. Cyc.*, by S. BIRCH, LL.D.]

**Sester'tius** [Lat. for *semita tertius*, "two and one half"; it was once worth  $2\frac{1}{2}$  asses]; in anc. Rome, a silver or bronze coin worth  $\frac{1}{4}$  part of a denarius.

**Sestus**, or **Sestos**. See ABYDUS.

**Set**, or **Typhon**. See TYPHON.

**Seton** (ELIZABETH ANN Bayley), b. in New York Aug. 28, 1774, married William Seton about 1794, and on his death at Pisa 1804, returned to New York; joined the R. Cath. Ch. Mar. 14, 1805; conducted a school at Baltimore 1805-08, and with her sisters-in-law, Harriet and Cecilia Seton, took the veil as Sisters of Charity Jan. 1, 1809, at Emmittsburg, Md., the first members of that order in the U. S. A conventual establishment was opened at Emmittsburg July 30, 1812, with "Mother Seton" as superior-gen. D. Jan. 4, 1821.

**Set'ter**, a hunting-dog of a breed apparently intermediate between the pointer and the spaniel. This dog was formerly trained to sit or drop when marking down game, but at present it stands at its work like a pointer.

**Sevasto'pol**, or **Sebastopol**, near the S. W. extremity of the Crimean peninsula in the Black Sea, was the great naval station of Rus. in that sea. The great harbor-fortifications which existed at the period of the siege were planned in 1834, and simultaneously land defences, which latter had not been constructed when (Sept. 1854) the memorable siege commenced. Every effort was then made to increase the strength of existing intrenchments, and the process continued *pari passu* with the siege. These defences, based upon a matured plan of permanent fortification, and having some of its features, combined therewith the characteristics of lines of field-works and those of the siege-works always resorted to by a besieged garrison, but yet differed from all these and from all others previously employed, owing to peculiarities of site and circumstances, to the skill of the engineer, and to the indomitable resolution of the defenders. Though compressed into comparatively small linear space, their real magnitude was enormous. The Russian loss in the defence was 84,000 men. (Tollében.) The French loss was 45,500 (Niel); the total loss of the allies must have been about 60,000. The total loss of besieged and besiegers must have been nearly 150,000 men.

The fortifications and naval establishments were, after the capture, destroyed by the allies, and by the Treaty of Paris, which terminated the war, Rus. was debarred from maintaining a naval force in the Black Sea beyond a fixed and very limited magnitude. By the stipulations on this point of that treaty Rus. in 1870 asserted her intention no longer to be bound. Pop. before the siege, 40,000; now 13,259. J. G. BARNARD.

**Seven Pines, Battle of.** See FAIR OAKS.

**Seven Sages** (or **Wise Men of Greece**), The, according to most authorities, were Bias, Chilon, Cleobulus, Periander, Pittacus, Solon, and Thales, but the selection of 7 names from among the sages of anc. Gr. is a purely arbitrary one.

**Seventeen-Year Locust.** See CICADA.

**Seventh-Day Adventists.** See ADVENTISTS.

**Seventh-Day Baptists**, a denomination of Chrs. formerly called *Sabbatarians*. They hold to the immersion of adult believers, and also to the observance of the 7th day of the week as the Sabbath. In the U. S. they number about 10,000 members, support one univ. at Alfred, N. Y., a number of acads. and periodicals, a tract and publication society, and a missionary organization.—**SEVENTH-DAY BAPTISTS** (GERMAN), a small sect which in 1728 seceded from the Dunkers of Pa., and established at first a solitary, and then



a conventual, life at Ephrata, Lancaster co., Pa. They hold a part of their property in common, adopt the Capuchin habit and a system of monastic names, and recommend, but do not absolutely require, celibacy. At present their leading establishment is at Snowhill, Franklin co., Pa. Their founder was Conrad Beissel.

**Seven Wonders of the World, The**, are the Colossus of Rhodes, Diana's temple at Ephesus, the Mausoleum at Halicarnassus, the Pyramids, Pharos at Alexandria, Hanging Gardens at Babylon, and the Olympian Zeus.

**Seven Years' War** (1756-63). When Frederick II. saw that war was unavoidable he fell at once upon Sax. with an army of 60,000 men (Aug. 1756), took Dresden Sept. 10, defeated the Aus. army, which hastened to the support of Sax., at Lobositz (Oct. 1), compelled the Sax. army to surrender Oct. 15, and placed the whole country under Prus. control. Nevertheless, his situation in the spring of 1757 was almost overwhelming. At the N. 22,000 Swedes gathered in Stralsund; in the E. 100,000 Rus. pushed onward to Memel; in the S. E. two Fr. armies approached through Bohemia; in the S. W. two Fr. armies marched toward Prus.; in the S. an army was organized from the contingents of the S. Ger. states. In the centre of this circle, on the Brandenburger heath, where there is little grain and no iron, stood Frederick II., with an army of about 200,000 men. In Apr. 1757 he broke into Bohemia; attacked the Aus. army under Charles of Lorraine before Prague May 6, split it in two, of which the one part retired into Prague and the other retreated to the S. W. to join Daun; invested and besieged Prague; met Daun at Kolin June 18; was completely defeated, and retreated with his whole force into Sax., slowly followed by Daun, while Charles of Lorraine marched onward to Silesia. In Hanover his army was totally defeated by the Fr. at Hastenbeck July 26, and compelled to conclude the capitulation of Kloster-Seven, Sept. 8, by which his army was dissolved. In the mean time the second Fr. army had conquered Hesse and penetrated into Sax. Frederick II. met it at Rossbach Nov. 5, and literally scattered it to the winds. He then turned to Silesia, which had fallen into the hands of the Aus.; routed Charles of Lorraine at Leuthen Dec. 5, and reconquered the whole prov. with the exception of Schweidnitz. An Eng.-Hanoverian army was organized under the command of Duke Ferdinand of Brunswick, and during the subsequent campaigns he succeeded in keeping the Fr. on the other side of the Rhine. In 1758 Frederick II. defeated the Rus. at Zorndorf Aug. 26, but he was himself defeated at Hochkirch Oct. 14, by the Aus. under Daun. He nevertheless kept both Silesia and Sax., but in 1759 was so completely routed at Kunersdorf, Aug. 12, by the Rus. and the Aus. that the morning after the battle he could hardly gather 5000 men. Dresden and a large part of Sax. fell into the hands of the allies, and although he reconquered it in 1760 by the victories at Liegnitz and at Torgau his ruin seemed unavoidable. On Oct. 25, 1760, George II. died, and the Eng. subsidies stopped. The Rus. under Tottleben took Berlin and plundered it for 3 days. But, fortunately, the czarina d. Jan. 5, 1762, and her successor, Peter III., was an admirer of Frederick II. Peace was concluded with Rus. May 5, and with Swe. May 22, and although the projected Rus.-Prus. alliance was frustrated by the assassination of Peter III., Catharine II., his successor, declared herself neutral. Peace was concluded between Prus. and Aus. at Hubertsburg Feb. 15, 1763, by which "all should remain as it had been before the war." (See Frederick II., *Histoire de la Guerre de Sept Ans.*) CLEMENS PETERSEN.

**Severus** (ALEXANDER). See ALEXANDER SEVERUS.  
**Severus** (LUCIUS SEPTIMIUS), Rom. emp. from 193-211, b. Apr. 11, 146 A. D.; commanded the legions in Pannonia when tidings came that the pretorian guard at Rome had murdered Pertinax and sold the imperial purple to Didius Julianus. The legions immediately proclaimed S. emp., and on June 2, 193, he appeared before the walls of Rome. Julianus was deposed and executed, and the pretorian guard was dissolved. Meanwhile the Roman legions in Asia had proclaimed their gen., Pescennius Niger, emp. S. defeated him in several battles, finally at Issus in 194; made successful campaigns against the Parthians, and returned to Rome, where he entertained the people in a most magnificent way, and gave the army new and still larger dotations. Another rival, Clodius Albinus, appeared in Gaul, but in the battle of Lugdunum (197) S. was victorious. New campaigns in the E. followed, and resulted in the capture and plunder of the Parthian cap., Ctesiphon. Then the emp. spent several yrs. (202-208) at Rome, but in 208 a rebellion broke out in Brit., and S. again took the field. His campaigns in Brit. were bloody, and without any lasting result. D. Feb. 4, 211.

**Severus** (SULPICIUS). See SULPICIUS SEVERUS.  
**Sevier**, se-veer' (AMBROSE H.), b. in Middle Tenn. in 1802, received a scanty education; removed to Ark. Terr.; studied law; was admitted to the bar; became clerk to the Territorial legislature; was elected to that body 1823 and 1825; delegate in Cong. 1827-36; U. S. Senator 1837-43; chairman of the committee on Indian affairs and on foreign relations; com. to negotiate peace with Mex. 1848. D. Dec. 21, 1848.

**Sevier** (JOHN), b. on Shenandoah River, Va., in 1740, emigrated to N. C. in 1769, and with an exploring party built the first fort on Wataga River, which he defended against the Indians, and in 1772 was delegate to a convention at Halifax, N. C.; in 1773 commissioned capt. of an expedition against the Shawnees and other tribes of Indians; took part in the battle of Point Pleasant, 1774; sat in the N. C. colonial assembly 1777; procured the erection of the Tenn. region into a dist. under the laws of N. C.; defeated the Indians at the battle of Boyd's Creek 1779; participated in the signal victory over the Brit. at the battle of King's Mountain, N. C., Oct. 7, 1780; was foremost in all the battles as well as negotiations with the Indians during many yrs.; was chosen in 1785 gov. of the State of Franklin, formed by the settlers out of a portion of what is now W. N. C. and E. Tenn.;

appointed brig.-gen. of the terr. S. of O. River. In 1796 the State of Tenn. was erected and admitted into the Union, and S. was chosen gov.; was elected a Rep. in the U. S. Cong. in 1811, and re-elected in 1813. During the war with G. Brit. (1812-15) he served with honor as a member of the military committee, and in 1815 accepted an important mission to adjust difficulties with the Creek Indians in Ala. Terr. D. Sept. 24, 1815.

**Sevier Lake**, a body of salt water lying in W. Ut., 120 m. S. S. W. of Great Salt Lake, N. lat. 39°, lon. W. from Greenwich 113° 10'; altitude above the ocean, 4600 ft. Its length N. and S. is 20 m., its width 10 m., and its area 140 sq. m. It has no outlet, and its sole tributary is Sevier River, which enters the N. end. The valley which contains the lake is an arm of the Sevier desert, and is uninhabitable by reason of the absence of fresh water.

**Seville**, city of Sp., cap. of a prov. of the same name, on the left bank of the Guadalquivir, 70 m. from its mouth. Under the Romans, Goths, and Moors it was the cap. of wealthy and powerful empires. The earlier kings of modern Sp. also resided here. When Amer. was discovered it became the mart of the new colonies. During the Fr. invasion (1810-13), and by the subsequent loss of the transatlantic possessions, it suffered very much, but recovered rapidly, and is to-day a city of brilliant remembrances, and is lively and enterprising. It is surrounded by old Moorish walls, surmounted by 66 towers. Across the city runs the Alameda, a broad, open street lined with palaces, planted with magnificent elms, and adorned with numerous fountains. The rest of the city, with the exception of the numerous public squares and promenades, consists mostly of narrow streets lined with high houses of Moorish construction. Among its many splendid edifices the cathedral is the most remarkable. Unique of its kind is the Giralda, a belfry 350 ft. high; and most interesting on account both of their elegant arch. and beautiful ornamentation are the Alcazar or royal palace, and the univ., founded in 1579. S. has many other good educational insts. Among its manufactures are a tobacco-factory, in which about 5000 persons are employed, a cannon-foundry, several manufactories of muskets and other firearms, powder, saltpetre, soap, leather, cotton thread, etc. Of its exports, oranges, olive oil, wine, wool, and cork, together with copper, lead, and quicksilver, form the prin. items. Pop. 133,868.

**Sèvres**, säv', town of Fr., dept. of Seine-et-Oise, on the Seine, is celebrated for its manufactures of porcelain. Pop. 7096.

**Sewage**. See SEWER, by GEN. Q. A. GILLMORE.

**Sewall** (JONATHAN), LL.D., b. at Boston, Mass., Aug. 24, 1728, grad. at Harvard 1748; began the practice of law at Charlestown about 1758; became atty.-gen. of Mass. 1767; gained a suit by which the slave James recovered his freedom at common law 1770; went to Eng. early in 1775; was included among the sufferers by the penal act of Apr. 30, 1779, against loyalists or "Tories"; settled at St. John, N. B., 1788, and was judge of court of vice-admiralty until his death, Sept. 26, 1796.—His son, JONATHAN SEWALL, LL.D. (1766-1839), was chief-justice of Lower Canada 1808-38.

**Sewall** (SAMUEL), b. at Bishopstoke, Eng., Mar. 23, 1652, grad. at Harvard 1671; studied theol.; acquired a fortune by his marriage (Feb. 23, 1676) with Hannah, daughter of John Hull, the celebrated master of the mint at Boston; was assistant gov. 1684-86 and 1689; was annually chosen a member of the executive council from 1692 to 1725; was judge from 1692 to 1718, when he was made chief-justice, being at the same time judge of probate for Suffolk co.; presided at the trial of some of the victims of the witchcraft delusion of 1692, but was soon convinced of his error, for which he publicly asked pardon of God and man in a paper read to the congregation on Fast Day, Jan. 14, 1697, by his pastor, Rev. Samuel Willard; wrote against slavery, *The Selling of Joseph*; was sec. and treas. of the society for the maintenance of Indian missions, and was author of *An Answer to Queries respecting Amer., Accomplishment of Prophecies, A Memorial relating to the Kennebec Indians, and A Description of the New Heaven* (1727). He resigned his judicial offices 1728, and d. Jan. 1, 1730.

**Sewall** (SAMUEL), LL.D., grandson of Dr. Joseph and great-grandson of Chief-Justice Samuel, b. at Boston Dec. 11, 1757, grad. at Harvard 1776; became an eminent lawyer at Marblehead; frequently sat in the legislature; was M. C. 1797-1800, judge of the supreme court 1800-13, and chief-justice of Mass. from 1813 to his death, June 8, 1814.

**Seward**, city and R. R. junc. cap. of Seward co., Neb., has fine water-power. Pop. tp. 1870, 1307; 1880, 2229, including 1525 in city.

**Seward** (FREDERICK W.), LL.D., b. at Auburn, N. Y., July 8, 1830, son of Wm. H.; ed. at the acads. of Albany and Auburn, grad. at Union Coll. in 1849; studied law, and was admitted to the bar at Rochester in 1851, and to the U. S. supreme court in 1854; was associate ed. of the Albany *Evening Journal* up to 1861; assistant sec. of state of the U. S. 1861-69; member of the assembly in 1874; edited *Autobiography of William Henry Seward*, 1801-34, with *Memoir* (1877), and afterward became assistant secretary of state of the U. S.

**Seward** (JAMES L.), b. in Georgia, studied law; was elected to the State legislature in 1836; was Rep. in Cong. 1839-59.

**Seward** (WILLIAM HENRY), LL.D., b. May 16, 1801, in Florida, Orange co., N. Y., was made ready for entrance to Union Coll., Schenectady, at 15, and took his degree in 1820. He then addressed himself to the study of the law, and was introduced to practice in 1823. He selected his place of abode at Auburn in Cayuga co., and there married Miss Frances Adelaide Miller in 1824. He began by practising law, but circumstances presented to him inducements to enter the field of national politics. In 1825 he acceded to the call of his fellow-townsmen to address them on the national anniversary. The yr. 1828 found him presiding in



a convention of young men of N. Y. having for its purpose the election of Mr. John Quincy Adams as Pres. for a second term, and the year 1830 brought him forward as a prominent leader in the uprising of the pop. of all W. N. Y. against the conspiracy of certain lodges of Freemasons, which had combined to visit upon the person of William Morgan secret and summary vengeance for his disclosure of their formulas. The consequence to Mr. S. was his election to a seat in the N. Y. senate. His political action was directed through 3 channels. The first was his election by the people to be gov. of N. Y.; the second, his election by the legislature of that State to a seat in the U. S. Senate; the third, his appointment by Pres. Lincoln to the post of sec. of state. These services absorbed 24 yrs. of the best part of his life, during which he was steadily exercising a direct healthy influence over the movement of great events.

Mr. Seward in 1860 had been himself a candidate for the nomination to the Presidency, with every prospect of success. He lost it by the force of certain bargains which are apt in this country to defeat the just expectations of the majority of the nation. The successful candidate, Mr. Lincoln, however, was not slow to recognize the value of his long public services by immediately placing him in what then was undoubtedly the most difficult position in the cabinet. For the 4 yrs. following he underwent a vast extent of labor and care in the maintenance of the country's influence upon foreign nations. In Mar. 1865 the great conflict at arms was over, but the labors of the state dept. continued to involve questions ominous to the peace of the country. The second term of Pres. Lincoln found Mr. S. completely in harmony with his chief, and ready to co-operate with vigor in the arduous task of reintegration of the old and fondly prized insts. under which the people had prospered as no other had ever done for a continuous period of  $\frac{3}{4}$  of a century. The imagination of a miserable wretch, inflamed by familiarity with histrionic effects, prompted a conspiracy that in the very hour of triumph laid low the heroic martyr Pres., and but just failed to involve Mr. S. in the awful catastrophe. Mr. S. survived to continue his labors under a successor to the Presidential chair who, with the best of intentions, possessed none of the conciliatory spirit of his predecessor, and stirred up strife instead of establishing harmony. The whole policy of restoration sank under the unpopularity attached to its official source, and Mr. S., who would not desert his chief, took his full share of the odium attending the failure. Blows fell thick and fast upon him. His wife and a highly cherished daughter in the flower of her age, successively withered under the shadow of the destroyer, and left him to return to his old home at Auburn, to find himself bereft of all the attractions that had once adorned it. He now decided to undertake a voyage and journey around the world. When finally he got back to his own home at Auburn, he directed the preparation of a vol. to contain his observations upon all that he had seen in the regions he had traversed. He d. Oct. 10, 1872. [From orig. art. in *J.'s Univ. Cyc.*, by Hon. CHARLES FRANCIS ADAMS, D. C. L., LL.D.]

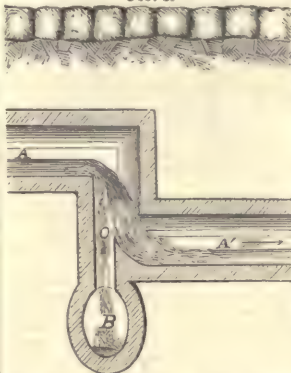
**Sewellel**, a rodent, *Aploodontia leporina*, which unites some of the characteristics of the beaver with those of the squirrel family and of the prairie-dog, is noted for its rootless molars; has a reddish-brown color with very small eyes and a short tail; is about the size of a muskrat, and has very strong jaws and a plump heavy body. It is found on the Pacific coast, is gregarious, and lives in burrows.

**Sewer** (O. Fr. *seuiere*), an underground drain or channel for conveying away sewage, such as refuse and filthy liquids and fecal matter. The construction of S. and the discharging of water, etc. by S., as well as the system or plan of S. for carrying off the sewage of a locality, are denominated sewerage. Technically speaking, a town or city provided with S. is said to be sewered.

Sanitary works and regulations for the promotion of the public health have been the accompaniments of civilization in all ages of the world, and most ancient cities had their systems of sewerage and water-supply, and their elaborate public baths or temples of health, the ruins of which, having been less exposed to the action of the elements than those more elegant structures which rose higher above the earth's surface, bear testimony by their magnitude to the liberal views which inspired their construction. This was followed by a period of decline and general neglect of the laws of health among the masses of the people. The present century has witnessed a revival of the spirit of sanitary reform, especially in thickly populated districts, and some of the ablest minds of the age have been enlisted in its behalf. It must be conceded that the amount of value or wealth which a community can produce by its labor, both mental and physical, depends upon the health of the people, and among two or more communities similarly circumstanced and following the same pursuits it will commonly, like the death-rate, vary directly with their sanitary condition. The requisite sanitary works of a town should provide (1) for a daily supply of pure water at the rate of not less than 20 gals. per capita of the pop.; (2) for the thorough drainage of the surface and subsoil; and (3) for conveying away all the liquid waste and fecal refuse produced by the community. In the general case the considerations which should govern the engineer, in fixing the essential features as well as the details of his project, will depend on (1) whether the subsoil water ordinarily stands so near the surface as to require tapping and draining off to a lower level; (2) whether the surface drainage, loaded with silt and soil not soluble in the water, and too heavy to be carried off by it and deposited in the final outfall, shall be provided with a separate set of channels, or be passed, in whole or in part, directly into the S., which convey away the fecal refuse from the habitations; (3) whether the less offensive sullage, arising from the domestic use of the water-supply, shall be conveyed from the houses in the same pipes which carry the animal excreta; (4) whether the S. shall be ventilated

directly into the streets, and if not, then the best method of securing their ventilation; (5) the most effectual and certain, and therefore the best, method attainable for excluding the sewage-gases from the houses; (6) whether the sewage is needed for manurial purposes, and if so, the best method of adapting the works to that end; and (7) whether, if not required as a fertilizer, the sewage can properly be passed into the natural water-courses. In dists. where the sewage is to be used for enriching the land the question of keeping it separate from the rainfall is an important one. The surface drainage of streets that are closely built up and subjected to heavy traffic is nearly if not quite as impure, in time of moderate and during the first stage of a heavy rainfall, as any sewage; and even if kept separate from the sewage, it might be unwise to allow it to flow into and corrupt the natural water-courses of the neighborhood in localities where it is a matter of grave importance to preserve the purity of these streams. The best arrangement for providing that no portion of the surface drainage except that most heavily charged with street soil shall pass into the S. while the rest flows by a separate drain into the natural water-courses, is the method by storm-overflow S., by which

FIG. 1.



or step in the drain, of such height that with a high velocity in the drain, its contents will leap over the opening in the S., and with a low velocity will drop into it. This arrangement is shown in Fig. 1, in which A A' is the rainfall drain, B the sewer, and O the vertical opening between them. With respect to the subsoil drainage, inasmuch as S. are or should be water-tight, as otherwise the contamination of the surrounding soil, and consequently of the atmosphere, by leakage, would be the certain result, they in no sense, when properly constructed, act as drains by lowering the subsoil water-level. In well-paved streets very little of the rainfall is absorbed into the soil, but finds its way into the S. or other channels provided for it: and were it not for the unpaved areas, including back yards and unimproved lots, the question of draining the soil in built-up streets would not perhaps possess great importance, especially if the soil be of a sandy or gravelly character. It has been shown in G. Brit., from carefully prepared statistics, that the death-rate from pulmonary diseases was reduced 50 per cent. by sewerage certain towns in such manner as to lower the subsoil water by drainage, while in other towns sewerage with impervious pipes throughout, with no provision for drainage, there was no decrease in the death-rate from consumption. Some provision for subterranean drainage should therefore be made without using the S. for that purpose, although the laying of S. alone, by cutting through the various impervious strata, invariably results in the drainage of the surrounding earth to a greater or less degree.

The transverse form of S. is a detail of capital importance, more especially if they are required to provide for an intermittent flow, as when the surface drainage passes into them in whole or in part; for in order that they may be self-cleansing the minimum velocity should never fall below 2 ft. per second in large sewers, and 3 ft. per second in those of 6 to 9 inches diameter, even when the volume of flow is smallest. The greater the sectional area of the stream in proportion to the wetted perimeter of the channel in which it flows, the greater will be the mean hydraulic depth, and therefore the greater the velocity. S. should therefore be narrow on the bottom, or invert, in order that the mean hydraulic depth for a small flow may be as great as possible. They should also be broad across the middle and upper portion, to give the requisite capacity for a large flow. A transverse section of the shape of an egg with the smallest end down secures these conditions best.

In order to afford the requisite facility for inspecting and repairing a system of sewerage, and keeping it free from obstructions, man-holes are constructed. (See Fig. 2.) These are shafts usually circular in horizontal section, and placed in a vertical position, constructed with brick, reaching from the street-surface through the crown of the S. They are large enough for a man to pass through them, and are closed on the top with an iron cover of such strength and so fitted to the opening as to resist the traffic of the street

FIG. 2.

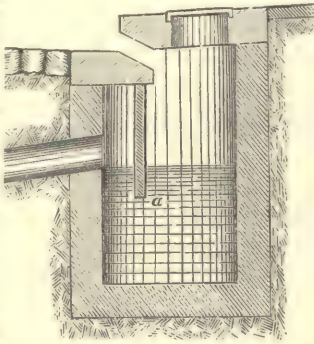




without injury or displacement. They are located at every point where the S. deviates from a straight line laterally or vertically, so that if a light be displayed in the S. at any man-hole, a man at the next one on either side can readily see if any stoppage exists between them. When the man-holes are used for purposes of ventilation, the covers are perforated.

The drainage of the street first flows through openings in the curb or gutter into street-gullies, provided usually with catch-basins which retain the sand, gravel, and heavy detritus, while the water, carrying the lighter street-soil in suspension, flows into a pipe from 8 to 12 inches in diameter, which issues from the catch-basin at a point some feet above the bottom, and leads to the S. These catch-basins may be circular or rectangular in plan, and are placed at intervals of 150 to 200 ft. apart on each side of the street. They should be well trapped to guard against the escape of S.-gases into the street. As often as the basin gets filled with silt up to the mouth of the pipe, it should be removed, and an opening in the covering stone is provided for that purpose. In Fig. 3, whenever the water from any cause gets below the level of the point *a*, a free passage for the gases will be opened from the S. to the street. As a remedy for this, a siphon-trap may be placed in the gully-drain, so near to the gully that it can be readily cleaned out in the event of its becoming choked.

FIG. 3.



The most perfect system of street S. will fail in performing its most important function, the protection of the health of the pop., unless the sanitary requirements of house-drainage are carefully and skillfully established. House-drains should promptly convey to the S. all the faecal matter and liquid refuse produced by the inhabs., and they should accomplish this in such manner that S.-gases are effectually excluded from the houses.

It is now an established rule that all drains and branch S. should discharge their contents into the mains in the direction of, and with a velocity at least equal to, the current in the mains, in order to avoid a reduction of velocity and the formation of a deposit at the point of junction. Junctions should be formed with curves, and the axis of the branch ought to be approximately tangent to the axis of the main, and the rate of fall in the curve should be increased sufficiently to compensate for the increased friction in the bend. Branch pipes from street catch-basins should join below the average water-level in the S. House-drains should join above that level if they are expected to perform any function in S. ventilation, as they would be effectually sealed if their opening into the S. be habitually submerged. When water is distributed through a house from a cistern located on one of the upper floors, its overflow-pipe, even if trapped in the best manner, should not, in any event, be directly connected with the house-drain, for the reason that as the overflow may be brought into use but seldom, the trap is liable to become unsealed by evaporation, and the cistern thereby placed in open communication with the S., or the trap may be forced by the S.-gases in case of exceptional pressure when the water in the cistern might become so tinctured. If not saturated, by the absorption of the poisonous constituents of the gases, as to be entirely unsuitable for domestic use. The overflow-pipe should be treated in all respects like the rain-water pipe when the latter is not used for ventilating the S.; that is, it should discharge in the open air, generally into a grated catch-basin at the ground-level, from which it flows through a trapped pipe to the house-drain.

One of the most difficult kinds of waste material to provide for is kitchen grease, which, so long as it is conveyed along in warm water, is fluid and flows freely. Whenever and wherever it cools, it solidifies and adheres to the object with which it happens to be in contact at that moment. Greasy water should not be allowed to reach the house-drain except through a capacious and well-trapped catch-basin, conveniently located with reference to easy and frequent cleansing. In houses not provided with the water-closet system all the waste liquids from bath-tubs, wash-basins, kitchen-sinks, etc. can safely be led outside to a ventilated and trapped catch-basin, having an outflow-pipe leading to the sewer. S.-gases entering this pipe will escape into the open air as soon as they reach the catch-basin, and the house will not become contaminated by them. The offensive discharges from water-closets cannot, however, be disposed of this manner, but must be conveyed in a tight house-drain directly to the S. It is of vital importance, therefore, to maintain such control over the poisonous gases which enter this drain that they cannot in any event or under any circumstances permeate the house.

The proper dimensions of S. will of course be governed by the proportion of the rainfall they are intended to carry off and the quantity of sewage produced by the pop.; and this last will depend to some extent on the volume of the water-supply and the methods of its consumption. When no provision except the S. is made for carrying off the rainfall, the ratio of the total rainfall to the quantity received by the S. will depend greatly upon the character of the surface-soil, and to some extent on the kinds of pavement

used and the area of roof-surface. Very nearly all the water which falls upon the roofs, and upon streets covered with asphalt or other monolithic pavement, finds its way into the S. within 30 minutes after its fall, while only a small portion of that received upon sandy or gravelly soil, unless the fall be excessive or is repeated at short intervals, will reach the S. at all. Prolonged rain-storms are a greater strain upon the capacity of a S. than those of shorter duration but of greater hourly amount; for the percentage of the fall which reaches the S. increases with the degree of saturation of the soil. The natural drainage-area should always be taken into account in adjusting the sizes of S., in order that the question whether the rain which falls upon the higher levels and flows through the dist. to be sewered shall go into the S. in whole or in part, or be kept pure in natural or artificial channels, may receive intelligent consideration. It will rarely occur that this outlying rainfall can be passed through the S. as economically as by separate channels of a more simple and less costly character. If the surface-drainage or rainfall to be passed into the S. is restricted to that which belongs to the dist. embraced by them, it will generally suffice to give them such capacity and inclination that they can discharge, without running quite full bore, a rainfall of 1 inch per hour, presuming that only half that volume will reach the S. within the hour. The ordinary house-sewage is so small a percentage of this discharge that no additional provision need be made for it. In exceptional cases, where manufacturing factories discharge large quantities of water into the S., account must of course be taken of it, but ordinarily a capacity adapted to convey away the rainfall will fix the maximum dimensions.

S. should be laid at such an inclination that the velocity maintained in them when the volume of flow is small will be sufficient to move the heavier materials along, even should they subside to the bottom, in order to prevent obstructing the flow by the formation of deposits. Small S. should have a greater inclination and a greater velocity than large ones, because they have a greater frictional area in proportion to the volume of flow.

**The Pneumatic System.**—In all the foregoing discussion the faecal and other waste and refuse matter produced by the inhabs. of a dist. or town is supposed to be carried away through the agency of the liquid portions thereof, moving under the laws governing the flow of water. This method of carrying off sewage is known as the water-carriage system. In Amsterdam, Leyden, and some other towns in Hol. the movement of atmospheric air has been applied to secure the same results, according to a method generally designated the "pneumatic system." In order to understand the principle of this system, suppose that an air-tight iron tank or reservoir occupies some central point of a town or dist. From this tank an air-tight main issues, having branches through the several streets to different points in the dist. These branches in turn branch off into the several house-drains, and these latter are connected respectively with the soil-pipes of the houses, the latter being open to the external air at their upper end above the highest closet. If the air be pumped out of the central tank, creating a vacuum therein more or less complete, there will ensue a downward rush of air in each and all the houses, and thence through the branches and main into the tank, carrying with it, under a suitable arrangement of the details, all the refuse matter which finds its way into the soil-pipes and house-drains. In this manner the tank may be filled with sewage. It is emptied by a similar process. A pipe with one end inside the tank, and reaching to the bottom, has its other end connected with an air-tight receiver, which may be a portable tank on wheels for carrying the sewage away. When this receiver is exhausted of air by the use of the air-pump, the sewage flows up into and fills it from the main tank. A single stop-cock, near the tank, in the main sets the system to work. When this is opened the pneumatic power of the vacuum in the tank begins to act, and a downward rush of air in the houses, branches, and main sets in with a more or less sudden shock, which puts the sewage in motion. In order to adapt this system to districts where there are differences of level, and therefore different rates of inclination in the branches, and also where the volumes of sewage supplied by the several house-drains vary within wide limits, a water-trap or vertical step is made in each house-drain, something like an ordinary siphon-trap. When this trap is full, all additional sewage entering it will flow off by its gravity. [See *WARNING on Sanitary Drainage of Houses and Towns.* (From orig. art. in *J.'s Univ. Cyc.*, by GEN. Q. A. GILLMORE.)

**Sewickley,** Allegheny co., Pa. See APPENDIX.

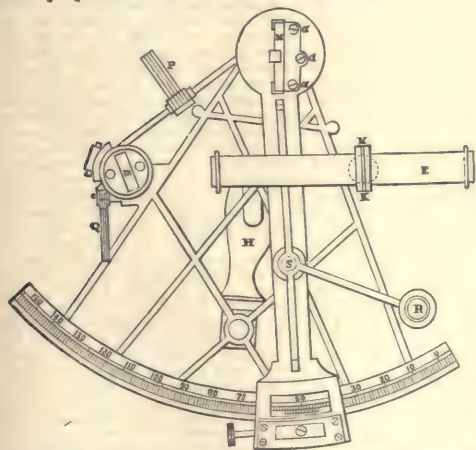
**Sewing-Machines** are a comparatively recent invention, though sewing by hand has been practised from the earliest existence of the human race. The first machines were intended mainly for embroidering. Such were Weisenthal's (1755), Saint's (1790), Duncan's (1804), Dodge's (1815), Thimonnier's (Paris, 1830), using a crochet needle and an awl; but, though employed for making army clothing, the sewing done by it must have been very poor. Walter Hunt's (invented in 1832-34, but not patented) was the first to use 2 threads, or to make the lock-stitch, and the first also to use the eye-pointed needle and shuttle. It was the first really practical machine. In 1841 Newton and Archbold patented the eye-pointed needle in Eng., which, however, they did not invent. In Sept. 1846 Elias Howe, Jr., patented a S.-M., very much like Hunt's, though less practical, and claimed as his own invention the eye-pointed needle and the shuttle. This machine worked fitfully and intermittently, when it worked at all, and he could not introduce it; during a sojourn of 18 months in Eng. he was unable to construct a machine which would work. On his return he found that Blodgett and Lerow, Allen B. Wilson, William O. Grover, and Isaac M. Singer had each invented S.-M. which worked well and constantly, and that each embodied



some contrivances which were covered by his patent, and he at once commenced suits against them. The litigation resulted, in 1853, in the formation of a combination, which for 24 yrs. largely controlled the production of S. M. The parties to the combination were Elias Howe, Jr., Wheeler & Wilson, Grover & Baker, and I. M. Singer & Co., and their successors. The first object of these inventors was to make a machine which could sew straight seams, and thus help in the manufacture of clothing; but, their litigation settled, they turned their attention to the invention of improvements and attachments by which they were able to make curved seams; to hem, bind, gather, tuck, plait, cord, quilt, and stitch the finest and lightest as well as the coarsest and heaviest fabrics. From the first these machines (and a little later the Willcox & Gibbs machine, the only representative of the twisted loop-stitch) made 3 different kinds of stitches—the lock-stitch, made with 2 threads, and using either the shuttle or the rotating hook and round-disk bobbin; the double-loop or Grover & Baker stitch (now no longer made); and the loop and twisted-loop stitch, already mentioned. The features essential to all working S.-M. were the eye-pointed needle, the feed which supplied the goods to the operation of the needle, the needle-bar, and the presser foot, the driving power, and some means of regulating the tension. The 2 thread machines required also the shuttle, containing a bobbin or its equivalent, the rotating hook, which had a circular-disk bobbin to supply the under-thread. There were, of course, many additions to these, and many modifications of them which characterized the different machines, and great ingenuity was also manifested in the construction of "attachments," by means of which all descriptions of fancy work could be done. When all the patents of the "combination" finally expired in 1877, there were 60 machines in practical use. A few of these have since failed or discontinued their production, but there are now (1882) more than a hundred actively competing for the patronage of the public. The Singer Co.'s machines lead, their annual production being over half a million machines; the Wheeler & Wilson, Domestic, New Home, and White produce from 90,000 to 100,000 each, and a dozen or more others from 20,000 to 60,000 each. The total annual product is about 1,300,000 machines, and 12,000,000 have been sold since 1851. The value of the annual production exceeds \$30,000,000, and the production from 1851 to 1882 over \$800,000,000. More than 100,000 persons are employed in the manufacture, about 2,500,000 persons constantly use the machines, and nearly as many more own them and use them occasionally. Of special S.-M. adapted to particular kinds of work there have been large numbers invented, and most of them have proved profitable. We may name among these the button-hole machines, the McKay sole-sewing machine, the Hautin S.-M. of Mr. S. Wardwell, Jr., for sewing harness, etc. with a waxed thread; cylinder machines for sewing seams on sleeves, trousers, boot-legs, leather buckets, hose, etc.; carpet-seam S.-M.; machines for making the patent ruffling, for sewing the tips and linings of hats and caps, for sewing the seams of knit underclothing, straw-sewing machines, book-sewing machines, pamphlet-sewing machines, etc. L. P. BROCKETT.

**Sex'tans**, or **Sex'tant**, in astron., one of the constellations formed by Hevelius. It is placed across the equator and on the S. side of the ecliptic.

**Sex'tant** [Lat. *sextans*], a portable astronomical instrument, invented by Newton, and reinvented by T. Godfrey of Phila. In 1730, using for the measurement of an angle a graduated arc of the sixth part of a circle, and employing in its construction the following theorem of optics: If a pencil of rays be reflected by each of 2 plane surfaces, the deviation of the axis of the pencil is double the inclination of the reflecting planes, supposing its course to be in one plane perpendicular to intersection of surfaces. The cut



represents the most common form of S. The frame is of brass, constructed so as to combine strength with lightness; the graduated arc, inlaid in the brass, is usually of silver, sometimes of gold or platinum. The divisions of the arc are usually 10' each, which are subdivided by the vernier to 10". The handle H, by which it is held in the hand, is of wood. The mirrors M and m are of plate glass, silvered. The upper half of the glass m is left without silvering, in order that the direct rays from a distant object may not be intercepted. To give greater distinctness to the images, a small telescope

E is placed in the line of sight m E. It is supported in a ring K K, which can be moved by means of a screw in a direction at right angles to the plane of the S., whereby the axis of the telescope can be directed either toward the silvered or the transparent part of the mirror. This motion changes the plane of reflection, which, however, remains always parallel to the plane of the S., the use of the motion being merely to regulate the relative brightness of the direct and reflected images. The vernier is read with the aid of a glass R attached to an arm which turns upon a pivot S, and is carried upon the index-bar. The index-glass M, or central mirror, is secured in a brass frame, which is firmly attached to the head of the index-bar by screws, a a. This glass is generally set perpendicular to the plane of the S. by the maker, and there are no adjusting screws connected with it. The fixed mirror m is usually called the horizon-glass, being that through which the horizon is observed in taking altitudes. It is usually provided with screws, by which its position with respect to the plane of the S. may be rectified. At P and Q are colored glasses of different shades, which may be used separately or in combination, to defend the eye from intense light of sun.

**Sex'tus Empir'icus**, a Pyrrhonic or sceptical philos., flourished in the first half of the 3d century A. D. He is known chiefly as the author of 3 works, setting forth the sceptical philos.: (1) *Institutiones Pyrrhonicæ*, dealing with the principles of scepticism; (2) a work on philos. in its 3 divisions, logic, physics, and ethics; (3) *Against the Mathematicians*, in 6 books, devoted respectively to gram., rhetoric, geom., arith., astron., and music.

**Seybert**, st'bert (ADAM), M. D., b. at Phila. in 1773, went to Europe 1793; studied at Lond., Edinburgh, Paris, and Göttingen, giving special attention to chem. and mineralogy; was M. C. 1809-15 and 1817-19; visited Europe 1819, and again 1824, and d. at Paris May 2, 1825. Wrote *The Statistical Annals of the U. S.* (1818), which gave occasion to the famous article (*Edinburgh Review*, Jan. 1820) in which Sydney Smith asked, "Who reads an American book?"

**Seychelles** (sa-sheel') **Cocoonut**, the double cocoonut, the fruit of *Lodicea Seychellarum*, a noble palm tree, now becoming rare in its native islands. The Orientals ascribe great and mysterious virtues to this curious nut, and in mediæval Europe it was sold for fabulous prices. Practically, it is far less valuable than the true cocoonut.

**Seymour**, see-mur, New Haven co., Conn., on Naugatuck River and R. R., 10 m. N. W. of New Haven. Pop. tp. 1870, 2122; 1880, 2318.

**Seymour**, city and R. R. centre, Jackson co., Ind., 50 m. S. of Indianapolis. Pop. 1870, 2372; 1880, 4250.

**Seymour** (BEAUCHAMP PAGET), Eng. vice-admiral, b. in 1821. He was junior naval lord from 1873-74, and from 1875-77 commanded the Channel squadron. Since 1880 he has been in charge of the Mediterranean squadron. In 1882 he became commander-in-chief of the English forces before Alexandria, and bombarded the forts of that city July 11-13. Vice-admiral S. is a Knight Companion of the Bath and a Fellow of the Royal Geographical Society.

**Seymour** (EDWARD). See SOMERSET, DUKE OF.

**Seymour** (GEORGE FOX), D. D., b. in New York in 1829, grad. at Columbia Coll. in 1850 and at the General Theological Sem. in 1854; had charge of a mission-station at Dobbs Ferry for 6 yrs.; became first head of St. Stephen's Coll., Annandale, 1860, and in 1861 rector of St. Mary's ch., Manhattanville, N. Y.; in 1865 went to St. John's ch., Brooklyn, N. Y., and was in 1865 elected prof. of ecclesiastical hist. in the General Theological Sem.; in 1874 was chosen bp. of the diocese of Ill., but the General Convention refused to confirm him; in 1875 elected dean of the General Theological Sem. In 1877 chosen bp. of Springfield, Ill., and consecrated June 11, 1878.

**Seymour** (Sir GEORGE HAMILTON), grandson of the first marquis of Hertford, b. in Eng. in 1797, grad. at Merton Coll., Ox.; entered the diplomatic service 1817; served as sec. of legation at Frankfort, Berlin, and Constantinople; became minister at Florence 1830, envoy at Brussels 1835, at Lisbon 1846, and at St. Petersburg 1851; was approached by the czar Nicholas with proposals to Eng. for the partition of Tur. 1853—a scheme which resulted in the Crimean war; was recalled on the proclamation of that war, Mar. 1854; made envoy to Vienna Dec. 1855, and retired from the service on a pension Mar. 1858. D. Feb. 3, 1880.

**Seymour** (HORATIO), LL.D., b. at Litchfield, Conn., May 31, 1778, grad. at Yale Coll. 1797; studied law; settled at Middlebury, Vt., 1799; was a member of the executive council of Vt. 1809-17; U. S. Senator 1821-33; was Whig candidate for gov. 1836, and became judge of probate 1847. D. at Middlebury Nov. 21, 1857.

**Seymour** (HORATIO), LL.D., nephew of Senator Horatio, b. at Pompey, Onondaga co., N. Y., May 31, 1810, removed in childhood to Utica; studied at Ox. and Geneva acads., N. Y., and at Partridge's Military Inst., Middletown, Conn.; was admitted to the bar at Utica 1832; was a member of the staff of Gov. Marcy 1833-39; was elected to the State assembly as a Dem. 1841, and 3 times re-elected, serving as speaker in 1845; was chosen mayor of Utica 1842; was gov. 1853-55; vetoed a prohibitory liquor law Mar. 1854; was again elected gov. as a War Dem. 1862; was defeated in the election of 1864, in which yr. he presided over the national Dem. convention at Chicago, as he did again at New York 1868, when he was himself nominated for the Presidency, much against his will, and received 20 electoral votes. He was pres. of the National Dairy-men's Association and of the Amer. Prison Association in 1876.

**Seymour** (Lady JANE), third queen of Henry VIII., sister of Protector Somerset and daughter of Sir John Seymour, b. in Eng. about 1510, became maid of honor to Queen Anne Boleyn; married Henry May 20, 1536, the day after the execution of Anne, and d. shortly after giving birth to a prince (Edward VI.) Oct. 24, 1537.

**Seymour** (THOMAS), BARON SEYMOUR OF SUDELEY,



brother of the Protector Somerset, b. in Eng. about 1505; was ennobled and made grand admiral of Eng. Jan. 1547; privately married Catharine Parr, widow of Henry VIII., the same yr.; was given the custody of the princess Elizabeth and of Lady Jane Grey; projected a marriage with the former 1548; was accused of treason; committed to Tower Jan. 19, 1549, attainted, and beheaded Mar. 20, 1549.

**Seymour** (THOMAS HART), b. at Hartford, Conn., in 1808, became a lawyer at Hartford, and ed. of the *Jeffersonian* (1837), a Dem. newspaper; was some time judge of probate; sat in Cong. 1843-45; served in the Mex. war as major of the 9th regiment; became lieut.-col. Aug. 12, 1847; commanded the 9th Inf. after the death of Col. Ransom at Molino del Rey; was brevetted col. for services at Chapultepec Sept. 13, 1847; was gov. of Conn. 1850-53, and minister to Rus. 1853-57. D. Sept. 3, 1868.

**Seymour** (TRUMAN), b. at Burlington, Vt., Sept. 24, 1824, grad. at W. Pt. 1846; entered the 1st Artill.; was brevetted lieut. and capt. for gallantry in the Mex. war; was prof. at W. Pt. 1850-53; served under Major Anderson at Ft. Sumter Apr. 1861; became chief of artill. of McCall's division in the Army of the Potomac Mar. 1862; was commissioned brig.-gen. of volunteers Apr. 28, 1862; was distinguished in the Va. and Md. campaigns; was severely wounded at Ft. Wagner July 18, 1863; commanded an expedition to Fla. Feb. 1864; was taken prisoner at the Wilderness; commanded a division in the Shenandoah Valley Oct. 1864, and became maj.-gen. 1865.

**Sforza**, the name of an It. family which ruled Milan as a dukedom in the 15th and 16th centuries and exercised considerable influence on the politics of It. by their ambition. The founder of the family was (1) GIACOMUZZO ATTENDOLO, a peasant-boy from Cotignola in the Romagna, b. 1369. He distinguished himself by his bodily strength, and received the surname *Sforza*, "the forcer;" became chief of a band of condottieri, and entered the service of Queen Joanna II. of Naples, who made him grand constable; served afterward Pope Martin V., who made him a count, and d. in 1424.—(2) His son, FRANCESCO, b. in 1401, was chief of a large troop of mercenaries; invented a new tactical trick; entered the service of Visconti, duke of Milan; received Visconti's daughter Bianca in marriage, and Cremona as her dowry; took Ancona from the pope. In 1447 Visconti died without any male heirs, and Milan instituted a republican govt. But in 1450 Francesco seized the ducal crown, defeated his adversaries, reigned well, and d. in 1466.—(3) His son, GALEAZZO MARIA, b. in 1444, was a monster of debauchery and ferocity, and was assassinated in 1476.—(4) He was followed by his son, GIOVANNI GALEAZZO, b. in 1468, during whose minority the govt. was carried on by his mother, Bona of Savoy.—(5) But in 1470 LUDOVICO THE MOOR, a brother of Galeazzo Maria, b. in 1451, banished Bona and assumed the regency, and in 1494 he poisoned his nephew and ascended the ducal throne himself; induced Charles VIII. of Fr. to assert his claims on Naples. But the success of the Fr. alarmed him, and he formed a league against Fr. To punish him, Louis XII. invaded his country, captured him in 1500, and confined him in the castle of Loches, where he d. in 1510.—(6) His son, MASSIMILIANO, b. in 1491, was made duke in 1512 by the Holy League, but expelled by the Fr. in 1513; reinstated in the same yr. by Charles V. after the battle of Novara, but was again driven out by Francis I. after the battle of Marignano; sold his claims to the dukedom to Fr. for a pension.—(7) His brother, FRANCESCO II., b. in 1492, was made duke of Milan by Charles V. in 1522 after the battle of Pavia, and at his death (Oct. 24, 1535) the country was incorporated with Aus.

**Shad** [Ger. *Schade*], a name applied to several species of the family Clupeidae. The S. are all inhabs. of the N. hemisphere, and live for the greater portion of the yr. in the sea, but in the spring ascend the rivers in large schools for the purpose of spawning. The eggs are moderate in size, the ovaries of a single female having generally, it is said, about 25,000 eggs, although sometimes as many as 100,000 to 150,000. The American species is *Alosa sapidissima*.

**Shad/doek** [called *Pomelmooze* in the E. I.], the large fruit of *Citrus decumana*, a small tree of the orange family (Rutaceae). It has a watery pulp, cooling, acid, aromatic, and somewhat bitter, and is used for preserves. It was named from a Mr. Shaddock, who carried it from India to Jamaica. The fruit sometimes weighs 15 lbs.

**Shad/ine**, the *Alosa sadina*, a little spotted shad about a foot long, caught off the N. Y. and N. J. coasts.

**Shad Tree**, or **Bush**, the *Amelanchier Canadensis* of the order Rosaceae; of several strongly marked varieties, some of them very small and others larger shrubs, or even trees, 50 ft. high or more. Its flowers appear in early spring in loose white racemes. The fruit is juicy and savory, is sometimes called service-berry in the N. W., is collected as food, and is an ingredient of the native pemican.

**Shaftesbury** (ANTHONY ASHLEY COOPER), FIRST EARL OF, b. at Wimborne St. Giles, Dorsetshire, Eng., July 22, 1621; entered Exeter Coll., Ox., 1637, and Lincoln's Inn 1638; was elected for Tewkesbury to the Short Parl. Apr. 1640; sat in the Long Parl. as a supporter of the king; went over to the popular party Feb. 1644; was a member of the "Barebones" Parl. July 1653, and of Cromwell's council of state Dec. 1653; separated from the cause of the Protector Dec. 1654; co-operated in the restoration of Charles II., was one of the coms. sent to the new king at Breda Apr. 1660; was made a privy councillor in May, and a com. for the trial of the regicides Oct. 1660; was raised to the peerage as Baron Ashley Apr. 1661; became chancellor of the exchequer May 1661; opposed the Act of Uniformity 1662; supported the Dispensing bill 1663; was one of the grantees of the prov. of Carolina 1663 and 1665; secured the services of John Locke as private secretary 1666; prepared with Locke the aristocratic const. for the govt. of the Carolinas; was a joint com. of the treas. 1667; a member of the "Cabal" 1670; created earl of Shaftesbury Apr. 23, 1672; was pres. of the council

of trade and plantations from Sept. 27, 1672, to Apr. 1673; was lord chancellor Nov. 17, 1672, to Nov. 9, 1673; was dismissed from the privy council May 19, 1674, on account of having gone over to the opposition; was imprisoned by order of Parl. for aiding the king in asserting the prerogative of that body 1677-78; procured the passage of the Test bill 1678; became pres. of the council Apr. 1679; procured the passage of the Habeas Corpus act 1679; was dismissed from office Oct. 1679; presented the duke of York before the court of king's bench as a "Popish recusant" June 26, 1680; attended the Parl. at Ox. Mar. 1687; was thrown into prison by order of the council on a charge of high treason July 2, but released Dec. 1, 1681; went to Amsterdam Nov. 1682, and d. there Jan. 22, 1683.

**Shaftesbury** (ANTHONY ASHLEY COOPER), THIRD EARL OF, b. in Lond. Feb. 26, 1671, entered Parl. 1693; succeeded to the peerage 1699; supported the administration of William III., and retired from public life on the king's death; was stigmatized as a free-thinker; pub. a *Letter on Enthusiasm*, *The Moralist*, a *Philosophical Rhapsody*, *Sensus Communis*, etc. His prin. work is *Characteristics of Men, Matters, Opinions, and Times*. D. Feb. 15, 1713.

**Shaftesbury** (ANTHONY ASHLEY COOPER), SEVENTH EARL OF, b. in Eng. Apr. 28, 1801, grad. at Christ Ch., Ox., 1822; entered Parl. 1826; supported the administrations of Liverpool and Canning; was made a com. of the board of control by the duke of Wellington; was a lord of the admiralty under Sir Robert Peel 1834-35; succeeded to the peerage 1851; has labored zealously to improve the condition of the working-classes; has been pres. of the Bible Society, the Pastoral Aid Society, the Prot. Alliance, and has been long regarded as the head of the so called "Exeter Hall" school of Low Churchmen.

**Shagreen**. See LEATHER.

**Shah** [Per. "king"], the title of the ruler of Per. and of certain other Asiatic princes. The sons and other male relatives of the Per. S. also assume this title, the full title of the monarch being *shah-in-shah*, "king of kings."

**Shahjehanabad**. See DELHI.

**Shahjehanpore**, town of Brit. India, presidency of Bengal, on the Gurrab, has 72,136 inhabs.

**Shakers** [so called from certain rhythmical movements of the arms which form a part of their ceremonial], a sect called by themselves the United Society of Believers in Christ's Second Appearing. They claim descent from the Fr. Camisards, and were founded by Mrs. Stanley, better known by her maiden name as Ann Lee. The S. lead a celibate life, hold their property in common, believe that they communicate with the spirits of the departed, that the millennium has come, and teach that for those who are not S., marriage, if entered into for the perpetuation of the human race, is not sinful. They sing and dance in worship, wear a peculiar dress, and devote themselves to agriculture, horticulture, the raising of medicinal herbs, and engage in a few simple manufactures. They are a thrifty, cleanly, and industrious people. They teach a system of doctrine which is founded partly on the Bible and partly on the supposed revelations of Mother Ann Lee and their other inspired leaders. They are opposed to war and the use of pork as food, and believe in the exercise of miraculous gifts.

**Shakespeare**, shak'speer (WILLIAM), b. in Stratford-on-Avon, Warwickshire, Eng., in Apr. 1564. His father, John Shakespeare, was of the yeoman class; his mother, Mary Arden, was of a family of the minor gentry. John Shakespeare became a landholder, and rose rapidly through all the grades of office in Stratford until he became chief alderman and *ex-officio* justice of the peace. Misfortune, however, befell him, and he was reduced to comparative poverty. Of S.'s early life until he married we know nothing. While but a lad of 17 he had become entangled with a woman of 25, Anne Hathaway. He married this woman when he was but 18, and her first child, as far as our knowledge goes, was born in May 1583. She bore him twins, a boy and girl, in Feb. 1584. S. was driven to seek some change for the better, and left Stratford to seek his fortune in Lond. In Lond. we find him engaged as an actor and as a playwright. It is not improbable that he had written his first poem, *Venus and Adonis*, before he went to Lond. However this may be, he went upon the stage as an actor of minor parts. We know that he was one of the original performers of Ben Jonson's *Every Man in his Humour*, and that he appeared in the same author's *Sejanus*. As a dramatist he began his career by re-writing old plays in conjunction with others, his seniors as playwrights. His superiority to all his contemporaries, however, soon asserted itself, and he began to write alone or with little assistance. His first wholly original play was probably *Love's Labour's Lost*. He probably also in his earliest dramatic days wrote, in conjunction with Marlowe, Greene, and Peele, the first and second parts of *The Contention between the Houses of York and Lancaster*, his own contributions to which he afterward embodied in Part I. and Part II. of his *Henry VI.* His success provoked the jealousy and excited the enmity at least of one of those whom he eclipsed—Robert Greene. Henry Chettle, who was one of the knot of writers to which both Greene and S. belonged, speaks of the latter as in his demeanor "no less civil than he was excellent in the quality he professes;" adding that "divers of worship" (i. e. social rank) "have reported his uprightness of dealing, which argues his honesty, and his facetious grace" (i. e. of a delicate fancy) "in writing which approves his art." Among the friends that S. won among the latter class was the earl of Southampton, a nobleman of taste and culture. There is reason to believe that to this nobleman's generosity he owed his ability to become a very considerable sharer in the Black Friars' Theatre, at which the company with which he was connected was in the habit of performing. Having attained this advantageous position, S. soon reached the utmost height of success, both as to reputation and profit. He now entered upon a career of dramatic production which soon placed him in independent



circumstances. He rose rapidly, both in fame and in fortune. He had money to spend and money to lend; and he used it to place his father in comfort and to acquire landed property and other wealth in his native town. The Herald's Coll. made his father a gentleman by coat-armour. He invested part of his money in the tithes of Stratford, and he bought "New Place," a large house which had been built by the Cloptons, a Warwickshire family of wealth and position. To this house he retired on his withdrawal from the theatre about A. D. 1611, and there he d. Apr. 23, 1616.

Traces of S.'s personal character and experience are found rarely in his works, if at all, unless we are to accept his *Sonnets* as an expression of personal feeling. These compositions, 154 in number, were pub. in 1609. The *Sonnets* remain a literary puzzle to this day. A few of the first in the collection are addressed to a very beautiful young man, and entreat him to marry; two of them are avowedly the expression of S.'s own feeling; but the most of them were written as an expression of the feelings and the experience of a man who loved and suffered deeply. If we are to regard these *Sonnets* as the result of S.'s own experience, we learn from them that he passionately loved and was loved by a beautiful dark-eyed "black"—that is, brunette—woman, who nevertheless tortured him by being false to him with his best friend. The *Sonnets* are worthy to be the utterance of such an experience by such a man. Although inferior to the plays, they are far superior to the other poems. S. assumed the forms of comedy and tragedy, and of history or historical play, which had been established before he began to write, and he conformed in every external respect to the fashion of his time and the needs of the theatre. His difference from other dramatists consists in his thought and his lang., and in his power of dramatic characterization. His isolation from his creations appears to have been perfect; once evoked from his mind, they exist independently and altogether outside of it, and act and speak altogether according to the laws of their own being, not of his.

The poems and plays were produced in the following order: *Venus and Adonis*, 1584-85; *The Passionate Pilgrim*, 1584-86; Part I. of *The Contention of the Two Houses of York and Lancaster*, *The True Tragedy*, etc., *The Taming of a Shrew* (in which only old plays S. had a share), 1587-89; *Love's Labour's Lost*, 1588-89; *The Comedy of Errors*, 1589; *Love's Labour's Won* (probably an early form of *All's Well*, etc.), 1589; *The Two Gentlemen of Verona*, 1589-90; *King Henry VI.*, Parts I., II., and III., 1590-91; *Sonnets*, 1590-1605 (v.), an early form of *Romeo and Juliet*, 1591-92; *Lucrece* and *Richard III.*, 1593; *A Midsummer Night's Dream* and *The Merchant of Venice*, 1594; *Richard II.*, 1594-95; *Romeo and Juliet*, *King John*, and Part I. of *King Henry IV.*, 1596; Part II. of *King Henry IV.*, 1597; *Much Ado About Nothing*, 1598-99; *Twelfth Night*, *Henry V.*, and *As You Like It*, 1600; *Hamlet*, 1600; *The Taming of the Shrew*, 1601; *Pericles* (S.'s part), 1602; *The Merry Wives of Windsor*, 1603; *Measure for Measure*, 1603-04; *All's Well that Ends Well*, 1604; *A Lover's Complaint*, 1605 (v.); *King Lear*, 1605; *Timon of Athens*, 1605-07; *Macbeth*, 1605; *Julius Caesar*, *Antony and Cleopatra*, and *Troilus and Cressida*, 1606-08; *Cymbeline*, *Coriolanus*, and *Othello*, 1609-11; *The Winter's Tale* and *The Tempest*, 1611; *Henry VIII.*, 1613. [From orig. art. in *J.'s Univ. Cyc.*, by RICHARD GRANT WHITE.]

**Shakopee**, city, cap. of Scott co., Minn., on R. R. and Minn. River. Pop. 1870, 1349; 1880, 2011.

**Shale** [Ger. *Schale*, "shell"], a name commonly given to soft laminated argillaceous rock formed by the induration of clay stratified in water. When containing much carbonaceous matter it is called bituminous S. When hardened by metamorphism, S. are converted into slates. (See PETROLEUM, GEOLOGY OF.)

**Shale Oil**. See PETROLEUM.

**Shaler** (ALEXANDER), b. in Haddam, Conn., Mar. 19, 1827; for many yrs. prominently identified with the N. Y. State militia, which he entered as a private in 1845, and in 1867 became maj.-gen. 1st division N. G. S. N. Y.; was major of the 7th N. Y. on the outbreak of war in 1861, but in June was appointed lieut.-col. 65th N. Y. Volunteers; became col. July 1862; served with the Army of the Potomac in its many engagements; in command of a brigade, 6th corps, from Mar.-Nov. 1863; commissioned brig.-gen. of volunteers May 30, 1863; commanded military prison at Johnson's Island, O., during winter of 1863-64. Returning to the field at the opening of the campaign in 1864, he was taken prisoner May 6, and held 8 months in Charleston; subsequently to his exchange he served in the S. W. until mustered out. Brevet maj.-gen. for gallant and meritorious conduct. Pres. of the Metropolitan Fire Dept. 1867-70, and a com. of that dept. 1870-73; became Pres. N. Y. City Board of Health June 13, 1883.

**Shaler** (NATHANIEL SOUTHGATE), S. B., b. in Campbell co., Ky., Nov. 20, 1841, grad. at Lawrence Scientific School 1862; became director of the State geological survey of Ky., prof. of paleontology at Harvard, and assistant at the Museum of Comparative Zoology at Cambridge, and wrote on geology and paleontology.

**Shallot**, the *Allium acedonicum*, an onion-like plant, which grows in cloves somewhat like the garlic. The cloves are set in the ground early, and become large enough for market 2 months before seedling onions are ripe. They much resemble the onion in taste. The tops and bulbs are both eaten.

**Shamanism** [Per. and Hindoo, *shaman*, "idolater"; Sans. *shramana*, an "ascetic"], the religion of a large number of primitive N. Asiatic tribes, blended in Central Asia with Lamaism. It has no idols. It is a mixture of pretended sorcery and ceremonies for the propitiation of evil spirits. The priests or shamans offer sacrifices and perform grotesque and tumultuous ceremonies.

**Shamo, Desert of**. See Gobi.

**Shamokin**, R. R. centre, Northumberland co., Pa., in the centre of an important anthracite coal-field, which produces annually 1,250,000 tons. Pop. 1870, 4220; 1880, 8184.

**Sham'rock**, the national badge of Ire., as the thistle is that of Scot., the rose of Eng., and the lily of Fr. The S. is a 3-leaved or trifoliate plant, which was used by St. Patrick to illustrate the doctrine of the Trinity. There is some dispute as to whether the wood sorrel (*Oxalis acetosella*) or the common white clover is the true and original S.

**Sham'yl** (*Samuel*), b. at Aul Himry, N. Daghestan, about 1797, became a disciple of the Mohammedan reformer, Kasi-Mollah, whom he assisted in uniting the various Caucasian tribes against the Rus. In 1834 he was chosen chief of the sect, and maintained a continuous war with Rus. The culmination of his power falls between 1844 and 1852, when he succeeded in organizing a number of tribes into a well-ordered state. But after this time the Rus. attacks became more energetic, and on Sept. 6, 1859, S. was captured and carried to St. Petersburg. He received a pension and resided in Kaluga, in Kiev, and in Mecca, where he d. in 1871.

**Shanghai**, shang-hi', or **Shanghai**, city of China, prov. of Kiang-Su, on the left bank of Wusung River, 12 m. above its junction with the S. portion of the mouth of the Yang-Tse-Kiang. It consists of the city proper and numerous suburbs. The city proper is surrounded with a wall 3 m. in circumference, but is generally poorly built, though it contains a very fine Chi. temple and several elegant tea and ice houses. Of the suburbs, that inhabited by the foreign merchants is the most remarkable. It is laid out like a European city, and contains many elegant residences, magnificent warehouses, manufacturing establishments, dock-yards, etc. The manufactures of S. are flourishing, and comprise silks, glass, paper, and articles of gold, silver, and ivory. But its commerce is still more important, on account of its favorable situation at the mouth of the Yang-Tse-Kiang. The prin. articles of exportation are tea, silk, oil, porcelain, and straw goods; of importation, opium, treasure, grain, and coal. Pop. 300,000.

**Shannon**, a river of Ire., rises in co. Cavan at an elevation of 945 ft. above the sea, flows first S. to Limerick, then W., and enters the Atlantic through an estuary 10 m. wide after a course of 224 m. It is navigable throughout nearly its whole course.

**Shannon** (WILSON), b. in Belmont co., O., Feb. 24, 1802, studied at Athens Coll., O., and at Transylvania Univ., Ky.; became a lawyer; was prosecuting atty. for the State of O. 1835, gov. 1838-40 and 1842-44, minister to Mex. 1844, M. C. 1853-55, Territorial gov. of Kan. 1855-56. D. Aug. 30, 1877.

**Shan'ny**, a marine spiny-rayed fish of the genus *Pholis*, family Blenniidae, and natural order Teleostea, is usually about 5 inches long, is found in shoals on the coasts of Eng. and Fr., and is remarkable for the habit of creeping, by means of its ventral fins, out of the water into the crevices of the rocks, and there remaining until the return of the tide. It has been known to live 30 hours away from salt water, but soon dies in fresh water.

**Shans, The**, occupy the central part of Farther India, N. of Siam and E. of Burmah, and form states which are tributary, partly to Siam and partly to Burmah. Their rulers levy no taxes, but support themselves exclusively from the proceeds of their hereditary estates and from a part of the fines. They are under the supervision of a royal com. from Burmah or Siam, who in his turn has left his family as hostages at the royal court.

**Shapoor** (anc. *Sapore*), the cap. of the Sassanian dynasty in the Per. prov. of Fars. Its ruins contain the most interesting specimens of Per. or Oriental antiquities.

**Shark**, the Eng. name applied to most of the species of the order or sub-order Squali, and to some extent synonymous with it.

**Shar'key** (WILLIAM LEWIS), b. in Tenn. in the beginning of this century, but removed with his parents to the Terr. of Miss. in 1804; grad. at Greenville Coll., Tenn.; studied law, and was admitted to the bar in 1822; was elected a member of the Miss. legislature in 1827, and chief-justice of the high court of errors and appeals in 1832; settled in 1850 at Jackson; was appointed provisional gov. of Miss. in 1865, and elected U. S. Senator in 1866; removed to Wash., and d. there Apr. 29, 1873.

**Sha'ron**, R. R. junc., Mercer co., Pa., 14 m. W. of Mercer. Prin. business, mining and manufacturing. Pop. 1870, 4221; 1880, 5684.

**Sharp** (GRANVILLE), grandson of Abp. John and son of Thomas Sharp, D. D., archdeacon of Northumberland, b. at Durham, Eng., Nov. 10, 1735, was for several yrs. a clerk in the ordnance office; was chief patron of the slave Somerset in suing for his freedom (1769), which resulted in the famous decision against the legality of slavery in Eng., pronounced by the court of king's bench May 1772; resigned his post in the ordnance office on account of opposition to the Amer. war Apr. 1777; devoted himself thenceforth to philanthropic objects, especially the overthrow of slavery and the slave-trade; was the first chairman of the Association for the Abolition of Negro Slavery May 22, 1787; was the prin. promoter of the colony of Sierra Leone; opposed impressment of seamen, advocated parliamentary reform, and favored the claims of Ire. D. July 6, 1819.

**Sharp** (JAMES), D. D., b. in the castle of Banff, Scot., in May 1618, ed. at the Univ. of Aberdeen; declared against the Solemn League and Covenant 1638; took orders in the Scot. Ch.; became prof. of philos. at St. Leonard's Coll., St. Andrew's, 1640; was the representative of the Presbys. sent to Cromwell 1656, to Monk and to Charles II. 1660; was appointed king's chaplain for Scot. and prof. of divinity in St. Mary's Coll., St. Andrew's; consecrated abp. of St. Andrew's and primate of Scot. upon an Episcopalian foundation Dec. 1661; was regarded as a tool of Charles in the persecution of the Covenanters, and consequently assassinated by "a band of nine enthusiasts" on Magus Muir, near St. Andrew's, May 3, 1679.

**Sharpe** (DANIEL), F. R. S., b. in Lond., Eng., in 1806, became a wine-merchant; made several visits to the wine-growing dists. of Port.; presented to the Geological Society



several memoirs on the rocks and fossils of Port., and of Wales and Eng. and Scot.; wrote On the *Fossil Remains of the Mollusca found in the Chalk Formation of Eng.*; reduced to system the fragments of the Lycian lang. preserved in inscriptions; became pres. of the Royal Geological Society. D. May 31, 1856.

**Sharpe** (SAMUEL), b. in Eng. about 1800; author of a translation of the N. T. from the text of Griesbach, and of a revision of the authorized version of the O. T., of a *Hist. of Egypt*, of many works on Egyptian chronology and hieroglyphics, of *Texts from the Bible explained by Anc. Monuments*, *Chronology of the Bible*, *Hist. of the Heb. Nation and Lit.*, and of a work claiming to decipher the mysterious Sinaitic inscriptions (1876). D. July 28, 1881.

**Sharps** (CHRISTIAN), b. in N. J. in 1811, became a machinist, and invented the "Sharps rifle." In 1854 he settled at Hartford, Conn., to superintend the manufacture of this rifle, and subsequently invented other firearms of great value, and patented many ingenious implements of other kinds. D. Mar. 13, 1874.

**Sharps Rifle**, on the breech-block principle, has a calibre of 0.500 inch, rifled, the breech-action being confined to 3 parts—the lever, the slide, and the extractor. The lever forming the trigger-guard opens the breech. The breech-slide is spheroidal, permitting the use of cartridges with varying thickness of base. The cartridge is rim-fire metallic, and the bullet cylindro-conoidal, with 3 cannelures, solid base, and flattened point.

**Sharpswood** (GEORGE), LL.D., b. at Phila. July 7, 1810, grad. at the Univ. of Pa. 1828; was admitted to the Phila. bar 1831; became a judge of the dist. court 1845, pres. judge 1851-67, judge of the supreme court of Pa. 1867, and for many yrs. prof. in the law-school of the Univ. of Pa. Wrote *Popular Lectures on Commercial Law*, *Lectures Introductory to the Study of the Law*, etc. D. May 28, 1883.

**Shas'tra** [Sans. *s'tra*, to "teach"], a name applied to the authoritative books of the Hindoos upon religion and law.

**Shattuck** (GEORGE HEYNE), M. D., LL.D., b. at Templeton, Mass., July 17, 1783, grad. at Dartmouth Coll. 1803; phys. at Boston and pres. of the Mass. Med. Society; pub. several professional works; built an observatory for Dartmouth Coll. D. Mar. 18, 1854.

**Shattuck** (LEMUEL), b. at Ashby, Mass., Oct. 15, 1793; teacher in N. H., N. Y., and Mich.; merchant at Concord, Mass., 1823-33; bookseller and pub. in Boston, where he was a member of the common council 1837-41; one of the founders of the N. Eng. Historic-Geographical Society 1844, and for 5 yrs. its v.-p.; sat several yrs. in the Mass. legislature. Wrote *Hist. of Concord, Mass.*, *Vital Statistics of Boston*, *Census of Boston*, etc. D. Jan. 17, 1859.

**Shattuck School**, Faribault, Minn., a collegiate boarding-school under the auspices of the P. E. Ch., was organized under a State charter in 1865. The name is in honor of George C. Shattuck, M. D., of Boston, Mass. The bp. of Minn. is pres. of its trustees. Boys of 10 yrs. and upward are fitted for the junior class in coll. or for business. It has a military organization under the charge of a U. S. officer.

**Shaw** (GEORGE), M. D., F. R. S., b. at Bletton, Buckinghamshire, Eng., Dec. 10, 1751, grad. at Magdalen Hall, Ox., 1769; took orders in the Ch. of Eng. 1774; studied med. at Edinburgh and Ox., taking the degree of M. D. 1787; was one of the original members and the first v.-p. of the Linnean Society; lectured on nat. hist. at the Leverian Museum; became librarian and assistant keeper of nat. hist. at the British Museum 1791, and principal keeper 1807. D. July 22, 1813. Wrote *The Naturalist's Library*, *Zoology of New Holland*, *General Zoology*, or *Systematic Nat. Hist.*, etc.

**Shaw** (HENRY W.), b. at Lanesborough, Mass., in 1818, settled at Poughkeepsie, N. Y., as an auctioneer; began to write humorous sketches for the newspapers over the signature "Josh Billings" 1863; became popular both as a writer and as a lecturer; pub. many comic sketches, and edited an annual *Albion*.

**Shaw** (LEMUEL), LL.D., b. at Barnstable, Mass., Jan. 9, 1781, grad. at Harvard 1800; studied law; was admitted to the bar in N. H. Sept. 1804; sat in the legislature 1811-16 and in 1819, and in the State constitutional convention 1820; was State Senator 1821-22 and 1828-29, and chief-justice of the Mass. supreme court from Aug. 31, 1830, to Aug. 1860. His reported decisions in the collections of Pickering, Metcalf, Cushing, and Gray amount to above 50 vols. The city charter of Boston was drafted by him in 1822. He was a member of the Amer. Acad., of the Mass. Historical Society, and for 27 yrs. one of the corporation of Harvard Coll. He pub. a few orations, addresses, and judicial charges. D. Mar. 30, 1861.

**Shaw** (THOMAS), D. D., F. R. S., b. at Kendal, Eng., about 1692, ed. at Queen's Coll., Ox., of which he became fellow 1727; was 12 yrs. chaplain to the Eng. factory at Algiers, after which he travelled through N. Afr. to Egypt, Pal., and Asia Minor; returned to Eng. 1734; pub. *Travels and Observations relating to Several Parts of Barbary and the Levant*, republished in Pinkerton's *Voyages*, a Supplement, and a *Further Vindication*, etc. In 1740 S. became prin. of St. Edmund's Hall, Ox., and regius prof. of Gr. D. Aug. 15, 1751.

**Shaw** (THOMAS BUDD), b. in Lond., Eng., in 1813, ed. in the free school at Shrewsbury and at St. John's Coll., Cambridge; became prof. of Eng. lit. at the Imperial Alexander Lyceum, St. Petersburg, 1842, at the Univ. of St. Petersburg 1851, and was tutor in Eng. to the imperial family of Rus. from 1853 until his death, Nov. 14, 1862. Wrote *Outlines of Eng. Lit.* and *Student's Specimens of Eng. Lit.*

**Shawl** [Per. *shál*], a kind of loose garment worn on the shoulders or around the waist, manufactured by the different nations of different materials, as the Cashmere S. of goat's hair, the Chi. of silk, the barege of wool, etc., and in different patterns as the palm pattern of India, the plaid pattern of Scot., etc. The most celebrated kind is the Cashmere S., famous over the whole world as early as the 16th century. (See CASHMERE.)

**Shawneetown**, city and R. R. junc., cap. of Gallatin co., Ill. Prin. business, farming, salt-making, and coal-mining. Pop. 1870, 1309; 1880, 1851.

**Shays** (DANIEL), b. at Hopkinton, Mass., in 1747, attained the rank of capt. during the war of independence; took part in an insurrectionary movement in W. Mass. against the State govt. 1786, known as "Shays's rebellion," the pretexts of which were the high salary paid the gov., the aristocratic character of the Senate, the extortions of lawyers, and the pressure of taxation. In Dec. 1786 he led a considerable force of insurgents to Worcester, and with 2000 men marched to Springfield (Jan. 1787), but was repulsed by the militia under Gen. William Shepard (Feb. 4, 1787). His forces were surprised and completely dispersed by Gen. Lincoln, and Shays fled to N. H.; was pardoned in June 1788, and removed to Sparta, Livingston co., N. Y., where he d. Sept. 29, 1825.

**Shen**, shā (JOHN D. GILMARTY), LL.D., b. in New York July 22, 1824, ed. at the gram. school of Columbia Coll.; studied law, and was admitted to the bar, but has devoted himself chiefly to lit., and has rendered great service in illustrating the obscure early annals of Fr. colonization and Jesuit missions. He has pub. *The Discovery and Exploration of the Miss. Valley*, *Hist. of the Catholic Missions among the Indian Tribes of the U. S.*, *Early Voyages up and down the Miss.*, grams, and diets, of Indian langs., etc.

**Sheafer** (PETER WENICK), b. in Dauphin co., Pa., Mar. 31, 1819, ed. at Ox. Acad., N. Y., became a surveyor, geologist, and mining engineer; was active in tracing the remarkable geological features of the "Second Mountain" range extending from near Pottsville to beyond Shamokin and Tamaqua; settled at Pottsville 1848; has since as a mining engineer been one of the chief promoters of the development of anthracite and iron interests near it, having managed, among many others, coal mines of Phila. and Reading Coal and Iron Co. and those bequeathed by Stephen Girard to the city of Phila.

**Shears** (REV. ALONZO GROESBECK), M. D., b. in Washington, Dutchess co., N. Y., Feb. 3, 1811; ed. at Wesleyan Univ., he became M. A. at Trinity and Yale colls., and M. D. of New York Med. Coll.; was ordained by Bp. Whittingham in Trinity ch., New York, Mar. 4, 1849; founded the New Haven Suburban Home School, of which he was rector 17 yrs.; wrote *Sermon on Brotherly Love* (Toledo, O.), *Laus Deo*, with music (1867), *Letters from Abroad*, etc.

**Shearwater**, a name bestowed on species of the subfamily Puffinæ of the family Procellariidæ, to which belong the petrels or Mother Carey's chickens, etc. The species are of moderate size. They are often met with at sea hundreds of miles from land. Above they are brown or cinereous, and below white; the tail is rather long and rounded; feet large; tarsus shorter than the middle digit.

**Sheathbill**, the Eng. name of the species of the family Chionidiæ and genera *Chionis* and *Chionarchus*. Only 2 species are known, and both are inhabs. of the S. hemisphere—one, *Chionis alba*, being native to the Falkland Islands, etc., and the other, *Chionis* or *Chionarchus minor*, is peculiar to Kerguelen's Island. Much difference of opinion has prevailed among naturalists respecting the relations of these birds to others in the class, some having regarded them as waders (Grallatores), others as swimmers (Natatores), and others still as gallinaceous forms. Nevertheless, the indications furnished by the skeleton prove that the birds in question are derivatives from gull-like (and therefore primarily natatorial) types, but modified for terrestrial life. They are quite omnivorous in diet, feeding upon vegetable substances (sea-weeds, etc.), mollusks, and eggs.

**She'ba**, or **Saba**, the name of 3 persons in the O. T.: (1) A great-grandson of Ham (Gen. x. 7), who appears to have settled somewhere on or near the shores of the Per. Gulf.—(2) The tenth of the 13 sons of Joktan (Gen. x. 28), who settled in S. Ar., and gave his name to the kingdom whose queen visited Solomon in Jerusalem (1 Kings x. 1-13).—(3) A grandson of Abraham and Keturah (Gen. xxv. 1-3), whose descendants were nomads, in close connection with the descendants of the Hamitic Sheba mentioned above.

**Sheboygan**, city and R. R. centre, cap. of Sheboygan co., Wis., on Lake Michigan, at the mouth of Sheboygan River, has a fine harbor, ships annually 500,000 bushels of wheat, and has an extensive trade in lumber. Pop. 1870, 5310; 1880, 7314.

**Sheboygan Falls**, Sheboygan co., Wis., on R. R. and Sheboygan River, has good water-power and flourishing mills and manufactures. Pop. 1870, 1174; 1880, 1148.

**Shechem**, shee'kem [Hebrew, *Shekem*, "shoulder," "ridge"], a very anc. city of Pal., so called because it was on the watershed between the Mediterranean and the Jordan. It is about 35 m. N. of Jerusalem, and was Abraham's first camping-ground in the country. Jacob dug a well, and Joseph was buried there. It was one of the cities of refuge, and the first cap. of the N. kingdom of Israel. In the N. T. it is called *Sychar*. During the reign of Vespasian (69-79 A. D.) it was rebuilt and named Neapolis, corrupted by the Arabs into NABLUS (which see). R. D. HITCHCOCK.

**Shechinah**, shek'e-nah or she-k'i'na [Heb. "presence"], a name which first appears in the Jerusalem Targum to designate the Divine Presence wherever it exists in a special manner, but more particularly as manifested in the holy of holies within the ancient sanctuary of Israel.

**Shedd** (WILLIAM GREENOUGH THAYER), D. D., LL.D., son of a clergyman, b. at Acton, Mass., June 21, 1830, grad. at Univ. of Vt. in 1839, and at Andover Theological Sem. in 1843; was pastor of the Congl. ch. in Brandon, Vt., 1844-45; prof. of Eng. lit. in the Univ. of Vt. 1845-52; prof. of sacred rhetoric and pastoral theol. in Auburn Theological Sem. 1852-53; prof. of ecclesiastical hist. and lecturer on pastoral theol. in Andover Theological Sem. 1853-62; pastor of the Brick ch. (Presb.), New York, 1862-63, and prof. of biblical lit. in Union Theological Sem., New York, 1863-74, when he was transferred to the chair of systematic theol. in the



same inst. Wrote *Outlines of a System of Rhetoric*, from the Ger. of Theringin, *Lectures upon the Philos. of Hist., History of Christian Doctrine*, etc.

**Shee** (SIR MARTIN ARCHER), D. C. L., b. in Dublin, Ire., Dec. 23, 1770, studied painting at the school of the Royal Dublin Society; entered as a pupil in the Royal Acad.; became an exhibitor in the following yr.; was elected an associate of the Acad. 1798, a member 1800, and pres. in 1830; was knighted; in a long career preserved the lineaments of many illustrious men. D. Aug. 19, 1850.

**Sheeah.** See SHIAS.

**Sheep** [Lat. *Ovis*], a genus of mammals belonging to the family Bovide, group Pecora or Ruminantia, and sub-order Artiodactyl, of the order Ungulata. The form is familiar in connection with the common S., which, in its ordinary variety, tolerably well exemplifies all species, save that the trunk is more massive and the legs more slender, and consequently the aspect less graceful, than in the wild species; the head is rather broad; the forehead flat or concave; the nose is naked; the chin is not bearded, either in the males or females; the horns arise behind the orbit, are more or less spirally curved, and the apices directed sidewise; though developed generally in both sexes, they are not infrequently wanting in the females; the incisors are nearly equal in size, and sloping; the molars destitute of supplemental lobes; the hoofs mostly triangular, and shallow behind; the tail is generally short. The species are numerous. The geographical range of the genus is moderately extensive, and covers several of the islands of the Mediterranean (Corsica, Sardinia, and Crete), the greater portion of the temperate parts of the highlands of Asia and the Rocky Mts. of N. Amer.; while, as is of course well known, in a domestic state its distribution is almost coequal with that of man. Of the wild species, 2 at most (*Ovis montana* and *O. californica*)—and perhaps only one—are inhab. of Amer., the others being mostly Asiatic.

The domestic S. is generally supposed to be derived from the musimon of Corsica or the argali of Asia. Whatever may be its origin, however, it has deviated considerably from the wild stock. Among the most eccentric of varieties are the fat-rumped S. of some parts of Asia, and especially of Tartary; the Fozzan S. of Afr., noteworthy for its arched forehead, pendulous ears, long legs, and the mane on the neck and shoulders. The fine breeds prevalent among the modern civilized nations are to a great extent due to the intermixture of the celebrated stock of merino S., which is supposed to have originated in Sp., and is celebrated for the fineness of its wool. The care which has been devoted to sheep-culture in various countries, such as the U. S., Eng., etc., has resulted in the development of breeds which are even superior to the original merino.

THEODORE GILL.

**Sheepshanks** (JOHN), b. at Leeds, Eng., in 1787, son of a wealthy cloth-merchant, employed his fortune in forming a magnificent collection of pictures by Eng. artists, which is now a prominent feature of the S. Kensington Museum. D. at Lond. Oct. 6, 1863.—His brother, RICHARD, b. at Leeds in 1794, grad. at Trinity Coll., Cambridge, 1816, where he became a fellow in 1817; studied law; was called to the bar 1829; became a clergyman about 1824; devoted himself to math. and astron., being elected to the Royal Astronomical Society 1824 and F. R. S. 1830; had a fine observatory; was a boundary com. under the Reform bill 1831; completed the restoration of the national standards of weights and measures destroyed by burning of houses of Parl. 1834; wrote astronomical articles for *Penny Cyc.* D. Aug. 4, 1855.

**Sheepshead**, a well-known and esteemed fish of the family Sparidae, found along the Atlantic coast of the U. S. south of Cape Cod, but most abundant in the warmer waters. The name is given in allusion to a fancied resemblance of the head to that of a sheep, produced by the form and color as well as the cutting teeth of the jaws. The form is compressed oval, the profile very declivous; the dorsal fin has 12 spines and 11 rays, and is preceded by a recumbent spine; the anal fin has 3 spines and 10 rays; the color is distributed in 5 or 6 blackish bands; the front or incisor teeth are quite broad, the lateral teeth molars, and in several rows. The species frequently exceeds 2 ft. in length, although averaging less. It feeds chiefly on mollusks and crustaceans.

THEODORE GILL.

**Sheep-Tick**, the *Melophagus ovinus*, a wingless parasitic insect of the order Diptera and family Hippoboscidae. They are often extremely annoying to sheep.

**Sheeraz**, or **Schiraz**, town of Per., cap. of the prov. of Fars, at an elevation of 4,500 ft. above the sea. It is in a beautiful and fertile valley, covered with rose-gardens, vineyards, groves of platane and cypress, and orchards in which pears, oranges, cherries, and other fruits ripen to the highest perfection. It was for more than 5 centuries one of the most splendid cities of Per., the residence of the ruler, the seat of science and art, but it was destroyed by earthquakes. It has been rebuilt, but not in the same style, and its manufactures and trade have declined considerably. Its gardens are still wonderful. Pop. about 30,000.

**Sheffield**, town of Eng., W. Riding of Yorkshire, at the junction of the Sheaf and the Don, is generally well built. Noticeable among its public buildings are the parish ch., built in the reign of Henry I.; St. Mary's R. Cath. ch., the cutlers' hall, the town hall, the new music hall, etc. Its educational and benevolent institutions are numerous and good. Its school of art has a great reputation. S. is the centre in Eng. of manufacture of knives, files, saws, carriage-springs, and all kinds of agricultural, mechanical, med., and optical instruments. Silver-plating and britannia metal were both invented here, and have given rise to a very comprehensive manufacturing industry. Pop. 284,419.

**Sheffield**, Pa. See APPENDIX.

**Sheffield** (JOHN), DUKE OF BUCKINGHAMSHIRE AND NORMANBY, b. in Eng. in 1649, succeeded his father as earl of Mulgrave 1658; served in the Dutch wars of 1666 and 1672;

defended Tangier against the Moors 1680; became privy councillor and lord chamberlain Feb. 1685; favored the revolution of 1688; was made marquis of Normanby May 10, 1694, duke of Normanby Mar. 9, lord privy seal and duke of Buckinghamshire Mar. 23, 1703, and built in St. James's Park the residence now known as Buckingham Palace and belonging to the Crown. D. Feb. 24, 1731.

**Shekel** (Heb. "weight"), a standard weight among the anc. Israelites, and also a coin of gold, silver, or copper, originally of a shekel's weight. The gold S. was worth about \$5.69 of our money; the silver, 53 cents; the copper S., a little more than 3 cents.

**Shelbina**, Mo. See APPENDIX.

**Shelburne** (WILLIAM FITZ-MAURICE PETTY), EARL OF, afterward MARQUIS OF LANSDOWNE, b. in Dublin, Ire., May 20, 1737, entered Christ Ch., Ox., 1753; entered the army 1757; distinguished himself at Minden (1759) and Kloster Kampen (Oct. 16, 1760); was instrumental in negotiating the support of Henry Fox to the Bute ministry, and was chosen to Parl. early in 1761; succeeded to the earldom, by the death of his father, May 10, 1761; became pres. of the board of trade and privy councillor in the Grenville ministry Apr. 1763; opposed the policy which led to measures oppressive to Amer.; was dismissed from office Sept. 8, 1763; separated from Bute and Fox, attaching himself to Pitt; became sec. of state for the S. dept. in Pitt's administration July 1766; resigned his post Oct. 1768; became thenceforth a powerful opponent of the Grafton and North administrations, especially in regard to the Amer. questions; was converted to free-trade views of political economy; became sec. of state in the foreign dept. in the Rockingham cabinet Mar. 1782, and premier on the death of Rockingham, July 1783; negotiated the preliminaries of peace with the U. S.; resigned Feb. 21, 1783, giving place to the coalition of Fox and North; was created marquis of Lansdowne 1784. D. May 2, 1805. His collection of historical MSS. is now in the Brit. Museum.

**Shelburne Falls**, on R. R., Shelburne tp., Franklin co., Mass., at the picturesque falls of Greenfield River, 40 ft. high, which afford water-power for important manufactories of cutlery, etc. It has an acad. A part of the v. is on the S. bank of the river, in Buckland tp. Pop. of Shelburne tp. 1870, 1582; 1880, 1621.

**Shelby**, R. R. Junc., Richland co., O. Pop. 1870, 1807; 1880, 1871.

**Shelby**, (ISAAC), b. near Hagerstown, Md., Dec. 11, 1750, son of Gen. Evan Shelby; served as lieutenant in a co. under his father's command at the battle of Point Pleasant, 1774; became capt. 1776; was commissary of the frontier 1777; major and member of Va. house of delegates 1779; col. 1780; rendered distinguished service at King's Mountain, Oct. 7, 1780; served under Marion 1781, and under Greene with 500 mounted volunteers 1781-82, in which yrs. he sat in the N. C. legislature; settled in Lincoln co., Ky. (then Va.), 1788; was a member of the constitutional convention 1791; gov. of Ky. 1792-96 and 1812-16; joined Gen. Harrison in Canada with 4000 Kentuckians; took part in the victory of the Thames; was com. with Gen. Jackson in negotiating a treaty with the Chickasaw Indians 1818. D. July 18, 1836.

**Shelbyville**, city, on R. R., cap. of Shelby co., Ill., 151 m. W. of Indianapolis. The surrounding country is rich in coal and timber. Pop. 1870, 2051; 1880, 2339.

**Shelbyville**, city and R. R. junc., cap. of Shelby co., Ind., on Big Blue River, is situated in a rich farming region. Pop. 1870, 2731; 1880, 3745.

**Shelbyville**, on R. R., cap. of Shelby co., Ky. Pop. 1870, 2180; 1880, 2393.

**Shelbyville**, cap. of Bedford co., Tenn., on R. R. and Duck River, contains the Shelbyville Inst. and high school. Pop. 1870, 1719; 1880, 1869.

**Sheldon**, Ill. See APPENDIX.

**Sheldon**, R. R. junc., O'Brien co., Ia. Business, farming and dairying. Pop. 1880, 730.

**Sheldon** (EDWARD STEVENS). See APPENDIX.

**Sheldrake**, or **Shieldrake**, the common name of 2 genera of Anatina or river-ducks, of which the most common species is *Tadorna vulpanser*, a beautiful water-fowl of rich, brilliant colors, green, white, chestnut-brown, and black, with a vermillion-colored bill. It abounds in Europe.

**Shellac**. See LAC.

**Shelley** (PERCY BYSSHE), b. at Field Place, near Hammersham, Surrey, Eng., Aug. 4, 1792, received his early education at a school taught by the parish clergyman at Warnham; entered at 10 Zion House School, Brentford; entered Eton Coll. at 15; was addicted to experiments in chem.; read much upon ghosts and the "occult sciences;" wrote an incredible amount of fragmentary verses, mostly "poor stuff;" entered Univ. Coll., Ox., 1810; pub. anonymously a vol. of burlesque poems; was expelled from his coll. Mar. 25, 1811, for having written a pamphlet entitled *The Necessity of Atheism*; went to Lond. with his friend Hogg, who was also expelled in connection with the same affair; eloped to Scotland with Harriet Westbrook, the beautiful daughter of a retired innkeeper, and married her there Sept. 1811; travelled with his wife to York and Keswick, where he met Southey and De Quincey; proceeded to Dublin, Ire., Feb. 24, 1812, where he printed 2 revolutionary pamphlets, and was requested by the police to leave the city; printed early in 1813 *Queen Mab*, his first poem of real literary merit, a production strongly tinged with anti-religious fanaticism; was remarked in Lond. Mar. 24, 1814, but soon found his married life nearly all his disposable from his wife, settling upon her nearly all his disposable income, and about this time returned. As neither of them had any respect for the marriage bond, they saw no difficulty in consulting their own inclinations, and proceeded to Switz., travelling as man and wife; returned to Eng. at the close of 1814; studied surgery during the winter of 1815-16; wrote in 1815 his second poem of permanent interest,



*Alastor, or the Spirit of Solitude*; proceeded to the Lake of Geneva in the spring of 1816; resided there some months in daily intercourse with Byron; returned to Lond. in the autumn; legalized his connection with Mary Godwin by marriage Dec. 30, 1816, Harriet having shortly before (Nov. 10) drowned herself in the Serpentine; conducted an unsuccessful chancery suit against Harriet's father for the custody of his 2 children, decision being given against him by Lord Eldon on the ground of atheism Aug. 23, 1817; settled at Great Marlow, Buckinghamshire, where he played the part of a country gentleman; made about this time the acquaintance of Keats and the brothers James and Horace Smith, and became very intimate with Leigh Hunt; pub. at the close of 1817 *The Revolt of Islam*, a grandly conceived, sublime, and highly original poem; suffered much from pulmonary disease, which led him early in 1818 to leave Eng. for the last time; travelled to It.; wrote at Byron's villa, near Este, *Julian and Maddalo*, one of his poetical masterpieces; proceeded to Rome in Nov., and to Naples Dec. 1818; wrote, chiefly at Florence, during this yr., his 2 greatest works, the tragedy *Prometheus Unbound* and the tragedy *The Cenci*; removed to Pisa Jan. 1820; wrote in this yr. his *Epipsychidion* and his *Witch of Atlas*; in 1821 *Adonais*, a beautiful monody on the death of Keats, and *Hellas*, a noble drama inspired by the insurrection in Gr.; commenced *The Triumph of Life*; took a summer residence, Apr. 1822, at Lerici, a v. on the Genoese coast; went frequently upon boating excursions with his friends, Capt. Trelawney and Lieut. Williams, and was drowned, along with the latter, in the Bay of Spezia July 8, 1822. The bodies were cast upon the shore many days later, and were burned in the presence of Byron and Leigh Hunt, in accordance with the quarantine laws of Tuscany. The ashes were buried by Trelawney in the Prot. burial-ground at Rome, near the tomb of Keats.

PORTER C. BLISS.

**Shell-Marl**, a pulverulent calcareous deposit, composed largely or exclusively of shells of fresh-water and land Mollusca, found accumulating at the bottom of a few lakes (such as Milk Pond, Sussex co., N. J.), more commonly beneath peat or muck in marshes. In the latter cases the marl occupies the place of a lake that has been filled up and obliterated, chiefly by the growth of vegetation, and has been formed from successive generations of shells which inhabited the water or the immediate shore. In a few instances marl is sufficiently pure to be used for quicklime; more generally, however, it contains too much earthy matter for this purpose, but is a very valuable fertilizer, as which it is largely used.

J. S. NEWBERRY.

**Shells**, in artill. See PROJECTILE.

**Shells**, in nat. hist. See CONCHOLOGY.

**Shelton** (FREDERICK WILLIAM), LL.D., b. at Jamaica, L. I., in 1814, grad. at Princeton 1834; was ordained in the P. E. Ch. 1837; has been settled over chs. at Huntington, L. I., Fishkill-on-the-Hudson, and at Montpelier, Vt., since 1854. He was a frequent contributor to the *Knickerbocker Magazine*, and wrote *The Troopiad, or Travelling Gentleman in Amer.*, *Salander and the Dragon*, etc.

**Semitic**. See SEMITIC.

**Shenandoah**, Page co., Ia., on R. R. and Nishnabotona River. Pop. 1880, 1387.

**Shenandoah**, R. R. centre, Schuylkill co., Pa., is an important centre of anthracite coal-mining and trade. Pop. 1870, 2951; 1880, 10,147.

**Shenandoah River** rises in Augusta co., Va., and runs N. E. along the Valley of Va., W. of the Blue Ridge. At Front Royal it is joined by its N. fork. It is about 170 m. long, and for 140 m. is navigated by bateaux. It joins the Potomac at Harper's Ferry, W. Va. It flows through a rich and picturesque region, and affords great water-power.

**Shenstone** (WILLIAM), b. at the Leasowes, near Hales-Owen, Shropshire, Eng., in Nov. 1714, studied at Pembroke Coll., Ox., and passed his life in retirement on his hereditary estate, writing elegies, ballads, odes, and pastorals, which had considerable popularity—e. g. *The Schoolmistress*, D. Feb. 11, 1763.

**Shepard** (CHARLES UPHAM), M. D., LL.D., b. at Little Compton, R. I., June 29, 1804, grad. at Amherst Coll. 1824; studied bot. and mineralogy at Cambridge under Nuttall; was employed on a govt. commission to investigate the methods of sugar-culture and manufacture in the S. States 1832-33; was lecturer on nat. hist. at Yale Coll. 1830-47; associate of Dr. J. G. Percival in the geological survey of Conn. 1835; prof. of chem. and nat. hist. at Amherst 1845-52, and in the Med. Coll. at Charleston, S. C., 1854-61; afterward became again prof. of nat. hist. at Amherst; is author of *A Treatise on Mineralogy and of a Report on the Geology of Conn.*—His son, CHARLES UPHAM SHEPARD, JR., M. D., b. at New Haven Oct. 4, 1842, became prof. of chem. at the Med. Coll. of Charleston, S. C., 1867.

**Shepard** (SILAS E.), D. D., b. at New Berlin, N. Y., in 1801, began to preach in Pa. when 19 yrs. old, and was in active service as a minister till his death; was one of the founders and eds. of *The Chr. Quarterly*. Pres. of Hiram Coll., O., in 1867-68. D. Oct. 12, 1877.

**Shepard** (THOMAS), b. at Towcester, Eng., Nov. 5, 1605, grad. M. A. at Emanuel Coll., Cambridge, 1627; became a preacher at Earle's-Colne, Essex; was silenced for nonconformity in 1630. He emigrated to Mass., arriving at Boston Oct. 3, 1635; succeeded Hooker as pastor of the ch. at Cambridge Feb. 1636; was influential in founding Harvard Coll. at that place the same yr.; pub. *N. Eng.'s Lamentation for Old Eng.'s Errors*, *The Clear Sunshine of the Gospel breaking forth upon the Indians in N. Eng.*; after the death of Rev. Thomas Hooker, he was esteemed the most learned exponent of Puritan theol. in N. Eng. D. Aug. 25, 1649.

**Shepherd** (E. M.). See APPENDIX.

**Shepherd** (ALEXANDER R.), b. at Wash., D. C., Jan. 31, 1835, became successful in the plumbing business; took an active part in local politics, especially in promoting the erection of D. C. into a terr.; became in 1870 pres. of Citi-

zens' Reform Association, and in 1871 v.-p. of board of works. In 1873 he became gov. of the Dist.

**Shepherd Kings**. See HYKOS.

**Shepherd's Dog**, a name applied to the breeds of domestic dog which are trained to assist in attending the flocks of sheep. Of all stocks of S. D., the Scotch colly is the most celebrated.

**Shepley** (ETHER), LL.D., b. at Groton, Mass., Nov. 2, 1780, grad. at Dartmouth Coll. 1811; became a lawyer at Saco, and subsequently at Portland; sat in the Mass. legislature 1819, and in the Me. constitutional convention 1820; was U. S. dist. atty. for Me. 1821-33; U. S. Senator 1833-36; became a justice of the supreme court of the State Sept. 23, 1836; was chief-justice 1848-55; pub. 26 vols. of *Reports while on the bench*, and was a com. to prepare the *Revised Statute of Me.* (1857). D. Jan. 15, 1877.

**Shepley** (GEORGE F.), son of the preceding, b. at Saco, Me., Jan. 1, 1819, grad. at Dartmouth Coll. in 1837, and at Dana Law School, Cambridge, 1839; admitted to the bar of the supreme judicial court, Bangor, Me., 1840; in 1844 removed to Portland; was appointed U. S. atty. for Me. dist. in 1848, and reappointed in 1853 and 1857; was commissioned col. of the 12th Me. volunteers, Sept. 1861; commanded a brigade in Gen. Butler's expedition against New Orleans; assigned to the command of the defences of New Orleans, and charged with the administration of civil affairs in the city; was commissioned brig.-gen. of volunteers by Pres. Lincoln, who appointed him military gov. of La. June 3, 1862. In 1864 he commanded the military dist. of Va. and N. C.; served with the Army of the James 1864-65; entered Richmond with the 25th army corps Apr. 3, 1865, and was appointed military gov. of that city. D. July 20, 1878.

**Sherburne**, on R. R., Chenango co., N. Y., 40 m. S. W. of Utica. Pop. tp. 1870, 2927; 1880, 3128, including 944 in v.

**Sherb All**. See APPENDIX.

**Sheridan** (PHILIP HENRY), b. in Somerset, Perry co., O., Mar. 6, 1831, was grad. from the U. S. Military Acad., and assigned to the 1st Inf. as brevet second lieut. July 1, 1853. After a brief term in barracks he was ordered to Tex.; transferred to the Pacific coast in 1855, serving in Wash. and Or. Terrs. until the fall of 1861, at which date he was capt. in the 13th Inf. Recalled to the "States," he was in Dec. assigned to the army of S. W. Mo. as chief quartermaster. After the battle of Pea Ridge (Mar. 1862) he was relieved, and in the Corinth campaign accompanied Gen. Halleck as quartermaster until May 25. On this date he was appointed col. of the 2d Mich. Cav.; 3 days later was off on a raid to Booneville, and May 30 in pursuit of the enemy retreating from Corinth. On the 1st of July, in command of a cav. brigade, he defeated a superior cav. force at Booneville, and was commissioned brig.-gen. of volunteers from that date. Transferred to the Army of the Ohio, he commanded a division at the battle of Perryville (Oct. 8), where "he held the key of our position, and gave the point to its utmost advantage." At the battle of Murfreesboro' (Dec. 31) S.'s division held the left of the right wing. In due time S.'s commission as maj.-gen. of volunteers followed, to date from this battle. The battle of Chickamauga took place Sept. 19-20, where S. fought with great gallantry, rescuing his division from a perilous position. On Nov. 24-25 was fought the battle of Chattanooga, where, on the 25th, S. gained additional and merited renown. The march to Knoxville, where Burnside was besieged, next followed. Upon Grant's promotion to be lieut.-gen. (Mar. 1864) he appointed S. chief of cav. of the Army of the Potomac. In the campaign of 1864 the cav. covered the front and flanks of the inf. through the battles of the Wilderness until May 8, when S. started on a raid against the enemy's lines of communication with Richmond, destroyed the depots, trains, and track at Beaver Dam and Ashland stations, liberated 400 of our men, and defeated the enemy's cav. at Yellow Tavern. The outer line of works around Richmond was taken, and crossing the Chickahominy at Meadow Bridge, James River was reached May 14, thence by White House and Hanover C.-H. back to the army. The battle of Hawes's shop was fought May 28, and Cold Harbor occupied on the 31st. On June 7 S. with 2 divisions started around the left of Lee's army to destroy the Va. Central R. R. in rear, which accomplished, the Fredericksburg road was struck at Chesterfield, thence again striking the Va. Central at Trevilian's, where he routed Wade Hampton (June 11), and next day tore up the road nearly to Louisa C.-H.; withdrew, rejoining the army June 19. On Aug. 7 the Middle dept. and depts. of W. Va., Wash., and Susquehanna were constituted "the Middle military division," and S. assigned to command of the same. Numerous severe cav. skirmishes occurred during Aug. and early in Sept. On Sept. 19 he attacked Early at the crossing of the Opequan, and after a vigorous battle routed the enemy. Early rallied his army at the strong position of Fisher's Hill, where, on the 23d, he was again defeated, and pursued to the mts. S. devastated the Valley on his return. He was now (Sept. 20) appointed a brig.-gen. in the regular army. On Oct. 19 Early, after surprising our army in the morning, was disastrously defeated. The thanks of Cong. were bestowed upon S. and his army, and Nov. 8 he was appointed maj.-gen. in the regular army. On Feb. 27, 1865, he destroyed the Va. Central R. R., the James River Canal, and immense quantities of supplies, and defeated Early again at Waynesboro', rejoining Grant before Petersburg Mar. 27. He commanded at the battle of Five Forks, and displayed great generalship. This decisive battle compelled Lee to evacuate Petersburg. S., pursuing, struck the flying army at Sailor's Creek. On the 8th 4 supply trains were captured at Appomattox Station, and at Appomattox C.-H. the advance of Lee's army was resisted until dark. On the morning of the 9th the white flag betokening surrender was displayed in his front. In June 1865 he was placed in command of the military division of the S. W., of that of the Gulf in July, of the dept. of the Gulf Aug. 1866, and of the 5th military



dist. (La. and ex.) Mar. 1867. In Sept. 1867 he was transferred to the dept. of the Mo., continuing in command until Mar. 4, 1869, when he was promoted to be lieutenant-gen., and assigned to command of the division of the Mo. During the political disturbances in La. in 1875, Gen. S. was sent to New Orleans. Assumed command of the army Nov. 1, 1883. [From orig. art. in J.'s *Univ. Cyc.*, by G. C. SIMMONS.]

**Sheridan** RICHARD BRINSLEY BUTLER), b. in Dublin, Ire., in Sept. 1751, ed. at Harrow School; produced his comedies of *The Rivals* and *The Duenna*; became purchaser of Garrick's share in the patent of Drury Lane Theatre; brought out *A Trip to Scarborough* and *The School for Scandal*; produced his farce, *The Critic*, 1779; became a prominent member of the circle of wits which surrounded Charles James Fox, by whose influence he was chosen to Parl. 1780; was under-sec. of state 1782, and sec. of the treas. 1783; won a dazzling reputation as an orator by his two "Begum" speeches against Warren Hastings; wrote adaptations of Kotzebue's plays, *The Stranger* and *Pizarro*; became treas. of the navy and privy councillor 1806. D. July 7, 1816.

**Sherman**, city and R. R. centre, cap. of Grayson co., Tex., is a trade-centre for a cotton and agricultural dist. Pop. 1870, 1439; 1880, 6093.

**(Shenoi.)** **CHARLES R.**, b. at Norwalk, Conn., Sept. 26, 1796; settled as a lawyer in Fairfield co., O., 1810; became an eminent member of the O. bar; was revenue collector for that co. several yrs., and judge of the supreme court of O. from 1825 to his death, at Lebanon June 24, 1829. His 3 sons became distinguished in military or civil life—John, U. S. Senator from O.; Gen. William Tecumseh; and Charles T., U. S. dist. judge for the N. dist. of O.

**Sherman** (JOHN), b. in Dedham, Eng., Dec. 26, 1613, grad. A. M. at the Univ. of Cambridge, Eng., 1663; emigrated to Conn. 1634; preached in that colony several yrs.; became a magistrate there 1641, and was minister of Watertown, Mass., from 1647 to his death, Aug. 8, 1685.

**Sherman** (JOHN), grandson of Roger, b. at New Haven, Conn., in 1772, grad. at Yale Coll. 1792; was pastor of the First ch. at Mansfield, Conn., from Nov. 1797 to Oct. 1805, when he left that post on account of having embraced Unit. principles; was for a short time pastor of a ch. at Trenton Falls, N. Y. (1806). Wrote *One God in One Person Only* and *Philos. of Lang. Illustrated*. D. Aug. 2, 1828.

**Sherman** (JOHN), son of Charles R. b. at Lancaster, O., May 10, 1823, received an academic education; was admitted to the bar 1844; was a delegate to the Whig conventions of 1844 and 1848; M. C. 1855-61; was Rep. candidate for the speakership 1859; became chairman of the House committee of ways and means; was chosen U. S. Senator 1860; re-elected 1866 and 1872; was long the chairman of the Senate committees on finance and on agriculture; took a prominent part in debates upon finance and the conduct of the war, was one of the authors of the reconstruction measures adopted 1866-67, and was sec. of treas. 1877-81. U. S. Senator 1881-87.

**Sherman** (ROGER), b. at Newton, Mass., Apr. 19, 1721, in 1743 settled at New Milford, Conn.; was chosen co. surveyor 1745; made for several yrs. from 1748 the astronomical calculations for an almanac issued in New York; studied law; was admitted to the bar 1754; sat several yrs. in the colonial assembly; removed to New Haven 1761; was assistant gov. 19 yrs. (1766-85), judge of common pleas and of the superior court 23 yrs.; treas. of Yale Coll. 1760-76; sat in Cong. from 1774 until his death; was one of the 5 members of the committee to draft the Dec. of Ind. 1776; served on many important committees on the board of war and ordnance and on the treas. board; assisted in codifying the laws of Conn. 1783; was one of the framers of the original "Articles of Confederation" 1777, an active member of the Federal constitutional convention 1787, U. S. Senator 1791-93, and mayor of New Haven from 1784 to his death in that city, July 23, 1793.

**Sherman** (ROGER MINOT), LL.D., nephew of Roger, b. at Woburn, Mass., May 23, 1773, grad. at Yale Coll. 1792; was tutor there 1795; became a lawyer at Fairfield, Conn., 1796; sat in both houses of the legislature; was a delegate to Hartford Convention 1814, and judge of superior court and of supreme court of errors 1840-42. D. Dec. 30, 1844.

and of supreme court of errors 1840-42. D. 1842. **Sherman** (SIDNEY), b. July 23, 1805, in Marlborough, Mass., the third descendant of Roger Sherman; established himself in the iron trade, Kew-Forest, in the manufacture of sheet lead, the first of the kind in the Alleghany Mts.; was also one of the association that first manufactured cotton bagging by machinery; in Dec. 1835 answered the call of Tex., by raising a small force. Gen. Houston found him already at Gonzales with his co.; under his command Capt. (now elected col.) S. fell back before the Mex. gen. Santa Anna to San Jacinto. On Apr. 20 Col. S. led a daring sortie, and on the 21st, in command of the left wing, he led the attack upon the Mex. lines. The enemy were routed. The surgeon gave him a commission as col. in the regular service; removed to Tex. in 1837, and in 1842 was elected to Cong. from Harris co.; in 1846 he was elected to the first R. R. charter, the Buffalo Bayou & Texas and Colorado R. R.; on the 18th anniversary of the battle of San Jacinto he introduced on a Texas prairie the first locomotive W. of the Miss. During the c. war Gen. S. planned the defences of Galveston. In the battle of Galveston, on Jan. 1, 1863, he lost his only son, a lieut. of artil. D. Aug. 1, 1873.

**Sherman** (THOMAS W.), b. at Newport, R. I., Mar. 26, 1813, grad. at the U. S. Military Acad. July 1836, when assigned to the artil. as second lieutenant, and sent to Fla., where he served against the Indians until 1842. In the war with Mex. he commanded his battery at Buena Vista, and was brevetted major; again in garrison on frontier duty 1848-61, in Apr. of which latter yr. he was assigned to duty guarding the Phila. and Baltimore R. R. and in restoring communications with Wash. On May 14 he was promoted to be lieutenant-col., and 3 days later appointed brig.-gen. of volunteers. In the Port Royal expedition (Oct. 1861) he com-

manded the last forces, which he had organized, continuing in command in S. C. until the close of Mar. 1862, when assigned to the Army of the Tenn. as division commander, participating in the Corinth campaign (Apr. to June). Transferred to the dept. of the Gulf, he commanded a division in the vicinity of New Orleans until May 1863, when he joined the expedition to Port Hudson. In the assault of May 18, 1863, he was killed. He was a gallant and successful commander in S. C. until 1860. Brevetted brigadier and major gen. for gallantry, and Dec. 31, 1870, was retired from active service with the rank of maj.-gen. D. Mar. 16, 1879.

**Sherman** (WILLIAM TECUMSEH), son of Judge Charles R. b. in Lancaster, O., Feb. 8, 1830. In July 1836 he was appointed a cadet at the U. S. Military Acad., and in July 1840 was grad., and appointed a second lieut. in the 3d Art. ; first lieut. Nov. 1841. He served in Fla. until 1842, in garrison at Ft. Moultrie, S. C., until 1846, in Cal. as acting assistant adjutant-gen. of the dept. of Cal. until Feb. 1849; in San Francisco on the staff of Gen. Persifer F. Smith; was ordered to New York in Jan. 1850, as bearer of despatches; in Sept. of that yr. he was stationed, with the rank of capt., at St. Louis and New Orleans until Mar. 1853; resigned from the army Sept. 6, 1853, to engage in the banking business in San Francisco; removed to New York in 1857, in which yr. the affairs of his firm were closed. In July 1859 he was elected supt. of the military acad. in La., and remained at its head until Jan. 18, 1861, when the State determined to secede. On May 14, 1861, he was appointed col. of the 13th regular Inf., and soon after his arrival at Wash. was placed in command of a brigade in Tyler's division, which he led at the battle of Bull Run July 21. On Aug. 3 following, his commission of brig.-gen. of volunteers was issued. Dec. 23 he was placed in command of the camp of instruction and post of Benton Barracks, from whence in Feb. 1862 he was transferred to Paducah, Ky., to aid in the operations then in progress on the Tenn. River. Here he organized the division which he subsequently commanded at the battle of Shiloh (Apr. 6-7), where his conduct did much to overcome the shock of the unexpected onset. The advance upon and siege of Corinth next followed, resulting in the evacuation of that place May 29. In the mean while (May 1) he had been promoted to be maj.-gen. of volunteers. Was called upon in Dec. by Gen. Grant to take command of the expedition for the capture of Vicksburg. In the Vicksburg campaign S. bore a prominent part with his command—in the expedition up Steele's Bayou to the Yazoo (March); the feat upon Haines's Bluff (Apr. 29-May 1); movement to Grand Gulf (May 1-6); capture of Jackson (May 14); the occupation of Walnut Hills; and subsequent assaults upon the land-defences of Vicksburg (May 19 and 22); and in the siege operations which resulted in the surrender of the city July 4, 1863, when S. with a detached command was at once ordered to pursue Johnston. By the 10th he was given leave the intrenchments of Jackson. Siege operations were actively pressed, but on the night of the 16th Johnston succeeded in escaping. On Sept. 22 he was summoned to the relief of Rosecrans's beleaguered army at Chattanooga. Meanwhile he had been appointed brig.-gen. in the regular army. By Nov. 15 S. arrived at Chattanooga; by forced marches his command was up and in position by the 23d, and by 3 p. m. the next day had carried the N. end of Missionary Ridge. At sunrise on the 25th, by orders, S. attacked Bragg's right, and a furious battle was maintained all day; at 3 p. m. the success of the day was insured, and by midnight Bragg's army was in full retreat. Gen. Grant having been promoted to be lieut.-gen., he named S. as his successor in command of the military division of the Miss. On May 6 S. set forth with his army from the winter quarters about Chattanooga. To oppose him was the army of Johnston. The spring campaign was inaugurated at Dalton May 7, which strong position Johnston was compelled to abandon May 13, and fell back upon Resaca, which in turn he evacuated after a severe battle (May 15), and retreated to Allatoona Pass. S., on the 23d, marched on Dallas; Johnston took up a strong position about New Hope ch., where severe fighting occurred May 25-28. On June 1 Allatoona was occupied by S.; on the 4th Johnston retreated to the strong positions of Kennesaw, Pine, and Lost mts. From June 10 to July 2 almost constant fighting occurred; and by July 2 Kennesaw was abandoned by Johnston, who by July 10 had fallen back across the Chattahoochee and taken up a line covering Atlanta. Here he was superseded in command (July 17) by Hood. On this day S. completed his crossing of the Chattahoochee, and on the 19th and 20th the battle of Peachtree Creek was fought, resulting in the withdrawal of the enemy to the intrenchments of Atlanta. On the 22d Hood by a night march had gained the left of S.'s line, which he attacked furiously, a fierce battle ensuing, the enemy finally retiring to their defences. On July 28 Hood made a vigorous attack, but was repulsed with great loss. On the 12th of Aug. S. had been made a maj.-gen. in the regular army. Sending Kilpatrick out to destroy the R. Rs. in the rear, he swung around to the S. W., and by Aug. 28 his army was behind Atlanta, busily engaged in destroying the only R. Rs. by which that city was supplied. On the 29th the Macon road was reached near Jonesboro', where Hardee was with his own and Lee's corps, the battles of Aug. 31-Sept. 1 ensuing, leaving S. between Jonesboro' and Atlanta. During the night of Sept. 1 Hood evacuated Atlanta, after destroying everything that could be used, and on the 2d Slocum with the 30th corps entered the city. Hood had been reinforced from time to time. S. received in June Blair's 17th corps. Hood now drew off the army against S.'s communications, appearing as far as Gaylesville, Ala., when he abandoned further pursuit and started upon his "march to the sea." By Dec. 10 S. was before



Savannah; Ft. McAllister was carried on the 13th, and on the night of the 20th Savannah was evacuated, while S. was on his way to Hilton Head. Returning to Savannah, he entered the city on the 23d. After resting at Savannah and refitting his army he moved northward Feb. 1. Columbia was occupied on the 17th, Cheraw Mar. 3, Fayetteville Mar. 11; the battle of Averysboro' was fought Mar. 16, that of Bentonville Mar. 19-20; Goldsboro' was occupied Mar. 22, Raleigh Apr. 13, and Apr. 18th, at Durham Station, S. accepted the surrender of Johnston's army. Resuming his march, Wash. was reached May 24, 1865, where, after the grand review, his army was dissolved. On June 27, 1865, he was appointed to command the military division of the Miss.; was promoted to be lieut.-gen. July 25, 1866, and Aug. 11 assigned to command the military division of the Mo. On the accession of Gen. Grant to the Presidency he became gen. (Mar. 4, 1869). In Oct. 1874 the head-quarters of the army were removed from Wash. to St. Louis, but in Apr. 1876 were re-established at Wash. He pub. in 1875 *Memoirs of Gen. W. T. Sherman, by himself*. Retired, Feb. 8, 1884. [From orig. art. in *J.'s Univ. Cyc.*, by G. C. SIMMONS.]

**Sherwin** (THOMAS), LL.D., b. at Westmoreland, N. H., Mar. 26, 1799, grad. at Harvard 1825; taught an acad. at Lexington, Mass., 1825-26; was mathematical tutor at Harvard 1826-27; was sub-master of the Eng. High School, Boston, 1828-38; was one of the originators of the Amer. Inst. of Instruction 1830; pres. of the Mass. Teachers' Association 1845; one of the eds. of the *Mass. Teacher*; a member of the Amer. Acad.; took an active part in procuring the establishment of the Mass. Inst. of Technology, and was from 1838 through life the prin. of the Eng. High School. D. July 23, 1869. Wrote *Elementary Treatise on Algebra* and a *Common School Algebra*.—His son THOMAS was lieut.-col. of the 22d Mass. Volunteers during the c. war, and at its close was brevetted brig.-gen.

**Shetland** (or **Zetland**) **Islands**, a group of about 100 islands, of which 23 are inhabited, in the Atlantic Ocean between lat. 59° 50' and 60° 50' N., and belonging to Scot. Area, 5888 sq. m. Pop. 31,605. The largest island is Mainland, with the town of Lerwick. They are all high and rocky, presenting steep, abrupt, and bold coasts, with fine natural harbors, and a rugged, wild surface in the interior. In the valleys some oats, barley, and potatoes are cultivated. Of trees there are none, but good pastures. Many cattle and sheep are reared, but the prin. occupation of the inhabs. is fishing. Eggs form an article of export.

**Shi'as**, or **Shi'ites** [Ar. for "sectaries" or "followers"], called by themselves *Al-Adelhi* (the "party of the just"), the followers of Ali, the husband of Fatima, the daughter of Mohammed. They maintain that Ali was the first legitimate khalif or successor to Mohammed, and consequently reject Abu Bekr, Omar, and Othman as usurpers. They differ among themselves—32 of the proverbial 73 Mohammedan sects being assigned to the S. From the Sunnis they differ very much as Prots. do from R. Caths. Since 1499 the Shia faith has been the national religion of Per. [See HUGHES'S *Notes on Muhammadanism* 1875.]

**Shibboleth** [Heb. for "ear of corn"], a test or password by which one's rank in society is indicated.

**Shields** (JAMES), b. at Dungannon, co. Tyrone, Ire., in 1810, emigrated to the U. S. about 1826; settled as a lawyer at Kaskaskia, Ill., 1832; was elected member of the legislature 1836, and State auditor 1839; became judge of the supreme court 1843, com. of the U. S. land-office 1845, brig.-gen. U. S. A. 1847; was dangerously wounded at Cerro Gordo, and brevetted maj.-gen.; again severely wounded at Chapultepec; was U. S. Senator from Ill. 1849-55, and from Minn. 1858-60, after which he settled in Cal.; was appointed brig.-gen. of volunteers Aug. 19, 1861; commanded at the battles of Winchester and Fort Republic 1862; resigned his commission 1863; settled soon after in Wis., and subsequently in Mo. D. June 1, 1879.

**Shi'as**. See SHIAS.

**Shillaber** (BENJAMIN P.), b. at Portsmouth, N. H., in 1814, was editorially connected with the *Boston Post* 1847-50, acquiring celebrity by his "sayings of Mrs. Partington," was printer and ed. of the *Pathfinder* 1850-52, ed. and proprietor of the *Carpenter* 1852-53; returned to the *Post* 1853-56, and was one of the eds. of the *Saturday Evening Gazette* 1856-66. He pub. *Rhymes with Reason and Without*, *Poems, Life and Sayings of Mrs. Partington*, etc.

**Shilling** [a word of doubtful origin], a coin of G. Brit., Den., Swe., and N. Ger. The Brit. S. is of silver, and worth about 24 cents in U. S. money.

**Shiloh**, an anc. town of Pal., the present *Seibun*, 20 m. N. of Jerusalem, was the seat of the ark of the covenant from the last days of Joshua to the time of Eli, but sank into total insignificance when the ark was carried away by the Philistines.

**Shiloh**, a locality in Hardin co., Tenn., about 2 m. W. of Pittsburg Landing, on Tenn. River, taking its name from a rude log chapel there known as "Shiloh Church." In the neighborhood a great battle was fought Apr. 6 and 7, 1862. Gen. Grant commanded on the Union side, Gen. Johnston was the leader of the Confeds. Gen. Lew. Wallace, who directed the advance on one side, was surrounded the first day, and the Union army was dislodged. But on the same day, at 2½ p. m., Gen. Johnston had fallen, and the command devolved upon Beauregard. At daylight on the second day Grant attacked along the whole line, which was gallantly resisted, a stubborn battle continuing until 4 p. m., when the Confed. army was in full retreat for Corinth.

**Shindler** (MRS. MARY S. B. PALMER), b. at Beaufort, S. C., Feb. 15, 1810, ed. in sems. at Wethersfield, Conn., Elizabethtown, N. J., and New Haven, Conn.; married to Charles E. Dana of New York 1835, with whom she settled at Bloomington, Ia., 1838; lost her husband 1839; returned to her parents in S. C.; contributed poems to the *Rosebud*, a paper edited by Mrs. Caroline Gilman at Charleston, S. C.; pub. several vols. of poems and novels—*The Southern Harp*,

*The Northern Harp*, etc. In 1848 she became an Episcopalian, shortly after her marriage to Rev. Robert D. Shindler, who in 1851 became a prof. in Shelby Coll., Ky., and ultimately settled in Texas.

**Shin'er**, a name applied in a vague manner to numerous small species of fishes of the family Cyprinidae inhabiting the fresh waters of the U. S., characterized by a compressed body and shining, silvery color. The most notable of the species so designated is the *Notemigonus crysoleucas*, a form quite nearly allied to the breams (*Abramis*) of Europe, but rarely exceeding a few inches in length.

**Shingles** (a disease). See HERPES.

**Ship-Canals**. See CANAL.

**Shipp** (ALBERT M.), b. in Stokes co., N. C., Jan. 13, 1819, grad. at the Univ. of N. C. 1840; became a Meth. preacher 1841, pres. of Greensboro' Female Coll. 1848, prof. of hist. and Eng. lit. in the Univ. of N. C. 1849, pres. of Wofford Coll., S. C., 1859, and prof. of exegetical theol. in Vanderbilt Univ., Nashville, Tenn., 1875.

**Shipp'en** (EDWARD), LL.D., b. at Phila. Feb. 16, 1729, studied law at Phila. and at the Temple, Lond., where he was admitted a barrister 1750; became prothonotary of the supreme court of Pa. and judge of admiralty 1753; was afterward member of council and pres. of courts of quarter sessions for Phila. co.; became judge of supreme court 1791, and was chief-justice of Pa. 1799-1806. D. Apr. 16, 1806.

**Shippen** (WILLIAM), M. D., b. at Phila. in 1735, grad. at Princeton 1754, and in med. at Edinburgh; began at Phila. May 1762 the first course of anatomical lectures ever given in the U. S.; became prof. of anat. and surgery in the Phila. Med. School Sept. 1765; served in the med. dept. of the army of the Revolution, and was its director-gen. from Apr. 11, 1777, to Jan. 1781. D. July 11, 1808.

**Shippensburg**, Cumberland co., Pa., on R. R. and National Pike, 41 m. W. of Harrisburg, contains a normal school and an inst. of learning for teachers. Large deposits of iron ore are near. Pop. 1870, 2065; 1880, 2213.

**Ships, Iron-clad**, vessels clad with iron plates to give protection against shot and shell.

(1) Artill. was first mounted in naval vessels during the reign of Edward III., about 1350. For several centuries naval construction did not advance. Only during the last 50 yrs.—since the Nile and Trafalgar—a revolution in naval warfare has been brought about by entirely new systems. This has been wrought by 3 agents: (1) the application of steam, strictly the screw-propeller, as the naval motor; (2) horizontal shell-firing from naval artill.; (3) application of iron plates to keep out the shells. The submarine torpedo may be added to this list. As soon as the peculiar qualities of the screw were established to the satisfaction of admiralty boards, it became certain that steam would be the universal naval motor.

(2) The prin. incentive to the application of iron armor was the destruction anticipated from horizontal shell-firing against wooden ships. But this mode of using shells made slow progress in ships of war, and it was not until 1854 that naval batteries consisted entirely of shell guns, the magazines being filled with loaded shells, ready fused. It was the extreme use of shells that brought about resort to armor to keep them out. The Fr. gen. Paixhans some 40 yrs. ago suggested iron as a protection against this missile.

(3) The first iron-clads used in battle were the Fr. floating-batteries *Devastation*, *Lave*, and *Tonnante* (1855), built for special service in the Crimea. Particulars: length, 171 ft. 9 inches; beam, 43 ft. 1 inch; draught, 8' 8"; hulls of wood; armor, 4.33 inches thick; armament, 16 guns of "50," carried 2 ft. 11 inches above water-line.

(4) *La Gloire*, completed 1861, was the real beginning of the present era of iron-clads; she was the first attempt at a swift, invulnerable, ocean-going iron-plated vessel; her hull, of wood, was on the model of the line-of-battle ship *Napoleon* of 91 guns, and at the same draught had equal displacement, but being more heavily laden her draught was greater; her guns, thirty-six 6.3-inch rifles, were carried in broadside. In one tier, 6 ft. above the water-line. Her sides were completely covered with armor—this was proof against projectiles from guns then in use. With the development in artill. which immediately began, this soon changed; now naval artill. can put loaded shells through the strongest armor afloat.

(5) Before *La Gloire* was finished the Eng. iron-clad *Warrior* (1861) was well advanced. The Fr. ship was plain and uncouth; the *Warrior* was a splendid-looking frigate, with masts and rigging in the old style, her bow and stern of the same form and ornamented in the same manner as the old ships which were passing away; her lines, to insure high speed with moderate power, were unusually fine. But there were more essential differences; the French vessel, 263 ft. in length by 59' 9" beam, 5380 tons displacement, was armored from stem to stern; her English rival, 419 ft. in length, 58 ft. beam, displacement 8950 tons, had a patch of armor on her sides of 4½-inch tongued and grooved plates covering 7/12 of her length, the rest of the ship being unarmored; behind this armor twenty-six 8-inch smooth-bore guns were carried; at the ends of this protected part armored bulkheads of the same thickness, in order to protect the guns from fore-and-aft fire, were carried across the vessel. The speed was 14.85 knots. The iron-clads which followed were the last attempt to carry complete armor in broadside vessels. So great was the increase in the power of ordnance that diminution in the area to be protected in order to increase the thickness of armor became imperative, and all iron-clads built after these, except rams and monitors, carried armor only over a central casemate and around the water-line. The most powerful iron-clads now in European waters are monitors; their construction seems to have been brought about by the rapid development of armor-piercing ordnance. [From orig. art. in *J.'s Univ. Cyc.*, by ISAAC NEWTON.]



**Ship-Worm.** See TEREDO.

**Shir'as** (ALEXANDER EAKIN), b. in Phila. Aug. 10, 1812, grad. at the U. S. Military Acad. in 1833, and entered the service as brevet second lieutenant of artill. serving in garrison until 1846, except while at the Military Acad. (1839-43) as prof. of math. He was in the W. in 1846 in charge of subsistence of the volunteers for the Mex. war; was appointed commissary of subsistence, with the rank of capt., Mar. 1847; assistant to the commissary-gen. in Wash. 1847-63, when he was appointed col. and assistant commissary-gen. in 1874 he became commissary-gen., with the rank of brig.-gen. He was breveted brigadier and major gen. in 1865 for faithful, meritorious, and distinguished services in his dept. D. Apr. 14, 1875.

**Shiraz.** See SHEERAZ.

**Shirley** (WALTER WADDINGTON), D. D., b. in Eng. July 24, 1828, ed. at Rugby School and at Univ. Coll., Ox., graduating with high honors in 1851 from Wadham Coll.; took orders in the Ch. of Eng.; was a brilliant and thorough historical scholar and an able preacher and lecturer; edited the *Fasciculi Zizaniorum Magistri Johannis Wyclif* and *Letters Illustrative of the Reign of Henry III.*; issued a *Catalogue of Wycliffe's Writings*; became select preacher to the Univ. 1862, and prof. of ecclesiastical hist. at Ox. (1864), and also canon of Christ Ch. D. Nov. 20, 1866.

**Shirley** (WILLIAM), b. at Preston, Sussex, Eng., in 1663, settled at Boston, Mass., 1734; was com. for fixing the boundary-line between Mass. and R. I.; was royal gov. of Mass. 1741-45; planned the successful expedition against Cape Breton 1745; treated with the E. Indians 1754; planned the expedition of Prideaux against Niagara, and proceeded himself as far as Oswego; was appointed lieutenant-gen. 1759; became afterward gov. of the Bahama Islands, but returned to Roxbury, Mass., where he d. Mar. 4, 1771. Author of *Electra*, a tragedy; *The Birth of Hercules*, a masque; *A Letter to the Duke of Newcastle, with a Journal of the Siege of Louisbourg*, and *The Conduct of Gen. William Shirley briefly Stated*.—His son WILLIAM, an officer in the army, was killed at Braddock's defeat, 1755.—His son Sir THOMAS became a maj.-gen. in the Brit. army, was created a bart. 1786, and was gov. of the Leeward Islands. D. Mar. 1800.

**Shi'shak**, the name of several monarchs of the 22d Egyptian dynasty, the most remarkable of whom was SHISHAK I. S. united Egypt under one govt., but was unable to subdue the Ethiopian rulers established at Napata. Hadad and Jeroboam found an asylum at his court, and 5 yrs. after the schism of the tribes he overran Judah (c. c. 922), and went up to Jerusalem, from which he took as spoil the treasures of the temple and the palace in the 6th yr. of Rehoboam. The highest regnal year of his reign is the 21st. His conquests in Asia appear to have been quite ephemeral.—SHISHAK II. was an obscure monarch, of whose reign no particulars are known, and was the fourth successor of Shi'shak I.—SHISHAK III., an equally inglorious monarch, appears to have reigned 51 yrs. at least; and SHISHAK IV., the last king of the 22d or Bubastite dynasty, is only known for an insignificant reign of 37 yrs.

**Shit'tim.** (1) Wood of the shittah tree, repeatedly mentioned in Exodus as the timber principally employed in building the tabernacle. It has been identified with the *Acacia seyal*, which abounds in the Sinaitic peninsula. The wood is light, but close-grained and enduring, of a fine orange-brown color. Its leaves are small, and in spring it is covered with tufts of yellow blossoms. It yields the gum-arabic of commerce.—(2) A fertile plain, so called from its acacia-groves, just opposite Jericho, in which the Israelites were encamped before crossing the Jordan.

**Shoa.** See ABYSSINIA.

**Shod'dy** [originally the wool that was *shed* or wasted in carding and spinning], in a strict sense, a fibre made by tearing in pieces in a suitable mill rags of worsted or combed-wool goods. The corresponding fibre of carded-wool rags is called mungo. But more frequently both kinds are classed together as shoddy or "devil's dust."

**Shoe'bourness**, a promontory on the N. shore (Essex co., Eng.) of the estuary of the Thames, directly opposite Sheerness. S. has acquired celebrity in recent yrs. as the locality of experimental firing at armored targets and for trial of the new guns. Here are tested the iron constructions used in fortifications, models of sides of iron-clads, as well as trials of the new monster guns themselves.

**Shoeing of Horses.** See FARRIERY.

**Sho'mer, or Jebel Shomer**, a part of Ar., bounded N. by the Syrian desert, N. E. by Irak-Arabee, S. by the Wahabee sultanate, and W. by Tur. Ar., forms an independent sultanate. Its pop. is estimated at about 500,000; the cap. is Hayel. Good crops of corn and fruit are raised by means of artificial irrigation. Dates, cotton, horses, mules, and asses are exported. A considerable trade is carried on between Hayel and Medina.

**Shooting Stars.** See METEOR.

**Shore** (JANE), b. in Lond., Eng., about 1445, married a rich Lond. goldsmith named Matthew or William Shore; became mistress of King Edward IV. about 1470, and of Lord Hastings after the death of the former, 1483, and was accused of witchcraft as an accomplice of Hastings, who was beheaded for that pretended crime, though the real reason for the proceedings against them was their known partiality to the cause of the young princes. Jane Shore was charged by King Richard III. with having withered his arm by her arts of sorcery; was committed to the Tower and her property confiscated; was never brought to trial, but was compelled by the bp. of Lond. to do public penance for impiety and adultery. She survived until after the accession of Henry VIII.

**Shore** (Sir JOHN). See TEIGNMOUTH, BARON.

**Short** (CHARLES), LL.D., b. at Haverhill, Mass., 1821, received his early education at Bradford Acad. and Phillips Andover Acad.; grad. with high honors at Harvard in 1846; in 1847 was first assistant master in Phillips Acad.; master

of the Public Classical School in Roxbury, Mass., 1847-53, and of a private classical school in Phila. 1853-63; pres. of Kenyon Coll., O.; prof. of intellectual and moral philos. 1863-67; became prof. of Lat. in Columbia Coll., New York, in 1868; edited *Advanced Lat. Exercises* in Schmitz and Zumpt's Lat. series; revised Mitchell's *New Anc. Geog.*; wrote an essay on the *Order of Words in Gr.*, etc. He is a director of the Amer. Oriental Society, and member of the Amer. committee co-operating with the Brit. committee in the revision of the Eng. Bible.

**Shorthand.** See PHONOGRAPHY and STENOGRAPHY.

**Short-horn**, a breed of cattle externally distinguished by the shortness of their horns, of which there are several classes, each designated from the region in which it originated, usually in the Brit. Islands, though some of them are from Hol. and other parts of Europe. Bulls and cows of this breed have been largely imported for improving our native stock. Prominent among the S.-H. are the Durham breed, characterized by the squareness of the body. The Ayrshire S.-H. are much smaller than the Durhams, and are celebrated at home and here for their milking qualities. Smallest of all the S.-H. is the Alderney breed, the best of all where butter is the prin. object. Of the Devons there are 2 varieties—the N. and the S.—the former being preferable for slaughter, the latter for the dairy.

**Shot.** See PROJECTILE.

**Shoveller Duck.** See ANAS.

**Showers of Fishes** are recorded to have fallen from the sky in numerous instances. In all well-authenticated cases of the kind whirlwinds and storms have been the means by which they have been lifted. In India, fishes of 3 lbs. weight are reported as having fallen from the sky.

**Shrapnel.** See PROJECTILE.

**Shreve** (HENRY MILLER), b. in Burlington co., N. J., Oct. 21, 1785, became interested in the navigation of the W. rivers when quite young. In 1810 he brought the first cargo of lead, buying it of the Indians, from Galena River to New Orleans, and opened a business which had been previously monopolized by the Brit. In 1814 he took command of the fourth steamboat, of which he was part owner, built in the W., and a few days before the battle of New Orleans carried supplies to Ft. St. Philip, passing the British batteries. In May 1815 he ascended the Miss. to Louisville in the Enterprise, the first steam vessel that had ever performed that voyage. Convinced of the defects of the engines of Fulton and French, he commenced the construction of the Washington, of 400 tons burden, upon an entirely new plan. The result was a steam vessel unlike any other then known, machinery far lighter than Fulton's, and using half the fuel. On Mar. 3, 1817, heavily laden both in descending and ascending, and crowded with passengers, the Washington made her first trip. The return trip from New Orleans was made in 25 days. In 1806 there were 6 keel-boats and 2 barges only owned on the O. River. In 1819, 25 steamboats were owned by the citizens of the O. Valley, and 26 others were nearly ready to be launched. After building other boats and making other improvements, he finished the George Washington in 1824 upon a new model, that which is in use at the present day. In 1829 he completed his snag-boat, the Heliopolis, for removing snags and sawyers from the O. River: its success was complete. Capt. S. was then placed in charge of the removal of the Red River raft: the great raft of the Red River, consisting of an accumulation of trees, logs, and driftwood of every description, firmly imbedded in its channel for more than 100 m., was removed, and the navigation of that river opened, inclusive of the raft, a distance of nearly 1200 m. In 1829 Capt. S. invented a steam marine battering-ram for harbor defence. He was made supt. of W. river improvements in 1826, and continued in that position until 1841. D. Mar. 6, 1854.

**Shreve** (SAMUEL HENRY), LL.B., b. at Trenton, N. J., Aug. 2, 1829, grad. at Princeton 1848, at Harvard 1850; studied civil engineering; was chief engineer of several R. Rs.; pub. in 1873 a treatise on the *Strength of Bridges and Roofs*, and became in 1875 engineer of the New York Rapid Transit Commission and consulting engineer of New York Elevated R. R. and of Gilbert Elevated Railway. D. Nov. 27, 1894.

**Shreveport**, city and R. R. centre, cap. of Caddo parish, La., situated on the W. bank of Red River, 500 m. from its mouth, and at the head of low-water navigation. It was incorporated in 1839. Situated in the very heart of the finest cotton-growing region in the world, it has become one of the most important cotton-markets in the S. W. The country immediately tributary to it embraces large portions of S. Ark., E. Tex., and N. La. Pop. 1870, 4607; 1880, 8009.

**Shrew, or Shrew-Mouse**, a small insectivorous, mouse-like mammal of the family Soricidae, found in nearly all parts of the N. hemisphere, is nocturnal, frequently aquatic, produces its young blind and naked, does not hibernate, is distinguished by an elongated and pointed muzzle, small eyes, plantigrade, 5-toed feet, and glands which secrete a musky fluid. There are several genera and many species.

**Strike** [*Laniide*], a family of birds of the tribe of Dendrocygna and order Passeres, embracing more than 30 species, of which the best known is the butcher-bird, found in the Atlantic States of N. Amer., and noted for its habit of impaling insects and small birds upon the points of thorns. It imitates the notes of other birds in distress as an artifice to ensnare them, and in the S. States is useful to the planter by destroying field-mice and insects.

**Shrimp**, a name applied to a vast number of small crustaceans, but proper to the typical Crangonidae. The common S. of the U. S. is principally used for fish-bait. Not a few small amphipod crustaceans are called S. Some of these creatures inhabit fresh water, but most are marine. Among the more interesting kinds are the brine-S.

**Shrove-Tuesday**, the day preceding Ash-Wednesday, so called from the old custom of confessing and receiving shrift on that day. It is in general a day of pleasure in



most R. Cath. countries. It is the Carnival of the Its., the *Mardi Gras* of the Fr., and the Pancake-Tuesday of former days in Eng.

**Shubrick** (WILLIAM BRANFORD), the fourth of 6 brothers, all of whom served in the army or navy in the war of 1812 with G. Brit., b. in S. C. Oct. 31, 1790; after attending a gram. school at Charleston and passing 2 yrs. of study in N. Eng., became in 1805 a student of Harvard; was appointed midpn. by Jefferson June 20, 1806; in May 1807 joined the sloop-of-war *Wasp*; at the beginning of the war of 1812 was an acting lieut. on board the *Hornet*; was transferred to the frigate *Constellation*, which rendered important services in the defence of Norfolk and the navy-yard at Gosport, where he performed efficient duty on land in defence of the batteries; in 1813 was transferred to the *Constitution*, and made two cruises, aiding in the capture of 3 ships of war. He returned to the U. S. in May 1815, second in command of the *Constitution*. In Dec. 1815 was made senior lieut. of the *Washington*, 74 guns; in 1820 was promoted to the rank of commander, and served second in command at the navy-yard at Charlestown, Mass., and New York, until Apr. 6, 1826, when he was appointed to the command of the *Lexington*; in 1829 was appointed commander of the *Natchez*, and made a cruise in the W. I.; afterward inspector of ordnance, etc.; second in command of the navy-yard at Washington until 1838, when he was ordered to the command of our W. I. squadron, which he held until 1840, having in 1831 been promoted to the rank of capt.; from Oct. 28, 1840, to Oct. 1843 was in command of the navy-yard at Norfolk, Va.; Feb. 3, 1844, appointed chief of the bureau of provisions and clothing for the navy. He was appointed, July 9, 1846, to command the Pacific squadron; sailed from Boston Aug. 1846, returned May 1849; Sept. 24, 1852, was appointed to the light-house board, and in 1853 chairman of the bureau of construction; July 8, 1853, placed in command of the E. coast squadron for the protection of Amer. fishermen; Aug. 3, 1857, appointed pres. of board to prepare regulations for the navy; Sept. 8, 1858, appointed to command the Brazil squadron and Paraguay expedition, from which, his last sea-service, he returned May 11, 1859, to resume duty as chairman of the light-house board; July 17, 1862, was appointed senior member of advisory board, having the day previous been commissioned rear-admiral after a service of 55 yrs. D. May 27, 1874. [From orig. art. in *J.'s Univ. Cyc.*, by HON. JOSEPH C. G. KENNEDY, LL.D.]

**Shulze** (JOHN ANDREW), b. in Tulpehocken tp., Berks co., Pa., July 19, 1775, in 1802 became a successful merchant of Myerstown, Dauphin co., Pa.; entered political life in 1806; was clerk of the courts and prothonotary of Lebanon co. 1813-21, gov. of Pa. 1823-29, and pres. of the U. S. electoral college 1840. D. Nov. 18, 1852.

**Shurtleff** (NATHANIEL BRADSTREET), M. D., b. at Boston, Mass., June 29, 1810, grad. at Harvard 1831 and at the Med. School 1834; became a phys. at Boston; was a zealous and learned scientist, genealogist, and historical student; mayor of Boston 1869-70. He traced his descent to 11 of the Pilgrims of the Mayflower, but was himself a R. Cath. Author of *An Epitome of Phrenology*, *A Perpetual Calendar for Old and New Style*, *Passengers of the Mayflower*, etc. He was the ed. of the *Records of the Gov. and Co. of Mass. Bay 1628-80*, and, with David Pulsifer, of the *Records of the Colony of New Plymouth*. D. Oct. 17, 1874.

**Shurtleff College**, an inst. of learning at Upper Alton, Madison co., Ill., founded in 1832 as Alton Sem., chartered in 1835 as Alton Coll., and took its present name in 1836 in honor of Dr. Benjamin Shurtleff of Boston, who gave it \$10,000. It is under the management of the Bap. denomination. There is a Kendall Inst. for young ladies, a preparatory dept., and 2 academic courses, classical and scientific. Both sexes are admitted.

**Shute** (SAMUEL), b. in London, Eng., in 1653, ed. at the Univ. of Leyden, Hol.; served in the Dutch army under William, prince of Orange; was afterward lieut.-col. under the duke of Marlborough; was royal gov. of Mass. 1716-23, and had a bitter and protracted controversy with the legislature as to the powers of his office. D. Apr. 15, 1742.

**Siam** occupies the middle portion of the Indo-Chi. peninsula, with all the country surrounding the Gulf of Siam. It is bounded on the N. by the country of the Laos, E. by Laos and Anam, S. by the Gulf of Siam, and W. by the Indian Ocean and the Tennasserim provs. Area, 250,000 sq. m. The surface is covered with hills and mts., especially in the N., while in the centre lies the rich and alluvial plain of the Ménam. The 2 mt.-ranges running S. E. from the Himalaya form at the same time the natural boundaries of S. The mts. on the E. and W. belong also to the 2 great chains which stretch S. from the table-land of Yunnan, and run on either side of the great valley watered by the Ménam. A third range, less continuous and direct, rises in the central regions. In this is situated the P'hra Bat, or "mountain of the sacred footprint of the Boodha." The most westerly of the mt.-chains reaches an elevation of 5000 ft. The mts. of the Siamese-Malayan provs. nowhere exceed 3000 ft. The whole region abounds in small rivers, but there are only 3 great navigable streams—the Saluen, the Mékong or "river of Cambodia," and the Ménam, the Nile of Siam. The only other river worthy of notice is the Bangpakong, about 240 m. long. All the rivers of S. are flooded. In the month of June the Ménam begins to rise. In Aug. the whole valley is like an immense sea. The valley is intersected by canals to distribute the benefits of this grand operation of nature, but the lands situated in the middle of great plains derive the greatest advantage from it.

The products of S. are very diversified and almost unlimited in quantity. Its rice is excellent, its sugar the best in the world. Among the other exports are cotton, tobacco, hemp, cutch, dried fish, cocoanut oil, areca-nut, beeswax, precious gums, spices, dye and other woods. In the abundance and variety of its fruit trees, vegetables, and aromatic herbs and spices S. is unsurpassed. The animal king-

dom is equally varied. Tin underlies the whole Malayan peninsula, even down to its extreme S. point; the mines in the island of Salang, off the W. coast, are scarcely less productive than those of Banca. Gold is extensively found; copper, iron, and lead abound. Zinc and antimony, sulphur and arsenic, are also found, and silver in combination; sapphire, ruby, spinel, corundum, amethyst, garnet, black coral, topaz, and other precious stones are found in the hills of Chantaboun, on the E. of the gulf. Salt and salt-petre are manufactured by solar evaporation. S. has 2 seasons, the hot and the dry, the former beginning in Apr. or May, and the latter in July. On the whole, the country is salubrious, but in the wet season and in marshy places ague and cholera are very prevalent.

The Siamese are mainly of Mongolian type. Beside the Siamese, a great variety of races inhabit the terrs. of S., as the Chi., the Cambodians, the Laos, Karens, Shans, Burmese, Peguans, and Malays. The pop. of S. is estimated at about 8,000,000. The whole empire is divided into 49 provs. with their respective p'hayas or govts., and these again are subdivided into dists. under inferior officers. In the arts the Siamese are in advance of their civilization. The gov't. of S. is theoretically a duarchy, practically a monarchy. The person of the king is sacred. His rule is despotic, but it is tempered by law. He may name his successor by will, but the secret council, composed of 12 of the highest officers of state, determine whether that will shall be carried into effect. A second king is also appointed by the secret council. The authority of this second king is dependent on that of the supreme king.

The name of Siam was first heard in Europe—4. e. in Port.—in 1511, 9 yrs. after Alfonso d'Albuquerque had landed on the coast of Malabar and conquered Goa. The kings of S. and Pegu sent embassies to him and sought his alliance and protection. In the 15th century the Ger. traveller Mandelshoe visited Ayodhya, the cap. of S., and called it "the Venice of the East." The Port. explorer Mendez Pinto was in S. in the 16th century. In 1682 an Eng. vessel is said to have reached Ayodhya, and to have found it in ruins. In 1855 a treaty of commerce was negotiated by H. B. M.'s plenipotentiary, Sir John Bowring; in 1856 a treaty was procured by Hon. Townsend Harris, representing the U. S., and one in favor of Fr., through H. J. M.'s envoy, M. Montigny. Since the way was opened to admit a resident consul of each of the treaty powers, millions of dollars have flowed into S. annually by channels through which but a few tens of thousands had been drawn before. Cap. Bangkok. [From orig. art. in *J.'s Univ. Cyc.*, by A. H. LEONOWENS.]

**Siamese Twins.** See ENG AND CHANG.

**Siberia**, the name of the whole N. part of Asia, belonging to Rus., and bounded N. by the Arctic Ocean, E. by different parts of the Pacific Ocean—namely, the Strait of Bering, the seas of Kamchatka, Okhotsk, and Japan—and W. by European Rus., from which it is separated by the Ural Mts. and the river Ural. Its S. boundary has varied very much, as it has been thrown farther S. after every war with Chi. and the independent empires of Central Asia. It seems now, however, to have been finally fixed, since the Rus. conquests in Central Asia have been formed into a separate political division. The area is estimated at 4,826,287 sq. m., the pop. at about 3,947,908. While W. S. is one unbroken plain, the S. and E. dists. of E. S. are mountainous, covered by the Altai Mts. These mts., however, are not high, and in general S. may be described as a plain, sloping from S. to N. toward the Arctic Ocean; and a general view of the surface of this plain may be given by dividing it into 3 longitudinal belts. The northernmost belt, extending along the shore of the Arctic Ocean, consists of swamps frozen several ft. below the surface. The middle belt is one continuous forest of fir, pine, larch, and birch, feeble and stunted when it tries to creep farther N. than lat. 64°, but at lat. 62° generally of a vigorous growth, and swarming with sables, ermines, marmots, martens, squirrels, lynxes, wolves, bears, and beavers. The S. belt is agricultural; in some parts it consists of steppes, best adapted for cattle-breeding; in others all the common European grains and fruits, even the grape, are grown with perfect success.

About ¼ of the inhabs. of S. are Rus., mostly exiles and their descendants. The most remarkable of the native tribes are the Ostiaks in the W., the Calmucks in the Altai, the Booriats, of Mongolian origin, the Toongoses, of Tartar origin, and the Tchoukatchees, related to the Esquimaux, in the E. and N.; they are mostly pagans, and live by fishing and hunting. A peculiar feature of Siberian life is its trade, very extensive as far as regards its own products—furs, skins, metals, fish, caviar, cattle, and grain—and still more extensive as a transit-trade by which large quantities of tea, silk, satin, and rhubarb from Chi. are exchanged for metals, furs, cotton goods, and cutlery from Rus. The commercial centre of S. is Tobolsk, from which the direct highway across the Ural Mts. leads to Perm, which has water-communication with different parts of the country.

**Sibley, Ia.** See APPENDIX.

**Sibley** (HENRY H.), son of Judge Solomon, b. at Detroit, Mich., Feb. 1811, was delegate in Cong. from Minn. Terr. 1849-53; chosen first gov. of the State of Minn. 1858; became brig.-gen. of volunteers Sept. 29, 1863; commanded an expedition against the Indians on W. frontier of Minn. 1863; was brevetted maj.-gen. of volunteers.

**Sibley** (HENRY H.), b. in La. July 1816, grad. from the U. S. Military Acad. July 1, 1838, when appointed second lieut. of 2d Dragoons; first lieut. 1840, capt. 1847, and major 1st Dragoons 1861; served in Fla. war 1838-39 and 1840-41; adjutant of his regiment 1841-46. In the war with Mex. he participated in the siege of Vera Cruz, battles of Cerro Gordo, Contreras, Churubusco, Molino del Rey, and final capture of the City of Mexico, gaining the brevet of major; engaged on frontier duty and on numerous expeditions, notably the Ut. expedition (1857-58, 1859-60), and that against the Navajoes (1860); resigned from the U. S. A. (May 13,



1861), and entered the Confed. service, in which he was soon a brig.-gen. Having organized a brigade in N. W. Tex., he left Ft. Bliss in Jan. 1862 to effect the conquest of N. M., and Feb. 16 appeared before Ft. Craig, commanded by Col. E. R. S. Canby. The action of Valverde was fought Feb. 21, closing by the withdrawal of Col. Canby's troops to the fort. Albuquerque and Santa Fé were occupied by S. in Mar., but the following month he was compelled to evacuate the terr. and return to Ft. Bliss. At the close of the war he entered the service of the khedive in Egypt. He is the inventor of the tent known by his name.

**Sibley** (HIRAM), b. at North Adams, Mass., Feb. 6, 1807, removed early to W. New York. Becoming interested in telegraph-lines, he conceived the idea of consolidating all the companies into one. Associating a few gentlemen with himself, he bought or leased several worthless lines, until finally over 20 corporations were merged into the W. U. Telegraph Co. Large profits resulted to the stockholders and great benefit to the community. Mr. S. subsequently conceived the idea of a line to Cal., and was mainly instrumental in carrying through Cong. a bill which secured a line to the Pacific coast. Few if any have surpassed Mr. S. in the successful efforts which first made telegraph-lines profitable and practicable.

**Sibley** (JOHN LANGDON), b. at Union, Me., Dec. 29, 1804, grad. at Harvard 1825; was assistant librarian there 1825-26; ordained as a Unit. minister at Stow, Mass., May 4, 1829; preached there until Mar. 1833; became ed. and proprietor of the *Amer. Magazine of Useful and Entertaining Knowledge*; was again assistant librarian at Harvard from 1841 to 1856; has edited since 1841 the *Triennial Catalogues of Harvard*, and since 1850 the *Annual Catalogues*; has pub. a *Notice of the Triennial Catalogues of Harvard Univ.*, with a *Reprint of those of 1674, 1682, and 1700* (1865); is author of *Biographies of Harvard Graduates*.

**Sibley** (SOLOMON), b. at Sutton, Mass., Oct. 7, 1769, became a lawyer; was a member of the first legislature of the N. W. Terr. 1799, a delegate to Cong. from Mich. Terr. 1820-23, and judge of the supreme court of Mich. 1824-36. D. Apr. 4, 1845.

**Sibthorp** (JOHN), M. D., F. R. S., b. at Oxford, Eng., Oct. 28, 1758, grad. at Ox. Univ. about 1778; studied med. at Ox., Edinburgh, and on the Continent; made botanical researches in Fr. and Switz.; became prof. of bot. at the Coll. of Phys. 1784; made a botanical tour in S. It., Crete, Cyprus, Asia Minor, parts of European Tur. and Gr. Mar. 1786-Sept. 1787; prof. of bot. at Ox.; one of the founders of the Linnæan Society; regius prof. 1793; made a second botanical exploration of Gr. and the Ionian Islands 1794-95; wrote *Flora Oionensis*, and *Flora Græca*. D. Feb. 8, 1796.

**Sibyl** [Gr. *σῖβυλλα*] was the common name given by the Grs., and subsequently by the Roms., to all old women who were believed to be possessed of prophetic gifts. The most famous of these women was the Cumæan S., so called after Cumæ, in Campania, where she resided. She is believed to be the one that brought 9 books of oracles and prophecies to Tarquinus Priscus, king of Rome. These books were preserved in the temple of Jupiter Capitolinus, but in 83 b. c. were destroyed by fire, together with the temple. A collection of sibylline oracles was then made in It., Gr., Asia Minor, Egypt, and Libya, which was deposited in the new temple of Jupiter Capitolinus. Under the title of *Sibylline Oracles* there still exists a collection of Gr. verses of Jewish, Christian, or pagan origin, probably made in the 2d or 3d century A. D.

**Sicard, se-kar'** (ROCH AMBROISE CUCURRON), b. at Fousseret, dept. of Haute-Garonne, Fr., Sept. 20, 1742, studied theol. and took holy orders at Toulouse; became director in 1780 of a school for deaf-mutes at Bordeaux; succeeded De l'Épée in 1789 as director of the school of Paris; was imprisoned as a royalist in 1792; was suspended by the directory in 1795 from his position as ed. of *Annales catholiques*, but resumed his office in 1799. Wrote *Mémoires, sur l'Art d'instruire les Sourds de Naissance, Cours d'Instruction d'un Sourd-muet, and Théorie des Signes pour l'Instruction des Sourds-muets*. D. May 10, 1822.

**Sicilian Vespers**, the name usually given to the outbreak of the insurrection of the Sicilian people against the French usurper, Charles of Anjou, at Palermo on Easter-day, Mar. 30, 1282, ended with the slaughter of most of Charles's foreign and native adherents throughout the island, and the final overthrow of his domination in Sic.

**Sic'ilies, The Two** (Reame, or *Regno Delle Due Sicilie*), the legal designation of a political state popularly called the kingdom of Naples, founded by the Norman dynasty in the Middle Ages, and comprising the S. E. provs. of It. Sic., and some smaller islands near the coast. The possessions of the state, which had no foreign dependencies, lay between N. lat. 36° 45' and 42° 52' and E. lon. 11° 55' and 18° 32', and contained about 33,000 sq. m.

**Sic'ily, Island of** [It. *Sicilia*; Lat. *Sicilia*, *Sicania*, *Trinacria*], the largest island of the Mediterranean, lying near the centre of that sea, belongs to the kingdom of It., from which it is separated by the Strait of Messina. It forms a nearly isosceles triangle, and contains about 11,900 sq. m., with a pop. of 2,922,757. The coast has a total development of about 700 m., but has few harbors suitable for vessels of great burden. Near the N. E. point of the island commences a chain of mts. of anc. geological formation, corresponding to those of Calabria. Its general direction is S. S. W. to Taormina, then turns to the W., and runs about parallel with the N. coast, and in general very near it, attaining a height of from 2000 to 3500 ft. to its culmination nearly S. from Cefalù in the Madonia Mts., the highest summit of which rises to the elevation of 6478 ft. There the chain divides into 3 ridges, often interrupted, running with diminishing height, S. W., S., and S. E., toward the S. coast of the island. The N. scarp of the coast-mts. is abrupt, the S. much more gradual; and in fact the general surface of the island may be considered an irregular plateau, descending

from the N. or coast-chain to the S. E. The S. E. portion of the island consists of gypseous and cretaceous mts. and plateaux, nowhere rising above 3000 ft., and it is in this region that the sulphur-mines of S. are found. Mt. Etna is an isolated volcanic peak, resting on a base about 30 m. in diameter, and rising to the height of 10,935 ft. The Macaluba, or mud volcano, near Girgenti, and various phenomena observed on the S. coast point to a renewal of volcanic activity in that region. The general surface of S. is very irregular, and there are no plains of any considerable extent, that of Catania being the largest. There are few lakes or ponds in the island. The temperature is agreeable except during the prevalence of the sirocco; in general it is not unhealthy. The soil is of exuberant fertility, but the agriculture generally is of the most primitive description. The manufactures are not of great importance. The fisheries are prosecuted with more energy than most branches of Sicilian industry.

In spite of the devastations of earthquake, volcano, and malaria, few regions of the earth are more favored by nature than this island, but from moral causes these advantages have been turned to little practical account, and the populace is ignorant, indolent, and vicious. The classic authors have preserved us many traditional accounts of the earliest inhabs. of S., but the proper hist. of the island goes no farther back than the colonization of the coasts by Gr. adventurers, beginning, it is alleged, in the 8th century B. C. Near the end of the 5th century B. C. the Carthaginians were invited by an expelled despot to interfere in Sicilian affairs, but were defeated. In 415 B. C. Athens sent a powerful force to the island for the protection of its allies in S. The Athenians were totally defeated. The Carthaginians now made themselves masters of a great part of it. Peace and war with the remaining terr. alternated for a long time, and about the yr. 278 B. C. Syracuse invoked the aid of Pyrrhus, who was victorious against the Carthaginians. A few yrs. later the Mamertines invited the Roms. to protect them against the Carthaginians. The Roms. consented, and their interference in B. C. 264 was the occasion of the first Punic war. The Roms. soon reduced the whole island. S. shared the fortunes of the other Rom. provs. until the downfall of the Empire. It then passed under the dominion of the Goths, from whom it was conquered by Belisarius, and it remained a Byzantine possession till the 9th century, when a new Afr. invasion subjected it to the Saracens. The Mussulmans held the island till it was torn from them by the Norman invasion, commencing in 1061 A. D., and ending by the submission of all S. to Duke Roger, whose son, Roger II., conquered a part of S. It., and was crowned king of the Two S. in 1127. On the failure of the Norman line, the pope bestowed this kingdom on Charles of Anjou, who was expelled by the revolt of the Sicilian Vespers in 1282, and succeeded by Peter III. of Aragon. The Aragonese dynasty reigned until 1576, when S., with its other possessions, was transferred to the Sp. crown. In 1706 Aus. obtained possession of S. The Peace of Utrecht in 1713 gave the sovereignty to Victor Amadeus of Savoy who ceded it to Aus. in 1717 in exchange for the island of Sardinia. In 1734 Sp. obtained possession of S., and in 1736 the island was reunited with Naples under Don Carlos as king of the Two S., and continued to be ruled by the same dynasty until its liberation in 1860.

GEORGE P. MARSH.

**Sick'les** (DANIEL E.), b. in New York Oct. 20, 1822, was ed. at the Univ. of New York; admitted to the bar in 1843; became identified with politics, and in 1847 was elected to the State legislature as a Dem. In 1853 he was appointed corporation atty. of New York, and the same yr. accompanied Mr. Buchanan to Eng. as sec. of legation. Returning in 1855, he was elected State senator, and the following yr. was chosen M. C. from New York, and re-elected in 1858 and in 1860. On the outbreak of the c. war he raised the Excelsior Brigade, and in June 1861 was appointed col. of one of its regiments, the 70th N. Y. In Sept. 1861 he was nominated a brig.-gen. of volunteers; commissioned maj.-gen. of volunteers Nov. 29, 1862, and was distinguished at the battle of Chancellorsville, May 3-4. At Gettysburg he lost a leg early in the second day's fight. In 1869-67 he commanded the military dist. comprising N. and S. C. On the 28th of July 1866 he was appointed col., and in Apr. 1869 was retired from active service upon the rank of maj.-gen. In the latter yr. he was appointed U. S. minister to Sp., which position he resigned in 1874. He received the brevets of brig.- and maj.-gen. U. S. A. for gallantry.

**Sic'yon**, an anc. city of Gr., was situated in the N. part of Peloponnesus, near the Corinthian Gulf, on a steep hill surrounded with strong walls. It was originally a Dorian settlement, and sided in the Peloponnesian war with Sparta. The city was noted as one of the prin. seats of fine arts in Gr. In the beginning of the Chr. era it fell into decay.

**Sid'dons** (SARAH), daughter of Roger Kemble, b. in Brecon, South Wales, July 5, 1755. She was familiar with theatres and theatrical people from infancy; played as a girl in her father's company; married Mr. Siddons, an actor, at 18; made her first appearance at Drury Lane, with Garrick, as Portia in *The Merchant of Venice*, in 1775, but made no mark; retired in disappointment, but reappeared in 1782. This time she made a deep impression as Isabella in *The Fatal Marriage*, and began her career of extraordinary success. For 30 yrs. until her retirement in 1812, she was the queen of the Eng. stage. Her favorite and famous characters were Lady Macbeth, Queen Constance, Queen Catharine, Jane Shore, Isabella, Ophelia, Desdemona, Portia, and Imogen. Her last appearance as an actress was in 1818, when she played for Charles Kemble's benefit. Thenceforth she lived in retirement. D. June 8, 1831.

**Sidell** (WILLIAM H.), b. in New York Aug. 21, 1810, grad. from the U. S. Military Acad. July 1833, when assigned to the 1st Artl. as brevet second lieut.; adopted the profession of civil engineering; was a city surveyor of New York and an assistant engineer on the Croton aqueduct, Brooklyn



dry dock, etc., until 1837; became prin. assistant to Capt. Talcott in the hydrographic survey of the delta of the Miss. River; was engaged in the construction of R. Rs. in various parts of the U. S., and in 1851-52 was assistant to Maj. J. G. Barnard in the survey of a railway route across the Isthmus of Tehuantepec; in 1858 he was appointed chief engineer of the same route, in which capacity he completed the location for a railway and constructed a carriage-road 110 m. long from Salina Cruz on the Pacific to Suchil on the Coatzacoalcos River. On the outbreak of c. war he accepted (May 14, 1861) the commission of major of the 15th U. S. Inf., but was assigned to duty as mustering officer in the dept. of the Cumberland; transferred to Louisville, Mar. 1863, as acting assistant provost-marshal-gen. of Ky., resuming soon after the duties of gen. supt. of recruiting and chief mustering officer of the State; in 1867 he joined his regiment, the 10th Inf. (to the lieut.-colonelcy of which he had been promoted in 1864), with which he served in Dak. Terr. until 1869, when placed in charge of the depot of the gen. recruiting service at Ft. Leavenworth, Kan.; retired from active service Dec. 15, 1870. For meritorious services in the war he was brevetted col. and brig.-gen. U. S. A. D. July 1, 1873.

**Sidereal System.** See ASTRONOMY AND STARS.

**Sidereal Time.** See TIME.

**Sid'ërite** [Gr. σιδήρης, "iron"], the mineralogical name for spathic iron ore. (See IRON, ORES OF.)

**Sid'i Moham'med**, b. in 1803, the eldest son of Abderrahman, succeeded his father in 1859 on the throne of Morocco; was involved in a war with Sp. on account of the piracies along the coasts of his dominions; compelled to cede to Sp. some terrs. and pay a very heavy war-indemnity. D. Sept. 30, 1873.

**Sid'mouth** (HENRY ADDINGTON), VISCOUNT, b. at Reading, Eng., May 30, 1757, ed. at Winchester School and at Brasenose Coll., Ox.; studied law; was admitted to the bar 1784; entered Parl.; was speaker of the House of Commons from 1789 until 1801, when, on the resignation of Pitt as prime minister, he formed a new ministry, accepting the posts of chancellor of the exchequer and first lord of the treas.; directed the negotiation of the Peace of Amiens 1802; supported a war-policy 1803; resigned office 1804; was raised to the peerage and made pres. of the council Jan. 12 1805; was lord privy seal in Grenville and Fox ministry 1806-07; was sec. of state for home dept. 1812-22, and member of cabinet without a portfolio 1822-24. D. Feb. 15, 1844.

**Sid'ney**, cap. of Cheyenne co., Neb., on R. R. and Lodge Pole Creek. Sheep-farming is a leading industry in this vicinity. Pop. 1870, 369; 1880, 1069.

**Sidney**, R. R. June, cap. of Shelby co., O., has factories, flouring-mills, etc. Pop. 1870, 2808; 1880, 3823.

**Sidney**, or **Sydney** (ALGERNON), b. about 1622, was a son of the earl of Leicester. When the great rebellion broke out, he and his elder brother set out to join the royal army in Eng.; were arrested at Liverpool by order of Parl.; King Charles I. believed that this was done by their own procurement, and sharply censured them, upon which the brothers joined the Parliamentary army, Algernon being made a capt. of horse in the regiment of the earl of Manchester. He was severely wounded at the battle of Marston Moor May 1644, and in Apr. 1645 was made col. of a regiment. In 1644 his brother, Lord Lisle, was appointed lieut.-gen. of Ire., and he was made lieut.-gen. of horse and gov. of Dublin; in that yr. he was chosen M. P. for Cardiff; in 1647 he was made gov. of Dover. In 1648 he was one of the judges at the trial of Charles I. Being opposed to the protectorate of Cromwell, he retired from Parl. in 1653, but when the Long Parl. was restored in 1659 he resumed his seat. He was absent from Eng. at the time of the Restoration, and lived abroad in exile for nearly 15 yrs., and labored all this time to bring about the establishment of a republic in Eng. In 1677 he received a pardon from the king, with permission to return to his native country. After the discovery of the Rye-House plot in 1683 he and Russell were arrested and committed to the Tower on a charge of high treason. The trial was opened Nov. 7, 1683, and on Dec. 7 he was beheaded.

**Sidney**, or **Sydney** (SIR PHILIP), b. at Penshurst, in Kent, Nov. 9, 1554, was the son of Sir Henry Sidney, the favorite of Edward VI.; was placed at school in Shrewsbury; studied at Ox., and afterward at Cambridge; in 1572 received a special license from the queen to go beyond the sea in order to perfect himself in foreign tongues; was received with great favor by Charles IX. in Paris; visited Belg., Ger., Hungary, and It., in all of which countries he was noted for his skill in knightly exercises, as well as for his fondness for lit. and art; returned to Eng. in 1572 and rose to high favor at court; was sent on a mission to Vienna, to urge an alliance of all the Prot. states against the overshadowing power of Sp.; upon his return he found Elizabeth meditating a marriage with the Fr. duke of Anjou, and addressed to her a spirited remonstrance against the match; his favor declined, and not long after the queen sharply rebuked him for having had the presumption to quarrel at tennis with the earl of Oxford, a nobleman, while he was only a simple gentleman; withdrew from court, retiring for a time to the seat of his brother-in-law, the earl of Pembroke, where he devoted himself mainly to literary pursuits. Wrote his pastoral romance *Arcadia* and his *Defence of Poesie*, upon which his literary fame mainly rests; the queen's favor for him revived, and he took a prominent part in all pageants of the court. In 1583 he was knighted, and married the daughter of Sir Francis Walsingham. The war was now raging between Sp. and the Netherlands, and Elizabeth made some show of assisting the Dutch. In 1585 S. was appointed gov. of Flushing, and soon after was made gen. of horse under his uncle, the earl of Leicester, in which capacity he gave promise of much military ability. On Sept. 22, 1586, he encountered a body of the Spaniards under the walls of the town of Zutphen; in the third and decisive charge received

a musket-bullet in the thigh, and was carried to Arnheim, where he d. Oct. 7, 1586.

**Sid'on**, or **Zidon**, an anc. city of Phœnicia, on the coast of the Mediterranean, near the site of the present *Saida*, attained by its manufactures and commerce very early a great celebrity. It had commercial stations in Sic., Sard., Sp., and on the N. coast of Afr.; it made expeditions to the Brit. Islands and into the Baltic; and the fame of its purple, glass, linen, gold, silver, and ivory ware was of a thousand years' standing. Its most brilliant period seems to have been between 1000 and 1300 B. C. It still flourished under Per. rule, but after an unsuccessful revolt against Artaxerxes Ochus in 351 B. C. it was nearly destroyed. During the Gr., Syrian, and Rom. dominion it sank more and more. During the Crusades it was alternately held by the Chrs. and the Saracens. In 1291 Malek Ashraf razed it.

**Sidonius Apollinaris.** See APOLLINARIS SIDONIUS.

**Siemens** (ERNST WERNER), b. at Leuthe, near Hanover, Dec. 13, 1816, entered the Prus. army as an officer of artil. in 1838; studied chem. and electro-magnetism; took out a patent for electro-plating and gilding in 1841, and laid in 1848 the first submarine mines exploded by electricity; left the army in 1849, and founded a telegraph-building establishment in Berlin, which built the telegraph lines of Rus., Sp., Brazil, N. Ger., etc. Among his inventions and improvements are the method of determining the position of injuries in subterranean and submarine lines, of examining insulated wires, of charging subterranean and submarine conductors in order to lessen the disturbing influences of induced currents in the cables.—His brother, KARL WILHELM SIEMENS, b. at Leuthe Apr. 4, 1823, was ed. at Göttingen; settled in 1843 in Lond. as a civil engineer, and founded there in 1853 a branch of the Berlin house, with immense telegraph-building establishments at Woolwich and extensive steel-works at Landore in Wales. He invented the regenerating gas furnace, the bathometer, a pyrometer, etc., and pub. *On the Conversion of Heat into Mechanical Effects, On a Regenerative Steam-engine*, etc.

**Si'ena** [Sena], city of It., chief town of the prov. of the same name, covering a beautiful hill, a spur of the Chianti chain, which divides the valley of the Ombrone from that of the upper Arno. It lies in lat. 43° 22' N., lon. 11° 11' E., and is connected with Florence (60 m. N.) by a railway that now extends to Rome. The climate of S. is colder than that of most It. towns in the same lat., the prevailing wind being from the N. E. The walls are about 4 m. in circumference; the citadel occupies the N. W. corner of the town, which is entered by 9 gates; and the prin. streets radiate in irregular lines from the Piazza Vittorio Emanuele, a fine large open space nearly in the heart of the city. The public buildings of S. are very remarkable. The Duomo, or Chiesa Metropolitana, one of the wonders of It., stands on an elevation not far from the centre of the town. It is one of the finest existing specimens of It. Gothic arch. In the ch. of St. Agostino and in several others, in the ex-convent of S. Domenico, and in many private palaces there are choice pictures by Spagnoletto, Perugino, Lippo Memmi, Salimbeni, Baltasar, Perruzzi, etc., and above all by the celebrated Sodoma or Bazzi, whose works are nowhere so well studied as in S. Among the palaces should be noticed the F. Tolomei (1205) and the F. dei Governi, one of the grandest in Tuscany. The Acad. of Fine Arts is very rich, especially in pictures of the Sienese school. The Univ. of S. shows its records as far back as 1240.

**Siena** (*Sena*) was raised about the time of the emps. to the dignity of a *colonia*, with the name of *Sena Julia*. As early as the reign of Charlemagne it was governed by a count. In the disputes between the papacy and the Ger. emps. S. at first took the side of the former, and developed into an independent commonwealth. In the twelfth century the chief authority was exercised by the bp. in conjunction with one consul; but soon after the number of consuls was increased, and by degrees the whole power was vested in them. The first of the many wars between S. and Florence occurred in 1141-45, and the Florentines were the victors. In 1186 S. joined the other large Tuscan commonwealths in their resistance to Henry, son of F. Barbarossa, but was reconciled to the emp. with large privileges. Not long after this a successful democratic movement was made to compel the selection of a certain proportion of the consuls from among the *guilds*, and a powerful party was thus formed against the aristocracy. In 1260 took place the famous battle at Montaperti, between the rival republics of Florence and S., where the latter won a victory which the Sienese of to-day talk of with pride. After various changes in the names and powers of the chief magistracy, the govt. of the commonwealth fell into the hands of Pandolfo Petrucci (1480), who continued successfully to direct public affairs until 1512. After his death the Medic, by the help of the Spaniards, annexed S. to the terr. of Florence. There is little activity of any kind in S. Pop. 25,000.

**Sien'na** [It. *terra de Siena*, "earth of Sienna"], an ochreous earth which when ground forms an excellent pigment called raw S., and when burned assumes a still richer orange-red tint. It is brought from It.

**Sier'ra Leo'ne**, a Brit. possession and colonial settlement on the W. coast of Afr., in lat. 8° N., consists of some islands and a peninsula, bounded N. by Sierra Leone River and S. by the Bay of Yawry. Its boundary toward the interior is somewhat undefined, yet its area is given at 468 sq. m. The soil is fertile, but the climate is hot and unhealthy. All tropical plants and fruits grow luxuriantly, and palm oil, pepper, ginger, gum-copal, ground-nuts, etc. are exported. Sugar, coffee, indigo, and cotton have been introduced, and succeed well. Pop. 38,963.

**Sier'ra Ma'dre**, the name of one of the prin. mt.-ranges of Mex., commencing a little N. of the City of Mex. and extending from lat. 19° to 25° N., and from 34° to 38° N. in N. M. As a whole these ranges are not well explored; in some places they contain very rich silver deposits.



**Sier'ra Neva'da**, a mt.-range of S. Sp., extends between the basin of the Guadalquivir and the Mediterranean. Its highest peaks are Mulhacen, 11,658 ft., and Veleta, 11,387 ft.

**Sierra Nevada** [Sp. for "snowy range;" the word *sierra* means "saw," and refers to the notched outline of the mts. as seen against the sky], a range of mts. in Cal., continuous northward with the Cascade Mts., and southward of the San Joaquin Valley, uniting near the Tejon Pass with the Coast Range. The S. N. extends along the E. border of the State. Numerous peaks reach an elevation of 10,000 or 15,000 ft. Among these are Lassen's Butte (10,577 ft.), Pyramid Peak Mts., Whitney (15,068), Dana (13,237), Brewer (13,586), Tyndall (14,386), Lyell (13,217), Shasta (14,444), Williams (14,500), and many others. Quartz-mining for gold, the cutting of timber, and the pasturage of sheep are important industries in these ranges. The Sierras are crossed by Central Pacific R. R.

**Sleyès**, se-ess' (EMMANUEL JOSEPH), commonly known as the **Abbé Sleyès**, b. at Fréjus, dept. of Var, Fr., May 3, 1748, was ed. for the Cl. at the sem. of St. Sulpice, Paris; took orders and became vicar-gen. and chancellor to the bp. of Chartres in 1784; in Jan. 1789 attracted the attention of the Fr. people by his pamphlet, *Qu'est ce que le Tiers État?* and having been elected a member of the States-General by Paris, he originated some of the most decisive steps toward the Revolution. He proposed that the three estates should examine their credentials in common, that the third estate should constitute itself as a national assembly, etc.; and his pamphlet, *Reconnaissance et Exposition des Droits de l'Homme et du Citoyen* (July 1789), was the precursor and immediate occasion of the declaration of the rights of man. As the Revolution ceased to be a philos. and became a passion, Abbé S. lost his influence, and during the Reign of Terror he entirely disappeared from public life. After the fall of Robespierre he returned; became a member of the Directory May 16, 1799; prepared and carried through the revolution of Nov. 9, 1799, by which the Directory was overthrown and the consular govt. instituted; retired from his consular office and took part henceforward very little in politics. Nap. made him rich, a count, a senator, etc., and seemed to have partiality for this *idéologist*. After the Restoration S. was banished from Fr. as a regicide, and removed to Brussels. After the revolution of 1830 he returned to Paris, and d. there June 30, 1836.

**Sigel**, see-gel (FRANZ), b. at Zinsheim, Bavaria, Nov. 18, 1824, grad. in the military school at Karlsruhe; became an officer in the army of the grand duke of Baden, in which he attained the rank of adjutant 1847; took part in the revolutionary movement of 1848; embarked for the U. S.; became major of the 6th regiment of N. Y. militia; settled in St. Louis, Mo., 1854, as prof. in a coll.; was commissioned early in 1861 col. of the 3d Mo. Volunteers; took part in the capture of Camp Jackson; fought the desperate battle of Carthage July 5; was second in command under Lyon at Wilson's Creek, Aug. 10; conducted the retreat from Springfield to Rolla; was thereupon commissioned brig.-gen., to date from May 17; commanded a division under Fremont in his campaign in S. Mo.; took an active part in the battle of Pea Ridge, Mar. 6-8, 1862; made maj.-gen., dating from Mar. 21; was placed in command of Harper's Ferry June 2; served under Pope in his Va. campaign, taking a prominent part in the second battle of Bull Run, Aug. 29-30; was placed in command of the 11th army corps Sept. 14, 1862; became commander of the dept. of W. Va. Mar. 1864; was defeated by Breckenridge at Newmarket May 15. He was chosen regis. of New York co. Nov. 1871.

**Sigh'ing** is a peculiar form of respiration, in which a long, slow, full inspiration is followed by a forcible, prolonged expiration, producing a blowing sound from the escape of air through the mouth and nostrils. It is simply a more complete respiratory act than ordinary respiration, resulting in a more perfect renewal of the air in the lungs, the insufficiency or impurity of which it is the expression, the effect of previous inactivity. It has thus become an expression of despondency, whether due to real sorrow or unsatisfied longings; also of relief from suspense. It is common to the Mammalia.

W. R. BIRDSALL.

**Sight**. See VISION and OPHTHALMOLOGY.

**Sight, Defects of**. Defects of sight are due either to (1) errors of refraction, (2) opacities of the refractive media, (3) lesions of the optic nerve, retina, or choroid, or (4) continued exclusion of the eye from visual purposes.

(1) In the lesser degrees of deviation from the normal condition of refraction (emmetropia) the vision can generally be raised to the normal standard by the use of suitable glasses, but in very high degrees of ametropia the sight can rarely be raised to over  $\frac{1}{4}$  or  $\frac{1}{2}$  the normal. In high degrees of myopia and myopic astigmatism there is usually an affection of the choroid (staphyloma posticum), which increases the area of Mariotte's "blind spot," and, when extensive, encroaches upon the region of the macula and interferes very seriously with the acuity of the sight. In high degrees of hypermetropia and of hypermetropic and mixed astigmatism all objects are seen under large circles of dispersion, and hence with great indistinctness. The eyes are thus, under the influence of prolonged bad vision, so affected that they do not, even when an existing refractive error has been corrected, at once exhibit the expected sharpness of vision. In young subjects this defect often passes away quickly under exercise of the organs with the correcting lens. It is difficult, and often impossible, to correct with glasses those defects of vision arising from irregular astigmatism.

(2) Serious defects of sight may arise from opacities of the cornea so slight that they can only be perceived by the aid of the ophthalmoscope or of a powerful convex lens. In the other extreme the cornea may be entirely opaque, thus reducing the vision to bare perception of light. Where the pupil is covered with opaque cornea, and another part

of the cornea is transparent, vision is often in a great measure restored by making an artificial pupil immediately behind the clear portion of the cornea. The deformity produced by opacity of the cornea is sometimes removed by tattooing the white spot with India-ink. Next we have opacities of the crystalline lens and its capsule. An infrequent form of opacity of the anterior capsule is the unabridged remains of the pupillary membrane of fetal life. This usually consists of one or more filaments of opaque tissue stretched from the pupillary border of the iris to a point of attachment near the centre of the anterior capsule. Opacities of the lens constitute what is known as cataract. This, like nearly all other affections of the eye causing defects of sight, may be either congenital or acquired. It may be the result of a blow upon the eye, or of diabetes, or of the general breaking down of the system, and consequent malnutrition of the lens due to old age. Whatever may be its cause, it can in no case be removed except by surgical operation. Opacities of the vitreous may be due to hemorrhage from the retinal or choroidal vessels, and the consequent mingling of blood with the vitreous humor, or to inflammatory or degenerative changes in the humor itself. A curious form of vitreous opacity is produced by the formation of numerous crystals of cholesteroline in that fluid, presenting a brilliant ophthalmoscopic picture, like a shower of sparkling meteors.

(3) Inflammation or atrophy of the optic nerve, or of either of the coats forming the back wall of the eye, separation of the retina from the choroid, tumors of the optic nerve and retina, hemorrhages into the substance of the retina, all produce grave defects of vision, and can be diagnosed only by means of the ophthalmoscope.

(4) In cases of squint of one eye, either convergent or divergent, the image of the object formed upon the retina of the deviating eye is almost always involuntarily suppressed. Thus the eye is excluded from vision, and gradually loses the power of performing its function, as would be the case with any other unused organ. When such an eye has been restored by operation to parallelism with its fellow, the visual power not unfrequently increases to a marked degree. In alternating squint, where the individual sees first with one eye and then with the other, the sight remains good in both eyes. Hence in these cases there is not the same urgent necessity for an early operation.

In cases where one eye is emmetropic and the other very hypermetropic, more or less impairment of vision of the latter usually occurs. This, if it has not gone too far, may often be remedied by daily and regular exercise of the amblyopic eye with a glass correcting the refraction, the perfect eye being temporarily excluded. Cases occasionally come under observation where it is impossible to detect any cause for the defect, which may range from a slight impairment of vision to total blindness. Ophthalmologists not very infrequently meet with cases in which defective vision of one eye had existed for many yrs. before it was accidentally discovered. (See also VISION.)

DAVID WEBSTER. REVISED BY CORNELIUS R. AGNEW.

**Sigilla'ria** [Lat. *sigillum*, a "seal," referring to the numerous marks left by the leaf-stalks], a genus of fossil trees of the coal-measures of the true Carboniferous era. Trunks have been found 5 ft. in diameter and 70 ft. long.

**Sig'ismund**, emp. of Ger. 1411-37, the last of the house of Luxemburg, b. Feb. 14, 1362, a son of the emp. Charles IV.; received after his father's death (1378) the margravate of Brandenburg, while his elder brother, Wenceslas, king of Bohemia, succeeded as emp. Having been betrothed to Maria, the eldest daughter of Louis the Great, king of Hungary and Poland, he became heir-apparent to these 2 crowns. But on the death of Louis (1383) the Poles chose his younger daughter, Hedvig, queen; Charles Durazzo seized the regency in Hungary, and Maria was kept in captivity by John Horvath, ban of Croatia. S. succeeded, however, in rescuing and marrying her, and was crowned king of Hungary in 1387. He now undertook a war against the Turks, but was completely routed at Nicopolis (1392) by Bajazet, fled to Gr., and found, when in 1401 he returned to Hungary, his queen dead, his throne occupied by Ladislas of Naples, and his brother deposed in Ger., and vindictive himself only with difficulty in Bohemia. In 1403 he expelled Ladislas, and again took possession of the throne of Hungary, and in 1410 was elected emp. of Ger. In 1414 he induced Pope John XXIII. to convoke an ecumenical council at Constance in order to reconcile the Hussite party with the Ch. He gave Huss a safe-conduct to the council, but he broke it; Huss was burned, and the Hussite war commenced, which did not end until shortly before his death (Dec. 9, 1437).

**Sigismund**, the name of 3 kings of Poland of the Jagellonian dynasty: SIGISMUND I., THE GREAT, b. Jan. 1, 1467, a son of Casimir IV., was chosen duke of Lithuania in 1506, and succeeded in the same yr. his brother Alexander on the Polish throne; was successful in repelling the invasions along the E. and S. frontiers by the Rus., Tartars, Moldavians, and Wallachians; understood how to curb the arrogant nobility; was prudent in his expenses, and a patron of lit.; favored the Ref. After the death of his first wife, Barbara Zapolska, he married Bona Sforza of Milan, who partly averted the love of his subjects from him. D. Apr. 1, 1548, and was succeeded by his son, SIGISMUND II., AUGUSTUS, b. Aug. 1, 1530, who opposed the queen-dowager with great decision. In 1553 Bona left Poland. At the Diet of Lublin (1569) S. succeeded in uniting Lithuania firmly to Poland, and at the Diet of Warsaw (1572) he granted religious liberty. Volhynia and Podolia were also incorporated, and his reign was a period of great prosperity. D. July 18, 1572, and with him the male line of the Jagellonian dynasty became extinct. But his sister, Catharine, who was married to John III., king of Swe., had a son, SIGISMUND III. (1587), and was crowned king of Poland as SIGISMUND III. (1587), and was crowned at Cracow; surrounded by Jesuits, his only passion was to unite Swe. and Poland, in order to re-establish Romanism



In the former and suppress the Ref. in the latter. In 1592 John III. died, and S. succeeded him as king of Swe., but in 1604 he was deposed by the Swe. estates. Unwilling to give up his claims, he then began that long series of wars with Swe. which contributed not a little to the final ruin of Poland. His relations to Rus., where he supported the false Demetrius; to the Cossacks, whom he attempted to convert to the R. Cath. Ch.; to the Turks, whom, however, he defeated at Choczim in 1621, were equally awkward, and in the interior his fanaticism and violence called forth one dangerous insurrection after another. D. Apr. 30, 1632.

**Sigmaringen.** See HOHENZOLLERN.

**Sign,** in astron., a portion of the ecliptic, containing a 12th part of the complete circle, or 30 degrees. The first sign commences at the point of the equator through which the sun passes at the time of the vernal equinox; and the signs are counted onward, proceeding from W. to E., according to the annual course of the sun around the circle.

**Signal Service.** The necessity of some means of communication in military service at distances beyond the reach of the human voice led to the organization of signal corps at very early periods. The invention of the electric telegraph greatly developed organizations of this description, and telegraph corps are now attached to almost all armies. Under the system adopted for use in the army and navy of the U. S., devised by Gen. Albert J. Myer, messages written in words or characters in any lang. or of any description can be sent by signals by day or night as far as one man can be made by any means to see another. The apparatus used in the S. S. of the U. S. A. is light and portable; it can be carried in the hand, on foot, or on horseback. Signals conveying messages are made by motions of flags by day or by torches by night.

In time of war the S. S. of the U. S. A. is equipped to maintain communication by signals, by telegraph, or by semaphores between different portions of an army or armies, or between armies and fleets. The field-telegraph trains of the S. S. are organized for use with armies; they are managed by soldiers, who are drilled to march with, manœuvre, work, and protect them. The train carries light or field telegraph lines, which can be very quickly erected or run out at the rate of 2 or 3 m. per hour; they can be put in use for any distance, and be as rapidly taken down, repacked, and marched off with the detachment to be used elsewhere. In time of peace the S. S. transmits intelligence in reference to storms or approaching weather-changes by the display of signals of warning and by reports posted in the different cities and ports of the U. S. Maps showing the state of the weather over the U. S. are exhibited at board-of-trade rooms, chambers of commerce, and other places of public resort. Bulletins of data for all the stations are also prominently displayed and distributed without expense to the leading newspapers. Signal stations are also established in connection with the life-saving stations. These stations are connected by telegraph, and, in addition to displaying storm-warning signals and making the usual meteorological reports, make special reports upon the temperature of the water, tempests at sea, the sea-swell, etc. They also summon assistance to vessels in distress from the nearest life-saving stations or from the nearest port. Stations for river reports, to give notice of the conditions of the rivers affecting navigation and floods, are also established on the prin. interior rivers and their tributaries. The officers and men of the S. S. are instructed for the different branches of the service at Ft. Whipple, Va., and at the central office in Washington. [From orig. art. in *J.'s Univ. Cyc.*, by CAPT. H. W. HOWGATE.]

**Signals, Fog.** See FOG SIGNALS, by J. HENRY, LL.D.

**Sigourney,** sig'ur-ne, city, on R. R., cap. of Keokuk co., Ia. Deposits of coal exist. Pop. 1870, 992; 1880, 1735.

**Sigourney.** LYDIA HOWARD HUNTLEY, b. at Norwich, Conn., Sept. 1, 1791, began to write verses at 7; pub. a vol. of *Moral Pieces in Prose and Verse* (1815), which brought her into favorable notice, and was thenceforth through a long life one of the most popular of Amer. female poets. She pub. 59 vols. of poems, essays, and letters, chiefly on moral or religious themes. In 1819 she married Charles Sigourney, a merchant at Hartford, and d. June 10, 1865. Among her works were *Letters to Young Ladies*, *Zinzendorf and other Poems*, *Pocahontas and other Poems*, etc.

**Sigüenza y Góngora, de** (CARLOS), b. in the City of Mex. in 1645, ed. in the univ. of that city; became chaplain to the abp. of Mex.; was for 30 yrs. prof. of astron. and math.; wrote several treatises on Mex. hist. and antiquities; was director of the military school at Mex.; accompanied the expedition of Andrés de Pés against the Fr. establishments in La. and Fla. 1693; planned the fortifications of Pensacola; pub. maps of the Fla. coast, a description of the Bay of Galveston, brief hist. of Tex. and N. M., etc. He entered the order of Jesuits 1693. D. Aug. 22, 1700.

**Sikhs,** seeks, the "disciples" (so the name imports) of certain religious teachers in Upper India who have played a notable part in Indian hist. during the last 100 yrs. The original founder of the Sikh doctrine was Nānak, b. near Lahore in 1469, of the Khatri caste, warriors once, but then and now offener traders. He is alleged to have roamed not only over India, but through Per. to Mecca. At last he returned home to resume his place in the household, and passed the rest of his life in preaching fervently, if somewhat vaguely, to Hindoo and Mohammedan alike, the worship of one God, virtue, and tolerance. He did not apparently claim a miraculous commission, nor did he attempt to change social usages; he appeared to recognize both Mohammed and the Hindoo incarnations as bearing divine missions; he gave no encouragement to asceticism, and he retained ordinary Hindoo lang. as to transmigration and kindred tenets. Nānak d. in 1539. A line of Gūrūs or chief teachers succeeded him, among whom Govind was the tenth and last and most memorable. Govind not only deepened the warlike stamp already for some time impressed on the

"disciples," but deliberately fixed his aim in the destruction of the hated Mohammedan power, and strove to recast and inspire the S. organization as a militant Ch. and nation devoted to that task. Govind d. 1708.

Neither Nānak nor Govind formally abolished caste, but practically their inst., receiving disciples from all classes, wrought in that direction. Govind enjoined that God was to be worshipped without images, but beheld in the body of the *Khālās* or Congregation of the Faithful. All S. were to be initiated by one rite: they were to be entirely at the disposal of the Faith and of the Gūrū. They were to honor Nānak and his successors; to bow in reverence only before the holy *Granth* or Book; to bathe in the holy pool of Amritsar; to look to war as their occupation and field of desert. Steel was to be their sacred emblem; sweetened water stirred with steel in the presence of 5 S., and then partly sprinkled on the novice, partly drunk by him, formed the initiatory rite. Each initiated S. was to assume the title of *Singh* (*Sinha*, "a lion," "a champion"), to keep his locks unshorn, and dress in blue, to abstain from tobacco; and their salutation was to be "Victory to the Gūrū!" The toleration of Nānak, at least as regarded Mohammedans, formed no part of Govind's teaching.

Beside the warlike disciples of Govind and his forerunners, there was a class of S. which at an early period disapproved of the secular turn taken by the majority, and gave themselves more strictly to devotion, claiming Sri Chand, Nānak's son, as their teacher. Representatives of these are found in many Indian cities, sometimes gathered in convents and devoting their time to theistic worship and the perusal of the *Adi Granth*. The S. present a striking instance of the effect of moral causes on the outer man. From a sect they have become a nation, not only with a national spirit, but with a strongly characteristic physique and physiognomy. Among all the bronze-tinted races they present probably the finest examples of manly beauty and dignity of aspect, whether as princes or warriors. [From orig. art. in *J.'s Univ. Cyc.*, by MAJ.-GEN. H. YULE.]

**Sik'im,** a dist. in the E. Himalaya (Bengal presidency, Brit. India), due N. of Calcutta, of 1284 sq. m., with 94,712 inhabs. Chief place, Darjiling, with an elevation of 7168 ft.; it is 78 m. from the foot of the hills, and is reached from Calcutta in a journey of from 3 to 4 days. Darjiling is a flourishing civil station with numerous European residents, situated on a spur of the gigantic mts., exceeding 28,000 ft., which cover the N. part of the dist. The planting of tea and cinchona proved extremely profitable. Rice, millet, oranges, and some sorts of a common Tibetan cloth are the prin. articles of production; the revenue of the raja is supposed to amount to 7000 rupees, exclusive of the heavy transit-duties and tolls to be paid on crossing rivers spanned by bridges.

**Silanius** [Σιλανίωv], b. at Athens, flourished about A. C. 320, a self-taught satyr (Müller from Pliny) of the school founded chiefly by Scopas. Among his works may be named a figure of Theseus, and particularly a *Jocasta at the Point of Death*, where the deathly pallor of the countenance was produced from mixing silver with the bronze of the statue.

**Silber** (WILLIAM BEINHÄUER). See APPENDIX.

**Silenus,** in Gr. mythology, a son of Pan and Gea, or of Hermes, and the chief of the Sileni, a group of satyrs; ed. the young Bacchus, and accompanied him afterward on his campaign against the giants, when he slew Enceladus. When he was drunk he had the power of prophecy.

**Silhouette,** sil'oo-et [named from M. de Silhouette, a parsimonious French statesman of the last century; hence, cheap, plain], a figure in profile cut out of black paper with the scissors. S.-work has of late yrs. been elevated to the rank of meritorious art by the late Paul Kownek.

**Sil'ica, or Silicic Acid** [old name, *silice*; Lat. *silice*, "flint-stone"; Ger. *Kieselerde*, *Kieselsäure*; Fr. *silice*, *acide silicique*], the dioxide of the element *silicon*, which, next to oxygen, is the most abundant of the elements that make up the solid crust of the earth. The abundant mineral *quartz* is pure silica, and the great mass of rocks and soils is made up of different compounds of silica with metallic bases.

*Quartz*, which occurs in crystalline form in granites and other rocks, also makes up sea-sand (true), sandstones, and a large portion of most soils, gravels, and pebbles. Quartz crystallizes in the rhombohedral or hexagonal system, occurring usually in 6-sided prisms, terminated by 6-sided pyramids. Its hardness is between those of feldspar and topaz. It polarizes light in the manner called *circular* polarization. *Amethyst*, the common gem, is one of the colored varieties of quartz. *Rock-crystal* includes the transparent, colorless, crystalline varieties, which are sometimes used for making lenses and spectacles, also for prisms. Groups of transparent rock-crystals are among the most beautiful objects presented to us by nature. Rock-crystal is often found inclosing within it other beautifully crystallized minerals. We also often find cavities within such crystals containing liquids, sometimes water, sometimes a saline solution, and sometimes hydrocarbon compounds of great volatility.

*Tridymite*.—A species of mineral silica, crystallizing in the same system as quartz, but so far below it in density as to constitute an undoubted allotropic form of silica.

*Hydrates of Silica* (*Opals*, *Triophs*, *Hyalite*, *Silicious Sinters*, etc.).—These are native compounds, whose compositions are not very definitely known. Some of these hydrates, however, contain as much as 13, 16, and even 21 per cent. of water, and some opals as low as 5 or 6 per cent. only. *Triophs*, or *infusorial earth*, which often occurs in quite extensive beds, is made up chiefly of microscopic silicious shells. S. in the form of hydrates enters more or less into solution in all river-waters, and is thus continually flowing into the ocean, in the water of which analysis indicates its presence in minute proportion. This proportion is, however, kept from increasing by a constant process of depletion that is going on through the agency of life.



**Silicates, Chemistry and Classification of.** The number of mineral silicates is very large, and materials are included therein of the greatest importance to mankind. Their study is therefore equally important. This study includes the grouping and classifying of S. James D. Dana of New Haven divides S. first into *anhydrous* and *hydrous* S.

**ANHYDROUS SILICATES.**—These have 3 subdivisions: I. *Bisilicates*, containing for 2 equivalents of oxygen in silica—that is, for each equivalent of silica—1 of oxygen in bases, or basic oxygen; II. *Unisilicates*, 2 equivalents of oxygen in silica to 2 in bases; III. *Subsilicates*, 2 equivalents of oxygen in silica to more than 2 in bases—mostly 2 to 3, but also 2 to 4, and other ratios.

I. *Bisilicates*.—Among these there are 3 groups, comprising in all 25 species and sub-species: (1) *The amphibole group*, (2) *the beryl group*, (3) *polucite or pollux*.

II. *Unisilicates*.—Of these Dana makes 13 groups, comprising 62 distinct species in all: (1) *Chrysotile*, (2) *phenacite*, (3) *heulandite*, (4) *garnet*, (5) *vesuvianite*, (6) *epidote*, (7) *axinite*, (8) *idole*, (9) *mica*, (10) *scapolite*, (11) *nepheline*, (12) *leucite*, (13) *feldspar*.

III. *Subsilicates*.—Dana makes 3 divisions of these, according to the oxygen-ratios between bases and silica. In all there are 17 species.

**HYDROUS SILICATES.**—Of these Dana makes 3 sections, 2 of which he designates as the *zeolites* and the *margarophyllites*, while to another (which he puts first in order) he gives no distinctive name, calling it the *general section*, or simply the *first section*. Of these 3 divisions the margarophyllites are much the most numerous, comprising about 75 species; while of the zeolites there are only about 30; and the general section, including all others, numbers about 30 species.

*First, or General Section.*—These are subdivided like the anhydrous silicates. I. *Bisilicates*.—Three groups, *pyroxenoids*, *berylloids*, and *picrosmine*. (1) *Pectolite*, or *hydric pyroxenoid*; (2) *dioptase group*, or *hydric berylloids*; (3) *picrosmine*, a hydrous magnesian silicate, which, if  $\frac{1}{4}$  of its water or hydrogen is basic, may be a bisilicate.

II. *Unisilicates*.—Six groups: (1) *Calamine*, or *hydric chrysotiloids*; (2) *thortite*, or *hydric heulandite*; (3) *pyrosulphate*; (4) *garnet*; (5) *gismondine*; (6) *carpholite*.

III. *Subsilicates*.—Among these are *allophane* and other amorphous minerals.

*Second, or Zeolite Section.*—This important and interesting class of S. has been supposed to have some relations in composition and in oxygen-ratios to the feldspars. The zeolites are characterized by rarely or never containing magnesia or iron, their bases being earthy and alkaline.

*Third, or Margarophyllite Section.*—This large section has its name from being generally (at least those which crystallize) foliated or micaceous in structure, with the same prismatic angle ( $180^\circ$ ) as the micas, and usually with a pearly lustre. A majority of them are, however, almost always amorphous or massive in structure.

I. *Bisilicates*.—There are 3 groups: (1) *Talc group*, hydrous silicates of magnesia; (2) *sepiolite group*, including both magnesian and aluminous silicates; (3) *chloropal group*. The basic constituent is chiefly iron oxide, either ferric or ferrous.

II. *Unisilicates*.—Five groups: (1) *Serpentine group*, are all magnesian; (2) *kaolinite or clay group*, hydrous silicates of alumina; (3) *pinite group*, amorphous hydrous S. which contain alkalies as bases, together with alumina. Their content of water is generally far less than that of the previous (or clay) group. (4) *Margarodite group* includes a great number of varieties, products of alteration of various anhydrous silicates; (5) *hisingerite group*. These are chiefly amorphous hydrous S. of iron and manganese, some containing a little magnesia.

III. *Subsilicates*.—Three groups: (1) *Chlorite group*, mostly crystalline micaceous minerals; (2) *chloritoid group*; (3) *sepyrtite group*. [From *orig. art. in J.'s Univ. Cyc.*, by PROF. HENRY WURTZ, PH. D.]

**Silico-Fluorides.** See FLUOSILIC ACID.

**Sil'con**, sometimes called **Silicium** [from Lat. *silex*, "flint-stone"], one of the elements, which, next to oxygen, is the most abundant one in the solid part of the earth's crust. Quartz, sandstones, and other forms of silica contain over 45 per cent. of their weight of S. Granite and gneiss rocks will average 35 per cent. of silicon, slates 30 per cent., and trap-rocks 23 per cent. S. is therefore many times more abundant than any other solid element, but it is as yet only a rare curiosity of the laboratory and museum. There are no elements, of such widely different functions in nature, which present so many extraordinary analogies as carbon and S., the first being a characteristic element of the organic kingdom, and the last of the inorganic. S. is more electro-positive or basilio than carbon. It is therefore a more powerful agent in smelting reduction than carbon. S. combines with iron at high temperatures, and pig iron often contain it. The definite compounds of S. with iron are as yet unknown.

**Silico-Nitrohumic Compounds.** See HUMUS.

**Silk and Silk Manufacture.** Silk seems to have been first brought into use as a textile in Chi. during the reign of Hoang-Ti, the third emp., through the exertions of his prin. queen, Si-Ling-Chi, who is still worshipped by the Chi. as "the goddess of silkworms." The date of this beneficent work was probably near 1800 B. C. The silkworm belongs to several genera of the family Bombycidae, and is found wild in great numbers in Chi. and other countries of S. or E. Asia, as well as in Afr. and S. Amer. The larva of the Bombycidae is the silk producer, and it commences spinning only at maturity—a period of 4 or 6 weeks from the time when it emerges from the egg of the silk-moth. Its growth is rapid, and its appetite for mulberry leaves is voracious. It attains a size of from 3 to 5 inches in length and  $\frac{1}{4}$  to  $\frac{1}{2}$  inch in diameter before it commences spinning its silken shroud—the cocoon of commerce. This cocoon contains the chrysalis, which, if not stifled by heat, steam, or hydro-

carbon vapor, hatches, perforates the cocoon in 4 or 5 weeks, and lays from 100 to 400 eggs, which, in their turn, develop the silkworms again. The cocoons have an outer covering of rough silk; when divested of this covering the cocoon contains several hundred yards of the finest silk filaments, which can be reeled with great facility. Generally from 8 to 10 of these filaments are united to make a single thread, and even this has to be doubled 4 or 6 times to make the finest sewing-silk.

The processes of rearing the silkworms and of reeling the cocoons were taught to the Chi. women by Si-Ling-Chi, and these processes were kept a profound secret from all the W. nations by the Chi. for at least 2000 yrs. The first manufacture of silk among the W. nations was attempted by Pamphila and her associates on the island of Cos or Ceos in the Aegean Sea, about 400 A. C. She either unravelled the threads of the Chi. silk goods, or possibly imported the raw silk, and wove the single delicate threads into a gauze so fine and transparent that it received the name of "woven wind." Her example was followed at a later period by the Rom. ladies, who, however, made the warp of these delicate threads, and the filling of cotton. The Chi. silks were very costly, and it was only under the reckless extravagance of the Rom. emps. that they were worn to any great extent. No attempt at silk culture was made in the W. until the time of the emp. Justinian, about A. D. 555, under whose orders 2 Nestorian monks, missionaries in Chi., brought from thence, in the hollow of their pilgrims' staves, a quantity of silkworms' eggs, and instructed several persons in the arts of rearing silkworms and reeling the silk. From this small beginning silk-culture spread over Gr. and Syria, was introduced into Sp. and Port. by the Saracens in 711, into Sic. in the 12th century, and into It. in the 13th. It did not take root in Fr. till about A. D. 1600, and during the 17th century extended to Belg. and Switz., and by the orders of James I. of Eng. was commenced in Va.

The progress of the manufacture of silk was still slower. The use of silk goods became very general among the wealthier classes from the 6th to the 17th century, but they were brought from Chi., through Per. at first, and later from Gr., and in the 9th and 10th centuries from Sp. About A. D. 1150 Sic. produced fine silks, made by Gr. exiles and their descendants; about 1250 Lucca became distinguished for its silks, and from 1310 onward the prin. cities of It. attained celebrity for this manufacture. It was not developed in Fr. till about 100 yrs. later, and made little progress there till the 17th century. The manufacture in that century extended to Eng., Aus., Ger., Switz., and the Netherlands. The European manufacture of silk goods is now greatest in Fr., It., Belg., Switz., Ger., European Tur., Aus., the Netherlands, and Eng.

There have been several attempts to promote silk-culture in Amer., but they have met with only very moderate success. The first was from 1622 to 1650 in Va. Some silk was exported to Eng., but tobacco proved a more profitable crop. From 1735 to 1771 a very strenuous effort was made to promote it in Ga. and the Carolinas. In 1750 over 10,000 lbs. of raw silk was exported from Savannah, realizing more than \$75,000. From this time the export declined, but considerable silk was raised in Ga. In Conn. it was attempted from 1760 to 1844, and from \$100,000 to \$200,000 worth was produced in favorable yrs. It was also carried on with some success in Pa., N. Y., N. J., R. I., and Mass., and many eminent men were interested in it. The *Morus multicaulis* speculation put an end to these efforts in 1839 and 1840. Recently a fourth attempt has been made to introduce the rearing of silkworms, especially in the S. and W. States. The manufacture of sewing silks, and occasionally of a small quantity of dress goods, trimmings, braids, passementerie, etc. was carried on persistently to a moderate extent, mostly for home use, in Conn. for about 80 yrs. The reaction from the disasters induced by the *Morus multicaulis* mania led to the development of the manufacture, using imported raw silk. The pioneers in this manufacture were the Cheney Brothers of S. Manchester, Conn.; W. H. Horstmann of Phila., and some manufacturers at Mansfield, Conn.; Northampton and other points in Mass. Sewing silk and twist, both of excellent quality, dress trimmings, and a few ribbons and braids were made at first; a little later pongees, Japanese silks, and other mixed goods; handkerchiefs, ribbons in large quantity, silk buttons, and a few pieces of broad goods. Messrs. Cheney made also spun silk from silk waste, pierced cocoons, etc., which proved very serviceable. In 1861 the exigencies of the war required a heavy tariff, and from 40 to 60 per cent. duty was placed on imported manufactured silks, while raw silk was admitted duty free, or with but a nominal impost. Under this tariff the silk manufacture has rapidly developed, while silk goods are lower than they ever were. Velvets, satins, crapes, gloves, hose, and shawls are not made here, but all other descriptions of silk goods are made in great perfection. "The Silk Association of America," which comprises the most of the manufacturers, has greatly promoted the development of the manufacture. The silk goods produced in the yr. ending Jan. 1, 1882, amounted to \$35,937,722; at the factory valuation of these there were—of sewing twist and floss silk, \$7,089,512; broad goods, \$8,330,187; handkerchiefs, ribbons, and laces, \$11,076,134; trimmings and small goods, \$7,541,904; mixed goods, etc., \$729,985. The imports of silk goods for the same yr. were valued, at the ports from which they were shipped, at \$32,377,226.48, and the duties (\$19,038,665.81) to be added to these values made the reported cost \$51,415,892.23.

**Silk, Chemistry of.** The fibres of silk are mainly composed, together with some albumen, of a substance called *sericine*, coated with a yellowish wax, which must be removed before dyeing the silk. *Sericine* is obtained pure by successive boiling with alcohol, water, acetic acid, and water again. The pure *sericine* is white and lustrous like silk itself, and sinks in water. It is not turned yellow

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by nitric acid. Dilute caustic alkalis do not affect it, but when strong they dissolve it, and on adding water the sericine is again precipitated. For distinguishing silk-fibre from cotton and flax, chemically, 2 reagents are available, one of which is a concentrated solution of oxide of nickel in ammonia, which forms a brown-yellow solution in the cold; the other is hot basic chloride of zinc, which first gelatinizes, then dissolves the silk. Picric acid will also distinguish the silk-fibres in a mixed tissue by dyeing them yellow.

**Silk Cotton**, the cottony down of many sterculiaceous trees of Afr., India, and S. Amer. of the genera *Bombax*, *Eriodendron*, *Chorisia*, *Salmalia*, etc. This beautiful cotton grows wild in great quantities. The trees are mostly very large, with very soft wood.

**Silk Spider** [*Nephila plumipes*, Koch], a geometric spider of the family Spideidae of S. C. It produces 2 kinds of strong, fine silk—yellow and white—which wind to a length of nearly 2 m. Its hearing and touch are acute, but its sight defective; it prefers the sunlight.

**Silk weed**, also called **Milkweed** [botanically *Asclepias Syriaca*], the common Amer. S., is an exceedingly abundant wild plant over a great part of the U. S. The silky fibre with which the seed-pods are filled has a very beautiful lustre, but is too brittle and destitute of strength to be of value except for merely ornamental uses. The milky juice contains 5 per cent. of the valuable substance *caoutchouc*, which may readily be coagulated in the fresh juice and separated by proper manipulation from the other matters present.

**Silkworm**. See SILK AND SILK MANUFACTURE.

**Silkworm Gut**, used by anglers in attaching the hook to the line, is prepared in Sp. and It. from the silkworm, just as it is ready to begin spinning its cocoon. The material is precisely that which becomes silk if the worm is allowed to spin. The worm is soaked in vinegar for some hours, and the secretion is then removed, stretched, and dried for use.

**Sill** (JOSHUA W.), b. at Chillicothe, O., Dec. 6, 1831, grad. at the U. S. Military Acad. July 1, 1853, when appointed a second lieutenant in the ordnance corps; served at W. Pt. until 1857 as assistant prof. of geog., hist., and ethics; subsequently in command of Vancouver ordnance depot, Wash. Terr., and Leavenworth depot, Kan. In Jan. 1861 he accepted the chair of math. and civil engineering in the Brooklyn Polytechnic Inst. On the outbreak of c. war he was tendered the colonelcy of a N. Y. regiment; was engaged in the occupation of Bowling Green, Ky., and Nashville, Tenn., Feb. 1862, and in Gen. Mitchell's expedition to Huntsville, Ala., and seizure of the R. R. from Stevenson to Decatur. In July 1862 he was commissioned brig.-gen. of volunteers, and commanded a division in the Army of the O. at the battle of Perryville, Oct. 8, and subsequent pursuit of the Confed. army. In the battle of Murfreesboro', Dec. 31, 1862, he was killed at the head of his brigade.

**Sillig** (CHARLES JULIUS), b. at Dresden May 12, 1801, studied philology in the univs. of Leipzig and Göttingen; in 1825 was appointed teacher in the Kreuzschule at Dresden, with which inst. he remained connected until his death, Jan. 14, 1855, having attained the position of associate rector. Much of his literary labor was bestowed on the explanation of anc. art. and on mythology as illustrated in art. Wrote *Epistola Critica de Catulli Carminibus*, *Catalogus Articuli Græc. et Rom.*, etc.

**Silliman** (BENJAMIN), M. D., LL.D., b. at N. Stratford (now Trumbull), Conn., Aug. 8, 1779, son of Gold Selleck Silliman (1730-90), a lawyer and col. of Conn. cv. during the Revolution; grad. at Yale 1796; was a tutor there 1799-1804, studying law in the mean time; was admitted to the bar 1802, and in the same year chosen prof. of chem. in Yale; gave his first full course of lectures on chem. at Yale in the winter of 1804-05; made a geological survey of a part of Conn., the first exploration of the kind in Amer.; pub. a memoir with an analysis of the fragments of the celebrated Weston meteorite of Dec. 14, 1807; aided Dr. Robert Hare in his experiments with the compound blowpipe, with which instrument he demonstrated the fusibility of several bodies never before fused; secured for Yale the valuable mineralogical and geological cabinet of Col. George Gibbs 1812; founded in 1818 the *Amer. Journal of Science and Arts*; made a series of important observations on the transference of carbon particles from the positive to the negative pole, while experimenting with a voltaic deflagrator 1822; was an eloquent lecturer on scientific topics before popular audiences; resigned his professorship 1853, and was made prof. emeritus, but at the request of his colleagues continued to lecture on geol. until June 1855, when he retired from active labors. Author of *Journal of Travels in Eng., Elements of Chem.*, etc. D. Nov. 24, 1864.

**Silliman** (BENJAMIN), M. D., LL.D., son of preceding, b. at New Haven, Conn., Dec. 4, 1816, grad. at Yale 1837; an instructor in chem., mineralogy, and geol. in Yale 1838-46; became prof. of applied chem. 1846, and successor to his father in the chair of chem. 1854. In 1847, in connection with the late Prof. John P. Norton, he established the Yale Scientific School, which has since grown into the Sheffield Scientific School. He was also prof. of med. chem. and toxicology in the Univ. of Louisville, Ky., 1849-54; was a director in depts. of chem., mineralogy, and geol. in "Crystal Palace" world's fair at New York 1853; was for many yrs. sec. of Amer. Association for the Advancement of Science; wrote *First Principles of Chem. and Principles of Physics*; was a popular lecturer on scientific subjects, and became State chemist of Conn. 1869. D. Jan. 14, 1885.

**Silo**. See ENSILAGE.

**Silo'am** [Heb. *Siloah*, a "sending" or "sent"; Ar. *Silwan*]. (1) The name of a fountain and a pool, in Jerusalem, on the S. edge of Ophel, about 1200 ft. S. S. W. of the Fountain of the Virgin, with which it is connected by an underground winding passage. The fountain proper, hewn out of the solid rock, is about 6 ft. in breadth, and is inter-

mittent. The lower basin is about 50 ft. long, 17 broad, and 19 deep, but now holding only 3 or 4 ft. of water. A stream runs from the pool to the Kedron. (2) The name of a little straggling, dirty v. occupying an old quarry on the E. side of the Kedron, overlooking the Pool of Siloam.

**Silphium** (Gr. *σίλιφιον*, a large resin-bearing plant), a genus of perennial plants of the family Compositæ, resembling sunflowers, found in abundance on the prairies of the U. S., in the S. States. They exude a plentiful resin-like juice, whence the commonest species (*S. laciniatum*) has received the name of resin-weed. Both the resin and the leaves are employed by farriers for asthma in horses. This species is known by the names of compass-plant, pilot-weed, and polar-plant, from a tendency to point its leaves N. and S. The prairie burdock (*S. terebinthaceum*) and the singular cup-plant (*S. perfoliatum*) belong to this genus.

**Silt** [Prov. Eng. *sile*, "sediment"] is the fine mud which is transported by rivers and deposited in lakes and estuaries. The same term is applied to any sediment which accumulates in harbors or river-channels, which, as they are filled, are said to be "silted up."

**Silurian System**, the name given to a series of fossiliferous strata which underlie the Devonian rocks in portions of Eng. and Wales, anciently inhabited by the Silures. This group is now divided into the Upper and Lower S., which are underlain by the Cambrian rocks of Sedgwick. In the U. S. the base of the S. S. is the Potsdam sandstone, the Trenton limestone series being the central mass, the Hudson River group the summit. The Upper Silurian series is formed by the Medina sandstone at the base, the Clinton and Niagara limestones in the centre, and the Helderberg group at the top.

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**Silva**. See SELVA.

**Silver** [A.-S. *silfor*], one of the precious metals, has been known from remote ages, and much used for ornaments, household vessels, and for money. It is the whitest of the metals, and takes a brilliant mirror-like polish. In hardness it is intermediate between gold and copper, and is very malleable and ductile. It may be beaten into foil or leaves 0.00001 of an inch in thickness. A grain weight of the metal may be drawn out into a wire 400 ft. in length. If repeatedly heated it becomes brittle. The specific gravity of S. ranges from 10.1 to 11.1, according to its condition and purity. The metal fuses readily on charcoal before the blowpipe or in a crucible in a forge or furnace fire. It expands forcibly upon cooling, and thus solid pieces will float in molten S. as ice floats in water. It may be vaporized by the burning lens or by the oxyhydrogen blowpipe or strong electrical currents. The vapors are white.

S. is abundantly distributed in nature, particularly among the metallic minerals. It exists in sea-water. Assuming that there is 1 centigramme of silver per cubic metre of water, it has been calculated that the oceans of the globe contain not less than 2,000,000 tons of S. The metal has been found in small quantity also in rock-salt in the mines of the dept. of Meurthe, Fr. All native gold generally contains from 5 to 13 per cent. of S.; Cal. gold averages about 12 per cent. of S. It occurs also nearly pure in masses and irregular grains, usually in irregular, ragged masses, or in thin sheets coating surfaces of the vein-stone, or filiform, as if drawn out into wire; hence the name "wire-S." applied to such specimens. At Kongsberg in Norway the metal has been found massive and in large and perfect crystals, which retain their white color without tarnishing in a remarkable degree. Large amounts of native S. have been obtained in Mex. and S. Amer. It is not uncommon, though not in large masses, in the upper portions of the S.-bearing veins of the W. States and Terrs. of the U. S. It is found also in a vein upon Silver Islet in Lake Superior, and associated with the native copper of the Keweenaw Point mines. Some of these specimens are remarkable for being completely joined to the copper. Specimens of S. when taken from mines are usually tarnished a dull-brown color, or even black. Native S. is rarely pure. The cuprifervous variety sometimes contains 10 per cent. of copper. With gold the proportions are variable. The *electron* of Pliny contains  $\frac{1}{2}$  of S. The pale gold of Transylvania contains from 35 to 38 per cent. of S. The native alloy in the great Comstock Lode of Nev. contains about 43 per cent. of S., the rest being gold. Native amalgams have been found in Chili, containing from 52 to 64 per cent. of S. The metal is also found combined with sulphur, antimony, arsenic, tellurium, etc., and with chlorine, bromine, and iodine, giving a great variety of interesting species.

A large class of the metallic minerals contain S. in varying proportions, especially galena, which is rarely free from a portion of S. The greater portion of the S. produced in Europe is extracted from argentiferous galena. The galena ores of the U. S., with the exception of those of the Miss. Valley, nearly all contain S. in large quantities, but the quantity of these rich ores is seldom large in the E. States. Sixty ounces to the ton of lead ore is a very fair yield in S. Formerly lead ores containing less than this could not be profitably worked for S., but lead containing only 3 ounces of S. to the ton can now be worked with profit.

The antiquity of S. coinage is very great. The most ancient coins known were struck in S. by Phidon, king of Ægina, a. c. 869. After the conquest of Egypt by Cambyse, about 540 yrs. a. c., a great improvement appears to have been made in the purification of S. The alloy in the Gr. S. coinage generally appears to have been lead. The Athenian currency was noted for its purity. S. currency was adopted by the Rom. republic about 369 b. c. After the loss of Sp., from which the chief supply of S. was drawn, the S. currency vanished, and was replaced by *billon* denarii, holding only  $\frac{1}{4}$  part of S. S. was largely used by the Roms. for household plate and table decoration. It was elegantly chased and embossed by Gr. artists in the repoussé style. The wealthy Roms. vied with each other in possessing the most massive dishes. The ornamentation of S., known as *niello-work*,



originated in Egypt, and was revived and carried to great perfection by the Florentine silversmiths. This art was applied to the decoration of armor as early as the days of Homer. In mediæval times massive plate was in great favor, and the chief form of investment for the noble-born and wealthy. Its extensive use for ecclesiastical decoration is also to be noted. In modern times solid S. ware has been to a great extent replaced by nickelliferous alloys and britannia ware, covered with a layer of pure silver by the galvanoplastic method. The value of S. relatively to other objects obviously depends upon 2 chief conditions—the demand and the supply. The variations in the demand are sufficiently indicated by the preceding references to its use in historic times. The supply is also variable, and at times excessive. The production of S. in the large way, owing to its mode of occurrence and mineralization, is more dependent upon the use of mechanical power (steam or water) than upon the labor of men. There may therefore be a large production of S. in sparsely populated regions and within a short period of time.

The value of S. relatively to gold has greatly changed within historic times, and it has been different in different countries. Commerce has tended to equalize this difference. In the anc. world S. was to the same extent the peculiar production of Europe that gold was of Asia. It follows naturally that the estimation of S. relatively to gold was higher in Asia than in Europe—a condition prevailing until within a recent period. Perhaps the earliest recorded ratio is found inscribed at Karnak, the tribute-lists of Thutmosis (1600 B. C.) giving 13.33 : 1. In the Middle Ages the ratio varied from 9 : 1 to 12.8 : 1. At the date of the discovery of Amer. the ratio was about 11.30 : 1, since which, up to the discovery of gold in Cal. and Australia, it gradually rose to 15.83 : 1 in the year 1850. The extraordinary production of S. from the mines of the Comstock Lode, Nev., together with the demonetization of S. in Ger., has had a great effect upon the price of S. in the market. In Jan. 1875, when an act was passed by Cong. providing for the resumption of specie payments in Jan. 1879, the price of fine S. in Lond. averaged about 57d. per ounce. In Mar. 1876 the price had fallen to 52½/4d. per ounce. During the yr. nearly \$13,000,000 in S. was purchased by the U. S. mint at an average of 111.4 cents per ounce, the equivalent nearly of 56½/4d. per ounce in Lond. The penny sterling is valued at 2.0277½ cents of the U. S. gold standard, the pound sterling being rated at \$4.86656 in U. S. gold dollars. To obtain the value in U. S. (gold) money of a given weight of S., say 25 grams of 9/10 fineness, the price in pence of the ounce of the Brit. standard should be multiplied by 1.585778, or it may be obtained by dividing the price in pence by 0.6306052. [From orig. art. in *J. S. Univ. Cyc.*, by PROF. W. P. BLAKE.]

**Silver City**, Grant co., N. M., in S. W. part of the Terr. Pop. 1870, 80; 1880, 1800.

**Silver Cliff**, Custer co., Col., near Westcliffe, which is on R. R., 194 m. S. by W. from Denver. Pop. 1880, 5040.

**Silver Compounds, Chemistry of**, may be classed into *halogen-, oxygen-, and amphoteric-* compounds.

(1) *Halogen-Compounds of Silver*.—*Chloride of S.* is an important substance, which is found native as *horn-S.* This ore is usually translucent, sometimes transparent and colorless, of the softness of talc, sectile like wax and similar in lustre, and of very great density. It contains 75.3 per cent. of S., the rest being chlorine. It is totally insoluble in all acids, but soluble in ammonia, from which it is again thrown by an acid as a curd-like precipitate. S.-chloride melts at about 500° F. to a clear liquid. On exposure to light and moisture it undergoes a change. A darkening of color occurs, and an increase of density. Photographic methods are chiefly founded upon these kinds of changes. *Bromide of S.* constitutes the mineral *bromargyrite* or *bromargyrite*, which is regular in crystallization, yellow or amber-colored when pure, much harder than the chloride, ranging in this respect between gypsum and calcite, sectile, and heavier than the chloride. Bromide of S. contains 57.4 per cent. of the metal. *Iodide of S.* forms the mineral *iodargyrite*. It is sulphur-yellow in color when pure, very soft and sectile. It contains 46 per cent. of S., and is hexagonal in crystallization. Both bromide and iodide of S., when precipitated, are much more sensitive to light than the chloride, and are hence used in photography, in most cases, instead thereof. *Fluoride of S.* differs from the other halogen S.-compounds in being soluble in water. It forms hydrated crystals, obtained by dissolving the oxide of S. in hydrofluoric acid and crystallizing. *Cyanide of S.* belongs properly among its halogen-compounds.

(2) *Oxygen-compounds of S.* are 3 in number—*argentous oxide*, *argentic oxide*, and the *peroxide*. The first is a brown or black substance, slightly soluble in water to a solution of alkaline reaction and metallic taste. Heat readily dissociates it into oxygen and metallic S. Its unstable character is shown by its exploding when rubbed together, even very gently, with many substances, such as red phosphorus, precipitated sulphur, selenium, some metallic sulphides, and tannic acid. Some organic liquids, as *creosote*, are set on fire by dry argentic oxide. It is a very powerful base, neutralizing acids completely. Peroxide is a curiously unstable substance, one of its most remarkable being that of reacting with peroxide of hydrogen, so that water and metallic S. are formed, with evolution of oxygen gas. The *oxygen-salts of argentic oxide*, of much practical interest, are only 2 in number—the nitrate and the sulphate.

(3) *Amphoteric-compounds of S.* comprise the *sulphide*, *selenide*, and *telluride*, of which the sulphide only is of practical importance. *Sulphide of S.*, in pure state, constitutes the mineral species *argentite* or *S.-glance*. This is a lead-gray mineral, which has a regular crystallization, but is often crypto-crystalline or amorphous. The hardness is about that of gypsum, and one of its most characteristic properties is a high degree of *sectility*. It contains no less than 87 per cent. of S., being, in fact, the richest of all silver ores.

It is common among the ores of the celebrated Comstock Lode. *Selenide of S.*; *Telluride of S.* (see *TELLURIDES*). [From orig. art. in *J. S. Univ. Cyc.*, by PROF. HENRY WURTZ, Ph. D.]

**Silver Compounds, Medicinal Uses of**. Argentic oxide and nitrate are the only compounds of S. used in med. Argentic nitrate is locally irritant and astringent, and, applied in concentrated solution, is also superficially caustic. It is extensively used in surgery as a caustic and as a means of promoting absorption, as of exuberant granulations; of inducing healthy action on the part of indolent or morbidly disposed ulcers or sores; and of controlling or aborting catarrhs of mucous membranes. The oxide, from its insolubility, is quite devoid of the above properties. Internally, in large dose or concentrated form, S. nitrate is an irritant poison, but in medicinal dose both the nitrate and oxide may improve the tone of the stomach and allay the nausea and pain attending organic diseases of the same.

**Silver Creek**, on R. R. and Lake Erie, Chautauqua co., N. Y. Pop. 1870, 666; 1880, 1086.

**Silver-Mines** must have been worked from a very early age, as silver is mentioned in the O. T. among the riches of Abraham, and was employed in great masses by Solomon in the ornamentation of the temple and his palace. It was obtained from Nubia and Ethiopia and from the countries of E. Asia and S. Europe. S.-M. were worked in Attica and Epirus by the Grs., and in Sp. by the Phœnicians and Carthaginians. The latter mines were especially famous. The mines of Schemnitz, Hungary, were worked in the 10th century, and they still yield from 30,000 to 40,000 marks of silver annually. Those of Joachimsthal, Bohemia, are as old. In 1873 the total production of silver by the Austro-Hungarian empire amounted to \$1,600,000. The silver production of the Ger. empire was larger, amounting in 1873 to \$3,000,000; the prin. mines are found in the Hartz and the Erzgebirge. In 1623 the Kongsberg mines in Nor. were opened, and they have been worked continuously since that time. During the Middle Ages the Sp. mines, so celebrated in antiquity, fell entirely into decay. After 1825, however, the silver-mining industry was once more taken up in Sp., and two new and rich mines were discovered. The total production of silver by Sp. in 1885 was estimated at 110,000 lbs. troy. By the discovery of Amer. and the conquest of Mex. and Peru by the Spaniards, the silver production received an enormous increase. Humboldt estimates that, for the period from 1492 to 1808, Mex. and Peru produced silver to the value of \$4,152,000,000, while the production by Europe during the same period hardly amounted to \$200,000,000. The most celebrated S.-M. in Mex. are those of Catorce, Guanajuato, Sombretete, Valencia, and Zacatecas, situated in the central group of the Cordilleras. Most of them were discovered and opened in the 16th and 17th centuries, and about 3000 distinct mines were in operation when Humboldt visited the country. The famous mines of Potosi, Bolivia, were discovered in 1545, and have yielded from that time, and up to our days, about \$1,300,000,000. Silver production received a new impetus from the discovery in 1859 of the COMSTOCK LODE (which see).

**Silver-Plating**. See *ELECTRO-PLATING*.

**Silver Reef**, city, Washington co., Ut., in S. W. part of the Terr., contains deposits of argenteriferous sandstone. Pop. 1880, 1046.

**Silverton**, on R. R., cap. of San Juan co., Col., in S. W. part of Terr., 494 m. S. W. of Denver. Pop. 1880, 264.

**Silver-Work**. See *REPOUSSÉ*.

**Sim'coe**, a lake of Ont., Canada, situated between Lake Ontario and Georgian Bay, 30 m. long and 18 m. wide, and about 170 ft. above Lake Huron, into which it discharges itself through Lake Gouginchin, the Severn, and Georgian Bay. The banks are generally clothed to the water's edge with wood.

**Simcoe** (JOHN GRAVES), b. near Exeter, Eng., Feb. 25, 1752, served in the war of the Amer. Revolution; raised and commanded the battalion of loyalists or Tories known as the "Queen's Rangers;" was with Cornwallis at Yorktown; wrote *Hist. of the Operations of a Partisan Corps called the Queen's Rangers*; was gov. of Upper Canada 1791-94; gov. of St. Domingo under the brief Eng. domination 1795-97, and became lieut.-gen. 1798. D. Oct. 26, 1806.

**Sim'con**, the second son of Jacob and Leah. The tribe of Simeon numbered 59,300 at the Exodus, but only 22,200 at the entrance into Canaan. Its terr. was scattered.

**Simeon** (CHARLES), b. at Reading, Eng., Sept. 24, 1759, ed. at Eton and at King's Coll., Cambridge; took holy orders; vicar of Trinity ch., Cambridge, Jan. 1783; became distinguished as a leader of the Evangelical party in the Ch. of Eng. D. Nov. 13, 1836.

**Sim'con Styl'tes**, b. at Sesan in the N. part of Syria about 390; grew up in solitude as a shepherd in the mts. of Amanus; in his 18th year he entered a monastery at Teleda. Finding the rules of the monastery too lenient, he afterward removed to Telanissa, in the vicinity of Antioch, where he built a hut and determined to live as an anchorite. But soon his fame for holiness attracted crowds of visitors, and in order to escape their intrusion he placed himself on the top of a column. The first column he occupied was only 10 ft. high, but the last was 60 ft., with a platform 4 ft. in diameter, and here he is said to have lived for about 30 yrs. He d. Sept. 2, 459, and his example found many imitators after his death. The so-called pillar-saints, abt-martyrs, or stylites were numerous in the E. countries, and did not wholly disappear until the 12th century.

**Sim'la**, prin. town in the Eng. Himalaya, in the Pand-schab prov. of British India, contains a dist. 33,995, as a town 7087 souls. S. is the permanent abode of numerous European residents, and during the summer the head-quarters of the gov't. of Brit. India. The town is built according to the cottage system. There are splendid warehouses, good hotels, and 8 schools for European children. During the summer Europeans come from all parts of Brit. India.



**Simmons** (GEORGE C.), b. at Portland, Me., Apr. 17, 1840, removed to Boston in 1859; served during the c. war in the 35th Mass. Volunteers 1862-64; clerk of U. S. board of engineers for fortifications since 1868, and has contributed largely to *Johnson's Cyc.* articles on Amer. and foreign military biography, etc.

**Simmons** (Sir J. LINTON A.), K. C. B., b. about 1816, entered the corps of royal engineers 1837; was engaged for 3 yrs. on the Me. frontier during the disputed terr. controversy; served in Tur. in 1853; joined Omar Pasha in 1854; was in front of Sevastopol from Apr. 1855 until after its fall; served in command of the division which forced the passage of the Ingar, turned the enemy's position, and captured his works and guns; was Brit. com. for laying out the Turco-Rus. boundary in Asia. In 1868 became maj.-gen., and lieut.-gen. in 1872; gov. of the Royal Military Acad. at Woolwich 1870-75; inspector-gen. of fortifications and works since 1875.

**Simms** (WILLIAM GILMORE), LL.D., b. at Charleston, S. C., Apr. 17, 1806, studied law, and was admitted to the bar 1827, but abandoned that profession for lit. and journalism, publishing in the same year 2 vols. of *Poems*; resided at Hingham, Mass., 1832-33; wrote there *Alatanis, a Story of the Sea*, and *Martin Faber, the Story of a Criminal*; returned soon afterward to S. C.; wrote a successful connected series of romances founded on Revolutionary incidents in S. C., romances of colonial life, a series of border romances, several historical romances on Sp. or other foreign subjects, etc. Mr. S. was several yrs. a member of the S. C. legislature, and filled other political offices. D. June 11, 1870.

**Simon** (JOHN), M. D., b. in Eng. in 1816, became honorary fellow of the Royal Coll. of Surgeons 1844; was afterward prof. in King's Coll.; surgeon to King's Coll. Hospital and to St. Thomas's Hospital; was the first appointed med. officer to the general board of health of the privy council. Wrote *Physiological Essay on the Thyroid Gland*, *Aims and Philosophic Method of Pathological Research*, and *Lectures on General Pathology*.

**Simon** (JULES), (JULES FRANÇOIS SUISSE-SIMON), b. at Loriet, dept. of Morbihan, Fr., Dec. 31, 1814, succeeded Cousin as prof. of philos. at the Sorbonne in 1839, but was dismissed in 1851 on account of his opposition to the *coup d'état*; lectured on philos. in various cities in Belg.; was elected a member of the Legislative Assembly for the dept. of Loire in 1863; offered a strong opposition to the policy of Nap. III., the plébiscite of 1870, the declaration of war against Prus., etc., and was a member of the govt. for the national defence established on Sept. 4, 1870, and of the govt. of Thiers, Feb. 19, 1871-May 24, 1873, as minister of public education; carried through a law which makes school attendance compulsory. Wrote *Histoire de l'École d'Alexandrie*, *La Religion naturelle*, *La Liberté*, *Souvenirs du 4 Septembre*, etc.

**Simon** (RICHARD), b. at Dieppe, Fr., May 13, 1838, entered the congregation of the Oratory in 1859, but left it again in 1878; was for a short time priest at Belleville, but retired in 1882 to his native city; devoted himself exclusively to literary pursuits. His writings—*Fides Ecclesie Orientalis*, *Histoire critique du Vieux Testament*, *Histoire critique de la Créance et des Coutumes des Nations du Levant*, etc.—form the first manifestations of that theological standpoint afterward known as rationalism. D. Apr. 11, 1912.

**Simonianism, Saint.** See SOCIALISM.

**Simonians.** See SIMON MAGUS.

**Simonides**, b. at Iulis, island of Cos, about 556 b. c., lived at the court of the Pisistratide in Athens, at that of the Scopads in Thessaly, during the Per. wars alternately in Athens with Themistocles and in Sparta with Pausanias, and went about 476 b. c. to Sic., where he lived at the court of Hiero in Syracuse, and d. about 467 b. c. He was the most celebrated lyric poet of his age.

**Simonides**, generally known as **Simonides of Amorgos**, b. at Samos, but led a colony to Amorgos, one of the Cyclades, where he flourished as a satirical poet in the middle of the 7th century b. c.

**Simonin** (LOUIS LAURENT), b. at Marseilles in 1830, studied at the mining school of St.-Etienne; undertook comprehensive geological explorations in Fr., It., Cal., the island of Réunion, and Madagascar; was appointed prof. of geol. at the central school of arch. in 1865. Wrote *La Richesse minérale de la France*, *L'Etrurie et les Etrusques*, *La Vie souterraine*, etc.

**Simon Magus**, a Samaritan of the apostolic age, b. Justin Martyr says, at Glitton. He is described in Acts viii. 9-24 as a sorcerer, called by the people "the great power of God," who was converted by the preaching of Philip, and sought to purchase with money the power of imparting the Holy Ghost; whence the expression *simony*, which, in canon law, denotes the buying or selling of ecclesiastical offices. The Simonians, one of the earliest of the Gnostic sects, took their name from him, and he became a sort of archetype of heresy. R. D. HIRSCOCK.

**Simonoseki**, town of Japan, at the S. W. extremity of the island of Nipon, in lat. 33° 56' N., is the entrepot for European goods coming from Nagasaki and destined for the interior of Japan. It commands the Strait of Simonoseki, which forms the W. entrance from the open ocean to the inland sea of Japan. Pop. 10,000.

**Simony.** See SIMON MAGUS.

**Simoom** [from the Arabic *samma*, to "hurt," to "poison"], the name of a hot, scorching wind which rises in the sandy deserts when intensely heated by the sun, and blows, loaded with fine sand and dust, over Pal., Syria, and Ar. It often proves fatal to animal life.

**Simplectus**, sim-plish'e-us, a Neo-Platonic philos., native of Cilicia, flourished in the first half of the 6th century A. D.; he taught at Athens, and was one of the philos. who, after the edict of Justinian (A. D. 529) closing the schools of philos. at Athens, emigrated, at the invitation of King Khosru Nushirvan, to Per., whence they soon returned to

Athens to enjoy liberty of thought indeed, but not liberty to teach. S. is known as a commentator on Aristotle.

**Simpson** [It. *Sempione*; Ger. *simpen*], v. and mt.-pass near the boundary between Valais and Piedmont, is famous for the military road which Nap. I. built here from 1800 to 1806. Near by, at the base of Monte Leone (10,977 ft.), a hospice has been erected for the gratuitous accommodation of travellers. The scenery on the S. slope is grand and severe in the extreme. In the v. of S., at an altitude of 4340 ft., the winter lasts fully 8 months.

**Simpson** (Sir GEORGE), b. at Lochbunn, Ross-shire, Scot., about 1796, accompanied the earl of Selkirk to Canada 1820; was employed by that nobleman in the establishment of his Red River colony; pushed his settlements northward to Athabasca Lake in rivalry with the Hudson's Bay Co.; after the 2 companies had coalesced (1821) appointed gov. of Rupert's Land and gen. supt. of the Hudson's Bay Co.; planned the expedition under his nephew, Thomas Simpson, 1836-39, which traced the coast of the Arctic Ocean from the mouth of Mackenzie River to Point Barrow, and from the mouth of Coppermine River to the Gulf of Boothia. He made an overland journey around the world 1841-42, of which he pub. a *Narrative* (1847); was knighted in 1855. D. Sept. 7, 1860.

**Simpson** (JAMES H.), b. in N. J. Mar. 1813, was grad. from the U. S. Military Acad. July 1, 1832, when appointed brevet second lieut. of artil. In 1838 transferred to the topographical engineers with rank of first lieut., and thenceforward engaged on the survey and improvement of lakes and harbors, and on light-house and Coast Survey duty until 1858, when appointed chief topographical engineer of the army of Ut.; opened a wagon-route from the valley of Great Salt Lake across the Great Basin of Ut., by which the journey to the Pacific coast was shortened some 200 m. In the early days of the c. war he served as mustering officer in O. and chief engineer of dept. of the Shenandoah. He was appointed col. of the 4th N. J. Volunteers in Aug. 1861, and in the Va. Peninsular campaign led his regiment in the action at W. Pt. and in the battle of Gaines's Mill, where taken prisoner and held until Aug. 12. On Aug. 27 he resigned his volunteer commission, and thereafter served as chief engineer of the dept. of the O. and of dist. of Ky., and as engineer agent for the W. armies. In Aug. 1865 he was detailed as chief engineer of the dept. of the Interior on proposed change of route of the Union Pacific R. R. W. from Omaha; attained the rank of col. in 1867; was brevetted col. and brig.-gen. Retired 1890. D. Mar. 1893.

**Simpson** (Sir JAMES YOUNG), BART., M. D., D. C. L., b. at Bathgate, Scot., June 7, 1811, ed. at the Univ. of Edinburgh and at the med. school of the same inst., taking his degree 1832; lectured there on pathology 1836; became prof. of midwifery 1840; introduced the use of chloroform as an anæsthetic 1847; became pres. of the Royal Society of Phys. at Edinburgh 1849, and of the Medico-Chirurgical Society 1852; foreign associate of the Fr. Acad. of Med. 1853; received the Monthyon prize for his introduction of anæsthesia 1856; created a baronet 1867. Wrote *Homœopathy, its Tenets and Tendencies*, and *Acupuncture, a New Method of arresting Surgical Hemorrhage and of accelerating the Healing of Wounds*, etc. D. May 6, 1870.

**Simpson** (JOSIAH), b. at New Brunswick, N. J., Feb. 27, 1815, grad. from Princeton Coll. in 1833, and pursued his med. studies at the Univ. of Pa., graduating in 1836; was appointed assistant surgeon U. S. A. July 11, 1837, and promoted to be surgeon 1855; brevet lieut.-col. and col. U. S. A. Mar. 1865; served through the Fla. war, being present at the battle of Okeechobee, Dec. 1837; in 1846 accompanied the regiment to the City of Mex., serving through the battles of Cerro Gordo, Churubusco, and Chapultepec; attending surgeon with head-quarters in New York and post surgeon at Bedloe's Island 1848-55; was med. director of the dept. of the Pacific 1855-58; Middle dept. and dept. of the Tenn., 1858-67; transferred to Baltimore as attending surgeon in 1867. D. Mar. 3, 1874.

**Simpson** (MATHEW), D. D., LL.D., b. at Cadiz, Harrison co., O., June 21, 1810, grad. at Madison Coll. 1829; studied med. and received the degree of M. D. 1833; was licensed the same yr. in the ministry of the M. E. Ch.; became v.-p. and prof. of natural science at Allegheny Coll. 1837; pres. of Ind. Asbury Univ. at Greencastle, Ind., 1839; ed. of the *W. Chr. Advocate* 1848, and was elected bp. 1852. He visited the Mex. missions 1874 and the European mission conferences 1875, and on his return became a resident of Phila. Wrote *A Hundred Years of Methodism*. D. June 18, 1884.

**Simpson** (THOMAS), F. R. S., b. at Market-Bosworth, Eng., Aug. 20, 1710, was in early life a weaver, but became an accomplished math. by private study; prof. of math. in Royal Military Acad. at Woolwich 1743-61, and pub. papers on pure math. and phys. astron. D. May 14, 1761.

**Simpson Centenary College**, Indianola, Ia., founded in 1867, has the full classical course of 4 yrs., and a scientific course, differing from the classical chiefly by the substitution of modern langs. for the anc. The law dept. was organized at Des Moines, the cap. of the State, in 1875. The inst. has also a commercial dept. and a musical, and classes in telegraphy and phonography.

**Simrock** (KARL), b. at Bonn Aug. 28, 1802, studied jurisprudence in his native city and in Berlin; entered the Prus. civil service, but was dismissed in 1830 on account of a song he wrote on the revolution of July in Paris; devoted himself to lit., and studied especially the old Ger. lang. and lit., of which he was appointed prof. at Bonn in 1850. Translated the *Nibelungenlied*, several works of the Minnesingers, the *Eden*, *Beowulf*, and *Heland*, etc.; pub. a *Handbuch der deutschen Mythologie*, *Die Rheinsagen*, *Deutsche Volksbücher*, etc. D. July 18, 1876.

**Sims** (EDWARD DROMGOOLE), b. in Brunswick co., Va., Mar. 24, 1805, grad. at Chapel Hill in the Univ. of N. C. in 1823, and became a tutor in that inst. He was the prin. of an acad. at La Grange, Ala., and on the establishment of



La Grange Coll. he filled the chair of math. and natural philos.; travelled 2 yrs. as a minister in the Tenn. conference; then was prof. of langs. in Randolph-Macon Coll., Va. At the close of 1838 he returned to Va., and filled chair of Eng. lit. in Randolph-Macon Coll., and in Dec. 1841 was elected to same dept. in Univ. of Ala. D. Apr. 12, 1845.

**Sims** (JAMES MARION), M. D., LL.D., b. in Lancaster co., S. C., Jan. 25, 1813, grad. at S. C. Coll., Columbia, 1832; studied med. at Charleston and Phila.; grad. M. D. at Jefferson Med. Coll. 1835; in 1836 entered upon the practice of his profession at Montgomery, Ala.; in 1845 called attention to his new theory of the nature and origin of *Trismus Nascentium*, publishing a series of articles on this subject 1848 in the *American Journal of Med. Sciences*. In 1845 his attention was also especially directed to the subject of *Vesico-vaginal Fistula*, which previous to this time had been considered incurable. Establishing a private hospital at Montgomery for the treatment of this disease, Dr. S. commenced a series of experiments which were crowned with success. His discovery was based on the use of silver sutures, the invention of a speculum which bears his name, and a great number of new and ingenious instruments by which alone his operation is or can be performed. He has since extended the use of metallic sutures to every dept. of gen. surgery. In 1853 he settled permanently in New York, where he established a great permanent woman's hospital for the treatment of diseases peculiar to woman. The hospital was immediately filled with patients from all parts of the country. In 1861 Dr. S. went abroad, and was invited to perform the peculiar operations associated with his name and discoveries by the profession wherever he appeared. He operated in Dublin, in Lond., in 9 different hospitals in Paris, and, by special invitation, at the hospital in Brussels. As an author, Dr. S. was known by his papers on *Trismus nascentium*, *Silver Sutures in Surgery*, *The Microscope in the Sterile Condition*, on *Ovariotomy*, on *Intra-uterine Fibroid Tumors*, and by his clinical *Notes on Uterine Surgery*. D. Nov. 13, 1883.

**Sims** (son) (ROBERT), b. at Kirton Hall, Ayrshire, Scotland, Oct. 14, 1687; ed. at the Univ. of Glasgow with a view to the ministry; studied med., but never practised; was distinguished for classical and mathematical attainments, and was prof. of math. at Glasgow Univ. 1711-61. D. Oct. 1, 1768. He edited the *Locust Plant* of Apollonius and the first 6 books of Euclid's *Elements*.

**Simultaneous Equations** [Lat. *simul*]. Two or more equations are *simultaneous* when the value of each of the unknown quantities is the same in all of the equations. A single equation containing more than one unknown quantity is indeterminate—that is, it can be satisfied by an infinite number of sets of values of the unknown quantities that enter it. Any two such equations may be made simultaneous, and by their combination one of the unknown quantities can be eliminated. If the number of equations is equal to that of the unknown quantities, the resulting values of the unknown quantities will be the only ones that will satisfy all the equations of the group. If the number of equations is less than that of the unknown quantities, the result of the combination will be a single equation containing two or more unknown quantities, and consequently indeterminate. If the number of equations is greater than that of the unknown quantities, the unknown quantities may all be eliminated, and there will result one or more equations between the known quantities, which must be satisfied in order that given equations may be simultaneous; these equations are called *equations of condition*.

**Sinai**, *si'nā* (Heb. *Sina*, i. e. "jagged," "full of clefts"). (1) A triangular peninsula of Ar. Petraea, between the gulfs of Suez and Akabah. The apex of the triangle points southward; its area is about 11,500 sq. m. First comes the wedge-like protrusion of the limestone plateau known as the Desert of the Wandering, then a sandstone belt, and finally the mt.-masses of granite and porphyry, flanked right and left by narrow strips of lowland bordering the gulfs. These mts. may be divided into 3 groups, the highest peaks of which, respectively, are Serbal (6734 ft.), Catharine (8526), and Shomer (8449). The peninsula is the home of about 5000 Bedouins.—(2) Used in the O. T. interchangeably with Horeb to designate the Mountain of the Law. The true S. is a gigantic mass, about 2 m. long from N. to S., and about  $\frac{1}{2}$  m. wide from E. to W. Its S. E. peak, called Jebel Musa, is the traditional scene of the giving of the Law. But here was not open space enough to accommodate the Heb. host. Its N. W. peak, called Sufsafeh, overlooks 3 wadies (Rahab, Delr, and Leja), which might easily have held 3,000,000 or 4,000,000 people. The watershed at the foot of S. is 5140 ft. above the sea, Jebel Musa 7359, Sufsafeh a little lower. The convent of St. Catharine is on the E. side of the mt. R. D. HITCHCOCK.

**Sinaloa**. See CINALOA.

**Sinapine**, *sin'-a-pin* [Lat. *sinape* or *sinapi*, "mustard-seed"], a vegetable alkaloid found, in combination with *sulphocyanic acid*, in the seed of *Sinapis alba*, or white mustard. It is inodorous, but has the bitter and hot taste of mustard. It dissolves to yellow solutions in water and alcohol, and is soluble also in ether, disulphide of carbon, and essential oils.

**Sinapine**. See MUSTARD and SINAPINE.

**Sincere Brethren**, a former secret society of Mohammedans, called also **True Friends**. The society sprang up in the Motazilite sect in the latter part of the 10th century. Its great work was philosophical and literary.

**Sinclair** (SIR JOHN), BART., LL.D., b. at Thurso Castle, Caithness, Scot., May 10, 1754, ed. at the univs. of Edinburgh, Glasgow, and Ox.; became a member of the Faculty of Advocates at Edinburgh 1775; was called to the bar at Lincoln's Inn 1782; printed tracts on parliamentary reform, on the naval strength of the Brit. empire, and *Observations on the Scot. Dialect*; pub. a *Hist. of the Public Revenue of the Brit. Empire*; was made a baronet; introduced great improvements in agriculture and wool-growing on his immense

estate of 100,000 acres; built up the port of Thurso; was influential in reviving the coast fisheries and in the establishment of the Scot. Society of Wool-growers and board of agriculture, of both of which associations he was the first pres.; maintained an extended correspondence with Gen. Washington; raised 2 battalions of fencibles for the national defence; sat in Parl. from 1780 to 1811; became a member of the privy council 1810; compiled *A Statistical Account of Scot., drawn up from the Communications of the Ministers of the Different Parishes*; printed the alleged Gaelic originals of *Ossian's Poems*, and for 50 yrs. issued an incessant stream of publications, 367 in number. D. Dec. 21, 1835.

**Sinde, Scinde, or Sindh**, *sind*, Brit. prov., forming part of the N. division of the presidency of Bombay, in Brit. India; bounded on the S. by the Runn of Catch and the Ar. Sea, on the W. by the Hala and Suliman Hills, belonging to Beloochistan (Kelat), on the N. by the Brit. province of the Punjab, and E. by the native states of Rajputana. Area, exclusive of the native state of Khairpore, 48,014 sq. m. Pop. 2,413,823. The centre of the prov., consisting of the valley of the Indus, is rich, and, where irrigated, highly cultivated. Toward the W. the valley rises into barren and rugged uplands, a country of pasture inhabited by wandering tribes of shepherds. On the left bank the plain stretches toward the E. Nara, an offshoot of the Indus. Beyond the Nara the country, passing through different stages of fertility, is finally absorbed into the Great Desert. In the S. the most recently formed portions of the Indus delta, consisting of salt-impregnated clay, are a waterlogged, unwholesome, thinly populated region, nearly devoid of vegetation. The climate shows an extreme of heat. The quantity of rain is exceedingly small. Geologically, the rocks of S. are only partially represented in the Indian peninsula, and must rather be considered as belonging to continental Asia, having been shown to be continuous with the formations found in Per. and Ar. The prin. agricultural products are, for the autumn (kharif) crop, rice, millet, panic (*Panicum spicatum*), and cotton, and for the spring (rabi) crop, wheat, barley, oil-seeds, and tobacco; wheat and oil-seeds go to Eng. Camels are very numerous; horses few, small, but very hardy; bullocks are reared in great numbers and exported to Guzerat. Though chiefly an agricultural and pastoral country, the pottery, the leather-work, and the carpets of S. are, in design and finish, of superior excellence. Islamism is the prevailing religion, 72.4 per cent. being returned as Mussulmans; the people are very peaceable and well-disposed, though far less civilized than the generality of Indian pops. Among the Mohammedans there are no castes; among the Hindoos of a notable character are the Amils, who are the best-educated class and the most generally employed in govt. service. The langs. are Sindhi, a dialect of the Aryan family, and not yet very remote from the Sans., and Beloochee, of the Dravidian group, being a mixture of Per., Sindhi, Hindi, and Sans.; both langs. are written with Per. characters. The lit. is poor.

**Sin'dia**, the dynastic name of the most powerful of the present native Mahratta princes of India, having their cap. at Gwalior. The family took its rise in the person of RAOJEE SINDIA, a low-caste retainer of the Mahratta peshwa, who rose to a high rank in the body-guard, and in 1748 received as a fief half of the prov. of Malwa. The most renowned among his successors were MADHAJEE SINDIA (d. 1794), DOWLAT RAO SINDIA (1794 to 1827), and the present ruler, BHAGERUT RAO SINDIA.

**Sine** [Lat. *sinus*], in trigonometry, the distance of one extremity of an arc from the diameter through the other extremity.

**Sin-Gan-Foo**, city of China, cap. of the prov. of Shen-Si, and formerly cap. of the empire, on the right bank of the prin. W. tributary of the Hoang-Ho, contains a pop. variously estimated at from 100,000 to 200,000, is inclosed by strong walls; is also celebrated for the discovery, a few yrs. since, of a Syriac inscription recording the establishment of Christianity there by Nestorians in the 4th century A. D.

**Singapore**, or **Singapur**, an island on the extremity of the Malayan peninsula, bearing the town of the same name. The area of the island is 222 sq. m.; the surface varies from 20 to 30 ft. above the sea-level; low hills are numerous, varying from 50 to 200 ft.; Bukemata, a hill in the centre of the island, has a height of 517 ft. The climate is agreeable to Europeans; the atmosphere is very moist. The seamen's hospital is an excellent building. The pop. of the islands has been computed to be 97,111. Chi. and Javanese are numerous.

**Singh, Runjeet**. See RUNJEET SINGH.

**Sing Sing**, on R. R. Westchester co., N. Y., incorporated in 1813, 33 m. N. of New York, is spread out over the E. slope of the Hudson, extending back from the river nearly 1 m., being about 2 m. in length from N. to S. Its streets and avenues, rising one above another to the height of from 200 to 300 ft., afford the most delightful views of the scenery of the Hudson. S. S. is noted for its salubrity as a summer resort, for its far-famed military schools, and for the number and beauty of the private residences in and immediately around it. It has a large public school with 600 to 700 scholars, 4 military high schools, Mt. Pleasant Acad., established over 50 yrs.; St. John's School, Holbrook's Military School, Symond's, the Ossining Inst. for young ladies, etc. Pop. 1870, 4696; 1880, 6578.

**Sinim**, another name of the **SENE** (which see).

**Sinking Fund**. See FUNDS.

**Sinoob** [the anc. *Sinope*], town of Asiatic Turkey, in Asia Minor, eyalet of Kastamooni, on a peninsula jutting out into the Black Sea, is surrounded with walls, has an excellent harbor, an arsenal and shipyard, extensive fortifications, and a vast castle of the Byzantine period. The anc. *Sinope* was a colony from Miletus, became the cap. of the kingdom of Pontus, was the residence of Mithridates, and is celebrated in modern times for the great naval battle, resulting in the destruction of the Tur. fleet by the Rus. ad-



miral Nakhimoff, Nov. 30, 1853. Trade is carried on in corn, timber, and fish. Pop. 10,000.

**Sintus**, or **Sintoos**, in Japan, the adherents of the *Sinayn* (that is, "the worship of the gods"), the anc. religion of the country, in which the chief deity is the sun-godess Ten-sio-dai-yin, invoked through inferior divinities called Kami.

**Sion, Mount.** See **Zion**.

**Sioux** (soo; Fr. se-oo') **City**, R. R. centre, cap. of Woodbury co., Ia. Pop. 1870, 3401; 1880, 7366.

**Sioux Falls**, R. R. junc., cap. of Minnehaha co., Dak. Terr., 100 m. N. of Sioux City, Ia. Sioux River falls 110 ft. in  $\frac{1}{2}$  m., forming a fine water-power. Pop. 1880, 2164.

**Siphon** [Gr. σιφών, a "reed"], in hydraulics, a bent tube, one leg of which is longer than the other. The shorter leg being plunged in a liquid, and the air exhausted, the liquid will flow from a higher to a lower level over an obstacle, provided the height be not more than that of the fluid column the atmosphere can support above the higher level. From its ordinary use for decanting wines, etc., a great stride is made to apply it to engineering purposes.

**Siphonia.** See EUPHOBIAEACE AND INDIA-RUBBER.

**Sir Darya.** See JAXARTES.

**Siren** (named from the SIRENS (which see) by Linnæus, on account of the incorrect belief that it has a singing voice), a remarkable genus of perennibranchiate tailed batrachians of the S. U. S. It has 2 weak fore legs, permanent gill-tufts as well as lungs, is 2 ft. long, and of a black color. It is considered venomous by the negroes.

**Sirens, The** [Gr. αἱ Σειρῆνες], in the Gr. mythology, females who were wont to sit upon the sea-shore and by their delightful song allure to destruction the passing mariners. Several places were considered as their abode, commonly the S. W. or W. coast of It.

**Sirkul.** (1) A lake situated at an elevation of 15,600 ft. in the Tameer plateau, whence issues the N. arm of the Amoo Darya. (2) A dist. extending along the E. foot of the Tameer steppes, below the Lake of Sirkul, at an elevation of 11,000 ft. The prin. city is Tashkorgan.

**Sir'us** [Gr. σείριος, "scorching"], the dog star, a star of *Canis Major*, one of the brightest stars visible in the N. hemisphere. The anc. often speak of its ruddy color, which is no longer perceptible.

**Sirocco** [Ar. shorokk], a hot, relaxing wind which rises in the Sahara, then blows across the Mediterranean, where it occasionally becomes filled with moisture, and finally over Sic., S. It., Malta, etc. It is very pernicious to both vegetable and animal life.

**Sisal Hemp**, the fibre of various species of agave. S. H. is produced in considerable quantities in Yucatan and at Key West, Fla. It makes excellent cordage, also hammocks of great strength and durability.

**Sisco**, or **Cisco**, a name given to several species of the genus *Argyrosomus* (sub-family Coregoninae) in the N. U. S. The prin. species are the *A. chupeformis* (also called "herring") of Lake Ont. and the *A. hoyi* of the deep waters of Lake Mich. They are recognizable by their herring-like form, with the lower jaw longest. They are small-sized fishes, rarely weighing as much as a pound.

**Siscowet**, **Siskowit**, or **Siskawit** [Indian], (*Salmo siscowet*, Agassiz), a species of lake-trout, and an important element in the lake fisheries. It is a stout fish, the height being equal to about a fifth of the length; the head forms a fourth of the length. The color varies according to the feeding-ground on which it is caught, and is brighter during the breeding-season. The species is characteristic of Lake Superior. It is an inhab. of the deep water of the lakes. It never reaches the large dimensions of the great lake-trout or salmon (*Salmo namaycush*), and averages about  $\frac{1}{4}$  lbs. in weight, 8 lbs. being near its maximum; it becomes extremely fat. The flesh is of a very light reddish tint. As a fresh fish it is quite inferior, but as a salt fish, packed in brine, it is most excellent. It spawns comparatively early—4 c. in the latter part of Aug. and Sept.

**Sisen'na** (L. CORNELIUS), b. B. C. 119, was prætor B. C. 78; defended Verres in 70, and d. B. C. 67, in Crete, being at the time legate of Pompey in the war with the pirates. Having been an actor in public affairs, he was well fitted to relate the events of his own time (including the Social war and the c. wars of Sulla) in his work, *Historia*, written in an archaic style. Cicero says of him that he surpassed all previous Lat. historians, and Sallust highly praises his diligence.

**Siskin** [Dan. siskjen], or **Aberderine** (*Chrysomitris spinus*), a bird of the family Fringillide, congeneric with the yellow or thistle bird of the U. S. (*Chrysomitris tristis*). The male has a black crown and nape, is olive-green on the neck and back, varied with blackish and yellowish green beneath; its throat is black; its length is about  $\frac{1}{4}$  inches. It is esteemed in Europe as a cage-bird.

**Simon'di**, de (JEAN CHARLES LÉONARD SIMONDE), b. at Geneva May 9, 1773, ed. in the coll. of his native town, and was a clerk in a large counting-house in Lyons; accompanied in 1798 his family, which left Geneva on account of the political disturbances, to Eng., where he stayed for 2 yrs.; returned in 1795, but fled again a short time after, and resided for several yrs. at Pescia in Tuscany, where his father bought a farm; settled finally in his native town in 1800; devoted himself to studies and literary work, though at the same time participating very actively in politics; married in 1819 an Eng. lady. Wrote *De la Richesse commerciale, Histoire des Républiques italiennes du Moyen-âge*, and *Histoire des Français*. D. June 25, 1842.

**Sisterhoods.** See SISTERS OF CHARITY AND MERCY, SISTERS OF.

**Sisters of Charity.** Beside the congregations mentioned under the head CHARITY, SISTERS OF, the following orders may be noticed: (1) *The Gray Nuns of Montreal*, found chiefly in Canada and the U. S., founded in 1745 by the widow D'Youville (1701-72); (2) *The Sisters of Charity of Nazareth*, founded in Ky. in 1812 by Bp. David, have a few

houses in the U. S.; (3) *Sisters of Charity of the Blessed Virgin*, founded in Phila. by T. C. Donaghy, a priest, now found mostly in Ia.; (4) *The Sisters of Christian Charity* have a few representatives in the U. S.

**Sisters of Mercy.** See MERCY, SISTERS OF.

**Sisters of the Holy Communion.** See HOLY COMMUNION, SISTERS OF THE.

**Sisyphus**, in Gr. mythology, a son of Autolycus, the husband of Merope, reputed father of Odysseus by Anticlea, founder of Corinth and the Isthmian games, was condemned, on account of his crimes against men and gods, to roll up a steep hill a huge boulder, which, on reaching the summit, rolled down again.

**Sit'ka**, or **New Archangel**, cap. of Alaska Terr., on Baranov Island, near the Pacific coast, has a small but commodious harbor; was founded by the Rus. in the 18th century, and was long the head-quarters of the Rus.-Amer. Fur Co. When transferred to the U. S. in 1867 it consisted of about 100 log huts. Since that time several commodious edifices have been built. Pop. about 1000.

**Siva.** See HINDU RELIGION.

**Sivathe'ride** [from *Siva*, the Hindoo god, and *θηρίον*, a "beast"], an extinct family of ruminating animals, with the skull broad behind and narrowed before, 2 pairs of horns, and broad molars, *S. giganteum*, from the Siwalik Hills, India, remarkable for its large size and peculiar horns. The bones of the skeleton of *S.* were massive, like those of oxen. The neck was strong, for the support of the heavy skull. The nose was probably more or less movable, as evinced by the short projecting nasals.

**Si'wah** [the anc. *Ammon* or *Ammonium*], an oasis in N. W. Egypt, 360 m. W. of Cairo and 160 m. S. of the Mediterranean. The E. part of the oasis is very fertile and rich in springs; in the N. part some limestone hills are found. In anc. times the place was celebrated as the seat of the temple of Jupiter Ammon and of the Fountain of the Sun. The oasis is inhabited by about 8000 Berbers and negroes, who profess Mohammedanism, speak a peculiar dialect much mixed up with Arabic, and are governed by elders.

**Six-Principle Baptists**, a sect of Amer. Chrs. who take as their creed the 6 principles laid down in Heb. vi. 1, 2—viz.: (1) repentance, (2) faith, (3) baptisms (of repentance, of fire, and of Christ's sufferings), (4) laying on of hands, (5) the resurrection, (6) the eternal judgment. They are found in R. I., Mass., N. Y., and Pa.

**Six'tus**, the name of 5 popes—SIXTUS I. (119?-128?), SIXTUS II. (257?-258), SIXTUS III. (432-440), SIXTUS IV. (1471-84), SIXTUS V. (1585-90), b. at Grotto-a-Mare, near Montalto, Dec. 15, 1521, entered the order of the Franciscans in 1534; became a teacher of canon law at Rimini in 1544 and at Siena in 1546; was ordained a priest in 1548; was employed in various diplomatic missions, and became a cardinal in 1570. Arrived at this point, his ambition seemed to go no farther. He lived quietly, and made the impression of being a man easy to lead. After the death of Gregory XIII. (1585) he was unanimously elected pope, but hardly was the result of the election pronounced before he threw aside the stick with which he had been wont to grope along, and stepped forward among the astonished cardinals, no more concealing the power and authority of his character. In all theological controversies he tried to remain neutral, but in the discipline of the Ch. he prepared a thorough reformation. His great idea was to raise the papal see once more to its former splendor. The aqueduct, *Acqua Felice*, the dome of St. Peter's ch., the obelisk in front of this ch., the foundation of the Vatican library, etc., are monuments of his internal govt. D. Aug. 24, 1590.

**Skaneateles**, on R. R., Onondaga co., N. Y., 18 m. S. W. of Syracuse, at the N. end of Skaneateles Lake. Large quantities of the teazel-plant are grown here. It is a favorite summer resort. Pop. 1870, 1409; 1880, 1669.

**Skate.** See **RALE**.

**Skeat** (WALTER WILLIAM), b. in London, Eng., Nov. 21, 1835, ed at King's Coll. School and at Sir R. Cholmeley's school, Highgate; grad. at Christ's Coll., Cambridge, as 14th wrangler 1858; became a fellow of that coll. July 1860; took orders in the Ch. of Eng.; obtained the curacy of E. Dereham, Norfolk, Dec. 1860, and that of Godalming, Surrey, Dec. 1862; became lecturer on math. at Christ's Coll. Oct. 1864, and subsequently Eng. lecturer; was in 1873 one of the founders of the Eng. Dialect Society, of which he is director and responsible editor. He has published *The Romance of William of Palerne, or William and the Werewolf, The Lay of Havelok the Dane*, etc. For the Philological Society he edited a *Mæso-Gothic Glossary* (1868), for the Ox. Univ. Press 2 vols. of *Specimens of Eng. Lit.*, and for the Cambridge Univ. Press the variorum edition of the *A.-S. Gospels*. Also author of *An Etymological Dict. of the Eng. Lang.* (1882).

**Skene** (WILLIAM FORBES), LL.D., b. at Peverie, Kincardineshire, Scot., June 7, 1809, ed. at the High School and Univ. of Edinburgh, also at that of St. Andrew's, and in Ger.; became a lawyer, a distinguished archaeologist, and officer of several learned societies. Author of *The Highlanders of Scot., their Origin, Hist., and Antiquities*, and ed. of *The Dean of Lismore's Book, a Selection of Anc. Gaelic Poetry; Chronicles of the Picts and Scots and other Early Memorials of Scot. Hist., The Four Anc. Books of Wales*, etc. His most important work is *Celtic Scotland*.

**Skepticism.** See SCEPTICISM, by W. T. HARRIS, LL.D.

**Skin, Chemistry of.** Animal skins consist mainly of elastine or keratine, and a tissue which with hot water yields a solution of gelatine. It is the latter which combines with tannic acid in the conversion of the skin into leather. Skins are not always tanned, but for some uses are dressed in other ways. Skins for gloves are treated with alum, and afterward with yolk of egg.

**Skin Diseases.** The human skin is subject to the same morbid processes to which other organs of the body are. The diseases appear as primary or secondary eruptions, the former being immediate products of the morbid processes,



the latter produced by further development or changes of the primary eruptions. The causes of diseases of the skin are either rooted in the whole organism, or they are local ones, by which the skin is primarily or chiefly attacked. There exist eruptions on the general covering which are intimately connected with and caused by diseases of the whole organism, such as in variola, scarlet fever, measles, syphilis. Certain rashes occur in typhoid fever, in purulent infection of the blood, so called pyæmia, in scrofulosis, scorbutus, etc. Moreover, diseases of internal organs may involve the skin, especially affections of the intestinal tract, of the liver and spleen, of the internal genital organs, of the urinary apparatus, of the nerve-centres. There are, lastly, normal processes—the dentition, menstruation, pregnancy—which lead to various kinds of cutaneous affections. Hereditary transmission is of a doubtless influence in causing S. D. (syphilis, psoriasis, leprosy, etc.); furthermore, the age, the business, the mode of life, and climate. But the most potent agencies for producing affections of the skin are those external to the body, attacking the skin directly. Beside general injurious influences—heat and cold, dryness and moisture, different arts and trades—merely local diseases are caused by the operation of caustic substances, neglect of cleanliness or exaggerated washing and rubbing with strong soap, long-continued pressure upon certain parts, and parasitic organisms which penetrate the skin.

1. *Diseases due to Perverted States of the Secretions of the Cutaneous Glands.*—Rancid odor of the perspiration, called bromidrosis; curable by repeated treatment with diachylon ointment; the secretion of a colored perspiration is termed chromidrosis. The sebaceous glands secrete an excess of fat, the so called seborrhœa; accumulations within the sebaceous glands or their ducts are the so called "flesh-worms"—comedones. In the mass of a flesh-worm there is often found an insect, the *Acarus folliculorum*. The flesh-worms, again, are the most common causes of pimples, as they act upon their neighborhood like foreign bodies.

2. *Diseases due to Inflammation.*—Measles, scarlet fever, small-pox, erythema, roseola, and urticaria or nettle rash are diffused inflammations of the skin due to perverted blood states. Erysipelas and furuncles (boils) are localized inflammations of the skin caused by vice of the blood. Herpes (hives) and miliaria are inflammations of the skin resulting in water blebs or blisters. The chronic inflammations are characterized by a tendency to repeated relapses and the protracted course which they run. Such are psoriasis, lichen, and pityriasis rubra. Psoriasis is a very common disease, characterized by white, rough, uneven patches on a dark-red ground, dispersed all over the body, mainly on the elbow and knee joints. It is, however, harmless, but very liable to recur after it has been removed by local caustic and tar applications, together with internal administration of arsenic, carbolic acid, etc. A second group of inflammatory skin affections is characterized by intense itching. To this group belongs a very common disease termed eczema, and a rare disease termed prurigo. The eczema (moist tetter or salt rheum) is a skin disease of usually chronic course, characterized either by the formation of aggregated papules and vesicles, or by more or less deeply red patches covered with thin scales, or in other cases by a moist surface. It is curable in every stage—by indifferent remedies when acute; by ointments, especially the diachylon and zinc ointment, when weeping; by tar preparations when scaly; and caustics when chronic and having led to hardening (so called hypertrophy) of the skin. Internal remedies almost always are useless. A third group of chronic inflammatory S. D. embraces acne and sycosis. Acne on the face, the chest, and the back—one of the most disfiguring diseases—is always produced by accumulation of sebaceous masses in the glands (flesh-worms), and is entirely curable by repeated emptying of the glands and irritating agencies, without internal treatment. The healing of sycosis (barber's itch) can be obtained by application of diachylon ointment, repeated shaving and pulling of the hairs, in the sheaths and follicles of which the inflammation is mainly situated.

3. *Diseases due to Hypertrophy.*—The corn, elephantiasis arabum, ichthyosis, warts, and papillary growths of the skin, horns of the skin, hypertrophy of the nails and the hairs are instances of hypertrophy. The pigment-granules of the skin are very often hypertrophied, leading to formation of brown spots, ephelides (freckles), chloasma (liver-spots), while long-continued irritation of the skin leads to universal dark discoloration—melasma.

4. *Diseases due to Atrophy.*—Inflammation often produces first hypertrophy, afterward ulceration, loss of substance, and atrophy. Leprosy, lupus, and scleroderma are instances of such combined diseases, as also the early falling out of the hairs without visible cause, the localized atrophy of hairs in alopecia areata.

5. *Diseases due to New Growths.*—Tumors, benign or innocent—viz. fibroma, cheloid, warts, and nevi; or malignant—viz. sarcoma, one variety of which, the pigmented or melanotic sarcoma, forms the most malignant kind of tumors of the organism.

6. *Diseases due to Anomalies of Innervation.*—Neuroses.—Lowered sensibility—æsthesia—and excited sensibility—hyperæsthesia; the itching of old persons, pruritus senilis, which malady often is treated successfully by internal administration of carbolic acid.

7. *Diseases due to Parasites.*—The scabies is produced by the presence of the itch-insect within the epidermis. Analogous is the action of the flea, the bedbug, the louse. By vegetable parasites are produced slightly scaling and itching brown spots, pityriasis versicolor; furthermore, herpes tonsurans (ringworm), a very common disease, appearing first in the shape of small vesicles or ring-like red eruptions, which when situated on the parts provided with hairs, lead to baldness; lastly, favus, a disease kindred to ringworm. If we succeed in killing the parasites locally, a perfect cure can be obtained in a short period of time, but on the scalp

and the beard these diseases usually are very obstinate. (See BARBER'S ITCH, BOIL, BURNS AND SCALDS, CHICKEN-POX, CORN, ECZEMA, ERYSIPELAS, HERPES, ITCH, LEPROSY, NETTLE RASH, RINGWORM, SCABIES, SCALD HEAD, SCURVY, WARTS.) [From orig. art. in J. S. Under. Cyc., by C. HEITZMANN, M. D.]

**Skin-Moths**, a name sometimes given to beetles of the family Dermestidae, which attack skins. They are small insects of dark color, and sometimes commit great ravages in collections of skins, and museums. The most notable species are (1) *Dermestes lardarius*, (2) *Dermestes vulpinus*, and (3) *Anthrenus museorum*. (1) The first is for the most part blackish, but the bases of the elytra are ash or gray buff, relieved by 2 or 3 black spots. (2) The second is totally black above, but the sides of the thorax and the under part of the body are covered with white scales. (3) The third species has transverse waved lines. All these species may be killed by applications of benzine; camphor and turpentine are also used.

**Skin'ner** (EZEKIEL), M. D., b. at Glastenbury, Conn., June 27, 1777, was in youth a blacksmith's apprentice, but became a phys. at Granville, Mass., 1801; removed to Lebanon, Conn., 1807; served both as a soldier and as a surgeon in the war of 1812-15; was licensed as a Bap. preacher at Stafford, Conn., 1819, and became pastor of a ch. at Ashford 1822. Proceeded to Liberia in 1834; became med. director of the colony; preached frequently, and acted for a time as gov. Returning to the U. S. 1838, he resumed his pastoral duties and his med. practice. D. Dec. 25, 1855.

**Skinner** (JOHN STUART), b. in Md. Feb. 12, 1788, was admitted to the bar 1809; settled at Baltimore 1813; was P. M. of that city 1822-37; began in 1819 the publication of the *Amer. Farmer*; afterward edited the *Turf Register* and *The Plough, Loom, and Anvil*; was the first organizer of agricultural shows and fairs in the Middle and S. States; wrote several works on farming and sporting topics, and was third assistant P. M. gen. 1841-45. D. Mar. 31, 1851.

**Skinner** (OTIS AINSWORTH), D. D., b. at Royalton, Vt., July 3, 1807, became a Univ. preacher 1826; was settled as a pastor at Baltimore, Md., 1831, at Haverhill 1836, at Boston 1837, at New York 1846, again at Boston 1849, and became in 1857 pres. of Lombard Univ. at Galesburg, Ill., preaching also at Elgin, and subsequently at Joliet 1858. He edited religious periodicals, wrote several religious treatises, and was an active worker in behalf of education, temperance, and reform generally. D. Sept. 18, 1861.

**Skinner** (RICHARD), LL.D., b. at Litchfield, Conn., May 30, 1778, was admitted to the bar 1801; settled at Manchester, Vt.; became known as the ablest lawyer in that State; was judge of probate for Bennington co. 1806-12; M. C. 1813-15, associate judge 1815, chief-justice of the supreme court 1816, speaker of the assembly 1818, gov. 1820-23, again chief-justice 1824-29. D. May 23, 1838.

**Skinner** (STEPHEN), M. D., b. in London, Eng., in 1623, grad. at Christ Ch., Ox., 1646; studied philology and med. on the Continent; became a phys. at Lincoln; devoted his life to the preparation of a vast work on Eng. etymology. D. Sept. 5, 1667.

**Skinner** (THOMAS HARVEY), D. D., LL.D., b. at Harvey's Neck, N. C., Mar. 7, 1791, grad. at Princeton 1809; studied law, and afterward theol.; was co-pastor with Dr. Janeway of the Second Presb. ch. in Phila. 1813-16, and pastor of the Fifth Presb. ch. 1816-32; prof. of sacred rhetoric at Andover Theological Sem. 1832-35; pastor of Mercer st. Presb. ch., New York, 1835-48, and prof. of sacred rhetoric and pastoral theol. in Union Theological Sem., New York, from 1848 to his death, Feb. 1, 1871. Pub. *Religion in the Bible, Aids to Preaching and Hearing, Vinet's Pastoral Theol.*, etc.

**Skins**, for furs. See FURS and THE FUR-TRADE.

**Skins**, for leather. See LEATHER.

**Skipjack**, a name given in the U. S. to several species of fishes very distinct from each other. They have no common characters.

**Skipper**, a name applied in Eng. to certain animals—viz. (1) to the *Scomberox auratus*, a long, compressed, mackerel-like fish; and (2) to butterflies of the family Hesperidae, small dark-colored butterflies.

**Skirret**, the *Sium asarum*, an umbelliferous parsnip-like plant, a native of Asia, long cultivated in Europe, which is very nutritious and palatable.

**Skobeleff** (MICHAEL DMITRIEVITCH), a Russian, b. 1843, ed. at the St. Petersburg Univ., but dismissed in 1861 for resistance to restrictions; in 1863 served in the army against the Polish insurrection; in 1865 received a captaincy in the army in the Caucasus. In 1873 he took part in the expedition against Khiva, and was sent to explore the desert between Khiva and the Caspian Sea. Was appointed to the staff, and became a maj.-gen. Crushed the rebellion in Khokand, and became gov. of the terr. he had subdued. Went to Bulgaria, and compelled the Tur. army to surrender. D. suddenly July 7, 1882.

**Skowhegan**, cap. of Somerset co., Me., on R. R. and Kennebec River, 100 m. N. E. of Portland. Pop. tp. 1870, 3893; 1880, 3860.

**Skullcap** [Lat. *Scutellaria*, from *scutella*, a "little dish"], the common name of a genus of perennial herbs found over a wide range of climates in Amer., especially in Mex. and the sub-tropical regions, though several species grow in the N. U. S. and in Europe. They derive their name from an envelope around the fruiting calyx.

**Skunk** [from the Abenaki *segunku*], the common name applied in the U. S. to the species of the family Mustelidae and sub-family Mephitinae. The body is moderately elongated and arched backward; the legs comparatively short; the feet sub-plantigrade; the tail rather long and very bushy; the color is particolored, black and white being contrasted. The skull is compressed backward, produced forward, and transversely convex. Their anal glands are in a single pair and of large dimensions; their outer walls consist of a thick fleshy tunic formed of 2 layers of interlaced fibres, capable of sudden strong compression of the



receptacles; these are enormous reservoirs, with a dense resisting fibrous coat, always containing a considerable quantity of the follicular product. The glandular substance is restricted to a particular portion, and contrasts by its dark color with the white ground of the envelope of the pouch. The contents of the receptacles are sufficiently offensive to justify the disgust which these animals excite in consequence of their curious means of defence. The species are all active carnivorous animals, feeding on small quadrupeds and birds as well as reptiles. They burrow in the ground, and in the N. States remain torpid during the winter. They bring forth from 6 to 9 young at a birth.

**Skunk-Cabbage** [*Symplocarpus foetidus*], the popular name of a large marsh-plant of the arum family, common in the Atlantic U. S., distinguished by the unpleasant smell and by the clusters of leaves from which it derives its name, is an endogen, producing early in the spring a head of flowers within a shell-shaped spathe or hood, of a dark purplish color variegated with patches of red or green. The roots and leaves have been used as stimulants.

**Sky-lark** (*Alauda arvensis*), a European bird, type of the family Alaudidae, celebrated for its song. It is characterized in its genus by the slight prolongation of the feathers of the occiput, but not enough so to form a crest; the very small size of the first primary, the equality of the second and third, and the margination outside with white of the external tail-feathers; the upper parts are variegated with blackish and reddish gray; the lower parts white on the abdomen, but with the neck, breast, and sides tinged with reddish and spotted with brown. The length is about 7 inches, the tail being 3. It is found all over Europe as well as N. Afr. and the corresponding zones of Asia.

**Slade** (William), b. at Cornwall, Vt., May 9, 1786, grad. at Middlebury Coll., 1807; began the practice of law, 1810; was ed. and pub. of the *Columbian Patriot* 1814-15; sec. of state 1815-23, judge of Addison co. 1816-22, clerk in the state dept. at Wash. 1823-29, State atty. for Addison co. 1830-31, M. C. 1831-43, reporter of the supreme court of Vt. 1844, gov. of that State 1844-46, and from 1846 to 1858 sec. of the national board of popular education. Compiler of *Vt. State Papers*, *Statistics of Vt.* and *Vt. Reports*. D. Jan. 18, 1859.

**Slags** [Dan. *slagg*], the imperfect glassy or vitrifiable compounds which are produced during the reduction of metallic ores by various fluxes. The S. produced in metallurgical operations should have the following properties: They should fuse at the right temperature; be of such fluidity and specific gravity as to allow the metal or matte (*regulus*) produced to sink readily through them; have such a composition that they will not attack the desired product or the furnace-walls, and will not allow undesirable bodies to separate from themselves; must be able to take up foreign substances, and must be in sufficient quantity to protect the desirable products from the hurtful influence of the blast or other agencies. The color of S. is very various. Generally, a dark S. will owe its color to metallic oxides, dark green or black indicating iron oxides, and dark brown manganese; light green indicates protoxide of iron; red or reddish brown, suboxide of copper. Some very dark S. from iron furnaces, however, owe their color probably to sulphur, and contain little iron oxide. The peculiar blue color of some blast-furnace S. has been referred to the presence of ultramarine, vanadium, molybdenum, cobalt, and titanium.

**Slan'der** [Gr. *σκάδαλον*], in law, is the speaking by one person, in the presence of one or more hearers, of defamatory words concerning another injurious to his reputation and character, by which pecuniary damage is done to him, and for which he is entitled to recover compensation in an action at law. The defamatory words which constitute S. are of 2 classes: (1) Those which the law presumes to be actionable in themselves; (2) those which become actionable only by alleging and proving that such pecuniary damage was in fact sustained by the person defamed. The gist of the defendant's liability is his *malice* in uttering the words, and this malice is conclusively presumed to exist if the defamatory statement is false. If the charge is true, no matter how injurious it may be, nor how hostile may have been the defendant's motives, the *legal* malice is not present.

**Slate** [O. Eng. *slate*], indurated metamorphosed shale; a hard tough rock which splits into thin plates, the type being roofing-S. The lamination of S. is not that of the bedding, but is often at right angles to it. It is produced by lateral pressure, is confined to disturbed and metamorphosed rock (argillite), and from its peculiar character is called slaty cleavage. S. is now the most highly esteemed material in use for roofing, and is very largely employed for that purpose. It is found in all countries where there are metamorphic rocks; the great source of supply has, however, been N. Wales, where there are immense quarries located on or near the coast. Excellent roofing-S. is also obtained in many localities in the U. S., as at Brownville, Me.; Poulney, Castleton, etc., Vt.; Granville, Jamesville, and Hampton, N. Y.; Newton, Delaware, and Slatington, Pa.; Peachbottom, on the N. line of Md., etc. S. of good quality is also known to exist in N. and S. C. and in the Huron Mts. N. of Marquette, Mich. Although the great consumption of S. is for roofing, it is employed for many other purposes, such as billiard-tables, counters, tiles, blackboards, and writing-S., and, when enamelled, for mantels, table-tops, etc.

**Slater**, Mo. See APPENDIX.

**Slater** (SAMUEL), b. at Belper, Derbyshire, Eng., June 9, 1768, was apprenticed at 14 to Jedidiah Strutt, partner of Arkwright in the business of cotton-spinning; assisted his master in making some improvements in his machinery, of which he acquired a thorough knowledge; introduced the Arkwright machinery into the U. S., reproducing from memory the models, and starting at Pawtucket Dec. 21, 1790, a mill with 3 carding-machines and 72 spindles, which was the virtual beginning of the cotton manufacture in Amer. he erected cotton-mills of his own at Oxford (now Webster),

Mass., in 1812, and added woollen-mills 1815-16, the nucleus of the prosperous v. of Slatersville. D. Apr. 21, 1835.

**Slatington**, Pa. See APPENDIX.

**Slave Coast**. See GUINEA.

**Slave Lake and River**. See GREAT SLAVE LAKE.

**Slavery**, the condition in which one person is the property of another, is found in the earlier stages of the hist. of almost every nation known. It originated, no doubt, from war. Among the anc. Assyrians, insolvent debtors, as well as captives taken in war, were reduced to S., and the S. was perpetual. The Heb. system was one of great mildness. Native Hebs. might either sell themselves on account of poverty, or be sold in punishment of theft; but only for 6 yrs. at most, and not even for that length of time if the jubilee yr. came sooner. The smiting out of a servant's eye, or tooth even, brought freedom to the servant. A master who killed his servant, man or maid, was to be "punished." With the Grs. and Roms. S. formed the very basis of the political const., and Plato, although he recognized it as being opposed to the true idea of human nature, declared it necessary for the maintenance of the state. In all the Gr. states the slaves outnumbered the freemen. In Rome the slave had originally no rights at all. For the smallest misdemeanor he could be legally punished with death, and he was never admitted as a witness without being put to the torture. Slave revolts occurred in 140 and 104 b. c. in Sic., and in 73 b. c. under Spartacus, and led to the introduction of some milder measures. But it was not until the time of the emps. that any great change took place in the condition of the slaves. Finally the inst. vanished before the spirit of Christianity, or assumed another character.

The Koran forbids the Moslems to keep their co-religionists as slaves, and neither Mohammed nor his next successors subjected their conquered enemies to S. They kept negro slaves, however, imported from Afr., but they treated them very mildly. It was the contact between the Mohammedans and the Chrs. during the Crusades which gave a new impulse to S. The Chr. knights made slaves of their Mohammedan captives; the Mohammedan warriors took redress. S. still exists in most Mohammedan countries, but as a political rather than as a social inst. Among the Berbers along the N. coast of Afr., S. and the slave-trade developed, as early as the 15th century, into a terrible calamity. Merchants and others, crossing the Mediterranean, were kidnapped by the Berbers, and if not ransomed sold into S. Charles V. fought against this evil with some momentary success, but it was not fully suppressed until 1830 by the Fr. conquest of Algeria. Another impulse the inst. and the trade received after the discovery of Amer. The invention of hunting negroes in the interior of Afr. to use them as slaves in the colonies is due to the Port., but for its application to the New World and its establishment as a regular and legal business the world is indebted to the Sp. priest Las Casas. (See ABOLITION OF SLAVERY.)

**Slaves and the Slave Trade**. See SLAVERY.

**Slavic Races**. See SLAVS.

**Slavonia** forms, together with Croatia and the Military Frontier, the kingdom of Croatia and Slavonia, a political division of the Aus. empire, comprising an area of 16,773 sq. m., with 1,892,499 inhabs. S. proper is bounded N. by the Drave and S. by the Save, E. by the Danube, and W. by Illyria and Styria. A branch of the Carnian Alps enters S. from the W., and traverses it in its whole length, forming the watershed between the Drave and the Save. These mts., which nowhere rise above 2700 ft., are rich in copper, iron, lead, and beautiful marble, and their slopes are clothed with fine timber-yielding forests, vineyards, and orchards. Along the rivers extend low, rather marshy, but very fertile plains. Of manufactures there are almost none; some linen fabrics are made for home use. The inhabs. call themselves *Slavonatz* and their country *Slavonska*. They are deeply attached to their fatherland and proud of their nationality. They are mostly R. Caths., and speak the Illyrian dialect, Cap. Eszek.

**Slavs**. The present Slavs or Slavonians may be divided into 3 main branches—E. W., and S. To the first belong the Rus.; to the second, the Poles, the Czechs, the Slovaks, and the Lusatian Wends; to the third, the Bulgarians, the Servians and Croatians, and the Slovenes. The whole pop. of the Slavonic world is supposed to number nearly 80,000,000. In the 4th century the S. were found in great numbers in the neighborhood of the Carpathians, and thence they appear to have spread northward to the Baltic and southward to the Adriatic. The earliest authentic records of the S. are given by writers during the second half of the 6th century. These authors were personally acquainted only with the S. S., who haunted the Lower Danube and spread through ancient Moesia and Pannonia. The N. S. they knew by report only. No political unity seems ever to have existed among these early S., but their different bodies consolidated at various periods between the 7th and 11th centuries into monarchies.

Of the anc. S. little information can be obtained except from extraneous sources. But they appear to have differed but little in the various lands which they occupied, everywhere bearing the character of being a brave and hardy race, but given to agriculture, and therefore of a peaceable nature, except where they were influenced by more martial neighbors. Among the W. S. at least, a cluster of such communities formed a *jupa*, or dist., at the head of which was a *jupan*, or chief, and in its centre a *grad*, or town. The mode of life among all the Slavonic tribes was patriarchal, the father ruling his family with despotic power. Polygamy prevailed among them in heathen times. Of Slavonic heathenism not much is known, but its deities appear to have been for the most part personifications of nature-forces. The W. S. appear to have been the first to accept Christianity, many of the Moravians, for instance, having been converted as early as the 7th century, their re-



ligious teachers coming from the W. But the submission of the great body of the S. dates from the mission of the Gr. monks Cyril and Methodius in the 9th century. After many changes and struggles the W. S. mostly submitted to the Lat. Church and employed the Lat. alphabet, while the Eastern, forming part of the Oriental Church, retained the alphabet invented by Cyril, their liturgies keeping to some extent alive at the present day the anc. tongue, which seems to have been common to all Slavonic peoples 1000 yrs. ago. [*From orig. art. in J.'s Univ. Ency., by W. R. S. RALSTON.*]

**Sleeper** (Sir WILLIAM HENRY), K. C. B., b. at Stratton, Cornwall, Eng., in 1788, became a cadet in the Bengal service of the E. I. Co. 1808; discovered the secret order of murderers called "Thugs," and effected their suppression (1838); filled many civil and military trusts with great credit, rising to the post of pres. at Lucknow 1849; became maj.-gen. Nov. 1855, and was knighted Jan. 1856. Wrote *The Thugs or Phansigirs of India, Military Discipline in our Indian Army, Journey through the Kingdom of Oude*, etc. D. Feb. 10, 1856.

**Sleep** [*A. S. slápan*] is a period of normal cerebral rest, characterized by a partial or complete cessation of consciousness and voluntary motion. S. is incomplete in proportion to the degree of consciousness and voluntary power which remains. It is preceded by lassitude, yawning, heaviness of the eyelids, an expressionless appearance of the face, and sluggishness of thought, constituting drowsiness; the respiration then becomes slower and deeper, the heart-beats slower and fuller, the pupils contract; the head, if upright, nods, while the jaw relaxes; relaxation of the muscles of the arms, then of the legs, occurs, and, finally, the whole voluntary muscular system relaxes. During this time concentration of thought has become more and more difficult, particularly for abstract reasoning; wandering from the subject, which is replaced by an imaginative train of thought, ideas become more and more incoherent until consciousness flickers out, and S. is complete. Of the impressions upon the special senses, consciousness is lost first to sight, then to taste, smell, hearing, and touch, in succession. On waking, an inverse order of phenomena occurs: the voluntary powers are at first feeble; there is an uncertain walk; the eyes feel heavy and sensitive to light; yawning and stretching follow, and a varying period of confusion and drowsiness, after which mental and physical vigor return rapidly. During S. the secretions and excretions generally are diminished; perspiration, however, according to some authors, is increased. The time occupied in S. is exceedingly variable: in man, 8 hours a day, or one third of our existence, may be considered the average, some individuals requiring but 4 hours, while 10 or 12 seem necessary for others; these variations depending largely on the soundness of S. and variations in the supply and demand of nutritive material for the brain. More S. is required, and the periods of activity and repose succeed each other with greater frequency in infancy than in adult life. S. is usually most profound during the first hours of repose. Regularity in the hours for retiring and rising is of far more importance for health than retiring at an early hour; yet for man and most animals the hours of darkness are most favorable to S., largely on account of a reduction in the number of impressions on the senses from the stillness, and the absence of light, together with the effects of long habit in the race. The carnivora, on the contrary, select the night for the time of their greatest activities, and man can accustom himself to almost any change in this respect, though not without disturbance, which accompanies an interruption of any established habit. A moderate degree of heat favors S., and severe cold produces a S. closely allied to stupor. Monotonous sounds, impure air, a hearty meal, are conducive to S. On the other hand, the cessation of an accustomed sound will often produce waking. An irritating article of food in the stomach will disturb S., while a small amount of easily digested food taken just before retiring will often reduce sleeplessness. We may ward off impending S. for a time by active movements, by rapidly changing our line of thought and conversation; on the other hand, by reclining, closing the eyes, imitating the long, full respirations of S. and casting off all mental effort, S. can be induced by many persons at almost any time.

It is probable that in going to sleep the innumerable paths in the cerebrum, consisting of nerve-fibres and cells along which excitations travel, producing mental processes, do not become inactive at once, but in irregular succession, depending upon the relative degree of exhaustion to which they have been subjected from previous activity, and upon variations in excitability to different impressions; which may come from the external world through the senses, or from other parts of the body, particularly from parts of the nervous system which remain active. This would account for the incoherence of dreams, which, like insanity, are the result of incoördinate cerebral action. Our thoughts, particularly the abstract ones, are the result of an exceedingly complex association of ideas, the product of corresponding excitations within the intricate network which forms an associating system for the cerebrum. Now, when from fatigue certain portions of this system become inactive, while others for a time retain their activity, an impulse originating in the latter encounters an interruption in the former, so that the usual association of ideas does not follow. Other paths, however, may still be open, and an unusual association take place, which, if remembered, will be considered on waking as an unusual or distorted picture. Sometimes the paths selected will be those traversed in former years: more frequently, however, fragments of ideas which made a special impression upon us a few hours or days before. The more complex processes which we call judgment depend upon more intricate associations over less frequently traversed paths, whose activities must give way before those of the simpler, earlier organized, and

more frequently traversed paths. The latter may gradually become involved until excitation is reduced so low that consciousness ceases entirely. All stages may have been passed through, from the brilliant fancies of an uncontrollable imagination, down to the confused delirium in which even the bare idea of existence is but a faint one. It is claimed by some that dreaming never ceases during S. They suggest that those who say they never dream may forget their dreams. It should be remembered, however, that complete loss of consciousness can neither be reached, nor recovered from without passing through the borderland of semi-consciousness and dreams. No experience can determine the question, for we have no consciousness with which to appreciate the *lost* consciousness, and just before consciousness is regained there is none to appreciate. The feebleness of mental processes in dreamy S. is shown by the fact that most dreams are not distinctly remembered; and although we go through with the voluntary acts in imagination, yet they seldom result in voluntary movements. Talking in one's S. is one of the exceptions. Many of the movements which occur during S. are due to the action of the medulla oblongata and the spinal cord. The remarkable productions in prose, poetry, and music, beyond the power of the dreamer in the waking state, are probably due, in the absence of a sound judgment, to an extremely incoherent production having been mistaken for a seemingly perfect one.

The fundamental causes of S. are probably the exhaustion of nutritive material and the accumulation of waste products in the nerve-elements of the brain. In the waking state loss exceeds gain in nutritive material; in S. the reverse occurs, though the processes of waste and repair must go on during both periods. Although fatigue of the cerebral nervous elements is the primary cause of S., various accessory causes exist; the most important lies in the action of the vascular system, which brings nutritive material to the nerve-cells and fibres. The blood-supply is regulated to a great extent by the nervous system, causing contraction or dilatation of the blood-vessels. It is claimed that during S. the quantity of blood in the brain is diminished.

The experiments of Durham, Hammond, and others lead to the vascular theory, that "sleep is the direct result of a diminished amount of blood in the cerebral blood-vessels." (*Hammond*.) This has been denied by others. Mosse claims to have seen a reduction in the cerebral volume at the moment of waking; others admit that a slight reduction in the amount of blood does occur during S.—that the current runs slower, and makes more favorable conditions for inactivity and for repair of tissue, but that the vascular changes are secondary to a reduction in activity in the nerve-cells of the cerebrum, the removal of whose controlling action permits the vaso-motor system to act more directly, causing contraction of the blood-vessels. (See *MACLEOD, Philosophy of Sleep*; *DURHAM, The Physiology of Sleep*, Guy's Hospital Report, 1860; *LANGLET, Étude critique sur quelques points de la physiologie du sommeil*.) W. R. BIRDSALL.

**Sleeper**, a name given to several fishes: (1) At some points in N. Eng. It is applied to the *Somniosus microcephalus*, a shark belonging to the family Scombridae. (2) On the coasts of Fla. and Jamaica it is bestowed on the *Ginglymostoma cirratum*, a shark belonging to the Ginglymostomidae. The species sometimes attains a length of nearly 10 ft. (3) In some of the W. I. islands the same name is given to species of the gobiids of the sub-family Eleotridae.

**Sleep of Plants**, name given to the changed position which most leaves and some shoots assume at night or on its approach.

**Sleepy Eye**, Minn. See APPENDIX.

**Sleidan** (JOHANN), whose true name was PHILIPPSON, b. at Schleiden, near Cologne, in 1506, studied jurisprudence at Liege, Cologne, Louvain, Paris, and Orleans; was employed by Francis I. as his representative at the Diet of Regensburg; settled afterward, having embraced the Ref., as a prof. of law at Strasbourg; was appointed historiographer by the princes of Schmalkaldian League; represented city of Strasbourg at Council of Trent. Wrote *De Statu Religionis et Reipublice, Caroli Quinti Cæsaris, Commentarii, De quatuor Summis Imperiis*, etc. D. Oct. 31, 1556.

**Slemmer** (ADAM J.), b. in Montgomery co., Pa., in 1828, was grad. from the U. S. Military Acad. July 1, 1850, when appointed brevet second lieutenant in the artill.; first lieut. 1854. Served a short campaign in Fla. against the Seminoles 1850-51; on frontier duty in Cal. 1851-54. Detailed for duty at W. Pt. in 1855, he served as assistant prof. of geog. and hist. a yr., and of math. 1856-59. In the latter yr. he returned to his company, at Ft. Moultrie, S. C., and in 1860 was transferred to Fla., where, in 1861, he commanded the small body of U. S. troops in Pensacola harbor. On May 4 he was appointed major of the 16th Inf., and ordered to New York harbor; engaged in recruiting his regiment July-Aug.; acting inspector-gen. of the dept. of the O.; attached to Gen. Buell's army, and participated in the siege of Corinth and in the subsequent movement to Louisville, Ky., and to the relief of Nashville, Tenn. He was commissioned a brig.-gen. of volunteers Nov. 29, 1862, and engaged in the battle of Murfreesboro', Dec. 31, where severely wounded. From July 1863 to the close of the war he served as pres. of an examining board. Was brevetted lieut.-col., col., and brig.-gen. D. Oct. 7, 1868.

**Sleswick**. See SCHLESWIG.

**Slickensides**, a peculiar polished and striated surface found commonly on the wall-rocks of mineral veins or faults, and where slate, shale, coal, and other fine materials have been crumpled and folded by pressure. Not un- frequently a foreign body, such as a concretion, shell, or nut lying in an argillaceous rock of which the particles have been moved on each other with great force, shows the polished striated surface called slickensides.

**Slidell** (JOHN), b. in New York about 1793, grad. at Columbia Coll. 1810; settled at New Orleans, where he became



a distinguished lawyer; U. S. dist. atty. 1829-33; M. C. 1843-45; appointed minister to Mex. 1845, but not received by the Mex. govt.; was U. S. Senator 1853-61; withdrew in consequence of the secession of his State, which he had done much to promote; sailed for Europe as com. of the Confed. govt. to Fr.; was taken from the Trent with Mason, Nov. 8, 1861, but given up Jan. 1, 1862, and resided in Eng. until his death, at Lond. July 29, 1871.

**Sloane** (Sir HANS, BART., F. R. S., b. at Killyleagh, co. Down, Ire., Apr. 16, 1660, became a distinguished phys. at Lond.; went to Jamaica in 1687; made there a large collection of plants and other objects of scientific interest; became phys. to Christ's Hospital, Lond., 1694, and retained that post 36 yrs.; was influential, as sec. of the Royal Society, in reviving the *Philosophical Transactions* as the organ of that body, and edited it for many yrs.; was made phys.-gen. to the army and a baronet 1716; became pres. of the Coll. of Phys. 1719, of the Royal Society 1727, and phys. to the king in the latter yr. Author of *The Nat. Hist. of Jamaica*. D. Jan. 11, 1753.

**Sloane** (JAMES RENWICK WILSON), D. D., b. at Topsham, Orange co., Vt., May 29, 1823, grad. at Jefferson Coll. in 1847; studied theol. at the Reformed Presb. sem. of N. W. C., where he grad. in 1853, and in 1854 became pastor of the Reformed Presb. ch. in Rushsylvania, O., and in 1855-56 of the Third Reformed Presb. ch. in New York. In 1868 he was elected prof. of theol. in the Reformed Presb. theological sem. at Allegheny City, Pa.

**Slocum** (HENRY WARNER), b. at Pompey, Onondaga co., N. Y., Sept. 24, 1827, was grad. from the U. S. Military Acad. July 1, 1852, when appointed second lieut. of artill.; first lieut. 1853; served in garrison at Ft. Moultrie, S. C., until Oct. 31, 1856; entered upon the practice of law at Syracuse, N. Y.; was a member of the N. Y. State legislature in 1859. On May 21, 1861, was appointed col. of the 27th N. Y. Volunteers, which regiment he led in the battle of Bull Run, July 21, where severely wounded; was commissioned brig.-gen. of volunteers. In the Va. Peninsular campaign of 1862 was engaged in the siege of Yorktown and action of W. Pt. At the battle of Gaines's Mill, June 27, his command was sent to Porter's relief at a critical period, and rendered important service; at the battle of Glendale, June 30, it held the right of the main line, as at Malvern Hill, July 1. He was made a maj.-gen. of volunteers July 4, and engaged in the second battle of Bull Run, of South Mountain, and of Antietam. He led the 13th corps at the battle of Chancellorsville and at Gettysburg, where in command of the right wing of the army; served in the dept. of the Cumberland until Apr. 1864; in Aug. 1864 he succeeded Gen. Hooker in command of the 20th corps, which was the first to occupy Atlanta, Ga., Sept. 2. In Sherman's "march to the sea" and invasion of the Carolinas he commanded the left grand division or wing of that army. In Sept. 1865 he resumed the practice of his profession at Brooklyn, N. Y., declining in 1866 the appointment of col. of inf. in the regular army. Was Dem. candidate for sec. of state of N. Y. in 1865, but defeated; elected to 41st, 42d, and 48th Cong.; became pres. of board of city works of Brooklyn 1876.

**Sloe**, the fruit of *Prunus spinosa*, a small thorny plum tree of Europe, sparingly naturalized in the E. U. S. This black austere fruit is used for preserves, for making a factitious port wine, and for dyeing black.

**Sloth** [*A.-S. slōwðh*], the English name for the species of the family Bradypodidae, notable for sluggishness. The form somewhat recalls that of the Primates (man and monkeys) in the exclusion of the members from the common abdominal integument, the length of the limbs, and especially of the fore ones, and the atrophy of the tail. All the species are confined to South and Central Amer. They are ill-adapted for progression on the ground, the feet being bent inward or "club-footed," but are admirably fitted for life in the trees. Unlike all other mammals, they cling to the branches by their feet with the back downward, and thus they progress, feed, and sleep. They rarely or never voluntarily descend to the ground, but when one tree is denuded of its leaves proceed from it to a contiguous one by means of interlocking or neighboring boughs.

**Slough**, slow (JOHN P.), b. at Cin., O., in 1829, became a lawyer in his native city, and a member of the Ohio legislature; settled in Kan., and subsequently at Denver, Col.; raised a company of volunteers at the outbreak of the war, and became col. of the 1st Col. regiment, which formed a part of Gen. Canby's expedition to N. M.; fought there the battle of Pigeon's Rancho; went thereafter to Wash., where he was made brig.-gen. and military gov. of Alexandria; was appointed chief-justice of N. M., and killed in an affray with a senator of the Territorial legislature Dec. 16, 1867.

**Slovaks**, a nation belonging to the Slavic family, inhabit the N. W. part of Hungary, between the Carpathian Mts. and the Danube, and the adjacent regions of Moravia and Aus. Here they formed an independent empire, the kingdom of Moravia, in the 9th century, and fought with success against the Avars, but in 907, in the battle of Presburg, they were defeated by the Magyars, their kingdom dissolved, and the larger part of the nation incorporated with the Magyars, to whom, however, they never became reconciled. Their lang. is closely related to the Bohemian. They are chiefly agriculturists; many of them, however, stroll over all European countries as peddlers. The manufacture of wire-work is much cultivated among them.

**Slovenzi, Slovenes, Vinds, or Corutans**, a S. Slavic race of Carinthia, Carniola, Styria, and Hungary, number 1,200,000, and are mostly R. Caths. of the Lat. rite. The Vindish lang. is allied to the Servian.

**Slow-Worm**, a name given occasionally to several species of reptiles of the order Sauria—e. g. *Anguis fragilis*.

**Slug**, a name applied to naked terrestrial mollusks, especially those of the families Arionidae and Limacidae. Both of these agree in having the body elongated, de-

pressed, and attenuated backward; the mantle moderately developed; 4 tentacles, of which the posterior are large and support the eyes at their extremities, and the anterior are small; the two types differ in several respects.

**Slug-Worms**, popularly but incorrectly called **Slugs**, are the larvae of certain of the saw-flies (Tenthredinidae). Insects usually assigned to the Hymenoptera, but in many respects resembling the Lepidoptera. The larvae in question are slug-like in form.

**Small-Arms**, portable firearms: known as muskets, musketoons, rifles, carbines, pistols, and sporting arms or fowling-pieces. The chief components of S.-A. are known as follows: The *barrel*, as smooth-bores or rifles, muzzle-loaders or breech-loaders; the *lock*, as match-lock, wheel-lock, or flint-lock, prior to the discovery of percussion powder; and as cap-lock, primer-lock, firing-pin lock, or needle-lock, since the introduction of percussion powder; the *stock*, as half-stock or full-stock.

The earliest firearms in use were not portable arms. Cannon, called bombard, were used "in the attack" upon towns and ships as early as 1350, but the Burgundians, in the *defense* of Arras in 1444, first successfully employed smaller tubes throwing lead balls. For field use they were placed upon tripods. These arms were so little efficient compared with the Eng. bow and arrows that for 50 yrs. thereafter all attempts to introduce firearms into the Eng. army failed.

The arquebuse of 1471 weighed about 90 lbs., threw a ball of 5 ounces, was fired by a match held by the left hand to the vent on the *left side* of the barrel. An arquebuse, firing a ball of 1½ ounces, and having a match-lock, called a *serpentine*, was adopted in 1494 in Fr. and Sp. for part of the inf. The wheel-lock was invented at Nuremberg, and applied to short arms for cav. use. The *monarque* was in use in 1525. It weighed 15 lbs., and was fired from a forked rest, which the soldier carried as a cane. In 1610 Gustavus Adolphus introduced cartridges having the ball and powder in the same paper cylinder, also the cartridge-box to receive the number allowed to each soldier; in 1630 a flint-lock was proposed for S.-A. in Fr., and the rifled carbine adopted; in 1640 the bayonet was first proposed in Fr.; in 1671 the Fr. adopted a flint-lock arm, which they called the "*fusile*." It had a hammer placed on the inside of the lock-plate, and a bayonet, with wooden handle to enter the muzzle; the gun could be fired from the shoulder without a rest. In 1686 the Eng. armed 3 regiments, called the Royal Fusiliers, with the Fr. fusil. In 1689 the bayonet was fitted with a socket-handle, fitting around the muzzle; in 1730 iron ramrods were first introduced. In Rus. it was proposed to use the "elliptical ball," having a cavity in the rear. The "*bride*" of the lock was introduced, also the "*tumbler*," separated from the hammer. In 1740 it was proposed in Fr. to rifle the carbine barrel for a length of only 8 inches nearest the muzzle, leaving the calibre of the rest of the barrel the same as the bottom of the grooves. In 1807 the Rev. Mr. Forsyth of Eng. first proposed to use a priming of percussion-powder for S.-A., the powder to be chiefly of chlorate of potassa. At the trial one priming sufficed for 40 discharges of the gun. In 1813 Hall, in the U. S., proposed a breech-loading arm, to be made on the system of "interchangeable" parts. In 1816 Blanchard at Springfield armory introduced his turning-lathes for the *exterior* of the barrel, finishing the flats in the lathe, as well as the conical parts. In 1817 Shaw of Borden-town, U. S., first proposed to use percussion-caps to prime S.-A. Hall having finished 100 of his arms, they were tried and found satisfactory. During the Mex. war (1847-48) the U. S. troops used the following varieties of S.-A.: *Infantry*, flint-lock and percussion smooth-bore muskets; *cavalry*, percussion B.-L. Hall's carbine, calibre .52 inch, North's pattern; *mounted rifles*, Harper's Ferry rifle, calibre .54 inch, percussion; *artillery*, muskets, smooth-bore, percussion, calibre .69 inch; pistols, flint and percussion, both smooth-bore, calibre .54 inch. New models were adopted in 1855-56 for all muzzle-loading S.-A. of .58 inch calibre, and with the primer-lock. In 1860 it was decided to abandon the Maynard primer and use the percussion-cap, without changing lock. War began in Apr. 1861; Harper's Ferry armory was broken up; that at Springfield ordered to be immediately extended. In Jan. 1866 a board of officers called by the sec. of war to examine and report what form and calibre should be adopted for breech-loading muskets and carbines, after testing 29 varieties of breech-loading muskets and 17 varieties of breech-loading carbines, reported that their experiments had shown the best calibre for muskets to be .45 of an inch, the best charge of powder from 65 to 70 grains, and best weight of ball from 480 to 500 grains. For altering arms they recommended the reduction of calibre by inserting a tube and using a hinged breech-lock. In 1869 a board of officers (Gen. Schofield, pres.), after examining 34 varieties of breech-loading muskets, 8 varieties of carbines, and 8 of pistols, recommended the Remington, Springfield, and Sharps's systems of breech-loading as superior to others. In Eng. the Martini-Henry rifle was adopted, in Fr. the Chassepot, in Prus. the needle-gun, in Aus. the Werndl system, in Sp. the Remington system, in Rus. the Berdan system. [From orig. art. in *J's Univ. Cyc.*, by GEN. P. V. HAGNER.]

**Small-Pox** (DAVID A.), b. at Middleton, Addison co., Vt., Apr. 6, 1809, studied law and entered the Franklin co. bar in 1831; was made a State senator in 1842; admitted to the bar of the U. S. supreme court in 1844; appointed collector of customs for Vt. in 1853, and U. S. dist. judge of Vt. 1857-75. D. Mar. 10, 1877.

**Small-pox**, or **Varicella**, is the most important of the group of acute general contagious diseases known as the *exanthematous fevers*, since, when not controlled by vaccination, it is the most fatal of them all. It is said to have prevailed in the E. countries from the most remote antiquity, but its early hist. is shrouded in obscurity. Of the original cause of S. we know nothing, but we do know that it now



never occurs save as the consequence of infection conveyed from one person to another. The contagion exceeds in virulence that of any other disease. The disease is communicable at all periods of its course, even in the period of incubation, before any symptoms have occurred, and as late as the close of the stage of decrustation; but probably it is most intensely contagious during the vesicular stage of the eruption. It is reasonably certain that the prevalence of the disease is more or less influenced by the season of the yr., and perhaps by the state of the weather. One attack of the disease generally exempts the affected person from subsequent attacks, but in exceptional cases second attacks do occur, and even fifth and sixth attacks have been recorded. The immunity conferred by vaccination is almost as complete as that which results from having had the disease.

On contracting the S. contagion the individual shows no signs of the disease until after the lapse of a *period of incubation*, which generally lasts 13 days. The *initial stage* is usually ushered in by a violent chill or by repeated slighter chills, followed by high fever, weakness, vomiting, severe headache, and pain in the back. Delirium is frequently observed, and in children convulsions or coma. This stage lasts from 2 to 4 (usually 3) days, and death may occur before its termination. Little red elevations of the skin (somewhat pale at first) appear upon the face and head, and a few hours afterward upon the back, breast, arms, abdomen, legs, and feet. They are often more plainly to be felt than seen. They are usually the most numerous on the face. On the second day after their appearance (fifth day of the disease) they have increased in size, constituting distinct papule, and are of a darker hue. On the third day (sixth of the disease) they are more conical, and each papula shows at its summit a minute vesicle containing a clear lymph fluid. By the seventh or eighth day (tenth or eleventh of the disease) it has reached the size of a split pea, and, the central depression being effaced, is nearly hemispherical in shape. On the outbreak of the eruption, or soon afterward, the fever disappears or moderates for the time being, according to the severity of the case; but about the sixth day of the eruption (ninth of the disease) the contents of the vesicle, which have gradually been growing opaque, become completely changed into pus. In other words, the vesicle becomes a pustule, and the *stage of supuration or maturation* begins. In mild cases this stage is accompanied by little or no fever, but in severe cases of confluent S. the *secondary fever* is generally well marked, being sometimes announced by a chill or chills, and lasting from 3 to 6 or 8 days, according to the severity of the case. About the eleventh or twelfth day of the eruption (fourteenth or fifteenth of the disease) the pustules begin to dry up, which process characterizes the *stage of desiccation*. In course of time the redness and swelling disappear without leaving any permanent marks, or else (in case the pocks have involved the papillary layer of the skin) the spots become whiter than the surrounding skin, radiated and depressed scars remaining for life. The individual is then said to be pock-marked.

*Variceloid* is S. mitigated by previous vaccination. The initial fever may be severe, but the eruption is moderate, many of the pocks shrivel early, and there is no secondary fever. S. is capable of rousing into activity any dormant diathesis or morbid tendency, such as the scrofulous, tubercular, syphilitic, etc. Ophthalmia, blindness, chronic ulcers, enlargements of the lymphatic glands, inflammation of the ear, boils or abscesses, cancerum oris, pestilential bubo and carbuncle, laryngitis, salivation, dropsy, necrosis, and many other affections have been known to follow the disease, apparently owing their origin to its occurrence.

The *mortality* of S. varies in different epidemics, ranging in unmodified cases from 15 to 50 per cent. Confluent S., even if the eruption be confluent only on the face and dislocate elsewhere, often proves fatal. Young children and aged persons are particularly apt to die if attacked by the disease. Symptoms of blood-poisoning or of a severe implication of the nervous system, as well as affections of the air-passages, are of bad import. Pregnant and lying-in women are in very great peril from S. In the former abortion usually precedes death. Drunkards also are very apt to die. Robust and healthy persons, in good hygienic circumstances, are much more apt to recover than are those of the opposite description. Death may take place at any period of the disease, but is most common during the secondary fever.

The *treatment* of S. consists in husbanding the resources of the patient, and in early detecting and combating complications. No sort of medication or regimen exerts any curative effect in the proper sense of the word. Many so-called specifics have been vaunted, but there is no satisfactory proof that they have ever accomplished anything. Vaccination, although of such signal efficacy in *preventing* S., is utterly powerless to cure it; and it has not been shown that vaccination of a person already suffering from S. can even ameliorate the disease, whether done in the ordinary way or by the subcutaneous injection of vaccine lymph. No treatment will prevent pitting.

The *prevention* of S. may be almost certainly accomplished by thorough VACCINATION (which see). Avoidance of exposure to the contagion will also, of course, prevent the disease, but this is difficult, and often impossible, to manage. S. patients should always be isolated, and the funerals of those who die should be strictly private. All clothing, bedding, etc., which may have become infected, should be destroyed by fire, or, if too valuable to be sacrificed, it should be disinfected by heat (as high as 212° F.) or by the fumes of burning brimstone. Every one exposed to the disease should be at once revaccinated. Patients are capable of conveying the infection until all the crusts have fallen off. [From orig. art. in *J.'s Univ. Cyc.*, by FRANK P. FOSTER, M. D.]

**Smallwood** (WILLIAM), b. in Md. about 1732, raised a battalion of Marylanders 1776; was engaged in the battle of White Plains; appointed brig.-gen. Oct. 23, 1776; accompanied Gen. Sullivan in the Staten Island expedition 1777; raised a new battalion of militiamen from the W. Shore of Md., whom he led at the battle of Germantown; was made maj.-gen. Sept. 15, 1780; was with Gates in his S. campaign, but left after the defeat at Camden, refusing to serve under Steuben; M. C. 1785, gov. of Md. 1785-88. D. Feb. 14, 1792.

**Smart.** See COBALT.

**Smart** (SIR GEORGE THOMAS), K. C. B., b. in Lond., Eng., in May 1776, became a chorister in the chapel royal when a boy of 8; took part in executing the Handel commemorations in Westminster Abbey 1784-91; became an accomplished conductor of musical festivals and of the famous Lent oratorios at Covent Garden and Drury Lane theatres; was one of the founders of the Philharmonic Society 1813; was the instructor of nearly all the great Eng. musicians of the last generation; knighted at Dublin 1818, and was in his later yrs. organist to the chapel-royal. D. Feb. 23, 1867.

**Smart-Weed.** See POLYGONACEÆ.

**Smeaton** (JOHN), b. at Austerhorpe, near Leeds, Eng., May 28, 1724, was noted in childhood for mathematical and mechanical talent; abandoned the study of the law for the business of a mathematical instrument maker 1750; invented the following yr. an instrument for measuring a ship's progress; made several valuable inventions in hydraulic machinery; was noted as the builder of Eddystone light-house, of Ramsgate harbor, of the Forth and Clyde Canal, the Greenwich and Deptford water-works, and many other important public improvements. D. Oct. 28, 1792.

**Smece** (ALFRED), M. D., F. R. S., b. in Eng. in 1818, studied med.; was admitted a member of the Coll. of Surgeons 1840; lecturer at the Aldersgate Sch. of Medicine; surgeon to the Bank of Eng.; senior surgeon to the Royal General Dispensary; is known for his thorough knowledge of electricity in all its branches; is the inventor of the "Smece voltaic battery," and of the system now in use for printing the Bank of Eng. notes. Wrote *The Eye in Health and Disease*, *Elements of Electro-Biology, Instinct and Reason, deduced from Electro-Biology*, etc. D. Jan. 1877.

**Smellie** (WILLIAM), b. at Edinburgh, Scot., in 1740, became in 1759 ed. of *The Scots' Magazine*; commenced business as a publisher 1765, and issued in 1771 the first edition of the *Encyc. Britannica*; edited with Dr. Gilbert Stuart *The Edinburgh Magazine and Review* 1773-76; translated Buffon's *Nat. Hist.*; wrote *The Philosophy of Nat. Hist.* D. June 24, 1795.

**Smelt** (in allusion to the cucumber-like odor of the typical species), the designation of fishes of the genus *Osmerus* distinguished by an elongated, transparent body, greenish back, and silvery sides. All the species of S. are esteemed for the delicacy of their flesh. They are normally salt-water fishes, but sometimes inhabit fresh waters for all their life, or ascend the fresh-water rivers.

**Smelting.** In its more extended use the term "smelting" applies to the entire process of reducing metals from their ores by fusion; in a more limited sense it applies to those particular metallurgical processes in which an ore or a product of other operations, such as roasting, treatment with acids, etc., is finally reduced to pure metal or some intermediate product. The fusions are conducted in shaft furnaces, reverberatory furnaces, or crucibles. Metals ready for use or sale may be produced from ores by a single smelting operation, as iron; or they may require a series of smeltings, alternated with roastings, as copper when made from sulphuretted ores. The smelting process may be simply reducing, or oxidizing and reducing, or may be designed to volatilize certain bodies, to oxidize others, and to reduce still others. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. H. B. CORNWALL.]

**Smerdis**, the younger son of Cyrus, accompanied his brother Cambyses on his campaign to Egypt, but excited his jealousy, and was ordered back to Susa. Cambyses commanded Prexaspes to go to Susa and put S. to death secretly. Prexaspes did so, and among those who knew the truth was one Patizethes, a Magian, gov. of the palace, whose younger brother bore a striking resemblance to the murdered prince. Afterward Patizethes represented this brother as the royal prince, and had him proclaimed king; and as Cambyses had just died in Syria from an accidental wound, the false S. was accepted by the people. But some Per. nobles soon became suspicious, and at last discovered the fraud. Seven noble Pers. then broke into the palace and killed the false S., and Darius, the son of Hystaspes, was elected king 521 B. C.

**Smet, de** (PETER JOHN), b. at Termonde, Belg., Dec. 31, 1801, was trained in the sem. at Mechlin; sailed with 6 other novices to the U. S. in 1821; assisted in founding the Univ. of St. Louis, Mo.; in 1838 was sent to labor with the Pottawattomies, and in 1840 was transferred to the Flathead mission; became procurator of Indian missions, and wrote *Indian Sketches, Oregon Missions*, etc. D. May 23, 1872.

**Smethport**, Pa. See APPENDIX.

**Smew** (*Mergellus albellus*), a bird belonging to the family Anatidae, and the only known species of its genus, inhabiting the N. parts of the Old World, and accidental to N. Amer. It is distinguished by the short narrow bill, whose margins are beset with short approximated lamellae. In the male the ground color is white; in the female the head is of a reddish-brown color; the length is about 17 inches. Like its relatives, it is an excellent swimmer and diver. It makes a nest near the water, and lays from 8 to 10 eggs.

**Smilax** (Gr. *σμίλαξ*), a large genus of endogenous plants of the order Smilacæ. True sarsaparilla and China root are among the products of the genus. Several plants of this genus are fine in hot-house and garden culture. Some are herbs, others are shrubs, and many are climbers.

**Smiles** (SAMUEL), M. D., b. at Haddington, Scot., in 1816, ed. for the med. profession; practised some yrs. as a surgeon



at Leeds; became ed. of the *Leeds Times*; was sec. to the Leeds and Thirk railway 1845-52, and to the S. E. Railway 1852-66, and subsequently of the National Provident Assurance Co. Author of *Phys. Education, Hist. of Ire. and the Irish People under the Govt. of Eng., Railway Property, its Conditions and Prospects, Self-Help, with Illustrations of Character and Conduct*, etc.

**Smirke** (Sir ROBERT), R. A., b. in Lond., Eng., in 1790, studied at Apley School, near Woburn; was ed. as an arch.; was gold medalist at the Royal Acad. 1799; visited It., Gr., and Ger.; pub. *Specimens of Continental Arch.*; was arch. of the new Covent Garden theatre 1808-09, of the mint 1811, the P. O. 1823-29, etc. His fame will rest chiefly upon the Brit. Museum, built by him at intervals from 1823 to 1847. He was knighted 1831, and was 30 yrs. treas. of the Royal Acad. D. Apr. 18, 1867.

**Smirke** (SYDNEY), R. A., b. in Eng. about 1800, studied arch.; gained the gold medal of the Royal Acad. 1819; pub. *Suggestions on the Architectural Improvements of the W. of Lond.* (1834); assisted his brother in designing the Ox. and Cambridge Univ. Club-house in Pall Mall, Lond., 1835-37; superintended the restoration of the Temple ch., of which he pub. an account (1842); designed Exeter 'Change, the new Carlton Club, the new buildings in the Temple, restorations of Lichfield cathedral, York minster, and Savoy chapel, the custom-houses at Gloucester and Newcastle, and in 1847 succeeded his brother as architect to the Brit. Museum. His last achievement was the new Royal Acad. in Burlington House. He was chosen R. A. 1860, became prof. of arch. at the Acad. 1861, and its treas. 1862; subsequently trustee of that inst. and of the Soane Museum; was a gold medalist of the Royal Inst. of Brit. Archs. D. Dec. 11, 1877.

**Smith** (ADAM), b. at Kirkcaldy, Fife-shire, Scot., June 5, 1723. His father died before his birth; a faithful mother's devotion carried him safely through a sickly infancy and childhood. His education was carried forward in the gram. school of Kirkcaldy, the Univ. of Glasgow, and Balliol Coll., Ox., with a view to his taking orders in the Eng. Ch. Abandoning all thought of the clerical office, he first came before the public delivering lectures on rhetoric and belles-lettres under the patronage of Lord Kames. In 1751 he was made prof. of logic in the Univ. of Glasgow, and the following yr. became prof. of moral philos. in the same inst. His first pub. work was the *Theory of Moral Sentiments*, issued in 1759. In 1776 his great work, entitled *An Inquiry into the Nature and Sources of the Wealth of Nations*, was pub. This treatise fairly entitles Adam Smith to be regarded as the father of modern political economy. After residing 2 yrs. in Lond., he was appointed a com. of customs for Scot., and removed to Edinburgh, where he spent the remainder of his life. Mr. S. was never married. D. July 8, 1790. A. L. CHAPIN.

**Smith** (ALBERT), b. at Chertsey, Eng., May 24, 1816, became a surgeon; settled at Lond. 1841; contributed to *Bentley's Magazine*; member of the staff of *Punch*; dramatic critic of the *Illustrated Lond. News*; wrote many burlesques, farces, and Christmas pieces; visited Constantinople 1849; brought out an "entertainment" called *The Overland Mail* May 1850; ascended Mont Blanc Aug. 1851. In 1858-59 he visited China. Wrote *A Month at Constantinople, The Story of Mont Blanc, To China and Back*. D. May 23, 1860.

**Smith** (ASA DODGE), D. D., LL.D., b. at Amherst, Hillsborough co., N. H., Sept. 21, 1804, studied at Kimball Union Acad., Meriden, N. H.; grad. at Dartmouth Coll. 1830 and at Andover Theological Sem. 1834; was prin. of Limerick Acad., Me., 1830-31; pastor of the Fourteenth st. Presb. ch., New York, 1834-63; was prof. extraordinary of pastoral theol. in the Union Theological Sem., N. Y., 1843-45, and was inaugurated pres. of Dartmouth Coll. Nov. 18, 1863. Author of *Letters to a Young Student*, etc. D. Aug. 16, 1877.

**Smith** (ASHBEL), M. D., b. at Hartford, Conn., in 1806, grad. at Yale Coll. 1824; in 1837 was appointed surgeon-gen. of the Tex. army; joint com. with Dr. R. A. Ivion in making the first treaty with the Comanches; minister of the republic of Tex. to the courts of St. James and St. Cloud; appointed secretary of state, and afterward served several sessions in the State legislature; in 1846 was in the Mex. campaign; on the secession of Tex. went into service and served to the end of the war. In his profession his services were rendered gratuitously, and in every yellow-fever epidemic he placed himself at the disposal of the poor and of his friends; wrote *Account of the Yellow Fever in Galveston, Tex.*, 1839, *Account of the Geog. of Tex.*, and *The Permanent Identity of the Human Race*.

**Smith** (AUGUSTUS WILLIAM), LL.D., b. at Newport, Herkimer co., N. Y., May 12, 1802, grad. at Hamilton Coll. 1825; became a teacher in the Oneida Conference Sem. at Cazenovia, N. Y.; was prof. of math. and astron. in Wesleyan Univ. from 1831 to 1857, when he was chosen pres. of that inst., and was prof. of nat. philos. in the U. S. Naval Acad. from 1859 to his death, Mar. 26, 1866.

**Smith** (AZARIAH), M. D., b. at Manlius, N. Y., Feb. 16, 1817, grad. at Yale 1837; studied med. as well as theol. as a preparation for missionary duties in the Levant; arrived at Smyrna Jan. 1843; travelled extensively through Asia Minor, having been for some time a companion of Layard; rendered great service by attending those attacked with cholera; settled at Aintab 1848, and d. there June 3, 1851.

**Smith** (BENJAMIN BOSWORTH), b. at Bristol, R. I., June 13, 1794, studied theol. at Brown Univ.; was ordained deacon in 1817, priest in 1818, and was consecrated bp. of the P. E. diocese of Ky. Oct. 31, 1832.

**Smith** (BUCKINGHAM), b. on Cumberland Island, Ga., Oct. 31, 1810, spent his childhood in Fla.; grad. at the Cambridge Law School 1836; was elected to the Territorial legislature of Fla.; was sec. of legation in Mex. 1850-52; made a thorough study of Mex. hist., antiquities, and of Indian philology, collecting many books and MSS.; was sec. of legation at Madrid 1855-58; made important researches in the Sp. libraries and archives respecting the colonial hist. of Fla. and La.; rendered services to Messrs. Bancroft,

Sparks, and Parkman in their respective historical inquiries; settled in Fla. on his return, and became a judge and a member of the State senate. Contributed to Mr. J. G. Shea's "Library of American Linguistics," a *Grammatical Sketch of the Hene Lang.*, etc., and wrote many other valuable books. Few Amer. scholars have been so conversant with the materials of early Amer. hist. as Mr. S. D. Jan. 5, 1871.

**Smith** (CHARLES FERGUSON), b. in Pa. in 1805, grad. at the U. S. Military Acad. in 1825, entering the army as a lieutenant of art. From 1829 to 1842 he served at the Military Acad. in various capacities. In the Mexican war he served with distinction in the battles of Palo Alto, Resaca de la Palma, Monterey, Contreras, and Churubusco. Appointed lieutenant-col. of the 10th Inf. in 1855, he commanded the Red River expedition in 1856, the Utah expedition 1857-61. On Aug. 31, 1861, he was appointed a brig.-gen. of volunteers, and ordered to Ky. In Sept. he became col. of the 3d Inf. In the severe fight for the possession of Ft. Donelson he commanded the division which held the left of our investing lines, and which, led in person by Gen. S., stormed and captured all the high ground on the Confed. right which commanded it. Gen. S. was selected to command the new movement up the Tenn., and Mar. 21 promoted to be major-gen. of volunteers, but d. Apr. 25, 1862.

**Smith** (CHARLES HAMILTON), F. R. S., b. in W. Flanders Dec. 26, 1776, entered the Brit. army in the Netherlands as a volunteer about 1795; served in the W. I. 1797-1800; was deputy quartermaster-gen. in the Walcheren expedition; took part in the Netherlands campaigns 1813-16; visited the U. S. and Canada on a special mission from the foreign office; retired from the army on half pay, with the rank of lieutenant-col., 1830; gave special attention to hist., archaeology, zoology, and ethnology; wrote *War in Europe, Britannica*; was associate author with Sir Samuel R. Meyrick of *The Costume of the Original Inhabit. of the Brit. Islands*; wrote 3 vols. of the *Naturalist's Library*. D. Sept. 21, 1859.

**Smith** (CLEMENS LAWRENCE). See APPENDIX.

**Smith** (EDMUND KIRBY), b. at St. Augustine, Fla., in 1824, grad. at the U. S. Military Acad. in 1845, and entered the army as brevet second lieutenant of inf. In the war with Mex. he distinguished himself at Cerro Gordo and Contreras. From 1849 to 1852 he was assistant prof. of math. at W. P. Transferred to the 2d Cav. in 1855 with the rank of capt., he served on frontier duty, and was severely wounded in a fight with the Comanche Indians in Tex. May 13, 1859. In Jan. 1861 he became major of his regiment; was soon after appointed a brig.-gen. in the Confed. army, and served in Va. At the battle of Bull Run, July 21, 1861, he arrived on the field toward the close of the action, but was soon disabled by a shot. Made major-gen. in 1862, he was transferred to E. Tenn., and placed in command of that dept. Under Bragg he led the advance in the invasion of Ky.; he routed the Union forces at Richmond, Ky., Aug. 30, and advanced to Frankfort. Promoted to lieutenant-gen., he was at the battles of Perryville, Oct. 10, and of Murfreesboro', Dec. 31, 1862-Jan. 3, 1863. He was soon after made gen., and engaged in the battle of Jenkins's Ferry, Apr. 30, 1864. He was the last to surrender his forces, May 26, 1865.

**Smith** (ELI), D. D., b. at Northford, Conn., Sept. 15, 1801, grad. at Yale 1821, at Andover Sem. 1826; went to Malta as supt. of a missionary printing establishment 1826; studied Arabic at Beyroot 1827; travelled through Gr., Armenia, Georgia, and Per. 1829-31—a tour which resulted in the establishment of the important Armenian and Nestorian missions of the Amer. Board; settled at Beyroot 1833; accompanied Dr. Edward Robinson in his geographical explorations of Pal.; introduced an elegant font of Arabic type, and was engaged from 1847 upon a new translation of the Bible into Arabic. D. at Beyroot Jan. 11, 1857.

**Smith** (ELIZABETH OAKES PRINCE), b. at Cumberland, Me., Aug. 12, 1806, resided from infancy in Portland, Me.; married there in 1823 Seba Smith, the well-known editor and humorist, whom she aided in his journalistic enterprises; obtained a considerable local reputation as a writer of prose and verse, but never appeared publicly as an authoress until after the loss of her husband's fortune in 1839, when she resorted for support to lit., settling in New York 1842. Wrote *The Sinless Child and other Poems*; pub. 2 tragedies, *The Rom. Tribute* and *Jacob Leister*; *The Western Captive*, etc. She has also lectured, and been a prominent advocate of "woman's rights."

**Smith** (EDWARD PARMELEE), b. at S. Britain, Conn., June 3, 1827, grad. from the theological sem. of New Haven; settled at Pepperell, Mass.; became an active member of the U. S. Chr. Commission during the war, and pub. *Incidents of the Chr. Commission*; appointed gen. field-agent for the Amer. Missionary Association in the S. States, and in 1873 U. S. com. of Indian affairs, but resigned in 1875, and went next spring to visit the Afr. mission field for the Amer. Missionary Association; arrived at the mouth of the Gambia Apr. 27, but d. July 1876.

**Smith** (FRANCIS H.), b. in Va. in 1812, grad. at the U. S. Military Acad. in 1833; second lieutenant Nov. 30, 1833. In 1836 he resigned from the army, and in 1837 was appointed prof. of math. at Hampden-Sidney Coll., Va. Upon the organization of the Va. Military Inst. at Lexington, Va., in 1839, S. was appointed its supt. and prin. prof. (of math.). Soon after the outbreak of c. war, the professors and assistants went into the field, and S., as col. of a Va. regiment, was stationed at Norfolk and in command of the fort on Craney Island. The inst. was subsequently reopened. Col. S. was called to Richmond to aid in its defence in 1864, and thence to Lynchburg. On returning to Lexington he found most of the buildings of the inst. burned. They were rebuilt, and the inst. continued under Col. S.

**Smith** (Sir FRANCIS PETTIT), b. at Hythe, Eng., Feb. 9, 1808, became a farmer in Kent, but amused his leisure with mechanical experiments; constructed in 1834 a model of a steam-vessel to be propelled by a screw driven by a spring; made a larger boat on the same principle, which he success-



fully tested in the Brit. Channel between Dover and Folkestone 1837; introduced his invention in 1838 to the notice of the lords of the admiralty, by whom he was commissioned to construct for the Brit. navy the screw steamer *Archimedes*; was made curator of the patent-office museum, S. Kensington, 1860, and knighted 1871. D. Feb. 11, 1874.

**Smith (GEORGE)**, b. in Eng. about 1825, taught himself the Oriental languages, including that of the cuneiform inscriptions from Nineveh; obtained the post of keeper of antiquities at the Brit. Museum about 1865; soon discovered and deciphered many tablets of great historical importance, especially in relation to Jewish annals; ed. of *Cuneiform Inscriptions of W. Asia*; pub. *The Hist. of Assur-bani-pal*; made known in 1872 his discovery of a Chaldean account of the Deluge; undertook in 1873 a new examination of the mounds of Nineveh, and found a vast number of new inscriptions from the Assyrian royal library; discovered the ruins of Carchemish, the cap. of the anc. Hittite kingdom, and demonstrated that region to have been the original home of the Etruscans; discovered tablets containing Chaldean legends parallel to the earlier chaps. of Genesis, including accounts of the Creation and the Fall. Author of *Explorations in Assyria, The Chaldean Account of Genesis, and The Anc. Hist. of Assyria*. D. Aug. 19, 1876.

**Smith (GERRIT)**, b. in Utica, N. Y., Mar. 6, 1797, grad. at Hamilton Coll. 1818; resided at Peterboro', Madison co., N. Y.; became a member of and liberal contributor to the Colonization Society 1825; in 1835 connected himself with the Amer. Anti-Slavery Society, of which he was thenceforth one of the leading members; gave away vast tracts of land in small parcels, distributed to actual settlers; was elected to Cong. 1852, but resigned after a single session; was a liberal contributor to the Free-Soll campaign in Kan.; gave pecuniary aid to John Brown 1859 when preparing the attack on Harper's Ferry; was many times nominated on an anti-slavery ticket for gov. of N. Y. and for other offices for which it was known that he would receive but a small vote; joined Horace Greeley in signing the ball-bond of Jefferson Davis 1867; wrote, printed, and distributed many pamphlets on slavery and other reforms; built a ch. at Peterboro', but underwent considerable fluctuations in his religious creed. Author of *Speeches in Cong., Sermons and Speeches, The Theologies*, etc. D. Dec. 28, 1874.

**Smith (GOLDWIN)**, LL.D., b. at Reading, Eng., Aug. 13, 1823, ed. at Eton; grad. with high honors at Magdalen Coll., Ox., 1845; became fellow and tutor of Univ. Coll.; was called to the bar at Lincoln's Inn 1847; became regius prof. of modern hist. at Ox. 1858; was a champion of the Amer. Federal gov't. during the c. war, when he wrote *Does the Bible Sanction Slavery? On the Morality of the Emancipation Proclamation*, etc.; visited the U. S. on a lecturing tour 1864, being received with distinction; pub. lectures on *Eng. and Amer. and The U. War in Amer.*; settled in the U. S. 1868 as prof. of Eng. hist. at Cornell Univ.; removed in 1871 to Toronto, Canada; became a member of the senate of the univ. of that city; was ed. of the *Canadian Monthly*, and took the direction of a political newspaper 1875. Wrote *Lectures on Modern Hist., Rational Religion, A Short Hist. of Eng. down to the Ref.*, etc.

**Smith (GREEN CLAY)**, son of John Speed Smith, b. at Richmond, Ky., July 2, 1830, served as a volunteer in the Mexican war; grad. at Transylvania Univ. 1849; became a lawyer at Covington; was a member of the Ky. legislature 1861, and a decided Union man; became col. of the 4th Ky. (Union) Cav. Feb. 1862, and brig.-gen. of volunteers June 1862; was M. C. 1863-66, a delegate to the Baltimore convention 1864, gov. of Mont. Terr. 1866, and subsequently a Bap. clergyman. In 1876 he was the candidate of the Prohibitionists for the Presidency.

**Smith (GUSTAVUS WOODSON)**, b. in Scott co., Ky., Jan. 1, 1822, grad. at W. Pt. July 1, 1842; second lieut. 1845; first lieut. 1853. After serving 2 yrs. in the construction of fortifications of New London harbor, he was called to W. Pt. as assistant prof. of engineering; the war with Mex. occurring, he was sent to the field with the engineer company of sappers and miners, which he commanded during the siege of Vera Cruz and subsequent operations of the war. In Nov. 1849 he was recalled to W. Pt., where he remained as prin. assistant prof. of engineering until Dec. 18, 1854, when he resigned from the army. He was subsequently employed in the construction of various gov't. buildings and in the iron works of Cooper & Hewitt at Trenton, N. J. From 1858 to Sept. 1871 he was street com. of New York. On May 31, 1862, Gen. S. succeeded to the temporary command of the Army of N. Va., and commanded at Petersburg, Va. In 1864-65 he was commander of the State forces of Ga., and was captured at Macon, Ga., Apr. 20, 1865. From 1870 to 1875 was insurance com. of Ky.

**Smith (HENRY BOYNTON)**, D. D., LL.D., b. at Portland, Me., Nov. 21, 1815, grad. at Bowdoin Coll. 1834; was a tutor there 1836-37 and 1840-41; was pastor of a Congl. ch. at W. Amesbury, Mass., 1832-47; prof. of mental and moral philos. at Amherst Coll. 1847-50; was prof. of ch. hist. in Union Theol. Sem., New York, 1850-54, and of systematic theol. 1854-74; afterward prof. emeritus; was moderator of the General Assembly of the (New School) Presb. Ch. 1863-64. Wrote *The Reunion of the Presb. Chs.*, and *On the State of Religion in the U. S.*; was the founder and editor of the *Amer. Theological Review*, and author of *The Problem of the Philos. of Hist., The Reformed Ch. of Europe and Amer.*, etc. D. Feb. 7, 1877.

**Smith (SIR HENRY GEORGE WAKELYN)**, BART., b. at Whiteclase, Cambridgeshire, Eng., in 1788, entered the army 1805; participated in the storming of Montevideo, the assault on Buenos Ayres, the capture of Copenhagen; was distinguished in the Peninsular campaign; participated as assistant adjutant-gen. in the capture of Wash., D. C., by Gen. Ross 1814; was military sec. in the campaign against New Orleans to Sir Edward Pakenham; assistant quartermaster-gen. in the campaign of Waterloo; was employed in

garrison duty at Halifax, N. S., and in the W. I.; commanded a division in the Kafir war 1834-35; was appointed adjutant-gen. to the forces in India 1839; was distinguished at the battles of Gwalior and Maharajpore, being knighted 1844; took part in the war against the Sikhs in the Punjab 1845; was sent to the relief of Loodianah, and took Aliwal at the point of the bayonet Jan. 28, 1846, capturing 67 guns; reinforced Lord Gough in time to enable him to win the decisive battle of Sobroon, Feb. 10, 1846; received the thanks of Parl., and was made a bart.; became gov. of the Cape of Good Hope 1847; conducted the Kafir war of 1851-52, and was made lieut.-gen. 1854. D. Oct. 12, 1890.

**Smith (ISAAC)**, b. in N. J. in 1736, grad. at Princeton 1755; practised med.; commanded a regiment in 1776; was judge of the supreme court of N. J. 18 yrs.; M. C. 1795-97, com. to treat with the Seneca Indians 1797. D. Aug. 29, 1807.

**Smith (ISRAEL)**, b. at Suffield, Conn., Apr. 4, 1759, grad. at Yale 1781; settled as a lawyer at Rupert, Vt.; was boundary com. 1789; took an active part in procuring the admission of Vt. into the Union; settled at Rutland; was a member of the convention for the ratification of the Federal const. 1791; was chief-justice of the supreme court of Vt. 1797, M. C. 1791-97 and 1800-01, U. S. Senator 1801-02 and 1803-07, and gov. of Vt. 1807-08. D. Dec. 2, 1810.

**Smith (JAMES)**, b. in Ire. about 1730, came to Pa. with his parents, and was ed. at the Coll. of Phila.; admitted to the bar; became a surveyor near Shippensburg, afterward a lawyer at York; raised in 1774 the first volunteer company in the State for the purpose of resistance to G. Brit.; was a member of the convention called to consider the expediency of abstaining from importing Eng. goods, and one of the committee to prepare instructions for the representatives; pub. an *Essay on the Constitutional Power of G. Brit. over the Colonies in Amer.*, which gave a powerful impulse to the Revolution; was elected to the convention for forming a const. for Pa. July 15, 1775, and of the Continental Cong. 1775-78; signed the Dec. of Ind., and was elected to the gen. assembly of Pa. 1780. D. July 11, 1806.

**Smith (JAMES MILTON)**, b. in Twigg co., Ga., Oct. 24, 1823, ed. at Culloden Acad. in Monroe co., Ga.; became a lawyer; in 1861 entered the Confed. service as major of the 13th Ga. regiment; rose to col. in 1862; was a member of the 2d Confed. Cong. until the close of the war; elected a member of the State legislature 1871, and became speaker of its house of reps.; in 1872 was elected gov. of the State to fill the unexpired term of Rufus B. Bullock, re-elected in Oct. 1872, and gov. to 1877.

**Smith (JAMES Y.)**, b. at Groton, Conn., Sept. 15, 1800, was for some yrs. a lumber-merchant at Providence; became a cotton-manufacturer at Willimantic, Conn., 1838, and also at Woonsocket, R. I.; was several times a member of the R. I. legislature; mayor of Providence 1853-57, and gov. of R. I. 1863-65. D. Mar. 26, 1876.

**Smith (JEREMIAH)**, LL.D., b. at Peterborough, N. H., Nov. 29, 1759, grad. at Rutgers Coll. 1780; studied law; was distinguished at the N. H. bar; was M. C. 1791-97; appointed by Pres. Adams in 1801 a judge of the U. S. circuit court, but did not serve; gov. of N. H. 1809-10, and several yrs. chief-justice of State superior court. D. Sept. 21, 1842.

**Smith (JOHN)**, b. at Willoughby, Lincolnshire, Eng., in Jan. 1579, spent 4 yrs. of his early manhood in military service in the Netherlands; was afterward engaged in wars against the Turks in Hungary and Transylvania; took part in the colonization of Va. (1606); accompanied Capt. Newport in his voyage of exploration up James River as far as the present site of Richmond; was on their return admitted as a member of the council; was intrusted with the command of several expeditions into the interior, and repressed with severity the projects of some of the settlers to return to Eng.; was taken prisoner, and detained for some time, though kindly treated by the Indian chieftain Wahunsenecaw; was tried by his fellow-councillors for the death of two of his companions, said to have been killed by the Indians through his imprudence, and was condemned to be executed the next day, but his life was saved by Capt. Newport; made 2 extended surveys of Chesapeake Bay and its tributary waters, of which he made a map; became pres. of the council Sept. 1608; had several skirmishes with hostile Indians. His departure from Va., to which he never returned, took place in Sept. 1609. In 1614 he explored with 2 ships fitted out by some Lond. merchants a large portion of the N. Amer. coast, to which he gave the name of New England. In 1615 he undertook another voyage to N. Eng. for the purpose of founding a colony, but was captured by a Fr. man-of-war and taken to Rochelle. About 1616 he received the title of "admiral of New England," and was thenceforth much engaged in promoting Amer. colonization by means of a series of publications on Amer., in which romantic versions of his career in many lands were put forth. Author of *A Map of Va., with a Description of the Country, the Commodities, the People, Govt., and Religion, etc.*; *A Description of N. Eng., or the Observations and Discoveries of Capt. John Smith (Admiral of that Country) in the U. S. of Amer. in the Year of our Lord 1614*, etc. D. June 21, 1631.

**Smith (JOHN AUGUSTINE)**, M. D., b. in Westmoreland co., Va., Aug. 29, 1782, grad. at William and Mary Coll., Va., 1800; studied med.; settled as a phys. at New York 1809; became lecturer on anat. in the Coll. of Phys. and Surgeons; edited the *Med. and Physiological Journal*; was pres. of William and Mary Coll. 1814-26, when he resigned and resumed the practice of his profession in New York; pres. of Coll. of Phys. and Surgeons 1831-43. D. Feb. 9, 1865.

**Smith (JOHN BLAIR)**, D. D., brother of Dr. Samuel Prichard Smith, b. at Pequea, Pa., June 12, 1756, grad. at Princeton 1773; studied theol. with his brother, whom he succeeded as pres. of Hampden-Sidney Coll. 1779; became one of the most noted preachers of the Valley of Va., and very successful as a revivalist; was pastor of Union Coll. 1795; ch. Phila., 1791-95; became first pres. of Union Coll. 1799; again pastor in Phila. May 1799. D. Aug. 22, 1799.



**Smith** (JOHN COTTON), LL.D., b. at Sharon, Conn., Feb. 12, 1765, grad. at Yale 1783; was admitted to the Litchfield bar 1786; was several yrs. a member of the legislature, of which he was clerk 1799 and speaker 1800; M. C. 1800-06; became a member of the council and judge of the State supreme court 1809; was shortly afterward lieut.-gov.; was gov. of Conn. 1813-18; was pres. of Amer. Board of Foreign Missions and of Amer. Bible Society, and contributor to literary and scientific periodicals. D. Dec. 7, 1845.

**Smith** (JOHN COTTON), D. D., b. at Andover, Mass., Aug. 4, 1826, grad. at Bowdoin Coll. in 1847; was ordained in 1849, and became rector of St. John's ch., Bangor, Me.; in 1852 became assistant minister of Trinity ch., Boston; in 1860 became rector of Ascension ch., New York. Wrote essays on evolution and a personal Creator, etc. D. Jan. 9, 1882.

**Smith** (JOHN E.), b. in Pa.; on the outbreak of the war was a resident of Ill., and served on the staff of Gov. Yates; appointed col. of the 45th Ill. Volunteers July 23, 1861, he was engaged in the capture of Ft. Henry and Donelson, the battle of Shiloh, and the siege of Corinth; in Dec. 1862 was commissioned a brig.-gen. of volunteers, and commanded a division in battles of Port Gibson, Raymond, Champion Hill, and Big Black River; in the battle of Missionary Ridge, in Sherman's Atlanta campaign and subsequent "march to the sea," and the invasion of the Carolinas. In Apr. 1866 he was mustered out of the volunteer service, and in the reorganization of the regular army (July 1866) was appointed col. of the 27th Inf.; transferred to the 15th Inf. Dec. 15, and 14th Inf. Dec. 20, 1870; brevetted brig.-gen. and maj.-gen. Retired May 19, 1881.

**Smith** (JOHN GREGORY), b. at St. Alban's, Vt., July 22, 1818, grad. at the Univ. of Vt. 1838, and at the New Haven Law School; commenced practice 1841 along with his father, John Smith (1789-1858), who was M. C. 1839-41, and subsequently chancellor of Vt.; aided him in developing important railway projects; succeeded his father as chancellor 1858; sat in both houses of State legislature; speaker of lower house 1862, gov. of Vt. 1863-65.

**Smith** (JOHN H. ATT.), b. at Saratoga Springs, N. Y., in 1823, and became a Bap. minister 1848; was some yrs. pastor of the Eleventh Bap. ch., Phila., subsequently of Lee ave. ch., Brooklyn, N. Y., where he became widely known as a pulpit-orator and as a leader of the "open-communion" movement; M. C. 1881-83.

**Smith** (JOHN LAWRENCE), M. D., b. near Charleston, S. C., Dec. 16, 1818, grad. at the Univ. of Va., and at the med. school of the Univ. of S. C.; acted as civil engineer on the Charleston and Cin. R. R.; commenced the practice of med. at Charleston, S. C.; gave attention to agricultural chem., and made a thorough examination of the marl-beds near Charleston; was for more than 4 yrs. (1846-51) mining engineer to the Tur. govt.; aided in the development of cotton-growing in Asia Minor, where he made extensive mineralogical explorations; was instrumental in the discovery of deposits of emery and corundum in the U. S.; invented in 1851 the inverted microscope; was elected in that yr. prof. of chem. in the Univ. of Va.; subsequently removed to Louisville, Ky.; became a prof. in the Med. Univ. of that city and supt. of its gas-works. Wrote *The Progress and Condition of Several Depts. of Industrial Chem. and Mineralogy and Chem.*; *Original Researches*. D. Oct. 12, 1883.

**Smith** (JOHN PRE), D. D., LL.D., F. R. S., b. at Sheffield, Eng., May 25, 1774, studied at the Independent acad. at Rotherham; became a dissenting (Independent) minister, and in 1800 resident classical tutor in the theological acad. at Homerton; exchanged that post in 1813 for the divinity tutorship, which he filled until 1843; was again classical tutor, and also prin. from the latter date until 1850, when he retired to private life. For 43 yrs. he was pastor of the "Gravel Pits Chapel," Homerton. Wrote *The Script. Testimony to the Messiah*, *The Mosaic Account of the Creation and Deluge illustrated by the Discoveries of Modern Science, Script., and Geol.*, etc. D. Feb. 5, 1851.

**Smith** (JOHN SPEED), b. in Jessamine co., Ky., July 31, 1792, served under Gen. Harrison at Tippecanoe; was his aide at the battle of the Thames 1813; sat several yrs. in the Ky. legislature, of which he was speaker 1827; was M. C. 1821-23, U. S. dist. atty. for Ky. under Pres. Jackson, and for a considerable period State supt. of public works. D. June 6, 1854.

**Smith** (JONATHAN BAYARD), b. at Phila. in 1741, grad. at Princeton 1760; became a successful merchant at Phila.; commanded a company of militia at the battle of Princeton; was a member of the Continental Cong. 1777-78; was many yrs. judge of common pleas. D. June 16, 1842.

**Smith** (JOSEPH), D. D., b. in Westmoreland co., Pa., July 15, 1796, grad. at Jefferson Coll. 1815, at Princeton Theological Sem. 1819; preached several yrs. in Va.; was prin. of acads. at Staunton, Va., and at Frederick City, Md.; pres. of Franklin Coll., O., and of a coll. at Frederick City; became gen. agent for the Presb. synods of W. Pa., N. Va., and E. O., and was pastor at Round Hill and at Greensburg, Pa. Author of *Old Redstone* and of a *Hist. of Jefferson Coll.* D. Dec. 4, 1868.

**Smith** (JOSEPH), b. at Sharon, Vt., Dec. 23, 1805, removed while a child to Palmyra, N. Y., where he grew up almost without education, leading a rather disreputable life. He began to have visions at 15, and on Sept. 21, 1823, the angel Moroni appeared to him, announcing that God had a work for him to perform, and that, buried in the earth in a certain spot a few miles distant, was a record inscribed upon gold plates, giving an account of the early inhabs. of Amer. and of their fate; and with this record a kind of spectacles through which alone the writing could be read. Three yrs. after, the angel placed the plates in his hands, together with the spectacles. The plates were inscribed on both sides with hieroglyphic characters in a lang. no longer extant, but which he was able to decipher and understand by the use of the miraculous spectacles. Smith professes to have dictated in English the contents of these plates to his

amanuensis, the plates themselves mysteriously disappearing as they were successively transcribed. This transcription was printed at Palmyra in 1830 under the title, *The Book of Mormon, an Account written by the Hand of Moroni upon Plates taken from the Plates of Nephi*. By Joseph Smith, Jr., Author and Proprietor. There can be no doubt that the *Book of Mormon* was a kind of historical romance, written nearly 20 yrs. before by Samuel Spalding, at one time a clergyman, and that he intended to publish it as such under the title *The Manuscript Found*; and that this MS. fell into the hands of Sidney Rigdon, a printer, who surreptitiously copied it, returning the original to Spalding, who d. soon after, but the MS. was preserved by his widow. Rigdon in the mean while had set up as the founder of a new faith, and fell in with S., and they two concocted the plan of making Spalding's romance a kind of Bible of their sect. S. and Rigdon soon gained a small body of followers, and in 1831 went to Kirtland, O., where they built a temple, set up a fraudulent bank, and were driven away by the citizens in 1838. S. had in the mean time fixed upon a place in Mo. as the site of his New Jerusalem, and here his adherents had begun to gather; but becoming obnoxious to the surrounding inhabs., they took refuge in Hancecock co., Ill., where in 1840 they established themselves in a fine location at a bend of the Miss., calling their new home Nauvoo. Here S. soon began to put forth a succession of new revelations, among others one establishing polygamy, and combining in his own person all civil, military, municipal, and sacerdotal authority. A newspaper was set up to oppose him, which was demolished by S. and his adherents May 6, 1844. Warrants were issued for his arrest, and that of his brother Hyrum and some others; they refused to obey the writs; the State militia were called out; the Mormons armed themselves, and a conflict was imminent. The gov. of Ill. at length induced the Smiths to surrender and submit to trial. They were committed to jail at Carthage. On the evening of May 27 a mob assembled, began firing into the door and window of the jail, and Hyrum and Joseph Smith were shot dead.

**Smith** (JOSEPH MATHER), M. D., b. at New Rochelle, N. Y., Mar. 14, 1789, settled as a phys. in New York 1811; was one of the founders of the Medico-Physiological Society; visiting phys. to the N. Y. State prison 1820-24; became ed. of the *New York Med. and Physical Journal* 1828, and visiting phys. to the New York Hospital 1829; was prof. of the theory and practice of physic in the New York Coll. of Phys. and Surgeons 1828-55, and afterward prof. of materia medica; was pres. of the Amer. Med. Association 1854, and pub. several valuable professional works. D. Apr. 22, 1866.

**Smith** (JOSHUA TOULMIN), b. at Birmingham, Eng., May 29, 1816, ed. in the public schools of Birmingham; pub. *Introduction to the Lat. Lang. and A Popular View of the Progress of Philos. among the Ancs.*; devoted himself to the Scandinavian langs. and lit.; resided in the U. S. 1837-42; pub. *Northmen in N. Eng., or Amer. in the Tenth Century*; devoted himself, on his return to Eng., to study of constitutional and Old-Saxon law; was called to bar 1849; wrote *The Parish, its Obligations and Powers, its Officers and their Duties*; illustrated antiquities of Birmingham, etc. D. Apr. 28, 1869.

**Smith** (JUNIAS), LL.D., b. at Plymouth, Conn., Oct. 2, 1780, grad. at Yale 1802; practised law at New Haven; gained an important claim against the Brit. govt. 1805; engaged in commerce with G. Brit.; was the first proposer of a line of steamships across the Atlantic 1832; founded a company for that purpose 1836, and successfully inaugurated the enterprise by the voyage of the *Sirius* in the spring of 1838; afterward introduced tea-planting into S. C. D. Jan. 23, 1853.

**Smith** (MATTHEW HALE), b. in Medway, Mass., Nov. 1810, was successively a preacher of Univ., Presb., Epis., and Bap. chs.; pub. books giving the reasons for some of his ecclesiastical changes; studied and practised law, edited newspapers, took part in politics, and engaged in business, but returned to theol. D. Nov. 7, 1879.

**Smith** (MELANCTHON), b. in New York May 24, 1810, entered the navy as a mdpn. Mar. 1, 1826; became lieut. in 1837, commander in 1855, capt. in 1862, com. in 1866, rear-admiral in 1870; retired in 1871. Served with great distinction during the war at the battle of New Orleans, the passage of Ft. Hudson, in the sounds of N. C., and in both the Ft. Fisher fights, and from 1866 to 1870 was chief of the bureau of equipment and recruiting.

**Smith** (NATHAN), b. at Roxbury, Conn., in 1770, studied law and practised at New Haven; was for many yrs. State prosecuting atty. of New Haven co. and U. S. dist. atty. for Conn.; was one of the framers of the State const.; was often elected to the legislature; delegate to Hartford Convention 1814, and U. S. Senator 1832-35. D. Dec. 6, 1835.

**Smith** (NATHANIEL), brother of Nathan, b. at Woodbury, Conn., Jan. 6, 1762, received a limited education; studied law, and commenced practice at the bar in his native town 1789; served often in the legislature; was M. C. 1795-99, State senator 1799-1804, and judge of the State superior court 1806-19. D. Mar. 9, 1822.

**Smith** (NATHAN RYNO), M. D., LL.D., b. at Cornish, N. H., May 21, 1797, grad. at Yale 1817; took the degree of M. D. at New Haven 1823, and was elected prof. of anat. and surgery in the Univ. of Vt. at Burlington 1825; on the organization of the Jefferson Med. Coll. in Phila. became the prof. of anat., but in 1827 accepted the chair of surgery in the Univ. of Md.; invented a sure method of lithotomy, and wrote *Surgical Anat. of the Arteries and other med. works*; in 1838 became prof. of practical med. in the Transylvania Univ., Lexington, Ky.; in 1840 returned to the Univ. of Md. D. July 3, 1877.

**Smith** (OLIVER HAMPTON), b. at Trenton, N. J., Oct. 23, 1794, emigrated to Ind. 1817; studied and practised law; became dist. atty. 1824, M. C. 1827-29, and U. S. Senator 1837-43. Author of *Recollections of Congressional Life and of Early Ind. Trials, Sketches, and Reminiscences*. D. Mar. 19, 1859.



**Smith** (PERSIFER FRAZER), b. at Phila. Nov. 1798, grad. at Princeton 1815; studied law; settled at New Orleans; became adjutant-gen. of La.; was col. of La. volunteers in the campaigns of 1836 and 1838 in Fla.; commanded the brigade of La. volunteers on the Rio Grande May 1846; was appointed col. of the mounted rifles May 27, 1846; was brevetted brig.-gen. for services at Monterey, and maj.-gen. for gallantry at Contreras and Churubusco; appointed civil and military gov. of the City of Mex. Oct. 1847, and of Vera Cruz May 1848; became brig.-gen. U. S. A. Dec. 30, 1856. D. May 17, 1858.

**Smith** (REV. PETER J., Ph.D.), b. 1841 near Treves, Pruss., came to U. S. 1847; ed. in U. S., Europe, Fr., and Ger.; ordained R. Cath. priest 1864; vicar at Vaudrevange on the Sarre 1865-68; returned to U. S. 1868 and became prof. of ch. hist. and canon law in Provincial Sem., Troy, N. Y.; rector of St. Mary's ch., Rome, N. Y.; contributor to ch. reviews, and member of many literary societies.

**Smith** (RICHARD SOMERS), b. at Phila. Oct. 30, 1813, grad. from the U. S. Military Acad. July 1, 1834, but resigned to follow the profession of civil engineering. In 1840 he was reappointed in the army. For 15 yrs. (1840-55) he was assistant prof. of drawing at the Military Acad.; accepted the chair of math. and drawing in the Brooklyn Polytechnic Inst. On May 14, 1861, he re-entered the army with the rank of major, and was assigned to the 12th inf.; was engaged in the battle of Chancellorsville May 2-4, 1863; relinquished his commission to accept presidency of Girard Coll., Phila., which position he held until 1868, and from 1868 to 1870 was prof. of civil engineering in Polytechnic Coll. of State of Pa.; from the latter date he was at the head of the dept. of drawing at the U. S. Naval Acad. at Annapolis. D. Jan. 24, 1877.

**Smith** (ROBERT), D. D., b. in the co. of Norfolk, Eng., in 1732, ed. at the Univ. of Cambridge, where he became a fellow; took orders in the Ch. of Eng. 1756; became rector of St. Philip's, Charleston, S. C., 1759; served as a volunteer in the war of the Revolution; preached for a time in Queen Anne co., Md.; presided over Charleston Coll. 1786-98, and was consecrated as the first P. E. bp. of S. C. Sept. 13, 1795. D. Oct. 28, 1801.

**Smith** (ROBERT), brother of Gen. Samuel, b. at Carlisle, Pa., Nov. 1757, served as a volunteer at Brandywine; grad. at Princeton 1781; studied law, which he practised at Baltimore; was for some yrs. a member of the Md. legislature; was sec. of the navy in the cabinet of Pres. Jefferson 1802-05, atty.-gen. Mar.-Dec. 1805, and sec. of state under President Madison 1809-11; was for some yrs. pres. of the Amer. Bible Society and of the Md. Agricultural Society, and provost of the Univ. of Md. D. Nov. 26, 1842.

**Smith** (ROBERT ANGLIE), Ph. D., F. R. S., b. near Glasgow, Scot., Feb. 15, 1817, educated at the University of Glasgow; studied chem. under Liebig at Giessen 1839-41; became a professional chemist; labored to improve the sanitary condition of towns and mines; made *Reports* to the board of health and to the Brit. Association on the air and water of towns; was employed by the royal mines commission to analyze the air of many mines; pub. an *Inquiry into the Action of Carbonic Acid on the Circulation of the Blood*; was appointed inspector-gen. of alkali-works 1863; made important researches on the comparative advantages of disinfectants, resulting in favor of the use of carbolic or phenic acid; pub. a *Memoir of Dr. John Dalton*, and *Hist. of the Atomic Theory up to his Time*, a vol. on *Disinfectants and Disinfection*, etc.

**Smith** (ROBERT PAYNE), D. D., b. in Gloucestershire, Eng., Nov. 1818, grad. with high honor at Pembroke Coll., Ox., 1841; obtained there a Sans. and 2 Heb. univ. scholarships; took orders in the Ch. of Eng.; became under-librarian of the Bodleian; pub. a *Catalogue of the Syriac MSS.* in that library; edited and translated from the Syriac the *Commentary of Cyril of Alexandria* on Luke, and the *Ecclesiastical Hist. of John of Ephesus*; commenced a *Syriac Lexicon*; is author of *The Authenticity and Messianic Interpretation of the Prophecies of Isaiah vindicated in a Course of Sermons preached before the Univ. of Ox., Prophecy a Preparation for Christ*, and *Commentary on Jeremiah*. Became regius prof. of divinity in Univ. of Ox. Aug. 1865, and dean of Canterbury Jan. 1871; visited U. S. as a delegate to General Conference of Evangelical Alliance in Oct. 1873; member of the O. T. revision co.

**Smith** (SAMUEL), b. at Carlisle, Pa., July 27, 1732, removed in childhood to Baltimore; became a capt. in Smallwood's Md. regiment Jan. 1776; participated in the battles of L. I., Harlem, and White Plains, and in the retreat through N. J.; became major in Gist's battalion Dec. 10, 1776, and lieutenant-col. 1777; was at the attack on Staten Island and at the battle of Brandywine; defended Ft. Mifflin from Sept. 26 to Nov. 11; was severely wounded and forced to remove to the Jersey shore; was at Valley Forge and at the battle of Monmouth, after which he resigned his commission in the army, but continued to serve as col. of militia; was a member of the Md. constitutional convention 1776; M. C. 1798-1803 and 1810-22; U. S. Senator 1803-15, and again 1822-33, serving much of the time as chairman of the finance committee, and occasionally as pres. *pro tempore* of the Senate; was maj.-gen. of militia at the defence of Baltimore against the Brit. 1814; quelled a formidable mob in 1835, and was thereupon elected mayor. D. Apr. 22, 1839.

**Smith** (SAMUEL EMERSON), b. at Hollis, N. H., Mar. 12, 1788, grad. at Harvard 1808; became an eminent lawyer; settled at Wiscasset 1812; was justice or chief-justice of common pleas for several terms, gov. of Me. 1831-34, and commissioner to revise the statutes 1837. D. Mar. 3, 1860.

**Smith** (SAMUEL FRANCIS), D. D., b. at Boston, Mass., Oct. 21, 1808, grad. at Harvard 1829; studied theol. at Andover Sem.; became a Bap. clergyman 1832; edited the *Bap. Missionary Magazine* at Boston 1832-33; was pastor of a ch. at Waterville, Me., and prof. of modern langs. in Waterville Coll. 1834-42; pastor at Newton, Mass., 1842-54; edited the *Chr. Review* 1842-49, and since 1854 has been ed.

of the publications of the Bap. Missionary Union. Pub. *The Psalmist*, *Lyric Gems*, etc.

**Smith** (SAMUEL STANHOPE), D. D., LL.D., son of Dr. Robert, b. at Pequea, Pa., Mar. 16, 1750, grad. at Princeton 1769; was tutor at Princeton 1770-73; ordained to the Presb. ministry 1774; labored as a missionary in Western Va.; was the first pres. of Hampden-Sidney Coll. 1775-79; became prof. of moral philos. at Princeton 1779, also prof. of theol. 1783; v.-p. of the coll. 1786, and pres. 1795; was a member of the committee appointed to draw up a system of gov. for the Presb. Ch. 1786; was an eloquent and effective pulpit-orator; pub. an *Essay on the Variety of Completion in the Human Species*, a vol. of *Sermons, Lectures on the Evidences of the Chr. Religion* and on *Moral Philos.*, etc. D. Aug. 21, 1819.

**Smith** (SEBA), b. at Buckfield, Me., Sept. 14, 1702, grad. at Bowdoin Coll. 1818; became a journalist at Portland; married Miss Elizabeth Oakes Prince 1823; won a wide reputation as a humorist by his *Letters of Major Jack Downing*; lost his property 1839; settled in New York 1842; devoted himself successfully to lit., as did his wife; pub. *Devotions of the Nineteenth Century*, *My Thirty Years out of the Senate*, *Powhatan*, a *Metrical Romance*, etc. D. July 29, 1868.

**Smith** (SYDNEY), b. at Woodford, Essexshire, June 3, 1771, was ed. at Ox., of which he became a fellow in 1790; in 1794 became curate of a lonely parish on Salisbury Plain. In 1796 he went to Edinburgh as private tutor to a young gentleman; remained there 5 yrs. and became intimate with Brougham, Jeffrey, and other Whigs, who in 1802 started the *Edinburgh Review*; went to Lond., where he became a popular preacher. In 1806 was presented with the living of Foston-le-Clay in Yorkshire. Pub. anonymously *Letters on the Subject of the Catholics*, to my brother Abraham, who lives in the Country, by Peter Plymley, which had a large share in bringing about R. Cath. emancipation. For many yrs. he was a regular contributor to the *Edinburgh Review*. He was appointed prebendary of Bristol and rector of Combe-Florey, and in 1831 made resident canon of St. Paul's, Lond. D. Feb. 22, 1845.

**Smith** (SIR THOMAS), LL.D., b. at Saffron-Walden, Essex, Eng., Mar. 28, 1514, ed. at Queen's Coll., Cambridge, where he became fellow 1531; became Gr. lecturer 1533, and public orator 1536; visited Fr. and It. 1539-42, graduating in law at Padua; became regius prof. of civil law at Cambridge 1542; aided Sir John Cheke in introducing into Eng. an improved Gr. pronunciation; took holy orders; held the rectory of Leverington, Cambridgeshire, and the deanery of Carlisle; was knighted by Edward VI.; made sec. of state 1548, and sent as ambassador to Charles V. at Brussels in July of the same yr.; was imprisoned in the Tower on the fall of the Protector Somerset; went as ambassador to Henry II. of Fr. Apr. 1551, to negotiate a marriage between Edward VI. and the daughter of the Fr. monarch; was again ambassador to Fr. 1559, 1562, 1567, and 1572; became provost of Eton 1554, privy councillor and assistant sec. of state 1571, chancellor of the order of the Garter 1572, sec. of state 1572. D. Aug. 12, 1577.

**Smith** (THOMAS MATHER), D. D., b. at Stamford, Conn., in 1797, grad. at Yale 1816, and at Andover Sem. 1820; became pastor of a Congl. ch. at Portland, Me., 1822; was subsequently settled over chs. at Fall River, Mass., Catskill, N. Y., and New Bedford, Mass.; transferred his allegiance to the P. E. Ch. while at the latter place, receiving ordination from the hands of Bps. B. B. Smith and Eastburn 1845; was prof. of systematic divinity in the theological school at Gambier, O., 1845-63, and pres. of Kenyon Coll. at the same place 1859-63. D. Sept. 6, 1864.

**Smith** (TRUMAN), b. at Roxbury, Conn., Nov. 27, 1791, grad. at Yale 1815; was admitted to the bar 1818; sat in the State legislature 1831-32 and 1834; was M. C. 1839-43 and 1845-49; had a decisive influence in procuring the nomination of Gen. Taylor for the Presidency; was U. S. Senator 1849-54; settled in New York in the practice of his profession soon afterward; was appointed by Pres. Lincoln judge of the court of arbitration established by the treaty of 1862 with G. Brit., and was subsequently a judge of the court of claims arising from the rebellion. Wrote *An Examination of the Question of Anæsthesia*. D. May 3, 1884.

**Smith** (WILLIAM), LL.D., b. in N. C. in 1763, ed. at Mt. Zion Coll.; was admitted to the bar at Charleston, S. C., 1792; M. C. 1797-99, U. S. Senator 1816-23 and 1826-31; was twice pres. *pro tem.* of the Senate; was a distinguished supporter of the doctrine of "State rights;" sat at various times in the legislature, and was a judge of State supreme court; received in 1831 the nomination of his own State for Vice-Presidency; spent his later yrs. in Ala. D. June 26, 1840.

**Smith** (WILLIAM), F. G. S., b. at Churchill, Oxfordshire, Eng., Mar. 23, 1769, became a land-surveyor, and was led to make maps of the succession of geological strata; afterward visited for that purpose nearly all the co. of Eng., producing a series of maps, collecting a museum of fossil remains, and demonstrating the identity of the formation which yielded the same fossils. Wrote *Delineations of the Strata of Eng. and Wales*, *Strata identified by Organized Fossils*, *Stratigraphical System of Organized Fossils*; issued between 1819 and 1824 21 colored geological maps of Eng. cos.; selected for the gov. the dolomitic stone-quarries of Anston, Yorkshire, as supplying the best building material for the new houses of Parl. D. Aug. 28, 1839.

**Smith** (WILLIAM), b. in King George co., Va., Sept. 6, 1797, ed. at Plainfield Acad., Conn.; was admitted to the bar 1818; was repeatedly elected to the State legislature; M. C. 1841-43, and again 1853-61; gov. of Va. 1846-49; became brig.-gen. in the Confed. army.

**Smith** (WILLIAM), LL.D., D. C. L., b. in Lond., Eng., in 1813, ed. at the Univ. of Lond.; studied law at Gray's Inn; was for some yrs. prof. of Gr., Lat., and Ger.; became classical examiner in the Univ. of Lond. 1853, and ed. of the *Quarterly Review* 1867. He is known by his series of classical dictys upon *Gr. and Rom. Antiquities*, *Biography and Mythology*, *Geog.*, etc.



**Smith** (WILLIAM ANDREW), D. D., b. at Fredericksburg, Va., Nov. 29, 1802, became a preacher of the M. E. Ch. S.; in 1846 became pres. of Randolph-Macon Coll.; in 1868 became pres. of Central Coll.; was a leading member of every Gen. Conference from 1832 to 1866; was appointed at the Gen. Conference of 1866 one of the coms. on the part of the S. Ch. to settle the property question with the N. Ch.; wrote *Lectures on the Philos. and Practice of Slavery*. D. Mar. 1, 1870.

**Smith** (WILLIAM FARRAR), D. in St. Alban's, Vt., Feb. 17, 1824, grad. at the U. S. Military Acad. July 1, 1845; passed 2 yrs. at W. Pt. as assistant professor of math.; engaged on surveys in Tex., on the Mex. boundary commission, and in Fla. In 1856 he was placed on light-house construction duty, and in 1859 appointed engineer sec. of the light-house board. On the outbreak of civil war he was engaged in the first battle of Bull Run on the staff of Gen. McDowell. Commissioned brig.-gen. of volunteers (Aug. 13), he served in the defenses of Wash. until Mar. 1862, and in the Virginia Peninsula campaign of 1862 commanded a division before Yorktown and in the battles of Williamsburg, Fair Oaks, White Oak Swamp, Savage Station, Glendale, and Malvern Hill; promoted to be maj.-gen. of volunteers July 4, 1862, he led his division in the Md. campaign at South Mountain and Antietam. In Nov. 1862 he was assigned to the command of the 6th corps, and engaged at Fredericksburg; transferred to 9th corps Feb. 1863. He directed (Oct. 27) the throwing of a pontoon-bridge across the Tenn. River at Brown's Ferry, below Chattanooga, and capture of heights overlooking it, and participated in the battle of Missionary Ridge. In Mar. 1864 he became maj.-gen. of volunteers, and in May was assigned to 18th corps, which he commanded at Cold Harbor, June 1-3, and siege of Petersburg. For gallantry in battle he was brevetted from lieutenant-col. to maj.-gen.; police com. New York 1875-80.

**Smith** (WILLIAM LOUGHTON), LL.D., b. probably in S. C. about 1745, was M. C. 1789-97; an able supporter of the administration of Washington and Adams, and an active opponent of Jefferson, against whom he pub. a pamphlet; was minister to Port. 1797-1800, and to Sp. 1800-01. Wrote *Comparative View of the Constit. of the States*, etc. D. in 1812.

**Smith** (Gen. WILLIAM RUSSELL), b. in Ala. about 1813, ed. at the Univ. of Ala.; practised law at Greensboro; served as capt. of mounted inf. against the Creeks 1836; became an ed. at Mobile; founded the *Tuscaloosa Monitor* 1838; was mayor of Tuscaloosa 1839, a circuit judge 1850-51, a Whig M. C. 1851-57; opposed secession, but sat in the Confed. Cong. 1861-65; was afterward pres. of the State univ. Wrote *Ala. Justice*, etc.

**Smith** (WILLIAM STEPHENS), b. in New York in 1755, grad. at Princeton 1774; served in the war of the Revolution, reaching the rank of lieutenant-col.; was successively aide to Sullivan, Steuben, and Washington (July 1781); married the only daughter of John Adams, whom he accompanied on his mission to Eng. as sec. of legation 1785; became surveyor of New York; sat 3 yrs. in the State assembly; was chosen pres. of the New York Society of Cincinnati 1804, and was M. C. 1813-16. D. June 10, 1816.

**Smith** (WORTHINGTON), D. D., b. at Hadley, Mass., in 1795, grad. at Williams Coll. 1816; studied theol. at Andover; was licensed to preach 1819; was pastor of the Congl. ch. at St. Alban's, Vt., 1823-40, and pres. of the Univ. of Vt. from 1849 to his death, Feb. 13, 1856. Author of *Select Sermons*.

**Smithson** (JAMES LEWIS MACLE), F. R. S., b. in Eng. 1765, a natural son of Hugh Smithson, first duke of Northumberland; ed. at Oxford, graduating at Pembroke Coll. 1786; was chosen F. R. S. in the following yr.; devoted himself to science, especially chem.; pub. in the *Philosophical Transactions* 8 papers, beside several in the *Annals of Philos.* and other scientific periodicals; was much interested in geol., and was at one time v.-p. of the Royal Society. D. at Genoa, It., June 27, 1829. (See SMITHSONIAN INSTITUTION.)

**Smithsonian Institution**, located at Wash., D. C., is a scientific establishment founded on the bequest of James Smithson of Eng. for the "increase and diffusion of knowledge among men." The amount first received was \$515,169; the "residuary legacy," \$26,210.63; total sum derived from the bequest, \$541,379.63. In 1867, under act of Cong. authorizing the increase of the fund to \$1,000,000, \$108,620.37, resulting from the savings of income and the increased value of investments, was added to the amount then in the treas. of the U. S., making the entire sum to the credit of Smithsonian \$650,000. Beside this, in 1874 a special fund of \$1000, known as the bequest of James Hamilton of Carlisle, Pa., the interest on which is to be "appropriated biennially for a contribution, paper, or lecture on a scientific or useful subject," was placed in the treas. of the U. S. In addition, the inst. holds bonds and certificates of the State of Va. amounting at par to \$88,125.20, the coupons of which are sold annually and the proceeds added to the income of the establishment. The Smithsonian bequest was accepted by act of Cong. approved July 1, 1836; it was established by act of Cong. approved Aug. 10, 1846. By the provisions of this act the establishment is administered by a board of regents composed of the chief-justice of the U. S. supreme court, 3 senators, appointed by the V.-P. of the U. S., 3 reps., appointed by the speaker of the House, and 6 citizens, chosen by joint resolution of Cong.; no 2 regents are allowed from any one State; 2 of the citizen members must be residents of D. C. Beside the board of regents, the Pres. and V.-P. of the U. S. and the cabinet officers during the time they hold their respective offices, and such other persons as they may elect honorary members, are by law constituted an "establishment" styled the "Smithsonian Institution." By this name they are known and have perpetual succession. The Pres. of the U. S. is the presiding officer of this "establishment." From the inauguration of the inst. to the present time the regents appointed by the 2 houses of Cong. have generally been selected from among the members who had already acquired a national reputation as eminent jurists or upright statesmen, while those from the citizenship of

the several States have usually been chosen on account of probity of character, high social position, and literary or scientific reputation.

The S. building is one of the most imposing edifices in the U. S. The arch. is the latest variety of the Rounded style of the 12th century. The material is lilac-gray freestone from the new red sandstone formation where it crosses the Potomac. The corner-stone was laid May 1, 1847. By law the S. is the depository of the National Museum, of which the secretary of the inst. is the curator. It is the only lawful place of deposit of "all objects of art and of foreign and curious research, and all objects of nat. hist., plants, and geological and mineralogical specimens, belonging, or hereafter to belong, to the U. S., which may be in the city of Wash. in whosesoever custody." The nucleus of these collections consists in the specimens brought home by the Wilkes and other early exploring expeditions. Through the agency and influence of the inst. these have been greatly augmented, and the museum may now be said to be rich in objects in several of the depts. incident to such an establishment, particularly ethnology, ornithology, and ichthyology. In the early hist. of the inst. it established a system for the interchange of Amer. and foreign scientific thought. By this system, which has now attained great proportions, societies and individuals are brought into close communion by the interchange of publications, the privilege being accorded at the expense of the inst. for ocean transportation. The support of the system costs annually about \$6000. The effect of this enterprise cannot be too highly estimated. By this means thousands of works embracing the details of the latest inventions and discoveries are brought to Amer., while in turn a knowledge is disseminated abroad of whatever is doing in the U. S. to advance the welfare of the people. There are now about 2200 foreign societies in correspondence with the inst., exclusive of individuals.

The S. Library was several yrs. ago transferred to the care of the Library of Cong., and now forms the National Science Library. It consists of about 75,000 vols. The inst. issues 3 series of publications. The first is a quarto entitled *Contributions to Knowledge*; the second, an octavo styled *Miscellaneous Collections*; and the third, an octavo *Annual Report*. The *Contributions to Knowledge* are memoirs pertaining to every branch of phys. science, and contain positive additions to knowledge based on original research; they are usually the results of investigations to which the inst. has in some way rendered assistance. The miscellaneous collections are monographs designed to facilitate the study of nat. hist., and to induce individuals to engage therein as a specialty. The annual report is made up of a statement to Cong. of the operations, expenditures, and condition of the inst., and an appendix containing translations from works not generally accessible to Amer. students; biographies, original and other, of distinguished scientists; ethnological and meteorological essays; extracts from correspondence; accounts of unusual phenomena, etc. of interest to the general as well as the scientific reader.

**Smithsonite**, mineral carbonate of zinc, named after the Eng. chemist Smithson, who was the founder of our Smithsonian Institution. It crystallizes in rhombohedrons of glassy lustre, white when pure, with the hardness of apatite. S. occurs in many Amer. localities; abundantly at Lancaster, Pa., near Bethlehem, Pa., and at the Perikomen lead-mine.

**Smithville**, on R. R., Burlington co., N. J., 18 m. N. E. of Phila. Pop. 1880, 285.

**Smoke** [*A.-S. smoca*], the product of an imperfect combustion. If coal be burned perfectly, the result will be carbonic acid, steam, and nitrogen, which substances will escape through the chimney-top and blend with the atmosphere under the form of invisible and incombustible gases and vapor. But as the combustion of coal in the way in which it is generally burned is very imperfect, inflammable gases and vapors and large quantities of fine particles of carbon issue together with the above substances, form soot and black and brown smoke, contaminate the air, and cause a considerable loss of fuel.

**Smollett** (TOBIAS GEORGE), b. at Dalquhurn House, Cardross, Scot., in 1721; pub. in 1748 with great success his first and best novel, *The Adventures of Roderick Random*; in 1751 *The Adventures of Peregrine Pickle*, and in 1753 *The Adventures of Ferdinand, Count Fathom*; edited for some time a Tory organ, the *Critical Review*; wrote in 14 months a *Complete Hist. of Eng.*, deduced from the *Descent of Julius Caesar to the Treaty of Aix-la-Chapelle*, to which he subsequently added a *Continuation* from 1748 to 1760; wrote *Adventures of Sir Lancelot Greaves*; aided Thomas Franklin and other writers in bringing out a translation of the *Works of Voltaire* (37 vols.); went for his health to It. in 1769, and wrote on the journey *The Expedition of Humphrey Clinker*, his most amusing book. D. Oct. 21, 1771.

**Smut** [*A.-S. smitta*]. The diseases of grain in which the kernels become converted into masses of black powder are popularly called *smuts*. In England the term *dunt* is often applied to similar diseases. The diseases known as smuts are all caused by fungi belonging to the order Ustilaginæ. The smuts are by no means, however, confined to grains, but are abundant on other plants, and, although generally confined to the floral organs, in some species are found on the leaves and stalks.

**Smyrna**, smirna, city of Asia Minor, situated at the bottom of the Hermæan Gulf, whose entrance lies opposite the island of Mitylene. Originally an Ionian colony, the Æolians took and walled it; it was erected on the banks of the sacred Meles; here stood the temple of Diana, and here Homer sang his immortal verse. The Ionians had repossessed their city but about 100 yrs. when Alyattes, king of Sardis, took and dismantled it in 628. Thence for 4 centuries her people dwelt in an unwalled town and in the v. of the neighboring plain, until Alexander the Great ordered a new city to be built on the slopes of Mt. Pagus. From



this time S. increased in wealth and prosperity, becoming, as it has been ever since, the chief commercial city of Asia Minor. Christianity was probably introduced into S. during the 1st century of our era, and Polycarp, one of its early bps. and a disciple of St. John, suffered martyrdom in 167 A. D. It is one of the 7 apocalyptic chs.; and it is worthy of note that it alone is commended, with Philadelphia, in the epistles to the 7 chs. After various vicissitudes during the Middle Ages, it fell finally into the hands of the Turks, in whose possession it has since remained. Its population has increased from 90,000 in 1831 (Tavernier) or 27,300 in 1702 (Tournefort) to 150,000, of whom only 40,000 are Turks. Modern S. is built in part upon the slopes of Mt. Pagus, but mostly on the low ground at their foot, formed in good measure by a torrent from the S., and extending to a tongue of land called "the Point." Its E. limit is formed by the above-mentioned torrent and the "caravan bridge," beyond which lie the Tur. cemeteries, thickly planted with fine cypresses. The sea-face is 2 m. in extent N. and S. The streets are either parallel or at right angles to the sea, but they are straight only in the Armenian quarter. The houses, usually 2 stories high, are now generally built of wooden beams incased in stone, to preserve them at once from fire and the earthquake. There are several free hospitals, each nation usually having its own, the Turks and Jews excepted. The Grs. have 3 chs., the Armenians 1, the R. Caths. 3, the Prots. 4 chapels, and the Jews 1 synagogue. The mosques are mostly anc. churches or *tekkes*. S. is the best supplied with schools of any city in the empire, and has 3 Fr., 1 Gr., and 1 Armenian weekly paper. S. is the chief mart for European commerce in Asia Minor. Its exports consist of silk, opium, drugs, dyes, and gums, gall-nuts, wool, valonea, dried figs, raisins, and fresh fruits; and the imports are coffee, sugar, cochineal, indigo, tin, iron, lead, broadcloth, cotton goods, rum, brandy, spices and machinery. The defences of S. consist of a battery on the shore and of the ruinous castle at the entrance of the bay. S. possesses the only railways yet built in Asia Minor—the one extending S. to Aidin, a distance of 83 m., and the other to Philadelphia, 113 m. in all. Many steamers, Aus., Fr., Rus., Eng., Gr., It., Sp., Tur., and Egyptian, place it in direct communication with all the prin. ports of the Mediterranean and the Black Sea. S. yet presents some venerable ruins—the castle on the hill, the great theatre beneath it, and the stadium, the scene of Polycarp's martyrdom. The beauty of its neighborhood is justly celebrated, and its country villas are unrivalled in the empire. The prov. is governed by a pasha.

**Smyrna**, R. R. June, Kent co., Del., 60 m. S. of Phila. Business, fruit-growing and agriculture. Pop. 1880, 2423.

**Smyth** (CHARLES PLAZZI), b. about 1820, was employed for some time under Mr. MacLean in the observatory of the Cape of Good Hope; was appointed royal astron. for Scot.; made a series of observations from the peak of Teneriffe 1856; pub. *Teneriffe, an Astronomer's Expedition, or Specialities of a Residence above the Clouds*; visited Rus.; wrote *Three Cities in Rus.* and made a thorough examination of and wrote on the Great Pyramid of Egypt.

**Smyth** (ROBERT COFFIN). See APPENDIX.

**Smyth** (NEWMAN), D. D., b. at Brunswick, Me., June 25, 1843, grad. at Bowdoin Coll. 1863, and at Andover Sem. 1867; assistant teacher in Naval Acad. at Newport 1863-64; first lieut. 16th Me. volunteers 1864-65; preached in Providence, R. I., 1867-68; spent a year in Europe 1868-69; pastor of first Congl. ch., Bangor, Me., 1870-74; of first Presb. ch., Quincy, Ill., 1875-82; of Centre ch., New Haven, Conn., 1882. Wrote *The Religious Feeling, Old Faiths in New Lights, and The Orthodoxy of To-Day*.

**Smyth** (WILLIAM HENRY), D. C. L., F. R. S., b. at Westminster, Eng., Jan. 21, 1788, entered the Brit. navy 1805; served at Cadiz 1810; was detailed by the lords of the admiralty to make a hydrographical survey of the coasts of Sic. and the adjacent islands, which resulted in the publication of his *Atlas and Descriptive Memoir on Sic.*; was promoted to commander Sept. 1815; completed a survey of the coasts of the Adriatic 1817; made a final survey of the Mediterranean 1821; pub. a large number of charts of different portions of that sea; became post-capt. 1824, rear-admiral 1853; resided successively at Bedford and at Cardiff, erecting a private astronomical observatory at each place; was pres. of the Royal Astronomical Society, and in 1857 became hydrographer to the admiralty. D. Sept. 9, 1865.

**Snail** [*A.-S. snægal*, "little snake"], a name given to the shell-bearing gasteropod mollusks. The terrestrial S. are divisible into 3 categories—viz. (1) Pulmonata, including the inoperculate forms, as well as allied forms living in the water, and also the slugs; (2) certain operculiferous forms which are closely allied to the aquatic Littorinidae, etc.; and (3) other operculiferous types which are most nearly related to certain other aquatic forms very different in structure from the former—e. g. Neritidae, Trochidae, etc.—and representative of another order, the Rhipidoglossa. It is thus seen that the form of the shell, and even the presence or absence of a shell, are of very inferior systematic significance, and entirely subordinate to differences in structure of the animal.

**Snake**. See SERPENT.

**Snake-Bird**. See DARTER.

**Snake-Bites**. See VENOM.

**Snake-Eel** (*Ophisurus*), a genus of marine eels, found only in warm lats. It is remarkable for the absence of the caudal fin.

**Snake-Fish**. See BAND-FISH.

**Snake** (or **Lewis**) **River**, over 1000 m. long, is the largest tributary of the Columbia. It rises in Shoshone Lake, in the U. S. National Park, within the limits of Wyo. Terr. Its source has an elevation of 7792 ft. Its upper valley is broken, with some fertile areas; lower down the country is to a great extent open, and in part is fine prairie-land. The stream has numerous rapids, and its great cataract in Id. rivals Niagara in grandeur and exceeds it in height.

**Snake-Root**, a popular name for many plants believed to be efficacious in the cure of snake-bites. In the U. S. the name is applied to the following among others: (1) The black S.-R. or sanicle (*Sanicula marilandica*), a common umbelliferous plant, with a root of an aromatic taste, of some value as an antispasmodic. (2) The *Eryngium yuccifolium*, button S.-R., or rattlesnake master, is diaphoretic and expectorant. (3) The Seneca S.-R. (see SENECA). (4, 5, 6) *Liatris spicata*, *squarrosa*, and *scariosa*, called also button S.-R., blazing star, rattlesnake master, etc., showy, composite-flowered plants, with stimulant and diuretic properties. (7) The *Eupatorium ageratoides*, common in the N. States, and a good tonic, is called white S.-R. (8, 9) The *Aristolochia serpentaria*, the well-known Va. S.-R., which has valuable stimulant and tonic powers and a pleasant fragrance. (10) The *Cimicifuga racemosa*, or black S.-R., is a valuable sedative and expectorant. (11) *Acaemum Canadense*, or wild ginger, is called S.-R. and Canada S.-R. in N. Eng. It is a pungent, aromatic plant.

**Snake-Stone**, a small piece of stone, bone, or other substance which is placed upon the bite of a poisonous serpent for the purpose of absorbing or charming away the poison. The vulgar in almost all countries have faith in this and other like means of cure, such as the mad-stone, which is applied to the bite of a rabid dog.

**Snake-Wood**. See LETTER-WOOD.

**Snapper**, a popular name for plants of the genus *Andrihnum*, herbs of the order Scrophulariaceæ. Many fine flowering varieties are cultivated.

**Snapper**, a name applied to a number of different kinds of fishes in the S. U. S. and W. I. islands. The most noteworthy are the species of *Lutjanus* and *Sebastes*.

**Snapping-Turtle**, the designation in the U. S. of several species of tortoises. (1) The common S.-T. of the N. and most of the S. U. S. is the *Chelydra serpentina*. This has the head moderately large, and covered with a soft skin, and the marginal scales of the shell are in a single row. It is said sometimes to attain a length of about 4 ft. and a weight of 50 lbs. (2) A species of the S. States is the *Macrochelys Temminckii*. This animal has the head very large and broadly triangular, and it is covered with numerous horny plates; the marginal scales of the shell are in 2 rows. It reaches a very large size; sometimes it is reported weighing as much as 100 lbs. Both of these species belong to the family Chelydridæ, and are distinguishable from all the other turtles of the U. S. by the long and imperfectly retractile neck and tall, and the cruciform plastron or lower shell. They owe their name to their habit of snapping at their food or enemies. (3) In some sections of the U. S. the name is also applied to the soft-shell turtles, or Trionychidæ, which snap abruptly at food or obstacles to their progress.

**Sneeze-Wood**, the beautiful and durable timber of *Pterocylon utile* (order Sapindaceæ), a tree of S. Afr. When sawing or rasping it, joiners are much troubled by the sneezing which its fine dust provokes.

**Snell** (WILHELM), b. at Leyden in 1591, studied math. and natural science; succeeded in 1613 his father as prof. of math. at the Univ. of Leyden. D. there Oct. 31, 1626. He discovered the law of the refraction of light, and was also the first to calculate the size of the earth by means of a trigonometrical measurement of an arc of a meridian.

**Snijder Rifle**, so called from its inventor. Its essential features are that the breech-block revolves around an axis on the right of and parallel to the axis of the bore, and the firing-pin passes obliquely from nose of hammer through breech-block to centre of base of cartridge.

**Snipe** [*Dutch, snip*], a name given to many birds of the family Scolopacidae. The prin. species in the U. S. are the Amer. S., gray S., jack or grass S., robin S., and stone S.

**Snipe-Fish**, a name given to the *Centricus scolopax*, the type of the family Centricidae, on account of the elongated snout, comparable to the bill of a snipe. It is also called trumpet-fish.

**Snorre Sturleson**, b. in 1178 at Hwamma, Iceland, belonging to one of the most prominent families in the island. He was educated at Odd by Jon Loftson, the most learned man in Iceland. In 1204 he married the richest heiress in Iceland, and became the most prominent man in the country. A deadly hatred arose between him and his brother, and bitter feuds with other families made his life a perpetual warfare. He sought support in Nor., but he was murdered at the instigation of the Nor. king, Hakon, by his 2 sons-in-law in 1241, at Reikholt. Of his literary productions, the most important is *Heimskringla*, giving the hist. of Nor. to the death of Magnus Erlingsson in 1177. The *Younger Edda* also bears Snorre's name, but only parts of it belong to him.

**Snow** [*A.-S. snæw*]. When vapor condenses at a temperature below 32° F., it freezes or passes into a crystalline form, producing S. S. flakes, though assuming a great variety of forms, usually present the outline of a hexagon or a six-pointed star. In high and middle lats. the ground is covered with S. each winter, but within the tropical regions no S. falls at or near the level of the sea, for the temperature of the lower atmosphere is always sufficient to melt it, even if it is formed in the upper air. In the N. hemisphere the limit of the fall of S. at the sea-level is an irregular line passing mainly between 25° and 40° N. lat.; in the S. it is more regular, lying in the continents between lats. 37° and 38°. In general, this line is nearest to the equator in the regions most exposed in winter to polar winds, as on the E. coast of Asia and of N. Amer. As the heat of the air decreases upwards, the formation of S. is always possible upon high mts., even under the equator. At the summit of the Andes and the Himalayas, for example, the moisture condensed during the rainy season falls in the form of S., while it rains on the slopes and plains below. Thus, in all lats. from the equator to the poles the tops of high mts. are covered with a layer of permanent S., which



the summer heat is not sufficient to melt. The lower limit of perpetual S., called the *snow-line*, is found within the tropics about 3 m. above the sea-level. In temperate lats. it descends to a little less than 2 m.; and at the N. limit of the continents it is about  $\frac{1}{2}$  m., or even less, above the sea; while on the arctic islands vast fields of S. remain permanently very near the sea-shore.

The height of the *snow-line*, as observed in different lats., is given in the following table:

Latitude.	New World.	English feet.	Latitude.	Old World.	English feet.
75° N.	North Greenland.....	2,300	75° N.	Bear Island.....	600
54°	Unalaska.....	3,500	71°	Mageroe, Cape North.....	2,300
48°	Mt. Baker, Or., about.....	8,000	67°	Suittelma, Lapland.....	3,800
43°	Rocky Mountains.....	12,500	61°	Scandinavian Alps.....	5,300
39°	Rocky Mountains.....	14,500	50°	Altai Mountains.....	7,000
38°	Sierra Nevada.....	11,000	46°	Alps, N. side.....	8,900
19°	Popocatepetl, Mexico.....	14,900	46°	Alps, S. side.....	9,200
5°	Tolima, Colombia.....	15,300	43°	Caucasus.....	11,000
1° S.	Andes of Ecuador.....	15,700	35°	Hindoo Koosh.....	13,000
17°	Andes of Bolivia, W. side.....	18,500	31°	Himalaya, S. side.....	16,200
17°	Andes of Bolivia, E. side.....	15,900	31°	Himalaya, N. side.....	18,600
33°	Andes of Central Chili.....	14,700	12°	Abyssinian Mountains.....	14,000
42°	Andes of Patagonia.....	6,000	3° S.	Kilima Njaro, E. Africa.....	16,000
54°	Andes of Sts. of Magellan.....	3,700	44°	New Zealand Alps.....	7,500

have a lower S.-line than the interior of the continents with their scanty S., dry atmosphere, and hot summers. The peaks of the Sierra Nevada bear perpetual S. 3500 ft. lower than the Rocky Mts. in the same lat. The S. slope of the Himalayas, which condenses the vapors brought by the warm monsoons, has a S.-limit, on an average, 1200 ft. lower than the N. slope on the dry and sunny plateau of Tibet. In the Alps the line of S. is somewhat higher on the S. slopes, exposed to the warm summer wind from it. In passing from the dry climate of Central Chili to the rainy region farther S., the S.-line descends from 14,700 ft. to 6000. A vast amount of S. in the latter region, and a wet, cloudy summer, account for the change. In the Rocky Mts., in a lat. corresponding to that of the Patagonian Andes, the S.-line has an altitude of 12,500 ft.—that is, full 6000 ft. higher. (See GLACIER.) A. GUYOT.

**Snowball**, the *Viburnum opulus*, a cultivated shrub of the order Caprifoliaceæ, called also Guelder rose. To this species belongs the high-bush cranberry of the U. S., whose fruit is edible. The S. is a variety with handsome globular cymes of sterile flowers.

**Snow-Berry**, the *Symphoricarpos racemosus*, a handsome shrub (order Caprifoliaceæ) common in the U. S. In many parts, and in grounds around dwellings where its white, inedible berries are familiar objects.

**Snow-Bird**, a name common to the several species or varieties of the genus *Junco* inhabiting the U. S. These belong to the family Fringillidæ, and have a small conical bill, the wings rather short, the middle toe shorter than the short tarsus, the outer toe rather longer than the inner, and extending to the claw of the middle one, and the tail nearly as long as the wings, slightly emarginate, and decidedly rounded; the color is blackish or ash above, white on the belly, and not developed in streaks anywhere; the outer tail-feathers are white. The several forms generally rather exceed 6 inches in length. They are distributed over different regions of the U. S.

**Snow-Bunting**, or **Snowflake**, the popular name of the *Pterophanes nivalis*, a species of the family Fringillidæ. In common with the other species of the genus, it has a very long hind claw, which is little curved, the tarsi are longer than the middle toes, and the lateral toes are equal and extend to the base of the claw of the middle one; the distinctive characters of the species are the comparatively small bill and the shortness of the hind toe; the general color is white, the middle of the back, inner tail-feathers, and ends of wing-quills black. The species ranges over the whole N. hemisphere.

**Snowden** (A. L.). See APPENDIX.

**Snowden** (JAMES ROSS), b. at Chester, Pa., in 1810, was speaker of the Pa. house of reps. 1842-44, State treas. 1845-47, treas. U. S. mint 1847-50, and director of the mint 1853-61; pub. many addresses and pamphlets on coinage, currency, and allied subjects; was author of 2 beautifully illustrated vols. descriptive of the anc. and modern coins in the U. S. mint and of other objects of interest in the same collection; of a vol. on *The Mint at Phila.*, D. Mar. 21, 1878.

**Snow-drop**, the *Galanthus nivalis* (order Amaryllidaceæ), a small herb much cultivated in gardens for its snow-white flower, appearing in earliest spring; native of Alps.

**Snowdrop Tree**, a popular name for *Halesia tetraptera* and *H. diptera* (order Styracaceæ), small trees or large shrubs native in the S. U. S. They bear showy white clusters of flowers, which appear in spring somewhat before the leaves. They are very fine in cultivation.

**Snowflake**, a popular name for the white flowers of *Lewojum vernum*, *æstivum*, and *autumnale*, European herbs of the order Amaryllidaceæ, cultivated also in Amer. gardens. They are hardy bulbous plants.

**Snow Shoe**, Pa. See APPENDIX.

**Snow-Shoes**, a pair of flat rackets or shoes, of which the broad surface prevents the wearer from sinking in the snow. They are either made of wood alone, or consist of a light frame crossed and recessed by thongs.

**Snuff**. See TOBACCO.

**Snuffer**. See PORPOISE.

**Snyder** (SIMON), b. at Lancaster, Pa., Nov. 5, 1750, learned the tanner's trade in youth; became in 1784 a merchant and miller of Selinsgrove, now in Snyder co., Pa.; was in 1789 a member of the State constitutional convention; speaker of the Pa. house of reps. 1802-06; was several times a candidate for gov., and was elected in 1808, 1811, and 1814, and was a member of the State senate 1818-19. D. Nov. 9, 1819.

This table shows that though the height of the S.-line decreases toward the poles, its greatest altitude is not at the equator, but near the tropics, and that it is also subject to great irregularity of elevation.

Two conditions regulate the altitude of the S.-line—the quantity of fallen S., and the amount of heat to melt it. In the sub-tropical zones, which have less S. and no less summer heat, the S.-line is higher than at the equator. In similar lats. the coast-regions, exposed to moist winds,

**Snyders** (FRANS), Flemish painter, b. at Antwerp in 1579, was a contemporary of Rubens, with whom he worked in concert, and a friend of Van Dyck, who painted his portrait. D. in 1657. His great power was in painting wild animals in the excitement of combat or the chase. His hunting-pictures are in the grand style.

**Soane** (Sir JOHN), F. R. S., b. at Reading, Eng., Sept. 10, 1753, was sent to It. for 3 yrs. (1777-80) as a travelling student at the cost of the Royal Acad.; made a diligent study of the remains of Rom. arch.; was appointed arch. to the Bank of Eng. 1788; became clerk of the works to St. James's Palace and the Houses of Parl. 1791, arch. to the royal woods and forests 1795, surveyor to Chelsea Hospital 1807, and prof. of arch. at the Royal Acad. 1806; pub. a vol. of his plans of *Public and Private Buildings* and a *Description* of his own house and museum; was knighted 1831. D. Jan. 20, 1837.

**Soap** [Fr. *savon*; Ger. *Seife*; Lat. *sapo*]. Soaps are salts of the fat acids with various metallic bases, chiefly soda-base and potassa-base. All the true oils and fats are decomposed by the alkaline hydrates, by certain metallic oxides, and also by acids, high steam, and hot water. Glycerine, the sweet principle of fats, is thus set at liberty, and the fat acids combine with the base, forming soap, or are set at liberty. This process is known as *saponification*. By this process potassium and sodium hydrates produce soluble soaps, while calcium, magnesium, zinc, barium, and lead-oxides, and the like bases, produce insoluble soaps. As a rule, soaps formed by sodium-base are *hard soaps*, while those produced from potassium-base are *soft soaps*. Castor oil, however, forms with potassa a hard and brittle soap. A fundamental distinction between the hard and soft soaps is found also in the fact that in the former the glycerine is removed in the mother-liquor or "spent lye," while in the latter it remains mingled with the semi-fluid mass. Moreover, it is not possible to dry the potassium soaps, owing to the very hygroscopic character of the base, while soda soaps may be so completely dried as to admit of grinding to powder. The nature of the fats and oils, as also of glycerine, has been sufficiently explained under each of these heads, and need not be recapitulated here.

**Soap-Berry**, the fruit of *Sapindus saponaria* and other W. I. trees of the order Sapindaceæ. The pulp is a powerful detergent, much stronger than ordinary soap, and the hard shining seed has been exported and used for making buttons, which are very durable. The name *Sapindus* was invented by Linnæus from *sapo Indicus*, "Indian soap."

**Soapstone**. See STÆTITE.

**Soapwort**, a name sometimes applied as a general name for the plants of the order SAPINDACEÆ (which see), on account of the soapy quality of the fruits of many species. It is also the name for the common *Saponaria* (order Caryophyllaceæ), which makes a detergent lather. This cleansing power depends upon the principle *saponine*.

**Sobieski**. See JOHN III., SOBIESKI.

**Socialism** holds an intermediate position between pure communism and simple co-operation. Unlike communism, it does not advocate the absolute abolition of property, but aims simply at a more just and equitable distribution of it. Every man according to his capacity, and every capacity according to its work is the great maxim laid down by Saint-Simon; and to carry out in reality this maxim is the great goal of all socialistic movements. On the other hand, it does not confine itself, like co-operation, to a mere regulation of the relation between capital and labor, restricting or even excluding competition, transferring the profit from capital to labor, etc., but attempts a complete reconstruction of society. The chief representatives of S. are Saint-Simon and Fourier. Several very interesting socialistic experiments have been made in the U. S.; but as yet S. has had its greatest importance as a ferment only. (See NOYES, *Hist. of Amer. Socialism*; NORDHOFF, *The Communist Societies of the U. S.*; HOLYOAKE, *Hist. of Co-operation*.)

**Social Science**, or **Sociology**, comprehends the systematic investigation, in various lines of research, of principles and laws affecting the welfare of mankind in society. In a broad sense S. includes political economy. Apart from this, it has mainly to do (a) with the laws of health and the causes of disease; (b) with the tendencies to gross and corrupting vice which spring from undue indulgence of the sensual appetites; (c) with *crimes* against human law and govt., particularly the means and insts. for the punishment and reform of criminals; (d) with the causes of wretched and degrading poverty; (e) with the principles on which



society is organized. The chief means of advancing this science are national and international associations and specific philosophical treatises, like those of Herbert Spencer.

**Social Wars** [*i. e.* wars with "allies," *socii*]. (1) The war (b. c. 91-88) between Rome and her It. allies. After the assassination of M. Livius Drusus (91 b. c.), who desired to grant citizenship to the It. allies rose in arms and proclaimed a new republic. A bloody war followed, and in the end the It. received substantially all the privileges they called for. (2) In Athens the first S. W. (357-355 b. c.) was between that city and her allies, Chios, Cos, Byzantium, and Rhodes. The allies sought and gained their independence. (3) The second Athenian S. W. was between Athens and the Achaean and Aetolian leagues (220-217 b. c.).

**Society Islands**, a group of islands in the S. Pacific, between lat. 16° and 18° S., and lon. 148° and 155° W., consist of one large island, Tahiti or Otaheite, and a number of small isles, comprising altogether an area of 450 sq. m., with 13,847 inhabs. The islands are mountainous. The soil is very fertile and the climate delicious. All tropical fruits grow luxuriantly. The inhabs. are Polynesians; most of them are Chrs. They form an independent state under the Fr. protectorate.

**Socinians and Socinianism** are the historical designations of the advocates and doctrines of the most thoroughly organized system of anti-Trinitarianism that has ever existed.

I. HISTORY.—The Trinitarian doctrine, as defined in the Nicene and Athanasian creeds forms a fundamental element of Christianity. It was denied by the early obscure Jewish-Chr. sect of the Ebionites and by some sects of Gnostic origin. The negative tendency in a higher form was afterward embodied in the Arian party. At the era of the Ref. the first anti-Trinitarians appeared chiefly among the Ger. Anabaptists. Among these were Martin Cellarius (b. 1499, d. 1564), John Denk (d. at Bâle 1528), Lewis Hetzer (executed 1529), and John Campanus (d. 1574). One of them, named Spiritus, first carried Unit. doctrine to Poland in 1546. Michael Servetus (b. in Sp. 1509, ed. at the Univ. of Toulouse (burned as a blasphemer 1553), pub. his first work, *De Trinitatis Erroribus*, in 1531. In 1532 he pub. *Dialogorum de Trinitate, Libri duo*, and in 1553 his *Christianismi Restitutio*. In It. many prominent persons adopted rationalistic views. In the second quarter of the 16th century, at Vincenza, a society existed consisting of persons denying the divinity of Christ and related doctrine. It was dispersed in 1546, previous to which, it is said, Bernard Ochinus and Lælius Socinus joined It. The latter devoted his great talents to theological speculations. He remained ostensibly a member of the Reformed Ch. at Zurich, although disseminating his opinions. He visited Poland in 1551, and again in 1558, and d. in Zurich in 1562. His nephew, Faustus Socinus (b. 1539, d. 1604), was indoctrinated by his uncle, and settled permanently in Poland 1579. He was appointed phys. to the queen. At this time all the Prot. synods held in Poland embraced promiscuously the ministers of all the Reformed societies, whether Lutheran, Calvinistic, or anti-Trinitarian. In 1566 the latter were forced to form an independent ecclesiastical organization. The Unit. Ch. thus formed comprised persons of very dissimilar opinions.

From the advent of Faustus Socinus these various elements were wrought into a homogeneous ecclesiastical organization, and brought into substantial agreement with the theological views of his uncle, and ultimately the denomination and system of theol. took their historical designation of "Socinian" from these great leaders. They flourished exceedingly for the greater part of a century, converting to their views many of the Polish nobility; they established colls. which attained great reputation, attracting multitudes of R. Cath. and Prot. youth, and they produced a number of theological speculators and polemics of great learning and ability, whose works attained a vast circulation. After a long struggle with their opponents the S. were suppressed in Poland in 1680. A first catechism was written by George Schoman (d. 1591). Faustus Socinus (d. 1604) left another incomplete. Valentine Schmalz and Jerome Moscorovius produced the *Racovian Catechism*, the standard of the S. chs. It appeared in 1605. After their expulsion from Poland, Andrew Wissowatius and other learned men, finding refuge in Hol., collected their more important writings and published them.

II. THEIR DOCTRINE. 1. *The Scriptures*.—They admit that a supernatural revelation is essential as a means to effect the salvation of men. This revelation is contained in the Scripts. of the O. and N. T. But these are to be interpreted in a sense agreeable to reason; which rule of interpretation led to the conclusion that although virtually infallible, they contain minor errors.

2. *Theology*.—(1) The divine unity is inconsistent with personal distinctions. (2) Free self-determination is more fundamental in the divine nature than either justice or love. (3) By the act of creating the world, God has voluntarily limited his omnipotence as to his essence, and by creating free agents he has voluntarily limited his power and his knowledge, because free-will is self-determined, and future contingent events are not the object of knowledge. (4) "There is no such justice in God as requires absolutely and inexorably that sin be punished. There is, indeed, a perpetual and constant justice in God, but this is nothing but his moral equity and rectitude, by virtue of which there is no iniquity in any of his works." (5) The Holy Ghost is the impersonal power and efficacy of God.

3. *Anthropology*.—The guilt of Adam's sin is not imputed. Man was created mortal, and since Adam has gradually acquired an hereditary tendency to sin, which of itself does not involve guilt. Responsibility is limited by ability.

4. *Christology and Soteriology*.—(1) Christ, as to his essential nature, is a mere man, but one miraculously generated by the power of the Holy Ghost in the womb of the Virgin. Hence he was from birth without sin. At his baptism he

was supernaturally sealed with the Holy Ghost. He was also taken up to heaven and admitted to the vision of God, and instructed in divine things. After his death he was raised to the throne of God. (2) As God's justice demands no satisfaction, Christ's death saves us as an exhibition of divine love; it subdues obduracy and confirms hope; it was the necessary means to his resurrection.

5. *The Church and Sacraments*.—The Ch. they defined as the company of those who believe saving doctrine. As to what this doctrine is, they allowed, within the limit of the recognition of the divine mission of Christ, the largest freedom of opinion. Socinus discarded the term "sacrament," and held that the Supper was the only sacred rite which Christ intended to be permanently observed. [From *orig. art. in J.'s Univ. Cyc.*, by PROF. A. A. HODGE, D. D.]

**Socinus**. See SOCINIANS and UNITARIANISM.

**Sociology**. See SOCIAL SCIENCE.

**Socorro**, N. M. See APPENDIX.

**Socrates**, son of Sophroniscus and Phænarete, b. at Athens in 470 b. c. (or 469); drank the cup of poison 399 b. c. His father was a sculptor, and S. worked in the same art, at least in his early yrs. He alludes to his mother as a midwife, and likens to her art his own skill in drawing out ideas by conversation. He is reported by Plato as having studied the work of Anaxagoras on *Nature*, probably under the instruction of Archelaus, the disciple of Anaxagoras. From him he received instruction not only in physical but also in moral doctrines. He probably met Parmenides when about 30, and mastered the Eleatic dialectic, chiefly devised by Zeno—a dialectic that proved its theories by showing the contradictions of opposing theories, like the *reductio ad absurdum*. He is said to have received instruction from Prodicus the Sophist, and from others perhaps through the aid of the wealthy Crito. He married, and had 3 sons. His wife, Xanthippe, has come down in history as the typical scold. S. is represented as using the violence of her temper as a means of cultivating his patience. He took part in 3 military campaigns—saving the life of the wounded Alcibiades at Potidaea (432 b. c.); saving the life of Xenophon at Delium (424 b. c.), but receiving assistance from Alcibiades against his Boeotian pursuers in the disastrous retreat which followed, and wherein his own cool bravery was conspicuously manifested. In the campaign of Amphipolis (422 b. c.) he showed his great powers of endurance, walking barefoot upon the ice and snow of Thrace, clad in his usual clothing, while others were clad in furs. He had already become noted for his peculiar mode of instruction by means of conversations which he held with people of all classes at the public resorts. In opposition to the Sophists—who were private teachers of culture, fitting wealthy youth for the needs of Athenian life, especially training them in dialectics, *i. e.* in the art of extemporaneous debate, an art much in requisition in the frequent popular assemblies and in the courts of that democratic city—S. taught how to investigate truth by the touchstone of universality. His dialectic was not used to make the worse appear the better reason, but for the discovery of the true and abiding that underlies the changing and variable. His interest was in man rather than in nature, and all his discussions had for aim the making clear of the ethical principles of life. He brought into light the self-contradictory character of selfishness and immorality, and laid especial stress on knowledge and intellectual insight as essential to real virtue. In this regard S. is the most significant personage in the ethical hist. of the race. For mere customary habit, he substituted action based on reflection, the careful decision from moral grounds taking the place of blind use and wont. His "demon" or *genius* spoke to him like the voice of conscience, or like a spiritual monitor. As S. left nothing in writing, we depend on Plato and Xenophon for information regarding his doctrines and the method of their exposition. With Aristotle and Plato he fills the highest rank of Gr. philosophers, and we may call these the greatest thinkers of all time. Aristophanes, however, chose to confound him with the Sophists, whose doctrines he opposed, and in the *Clouds* held him up to ridicule as an idle dreamer, morally worthless and physically incapable (as Grote remarks), nearly at the time when he was exposing his life for his country on the battle-fields mentioned. Twenty-four yrs. after the appearance of the *Clouds*, Meletus, a poet, seconded by Anytus, an influential demagogue, and Lycan, an orator, hung up an indictment against him as "guilty of crime—first, for introducing new gods whom the city worships, but for not worshipping the divinities of his own; next, for corrupting the youth. The penalty is death." Of the 500 judges who sat on his trial, many were from the celebrated statesmen, orators, poets, Sophists, and others on whom S. had tried his dialectic skill, and were still smarting at the humiliation which his bitter irony had given them. Revenge was desired. In his defence he took such a haughty position that his judges were incensed, and condemned him by a small majority, which, however, was increased to 80 votes in favor of his death by his obstinate self-justification. S. refused to avail himself of the means to escape from prison offered him by Crito, thus attesting his law-abiding character. He drank the cup of hemlock with perfect composure after a conversation with his friends upon the immortality of the soul, being assured that he was merely setting out upon a happy journey, and that by his death he attested the steadfastness of his convictions to his disciples. WILLIAM T. HARRIS.

**Soda**. (The term is apparently Sp. in origin, *soda* or *sosa* meaning "barilla" in that tongue; Fr. *soude*; Ger. *Soda*, chemically *Natron*; Dut. *souda*.) This word is quite differently applied in strict chemical lang. and in common parlance. In the former it signifies at the present day anhydrous oxide of the metal sodium. What is commercially called S., however, is the compound formed by the action of water upon the former, generally designated, even by chemists, "hydrate of soda" or "sodic hydrate." The carbonates of *soda* also are often called "soda" commercially.



*Anhydrous Soda* (in precise nomenclature, *disodium monoxide*).—It is formed when metallic sodium burns in dry air. It is gray, melts at incandescence, and is not susceptible of electrolysis. It is not so volatile as the "hydrate."

*Sodic Hydrate or Caustic Soda*.—The hydroxyl school of chemists formulate it as a compound, *hypothetically*, of sodium and hydroxyl; or sometimes as a compound of hydrogen and "natroxyl." According to older views, it was really hydrate of soda. In its formation, however, from soda and water, 18 volumes of liquid water condense, with great heat-evolution, to 15 volumes; moreover, no water can be expelled by heat from the compound, which, when heated, volatilizes as a whole. The hydrogen therefore cannot be believed to exist in the molecular condition that it has in water. Caustic soda is prepared commercially from the carbonate by the action of lime. Three parts of crystallized carbonate (*sal-soda*) are dissolved in 5 times as much boiling water, and 1 part of quicklime, slaked and mixed to a cream with 3 parts of water, is gradually added, with continued ebullition. The caustic solution is then decanted after settling, and boiled down rapidly with the access of air.

*Salts of Soda*.—The most important salts or compounds of soda are the acetate, borate, carbonates, hypochlorite, hyposulphite, nitrate, phosphates, silicates, sulphate, sulphite, and tungstate. *Acetate of Soda*.—This is a commercial article, prepared on a large scale by the manufacturers of wood-vinegar or pyroligneous acid. It is a white salt in prismatic crystals, which effloresce in the air, soluble in 3 parts of cold water. Heat converts it into a mixture of carbon and carbonate. *Borates of Soda*.—Of these the most important is borax. *Carbonates of Soda*.—Of these there are 2 of great importance—the neutral or normal carbonate, commercially *sal-soda* or "washing soda," and the bicarbonate, commercially "cooking soda." *Sal-soda* crystallizes in splendid large, transparent crystals, which are monoclinic. This salt effloresces in the air very rapidly, falling down to a white powder, which contains but half as much water as before. It dissolves in twice its weight of cold water. On exposure to a gentle heat it loses all water, and becomes dry anhydrous carbonate. *Cooking soda* is made by exposing the last compound to carbonic acid gas, which is absorbed, with evolution of heat and separation of water. Commercial bicarbonate of soda is a white granular powder, which requires 13 times its weight of water for solution.

*Sulphate of soda, or Glauber's salt*, forms large transparent monoclinic crystals. This salt occurs native in most mineral springs, and as the mineral species *mirabilite*, there being several abundant Amer. localities. It is manufactured in enormous quantities, in the decomposition by sulphuric acid of common salt, in the process of making soda from the latter. Glauber's salt is highly efflorescent, falling to a white powder in the air, and in time losing all its water of crystallization. It dissolves in 3 times its weight of cold, and in its own weight of boiling water. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. HENRY WURTZ, PH. D.]

**Soda-Ash.** This is the technical and commercial name given to crude soda, as first produced in the process of manufacture, before having gone through any refining processes. In former times the only source of the alkali soda was from the ashes of marine and sea-shore plants, or kelp. The trade in kelp ceasing during the wars of the Revolution, the committee of public safety called upon Fr. chemists to find some new source of soda, all the *potash* attainable being needed for gunpowder. Hence, Leblanc's method of obtaining it from common salt first arose. This consists in converting the salt first into sulphate by means of sulphuric acid, and then heating this together with charcoal and carbonate of lime, which gives (theoretically) a mixture of carbonate of soda and sulphide of calcium. This process is now carried on, particularly in Eng., on an enormous scale in many large chemical works, all the soda used for making soap, glass, and a multitude of other products indispensable to civilization being thus procured.

**Soda-Water.** See AERATED WATERS.

**Sodium** [Lat. and Ger. *Natrium*], one of the elements of matter, a very important and remarkable metallic substance of which anhydrous soda is the oxide. Its occurrence in nature is chiefly as common salt (chloride of S.) in the ocean, and as a constituent of soda-silicates, chiefly the feldspars *albite* and *oligoclase*, on the land. A cubic foot of ocean-water contains about 6440 grains, not far from 1 lb. avoirdupois, of metallic S., and a cubical tank 14 ft. on each side filled with sea-water will contain more than 1 ton of this alkali-metal. A cubic foot of rock-salt contains over 52 lbs. of S. S. is a metal probably more abundant in its occurrence than iron, and probably not necessarily much more difficult or expensive to obtain in approximate purity than the latter metal. It is one of the elements most essential to animal life, being a constituent of all blood. It is also found in the vegetable organisms that dwell in the ocean and along its coast.

S. is a brilliant silver-white metal, of the softness of wax within the normal range of temperatures, but becoming somewhat harder at 20° below zero. Its color is stated, when the surface is chemically clean and bright, to have a tinge of *rose-red*, brought out very distinctly by repeated reflections. Its density is variable. The exact fusing-point of S. is a little in doubt. It crystallizes in octahedrons of the dimetric or tetragonal system. Its vapor is colorless. When exposed to the air, it rapidly absorbs oxygen, and moisture if present, forming either anhydrous oxide or caustic soda. When water touches it, there is an intense reaction, with evolution of hydrogen gas, and formation of the latter compound, or hydrates thereof. If the quantity of water is small, the heat produced is so high that the metal takes fire, and burns with a very large monochromatic yellow flame and most intense heat, producing more or less peroxide of S., with protoxide. In oxygen gas it burns almost entirely to peroxide. In the preservation of

S. it must be kept immersed under the surface of some liquid which is free from oxygen. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. HENRY WURTZ, PH. D.]

**Sodium Compounds, Medicinal Uses of.** *Caustic soda* produces effects closely resembling caustic potassa, but it is little used. *S. carbonate* and *bicarbonate* also resemble the corresponding potassium salts, but are milder in their effects. They are much used as simple alkalies in digestive derangements, or as alkaline washes in skin diseases. *S. baborate* (borax), being feebly alkaline in reaction, has something of the same effect as the carbonates. It is mostly used locally, in solution, as a weak alkaline application to the skin or a mouth-wash. A crystal of borax held in the mouth and allowed slowly to dissolve is an excellent means of temporarily relieving huskiness of the voice. *S. acetate* may be used for the same purposes as the potassium salt. *S. phosphate* is a mild saline purge, and has the advantage of possessing little taste. *S. sulphate* (Glauber's salt) is an active cathartic, but on account of its offensive taste has been superseded by magnesium sulphate. *S. nitrate* is a neutral salt without striking properties, and is but little used in med. *S. chloride* (common salt) is used for medicinal purposes, mostly as an emetic, in strong solution in warm water. *Solution of chlorinated soda* is a powerful and valuable antiseptic and disinfectant.

**Sodium, Compounds of.** S., like other metals, forms different classes of compounds with oxygen, with sulphur, with the halogens, with mercury to *amalgam*, and with other metals to *alloys*.

*Oxides*.—Peroxide or dioxide is formed by burning S. in oxygen. The product is white when cold, and yellow when hot. If slowly introduced into water, to avoid heating, hydrates may be obtained, which may be crystallized.

*Haloid Salts*.—The most important of these is chloride of S., common salt.

**Sodium Amalgam.**—Pure quicksilver and S., when brought together, unite, with highly explosive violence, to an amalgam, which possesses very extraordinary qualities. This amalgam has assumed much interest within the last 12 yrs. by reason of its introduction into use as an agent in the amalgamation of the precious metals in their ores, and their extraction from the same; the adhesion of the quicksilver to these metals being enormously intensified by the presence of a very minute amount of S., and the quicksilver itself being prevented from breaking up into minute globules, which are difficult to recover again in coherent form. Quicksilver, or gold or silver amalgam, which has become already broken up in this way, is also caused to coalesce again instantly into one mass by the addition of a minute proportion of amalgam of S. The preparation of the S. amalgam successfully on a large scale, without continual and dangerous explosions, depends upon a very simple device, that of forming first a poorer pasty amalgam by melting up a rich S.-amalgam with some additional quicksilver, to which the S. is then added in lumps the size of half an egg. Each lump suddenly melts down upon the surface of the pasty amalgam, combining therewith with a great development of heat, but without any serious explosion or danger of any, and forming a thin broad cake of rich amalgam, which is very hard. These cakes are immediately removed with tongs, and thrown into a kettle to be melted down under a thin layer of paraffine. As the heat produced raises the remaining pasty amalgam to a point of very liquid fusion, and to a temperature at which combination with S. would be very explosive, it is necessary to wait a few minutes until the mass has cooled again. If the amalgam is to be preserved or transported in glass bottles, it should be cast into quite thin sheets before being broken up for bottling, on account of its great weight, and the bottles should be thick and strong. *Moisture* being the great enemy of S.-amalgam, the bottles should be tied over with sheet caoutchouc or thin rubber-cloth. S.-amalgam is largely used in chemical laboratories as a reducing agent. It is so powerful in this way that it will precipitate the earthy metals barium, strontium, and calcium from their solutions. In a large number of cases in which organic compounds are to be deoxidized or subjected to the action of "nascent hydrogen," S.-amalgam is employed.

*Alloys of Sodium*.—The most interesting alloy is the *permanently liquid* one with potassium. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. HENRY WURTZ, PH. D.]

**Sod'om**, a city of anc. Syria, memorable for its connection with Abraham and Lot, and its miraculous destruction by a storm of brimstone and fire. The exact situation of S. has been for 2000 yrs. a subject of controversy; the old opinion, that the "cities of the plain" occupied a part of the present basin of the Dead Sea, is now generally given up. The plain at the N. E. corner of the sea is supposed to have been the spot.

**Soerabaya', or Surabaya**, town of Java, in the E. I., cap. of a Dutch prov. of the same name, on the N. coast of the island, opposite Madura, at the mouth of the Kediri. It has a good harbor, and is strongly fortified. It communicates regularly with Samarang, Batavia, and other places by steamboats, and carries on an important trade, exporting rice, coffee, cotton, sugar, tobacco, and cocoa-nuts, and importing manufactured goods. Its ship-building is also extensive. Pop. 118,824.

**Soerakar'ta, or Surakarta**, town of Java, in the E. I., cap. of a Dutch residency of the same name, on the left bank of the Solo, is connected with Samarang by railway. It contains a magnificent palace of the native emp.; the Dutch fortress is opposite the emp.'s palace. The trade of the city, especially in pepper, vanilla, and cacao, has increased much in the last few yrs. Pop. about 50,000.

**Softas, The** [probably from the Ar. *soffah*, "bench"], generally all persons attached to the mosques in any capacity whatever, but more especially applied to the students who are initiated in the upper branches of religious instruction in the mosques, and who constitute a corporation long



after the completion of their learned pursuits. Some of them supply candidates for the offices of imams and mollahs, but the larger part hang loosely on society.

**Soils, Chemistry of.** See AGRICULTURAL CHEMISTRY.

**Solanaceae** [from SOLANUM, which see], a natural order of gamopetalous exogenous plants, often containing powerful narcotic principles. Among the poisonous plants of the order are belladonna, henbane, mandrake, stramonium, and tobacco. Some, however, as generally used, are not poisonous; such as the true potato, the egg-plant, and the tomato. The capsicums, chillies, or pod-peppers, moreover, are not poisonous, but very pungent with a volatile acidity. The juice is watery and mawkish or nauseous.

**Solan Goose.** See GANNET.

**Solanine** [Lat. *solanum*, "nightshade"], a natural organic alkaloid found in various species of the genus *Solanum*, including the black nightshade, potato, bitter-sweet, and others. S. is a solid crystalline substance, readily soluble in alcohol. It is very poisonous, producing paralysis of the lower extremities before death. This symptom has been observed in the case of cattle poisoned by eating the green shoots of potatoes, which contain S. largely.

**Solanum** [Lat.], a genus of herbs and shrubs of the order Solanaceae, most or all of which contain the poisonous principle *solanine*. The common potato and the egg-plant, however, as ordinarily used, are not poisonous, though there is little doubt that traces of the poisonous principle exist. *S. dulcamara* is the bitter-sweet. Several afford edible fruits, that of the egg-plant (*S. melongena*) being the most important.

**Solar Cycle.** See CYCLE.

**Solar System.** The S. S. consists of the sun, together with the planets, comets, and meteors which revolve around it as the centre of their motions. The term "planets" includes bodies of 3 distinct classes: (1) the major planets, Mercury, Venus, the Earth, Mars, Jupiter, Saturn, Uranus, and Neptune; (2) the minor planets, or asteroids (now numbering 245), revolving between the orbits of Mars and Jupiter; (3) the satellites, or secondary planets, 18 in number, of which the earth has 1, Jupiter 4, Saturn 8, Uranus 4, and Neptune 1. The magnitude of Mercury, the smallest of the major planets, is 1000 times greater than that of the largest asteroid. It may afford some idea of the dimensions of our system to remember that a cannon-ball flying outward from the sun with the uniform velocity of 500 m. per hour would not reach the orbit of Neptune in less than 680 yrs. As to the place occupied by the sun and its attendant orbs among the fixed stars, it is sufficient to remark that *Alpha Centauri*, presumably the nearest of those bodies, is 7000 times more remote than Neptune. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. D. KIRKWOOD, LL.D.]

**Solar Time.** See TIME.

**Solder** [remotely from the Lat. *solido*, *solidare*, to "unite," to "consolidate"], an alloy employed to unite pieces of metal together by fusion upon the proposed joint. The soft S. are usually of lead and tin; the hard S. are commonly of zinc and copper.

**Sole** [Lat. *Solea*], a name given to fishes of sub-order Heterosomata in different Eng.-speaking countries. (1) In Eng. it is distinctive of the *Solea vulgaris*, to which it properly alone belongs. This species is a typical representative of the family Soleidae, in which the scales are ctenoid, the vertical fins not confluent, the pectorals of both sides developed, and the color dark brown on its upper and white on its lower side, with the pectoral fin blackish at its end; it generally ranges between 10 and 20 inches in length and between 1 and 10 lbs. in weight, although the latter dimensions are rarely attained. (2) The name is extended, with a qualifying adjective, to related species on the Brit. coast; e. g. the *Solea (Pegusa) aurantiaca*, or lemon sole. (3) In Cal. it is applied to several species of true Pleuronectidae. These have few characters in common, and belong even to different sub-families.

**Solemn League and Covenant.** See COVENANT, NATIONAL, OF SCOTLAND.

**Solemn League and Covenant.** This international politico-religious agreement figures very prominently in the hist. of Scot. and Eng. during the Puritan revolution. It was drawn up in 1643. It agrees in spirit with the "National Covenant" of 1638, but has a wider scope, extending over the 3 kingdoms, while the National Covenant was purely Scotch. It aims at a complete uniformity in religion throughout Scot., Eng., and Ire. (which was an impossibility, as the result proved), and grew out of the intense religious ardor of an age in which Ch. and State, ecclesiastical and political interests, were blended. It consists of 6 articles—pledging the subscribers to preserve the established Presb. religion in Scot., to extend it to Eng. and Ire., to put down popery, prelacy, superstition, heresy, and immorality, to uphold the rights of Parl. and a constitutional monarchy, and to defend every member of the confederation. The immediate occasion of the S. L. and C. was the joint application of the Long Parl. and the Westminster Assembly of Divines to the Scotch Convention of Estates and the General Assembly, then in session at Edinburgh, for effectual aid in the war against the usurpations of Charles I. The Eng. desired a civil league, the Scotch a religious covenant, having been used to the system of covenanting from the days of the Ref. Both schemes were combined, and the religious feature made prominent. Alexander Henderson, the moderator of the General Assembly, and a man second only to Knox in the esteem of the Scotch people, drew up the document. It was unanimously ratified by the General Assembly and the Convention of States Aug. 17, 1643. The people went into it with the *perfidium ingenium* *Scotorum*, and signed it with eagerness all over the country, from city to city, from v. to v., from parish to parish. The members of both houses of the Long Parl. and the divines of the Westminster Assembly adopted and solemnly signed the Covenant in St. Margaret's ch., under the shadow of Westminster Abbey,

Sept. 25, 1643. The adherents of Parl. throughout Eng. followed the example, notwithstanding the king's prohibition. The 2 countries entered into a treaty Nov. 29, 1643, by which the Scotch promised, on the basis of the Covenant thus ratified, to furnish an army of 18,000 foot, 2000 horse, and 1000 dragoons, for the common war against royal and prelatist tyranny; Eng. to refund the expenses after the conclusion of peace. The united army fought and conquered under the banner of the Covenant. But the positive end was not attained, and was in fact unattainable. No human power could bring Eng. and Scot. under one system of doctrine, govt., and worship. With the Restoration the S. L. lost its significance, and was burned by a hangman (1662). Charles II. had indeed twice signed it and sworn to it in exile—at Spey June 23, 1650, and at his coronation at Seone Jan. 1, 1651—but he broke his oath as soon as he ascended the throne in 1662, and re-established the royal supremacy and episcopacy, not only in Eng., but even in Scot. The Covenanters or Cameronians continued to adhere to the S. L., and fought for it with the heroic spirit of martyrdom through all those troubled times.

"Whose memory rings through Scotland to this hour."

(See the relevant chapters in the general histories of Scot. (BURTON, etc.) and Eng.; JOHN STOUGHTON, *The Ch. of the C. Wars*, i. 293, 320; MASSON, *Life of John Milton*, iii. 6-15.)

PHILIP SCHAFF.

**Solenhofen Beds**, a famous group of lithographic slates of the Middle Oolite, found at Solenhofen in the Papenheim dist., near Eichstadt in Bavaria. They are singularly rich in well-preserved fossils.

**Solferrino**, a v. of N. It., in the prov. of Brescia, where the allied Fr.-It. army completely defeated the Aus. on June 24, 1859.

**Solís, de** (ANTONIO), b. at Alcalá de Henares, Sp., July 18, 1610, ed. for the law at the Univ. of Salamanca; produced at 17 his successful comedy, *Amor y Obligación*; wrote a celebrated *Historia de la Conquista de México*; took holy orders 1666, and thenceforth wrote chiefly on sacred subjects. D. at Madrid Apr. 19, 1686. Among his comedies, *Triunfos del Amor y Fortuna*, *El Alcazar del Secreto*, *La Gitana de Madrid*, and *Un Bobo hace Ciento* are esteemed masterpieces.

**Solitaire**, the *Pezophaps solitaria*, a bird related to the Dodo, formerly inhabiting the island of Rodriguez. When the island was settled in 1691 it was abundant. It was something larger than the turkey, and did not use its wings for flight. It was a slow runner, and defended itself with its wings and beak. Its flesh was good.

**Solty** (EDWARD), F. R. S., b. in Lond., Eng., Oct. 11, 1819, ed. at Berlin; became chemist to the Royal Asiatic Society 1838, lecturer at the Royal Inst. 1841, and prof. of chem. in the Military Coll. at Addiscombe 1845; gave especial attention to the applications of chem. to agriculture and technology; wrote *Syllabus of Chem.*, etc.

**Solomon** (*Shēlōmō*, *Salōmōn*, *Salomo*, *Suleiman*), son of David and of Bathsheba, b. 1033 B. C., called by the father Solomon, "the peaceful one," by Nathan, Jedediah, "the darling of the Lord," was trained by Nathan (Jehiel) the prophet-priest in all Heb. learning; afterward studied the learning of other nations. David proclaimed him king when Adonijah tried to seize the throne. He was soon after formally "established" (1015). He reigned 39 yrs. and 6 months. He at first pardoned Adonijah, but soon after slew him and Joab, banished Abiathar, and severely rebuked his own mother, who were all implicated in new intrigues, and slew Shimel, the last bitter leader of Saul's house. He began his reign humbly and wisely, asking God for wisdom, which was granted. In his fourth yr. he began his great work, the "house of the Lord." It was completed in 7 yrs., and its dedication was the crowning day of Jewish hist., and in the service S. appears as the supreme head of the nation. He built his own palace from his 7th to his 20th yr. He peacefully consolidated the empire which his father had conquered, and recaptured, fortified, or built cities or stations for commerce or protection at strategic points. He built reservoirs, aqueducts, many wonderful buildings, and laid out "paradises" and gardens. He started the hitherto pastoral or agricultural Hebs. on the new road of commerce. He reorganized and enlarged the civil service of David. Many kings were his tributaries; untold wealth and the wonders and curiosities of many countries flowed into or through the land. Everywhere there were signs of great delight and prosperity. Many foreigners were attracted by his splendor and wisdom, notably Balkis (?), the queen of Sheba, with her marvellous retinue. His harem grew to number 1000 inmates, and thus to accord with Oriental ideas of his royal magnificence. Contrary to the law of Moses, he not only multiplied wives, but by his marriages formed alliances with many heathen nations. In his old age his "strange" wives led him to commit or permit gross and vicious idolatry. Before his death, Edom and Syria revolted, tribal jealousies arose in Israel, and Jeroboam, formerly a supt. of building, began to plot the division of the nation. He left one son, Rehoboam, who succeeded the nation. He from whom 10 tribes revolted. S. appears as a him, and from whom 10 tribes revolted. S. appears as a voluminous author; his extant writings are Proverbs, Ecclesiastes, and the Song of Songs. [From orig. art. in *J.'s Univ. Cyc.*, by REV. ISAAC RILEY.]

**Solomon City**, Kan. See APPENDIX.

**Solomon Islands**, a group of islands in the Pacific Ocean between New Britain and Queen Charlotte's Islands, and between lat. 5° and 12° S. Discovered in 1567 by Mendana, they are as yet very little known. The inhabitants are Papuans, and very savage. They are cannibals.

**Solomon's Seal**, a popular name for the lilaceous herbs of the genera *Polygonum*, *Smilacina*, and *Majanthemum*, properly belongs only to *Polygonum*, in which the "seal" is the circular depressed scar left on the root-stock by the separation annually of the flowering stem.

**Solomon, Song of.** See CANTICLES.



**Solomon's Temple.** See JERUSALEM.

**Sol'on**, the son of Exekestides, filled the office of first archon in Athens (b. c. 594), and in that capacity established there the const. framed by him. S. is the noblest representative of the many-sidedness which distinguished the Athenian more than all other Hellenes. An Eupatrid by birth, he engaged also in trade and commerce by sea. By this means it was possible for him, after finishing all exercises, as well in music and poetry as in gymnastics, to become acquainted with the entire coast-world of the Archipelago. It was a time of fermentation in society; navigation took all at once a gigantic stride forward; those parts of the communities engaged in trade took form as a new middle class, and stood defiantly opposed to the anc. families; property in land was outstripped by movable capital. In this revolutionary time the best possessions of the nation were endangered—viz. the free citizen class and the sovereign authority of the law. For this reason S. deemed it the work of his life to give his native city the benefit of all progress in culture which the times offered. A thorough, peaceful reform of the state was needed, which should reconcile the differences which tore the communities asunder. This was the thought of S.: like all best reformers, he was one of the "middle citizens," who, standing outside of and above parties, are alone in a position to secure the proper adjustment of their differences. But the Athenians were feeling depressed; Megara held possession of Salamis, and was consequently mistress of the sea. Inflamed by S.'s inspiring poetry, they conquered Salamis (604 b. c.). From that day Megara sank, and Athens rose resistlessly to power. The second step was the summoning of Epimenides from Crete, whose extraordinary personality served to expiate the previous civil dissensions and regulate anew the religion of the city. The reform in the worship of Apollo is probably connected with this event. It was a real advance toward unity that all citizens now sacrificed to Apollo. By this means also Athens was connected anew with Delphi, and she engaged in the "holy war" (600) to defend the rights of the Delphic god.

S. was the first man in Athens. As recognized mediator between all parties he carried out the most important reforms, applying them to the evils of society at the very root. The radical evil was that the small land-owners were hopelessly in debt. Owing to a hard debtor-law, they forfeited even their freedom; a wretched proletariat was thus formed, and the land fell more and more into the hands of the great capitalists. S. caused Athens to alter its standard of coinage by adopting also for silver the Euboean gold-standard. The result was a lighter drachma, in which debts could be legally paid, so that the poor obtained a relief of 27 per cent.; the debtor-laws were made milder, and fixed limits set to the acquisition of large estates. Then followed the great political reform—the conversion of the state, ruled by families, into a timocracy. The citizens were divided into property-classes. But the measure adopted was not movable capital, but the net proceeds of property in land. None could hold office as archons except the members of the first class, the Pentakosiomedimni (with a minimum of 500 bushels of barley net income), while the citizens of the second class, the knights, with 300, and those of the third (Zeugitæ), with 150 medimni as minimum of each yr.'s income, had access to the council and to the remaining offices. The mass of the people, the Thetes, who did not belong to the 3 classes, could not become members of the council nor fill any office, but took part in the public assemblies. The council of 400, representing the 3 classes, and which, changing every yr., administered the current business of govt., was a political school for the citizens, and made a rupture between govt. and people impossible. It was the organ of contemporary progress, while the Areopagus, to which the experienced men of affairs were advanced, kept a conservative check on progress. In law, the important reform was carried through that the archons could no longer render final decision in suits, but that appeal to the commonwealth could be made in every case. On private life also the laws took a firm hold. In all his reforms S.'s purpose was to purify the public morals, banish all barbarous influences, and bring to perfection whatever was peculiarly Hellenic. He united religion, state, and house in a harmonious whole; every citizen was made responsible for the commonwealth; and on the other hand the prosperity of the state was based upon the stability of the family. The legislation of S. is the greatest work of art which political wisdom has produced, the clarified expression of the Athenian consciousness. After the decisive year of office, during which he ruled Athens with dictatorial power, S. is said to have travelled 10 yrs. in foreign countries. S. lived retired in Athens until his death (559 b. c.), surrounded by a narrow circle, of whom Mnesiphilos, the teacher of Thmistocles, was one. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. ERNST CURTIUS.]

**Solstice**, sol'stis [Lat. sol, "sun," and sistere, to "stand" or "cause to stand," in the sense of stopping or arresting motion]. The inclination of the earth's equator to the ecliptic or plane of its annual motion about the sun is the cause that the latter is during one half the yr. on the N. polar side of the equator, the other half on the S., causing the vicissitudes of summer and winter to the respective hemispheres. The distance from the sun N. or S. of the equator is thus constantly varying. The 2 points at which this apparent N. or S. motion ceases are the summer and winter S. At these periods the day is the longest or shortest, according as the earth is in the summer (June 21) or winter (Dec. 21) S.

**Soluble Glass.** See WATER-GLASS.

**Solym'an II., the Magnificent**, sultan of the Ottoman empire 1580-66, b. about 1495, a son of Selim I., whom he succeeded. During the first part of his reign he was much occupied in the S. and E. parts of his dominion. He quelled an insurrection by Ghazali Bey in Syria in 1521, another by Ahmed Pasha in Egypt in 1523, and made 3 cam-

paigns against Per., of which the second (1534-36) and the third (1548-50) occupied several yrs. and resulted in the conquest of Armenia, Georgia, Irak, and Shirvan. But these undertakings were merely disturbances and diversions; his real ambition and policy were directed toward W. Europe, and more than once European civilization and Christendom were seriously endangered by his victories. Europe had 2 bulwarks against the Turks—Hungary, inhabited by a chivalric, warlike race, which, although allied to the Turks, hated them as only brothers can hate; and Rhodes, where the Knights of St. John were settled. But in 1522 S. expelled the knights from Rhodes, and in 1526 he completely routed the Hungarians at Mohacs. In 1527 he supported John Zapolya in Hungary against Ferdinand of Aus., took Buda in 1529, and appeared before Vienna with an immense army. But Vienna he could not take; the art of siege he did not understand. Four times he tried in vain. After losing over 100,000 men he gave up the attempt, and concluded peace, retaining a large part of Hungary as a Tur. prov. In 1534 he appointed the famous Barbary pirate, Khair-ed-Din (generally called Barbarossa), admiral, and soon his fleet drove the Venetians away from their last possession in the Morea and the Archipelago, and conquered Tunis and Algeria, from which a descent was to be made on It. and Sp. Meanwhile Charles V. had given Malta to the Knights of St. John in 1530, and in 1557 they began to build and fortify the cap. of L'Avaletta. S. could not permit the formation of a strong military station at this point, and in 1565 led an immense armament against the city; but again his attempts in the art of besieging were foiled, and he was repulsed with great loss. In 1566, during a campaign in Hungary, while besieging the fortress of Sziget, commanded by Zrinyi, the difficulties in carrying this point threw him into a fit of rage, and apoplexy killed him Sept. 5, 1566.

**Somateria.** See EIDER DUCK.

**Somers**, sum'erz (JOHN), BARON SOMERS OF EYESHAM, b. at Worcester, Eng., Mar. 4, 1651, ed. in the cathedral school at Worcester, and at Trinity Coll., Ox.; studied law at the Middle Temple; called to the bar 1676; began legal practice at Lond. 1682; soon became a leader of the Whigs; one of the counsel for the 7 bps. 1688; member of the "Convention Parl." Jan. 1689; chairman of the committee which drew up the Declaration of Right; solicitor-gen. May 1689; knighted Oct. 1689; atty.-gen. May 1692, lord keeper of the great seal Mar. 1693, one of the lords justices 1695, lord chancellor 1697; was raised to the peerage Dec. 1697; removed from the chancellorship Apr. 17, 1700; drew up the plan for union of crowns of Eng. and Scot. 1706; became pres. of council Nov. 1708; resigned that post 1710. D. Apr. 26, 1716.

**Som'erset**, Ky. See APPENDIX.

**Somerset**, on R. R. cap. of Somerset co., Pa., is the centre of an active trade in coal, iron, and lumber. Pop. 1870, 945; 1880, 1197.

**Somerset** (EDWARD SEYMOUR), DUKE OF, b. about 1500, was brother of Jane Seymour, third queen of Henry VIII., and mother of Edward VI.; upon his sister becoming queen he was created Viscount Beauchamp and earl of Hertford; distinguished himself in the Scot. and Fr. wars, and was named by Henry in his will as one of the govs. of his son during his minority. After the death of Henry he was created duke of Somerset and earl-marshal of Eng., in Feb. 1547, and in Mar. was made lord protector and gov. of the realm. A powerful party was formed against him, among whom was his own brother, Sir Thomas Seymour, who was executed by his orders Mar. 1549. This brought the Protector into great odium, and in Oct. 1549 he was deprived of the young king of his protectorship and thrown into the Tower, but was released with a full pardon in a few months. Among his foremost rivals was the earl of Warwick, afterward duke of Northumberland. S. entered into a plot against his life; was arrested, tried, and beheaded on Tower Hill Jan. 22, 1552.

**Somerset** (FITZROY J. H.). See RAGLAN, BARON.**Somerset** (R. CARR). See OVERYBUR, T.

**Som'erville**, city and R. R. centre, Middlesex co., Mass., 3 m. from Boston, incorporated as a city 1872. Pop. 1870, 14,685; 1880, 24,933.

**Somerville**, R. R. centre, cap. of Somerset co., N. J., 37 m. from New York. Pop. 1870, 2236; 1880, 3105.

**Somerville** (MARY), F. R. A. S., b. at Jedburgh, Scot., Dec. 26, 1780, daughter of Admiral Sir William Fairfax. Her education was most imperfect; every effort after self-culture was thwarted. In 1805 she married Samuel Greig; in 1808 was left a widow with 2 sons and an independent fortune. She went through a complete mathematical course without aid or sympathy, mastering alone not only pure but applied math. In 1812 she married her cousin, William Somerville, who introduced her to the highest literary circles of Europe. She lived to the age of 92, with scarcely waning powers of mind or body. In 1830 her *Mechanism of the Heavens* was pub. In 1834 she pub. her *Connexion of the Phys. Sciences*, in 1849 her *Phys. Geog.*, in 1869 her *Microscopical and Molecular Science*. She was elected honorary member of the Royal Astronomical Society in 1832, and afterward honorary member, or associate, of the Royal Acad. at Dublin, of the Bristol Philosophical Society, of the Société de Physique et d'Histoire naturelle of Geneva, of the Coll. of Resurgenti, of the Imperial and Royal Acad. of Science, Lit., and Art at Arezzo, and others. In 1860 she was again left a widow; the later yrs. of her life she passed in It. D. Nov. 29, 1872.

**Somnam'bulism** [Lat. *somnus*, "sleep," and *ambulare*, to "walk"], a peculiar perversion of the mental functions during sleep, in which the subject becomes an automaton. The organs of sense remain torpid and the intellectual powers are blunted. During this condition some instinctive excitation may take place, and there may be the production of impulses, in consequence, of different kinds. Nightmares, which are akin to the somnambulist state, generally come on while the person is lying on his back, when the



blood gravitates toward the cerebellum, which is supposed to be the co-ordinating centre.

**Somnauth-** (or **Somnath**)-**Putten**, town of Hindostan, in the Baroda dominions, on the peninsula of Guzerat, contains a famous temple, now mostly in ruins, but at one time one of the richest and most venerated places of Hindoo worship.

**Song of Birds**, the musical notes uttered by many birds, especially by members of the section Oscines and order Insectores. The music of birds not only differs widely in the different species, but individuals of the same species, especially from localities far remote from each other, are sometimes found to differ surprisingly in their song; and nice observation often shows in individuals of the same neighborhood and species very considerable variations in melody. The song of male birds is almost uniformly by far the best, and especially about the pairing-time do the males of most singing birds put forth their best efforts, as if to win the notice and favor of their mates.

**Song of Solomon**. See CANTICLES.

**Sono'ra**, a state of the Mex. confederation, bordering W. on the Gulf of Cal., and bounded N. by the U. S. Terr. of Ariz., comprises an area of 81,025 sq. m., with 139,240 inhabs. The W. and N. part of this state is mostly low and level land, in some places consisting of arid soil, but in others yielding 2 crops annually of wheat, maize, tobacco, rice, sugar, cotton, and all kinds of tropical and semi-tropical fruit. The E. and S. part is covered by branches of the Sierra Madre, which form elevated plateaus interspersed by deep fertile valleys, and of whose mineral wealth travelers give almost fabulous reports.

**Sonora**, city, cap. of Tuolumne co., Cal., 130 m. E. of San Francisco, equidistant from Yosemite Valley and Calaveras Big Trees, is the central point for a large gold-mining area. Prin. business, mining, farming, lumbering, and viticulture. Pop. 1870, 1322; 1880, 1492.

**Son'tag** (HENRIETTE), b. in Coblenz May 13, 1805, was a singer from childhood; was gifted with fine vocal and dramatic powers, which were highly cultivated; excelled in Ger. and It. music, and at 25 rivalled Malibran, Pasta, and Catalani; married Count Rossi, an It. noble, in 1830, and retired to private life. Pecuniary misfortunes compelled her at 45 to resume her professional career; she sang in Europe; came to the U. S. in 1853, and d. in Mex. June 18, 1854.

**Soo-Chow-Foo**, or **Su-Chau**, town of Chi, prov. of Kiang-Soo, in a very rich and densely peopled dist., is a well-built city, intersected by broad canals, on which lives a floating pop. Its manufactures of linen and cotton fabrics, articles of paper, glass, ivory, iron, wood, and horn, and lacquered ware are celebrated. Its trade is very active. Its pop. is estimated at 500,000.

**Soofees**. See SUFFIS.

**Sook-el-Shooyookh**, a town of Asiatic Tur., prov. of Irak Arabi, on the Euphrates, was terribly devastated by the plague in 1882, but is still the most important horse-market in the Tur. empire.

**Sooloo'** (or **Suluk**) **Islands**, a group of 150 islands in the Indian Ocean, extending from Borneo to Mindanao. All the islands are high, well wooded, and exceedingly fertile, yielding sandal-wood and teak timber, and producing sugar, rice, coffee, and spices in abundance, beside being rich in metals and fish. But the inhabs., who are Malays and governed by an independent sultan, are pirates.

**Soong'ria**, **Songaria**, or **Zungaria**, a vast region of central Asia, belonging mainly to Chi.; bounded on the N. and W. by Rus., on the E. by the Chi. prov. Kansu, on the S. by E. Turkestan. It is a plateau of moderate elevation, inclosed between the Altai and Thian-Shan mts., and intersected by minor chains which divide the country into several basins with several considerable lakes. The prin. valley is that of the Ili, with the cap. Gouldja. The inhabs., hardly 500,000, are a branch of the Mongolian race, mostly nomadic, raising large herds of camels and buffaloes.

**Soo'soo**, the *Platanista Gangetica*, a cetacean of the Ganges, the only living representative of the family Platanistidae, which is allied to the Iniidae, or fresh-water dolphins of S. Amer. It is 12 ft. long, and ordinarily very sluggish, but can move after its prey with much vigor. It has long beaked jaws, 120 teeth, and curious rudimentary eyes.

**Soot** (Sax. *sot*; Dan. *sod*, *sod*), a carbonaceous deposit from smoke, formed in chimneys. That which forms nearest the fire is often shining and varnish-like, consisting chiefly of dried tarry matters, mixed with carbon, and giving a brownish-black powder, sometimes used as a pigment under the name of bistre. That which forms farther up the chimney is more of the character of lampblack.

**Soothsayers**. See ASTROLOGY, DIVINATION, MAGIC, and ORACLE.

**Soothsayers**, insects. See MANTIS.

**Soph'l'a Dorothe'a**, b. at Celle Sept. 15, 1666, a daughter of Duke George Wilhelm of Brunswick-Lüneburg-Celle, was married Nov. 21, 1682, to George, eldest son of the elector Ernst August of Hanover, and afterward king of Eng. She bore him 2 children, but the marriage was very unhappy. She asked for a divorce, and when neither her father nor her father-in-law would give their consent, she determined to elope with Count Königsmark to Wolfenbüttel. The intrigue was discovered, and July 2, 1694, the count was murdered by 4 electoral guards. Dec. 28, 1694, the divorce took place, and she lived afterward in retirement till her death, Nov. 13, 1736, at Ahlden, near Celle.

**Soph'ist** (Gr. σοφιστής, *sophistai*), applied to the 7 wise men of Gr.; afterward to the teachers of Athens who gave lessons in the arts and sciences for money). The art of presenting grounds or reasons to justify any view is the art of the S. The chief of these were Protagoras the Individualist (b. 490 b. c.), Gorgias the Nihilist (came to Athens 427 b. c.), Hippias the Polymathist, and Prodicus the Moralist (both younger contemporaries of Protagoras). Everything that existed in the Gr. consciousness as opinion, faith, custom,

religious tradition, even the evidence of the senses, was sapped and rendered uncertain by the ratiocination of these S. Protagoras asserted: Man is the measure of all things. Just as each thing appears to each man, so is it for him. All truth is relative. The existence of the gods is uncertain.

WILLIAM T. HARRIS.

**Sophocles**, *sof'o-klēz*, b. in 495 b. c. at Colonus, a v. of Attica, near Athens. From 468 b. c. to 441 b. c. he reigned in the Athenian theatre—that is, he was the modeller of the religious and æsthetic ideas of the Athenian people, the artistic representative of the spirit of the age; and even Æschylus adopted his innovations, the introduction of the third actor, the reduction of the trilogy from a pragmatism to a merely philosophical unity, etc. His last victory was won after his death by the performance of his posthumous tragedy, *Edipus at Colonus*. D. at Athens in 405 b. c. He is said to have composed 130 plays, beside lyrical poems, but only 7 tragedies have come down to us entire—viz. *Antigone*, *Electra*, *Trachiniae*, *Edipus Rex*, *Ajax*, *Philoctetes*, and *Edipus Coloneus*. There are Eng. translations by Dale, Plumptre, Campbell, and others.

**Sophonisba**. See MASINISSA.

**Sophron** flourished at Syracuse in the middle of the 5th century B. c., and was the inventor of the so called *mime*. The Grs. of Sic. used at the festivals of Dionysus to give dramatic representations of events of every-day life. In these representations pestilication and musical composition seem to have been the prin. elements, but words were also supplied, which, by the transition to a form of literary composition, became of predominating importance.

**Soranjee**, the name given in the E. I. to morindine, a yellow crystalline coloring-matter found in the root of *Morinda citrifolia*. When heated it is converted into morindone, a beautiful crystalline substance.

**Sorb'ite** [Lat. *sorbinum*, "sorb-tree"], or **Mountain-ash Sugar**. This saccharine substance is formed in the juice of the berries of *Sorbus aucuparia*, the mountain-ash, a European plant, as well as in the related Amer. plant, *Sorbus americana*. These small trees have bunches of brilliant scarlet berries. The sugar is stated to be incapable of fermentation, and when the juice of the berries is allowed to ferment, so that it afterward settles clear, the unchanged S. will crystallize out on evaporation in fine transparent crystals, trimetric, and sweet as cane-sugar. It is soluble in half its weight of cold water, insoluble in alcohol, dissolves lime and baryta like sucrose, and will undergo the lactic and butyric fermentations with cheese, like lactose.

**Sorbonne**, the name generally applied to the theological faculty of the anc. Univ. of Paris, was derived from Robert de Sorbon, chaplain to Louis IX. In 1252 he founded an inst., connected with the Univ. of Paris, in which a number of secular priests were to teach theol. gratuitously to poor students, and in the following yr. the inst. received its charter from Louis IX., which was confirmed in 1268 by Pope Clement IV.

**Sorb Tree**, or **Wild Service**, the *Pyrus terminalis*, a small European tree (order Rosaceae, whose wood is very hard and valuable, and the fruit, the sorb, when over-ripened, is edible.

**Sorcery**. See MAGIC.

**Sorel** (AGNES). See AGNES SOREL.

**Sorel's Cements**. These cements owe their name to the inventor, the Fr. chemist Sorel. The principle on which they are founded is the mixing of a concentrated solution of a metallic chloride with the oxide of the same metal to a pasty mass, when, in case of several metals, a solid insoluble oxychloride is rapidly formed, which is sometimes quite crystalline and hard. The most approved compositions of this class are those made with the chlorides of zinc and magnesium.

**Sorex**, the shrew. See SORICIDÆ.

**Sorghum**, a genus of grasses of the tribe Andropogoneæ, closely allied to the sugar-cane, presenting many varieties and having various names. The variety usually known as S. (*S. vulgare* or *S. saccharatum*) has been cultivated from time immemorial in Afr. and Chi.; in Afr. it is called *imphée*. The plant was almost unknown in Europe until 1851, when Count de Montigny, the French consul at Shanghai, sent seeds to Paris. In 1856 some of this seed was obtained by the U. S. patent-office and distributed, but the introduction of the plant here is mainly owing to Mr. Orange Judd of New York, proprietor of the *Amer. Agriculturist*, who imported 25,000 packages of the seed, which he distributed among the subscribers to his paper, all parts of the country. In 1857 Mr. Wray, an Englishman, brought to New York seeds of several varieties of the Afr. imphée, and they were tested by many agriculturists, but the result was upon the whole unsatisfactory, and the Chi. variety is the one chiefly cultivated here. This attains a height of from 8 to 18 ft., and before the seed-cluster makes its appearance bears a close resemblance to Indian corn. It will grow in any place where maize succeeds, but rarely ripens its seed N. of lat. 41°. It is sown in drills or in hills like Indian corn, and the mode of cultivation is essentially the same. The stalks are cut off at the ground just before the hard frosts set in, stripped of their leaves, and stored away for pressing. Well-ripened stalks yield about half their weight of juice, of which from 5 to 10 gals. are required for a gal. of syrup. The saccharine matter is chiefly in the form of glucose, and produces only a very small percentage of crystallized sugar, so that the plant is cultivated chiefly for the molasses or syrup. A fair average yield is about 150 gals. to the acre. This syrup varies greatly in quality, according to the care and skill bestowed upon its manufacture. The finer qualities are by many preferred to the best cane-molasses. The seeds are chiefly used as food for cattle, swine, and poultry, although bread has sometimes been made from the flour. Coarse wrapping-paper has been manufactured from the refuse of the stalks after pressing. As fodder for cattle it is not equal to Indian corn.



**Soricidæ**, so-ris'i-de [from *Sorex*, the Lat. name of the typical form], a family of mammals of the order Insectivora, which are often designated as shrews or shrew-mice. Externally, they have much resemblance to mice, but are readily distinguishable by the longer and pointed snout. They have the feet all formed for progression; the eyes are perfect, and external ears are present, though sometimes very small. The family thus defined is a very homogeneous one, and although it is by far the largest (as regards number of species) in the order to which it belongs, the differences between its constituents are less than in any other of the related polytypic families. Representatives are found in the entire N. hemisphere, and extend southward into India and E. Asia in the Old World and into Mex. in the New. The species are all of small size, and some of them are among the least of mammals. They have certain glands, near the fore limbs, on the sides, and behind at the base of the tail, in which is secreted a musky fluid. They feed not only on insects, worms, etc., but on such young vertebrates (birds, etc.) as they are able to overcome.

**Soro'sis** [Gr. *σωρευσις*, "aggregation"], a term in bot. applied to a compound fleshy fruit formed by the close aggregation of many flowers whose floral whorls become succulent, as the pineapple.

In Mar. 1868 the first woman's club of Amer. was organized under the name of *Soro'sis*, and has continued to exist under the same style and title, its object being to bring together representative women in lit., art, science, and kindred pursuits, and by uniting them render them helpful to one another and useful to society. The first annual report of the executive committee of S., adopted at the annual meeting of the club and pub. in the *World* of Mar. 23, 1869, states that Mrs. Croly was stimulated to the formation of a woman's club by the refusal of the committee on the Dickens dinner from the Press Club to allow women to participate equally with men on that occasion. She thereupon invited the co-operation of ladies, and a meeting was called at her house in W. Fourteenth st. to formulate a plan having that object in view. At the close of the first yr. 19 regular club meetings had been held—15 at Delmonico's (the home of the club), 4 at the houses of members; and the meetings, it is stated, were rendered conspicuously profitable by conversational disquisitions and literary exercises of a high order. Many women's clubs have since been formed, but S. is the only one whose membership and management consist of and are maintained wholly and solely by women. The scheme of the club is social and educational. It holds 2 meetings during the month—one on the first, the other on the third Monday—both at Delmonico's, corner Twenty-sixth st. and Fifth avenue. The first is social, and to it the members are permitted to bring guests; the second is for business purposes, and is confined to members only. This membership is divided up into 9 working committees—lit., art, science, education, philanthropy, house and home, drama, journalism, and business-women. The initiation fee is \$10, and golden S., the badge of the society, \$5; the annual dues are also \$5.

**Sor-rel**, a popular name for several sour-leaved plants, especially for those of the diercio section of the genus *Rumex* (order Polygonaceæ), to which genus the coarse herbs called dock also belong. Plants of the genus *Oxyria* (of the same order) are called mountain-S. The wood-S. are of the genus *Oxalis* (order Oxalidaceæ). There are numerous species of the above genera, some of which are occasionally used as salad-herbs and as flavors for sauces. In Europe the S., mt.-S., and wood-S. are cultivated for table use in gardens. Of *Oxalis* there are many species, some cultivated for their flowers, and others for their thick starchy roots, used as food in some countries. All the S. owe their sourness to the presence of oxalic acid and its salts. (See *OXALIS*.)

**Sorrel, Salts of.** See *OXALIS*.

**Sorrel Tree, or Sour-Wood**, the *Oxydendrum arboreum*, a small tree of the U. S., found in O., Pa., and southward. Its leaves resemble those of the peach, and have a sour taste, whence the name.

**Soteriology** (Gr. *σωτηριας λόγος*, "doctrine of salvation") treats of the redemptive work of Christ. In its wider signification it includes both the atonement which Christ made and its application through faith to individuals. Thus defined, it would comprise not only the doctrine of expiation, but also those of regeneration, justification, and sanctification. It is, however, used more generally to denote only the atonement.

**Sothic or Sothiac Period**, and **Sothic or Sothiac Year** [from *Sothia*, the Egyptian name for *Sirius*, the dog-star]. From a period of fabulous antiquity, said to date from the reign of Osiris, the Egyptians employed a calendar yr. of 365 days, embracing 12 months of 30 days each, with 5 epagomenal or supplementary days at the end. But the observation of the heliacal rising of the dog-star (that is, of the earliest appearance before sunrise of this star annually) led them to the discovery that their calendar yr. was about 6 hours too short. They did not, however, on this account abandon it, though they perceived it to go backward relatively to the true yr. by an entire day in every quadrennium. The yr. of 365¼ days was called the *Sothic yr.*; that of 365 days, the *vague* [Lat. *vagus*, "wandering," "unsettled"] yr., of which the beginning, going backward one day in every 4 yrs., completes the circuit of the seasons in 365 × 4 = 1460 *Sothic yrs.*, or 1461 *vague yrs.*; which duration is called the *Sothic period*.

**Soubise**, soo-bēz', the name of an old family of Fr. nobility whose possessions and titles fell to the family of Rohan in 1557. BENJAMIN DE ROHAN, b. in 1583, distinguished himself by his zeal in defending the Prot. cause in Fr. D. Oct. 9, 1642. The family became extinct with CHARLES DE ROHAN, Prince de Soubise, who was b. July 16, 1715. He gained the favor of Madame de Pompadour, and was appointed commander-in-chief of one of the 2 Fr. armies which

invaded Ger. in the Seven Years' war. Surprised at Gotha by Seydlitz, completely routed at Rossbach (Nov. 5, 1757), he was recalled and made minister of war, but in 1758 he again took the highest command in the field, this time with the duke de Broglie at his side. A victory was won at Lützelburg, and S. was made a marshal. D. July 4, 1787.

**Soudan.** See APPENDIX.

**Soul** (Gr. *ψυχή*; Lat. *anima*), a term variously applied to signify either the principle of life in an organic body, or the first and most undeveloped stages of individualized spiritual being, or, finally, all stages of spiritual individuality, incorporeal as well as corporeal. Aristotle, whose treatise *De Anima* (Περὶ ψυχῆς) is the first and still the greatest work on the subject, has himself produced this confusion by defining the soul in one instance as the self-determining power (*ἐντελέχεια*) of an organized body, and then afterward attributing to it reason (*νοῦς*), and making it as reason entirely separable from body. The much-debated question of the immortality of the soul implies a definition of soul as including not only its phases of corporeal existence, but also the higher ones of thought and will. Hence if *ψυχή* (soul) be only the principle of organic life, and *νοῦς* (reason) be the principle of intelligence elevated above the former and transcending it, the immortality of the former is precluded by definition, for the principle of conscious individuality is placed in the latter. Plato defines (*Leg.*, cap. 10) the soul as a self-moving activity (*κίνησις αὐτῆς κινουμένης*). Transmigration of souls (*Phædo*) is consonant with his theory of the pre-existence of the soul, and of the origin of the appetitive and irascible phases of the soul through the descent of the rational soul into a body. Having made the discovery of general and necessary ideas, which could not have originated in sense-perception, he undertook to account for them through reminiscence; the soul had perceived them in a former life. These ideas, *a priori*, were simple and eternal; how could the soul in which they were contemplated be other than simple and eternal? Aristotle held that the *νοῦς ποιητικός* = the *actus purus*, or pure reason, exists before the body, and enters it from without (*ὑπάρχον*) as something divine and immortal (*De Gen. et Corr.*, ii. 3). The *νοῦς παθητικός* = passive reason, including the nutritive (vegetable), sensitive (animal), and so much of the rational soul as included memory, imagination, sense-perception, and discursive intellect, he regarded (*De An.*, ii. 2) as perishable with the body. Exactly what he meant by this was long in dispute. Alexander of Aphrodisias, the great commentator, held that the active reason is the world-soul, and that individuals are mere incarnations of it which perish with the body. The statements of Aristotle, however, taken together, indicate his belief in the existence of the soul independent of the body; and not merely as a general world-soul, but also as individual souls. The scholastics and Ch. fathers generally hold Aristotle's view, as thus interpreted, while the Arabian thinkers follow Alexander's interpretation. Kant endeavored to show that the metaphysical argument which proved the immortality of the soul from its nature as simple substance is a paralogism, because the Ego which thinks is subject only, and does not appear as object in consciousness. At present there is a very great activity on the part of the physiological school of writers, who are engaged in investigating the physical correlates of psychical action. Very many of these hold the soul to be a function of the brain and nerves. WILLIAM T. HARRIS.

**Soule** (GIDEON LANE). See APPENDIX.

**Soule**, soul (JOSHUA), D. D., b. at Bristol, Me., Aug. 1, 1781, was licensed as a Meth. preacher 1798; was presiding elder of the Me. dist. 1804-13; author of the plan for a delegated general conference of his Ch., adopted at Baltimore 1808; was ed. of the *Meth. Magazine* 1816-20; preached in New York and Baltimore; declined a bishopric 1820, but was again elected and accepted 1824; was a delegate to the Brit. Wesleyan Conference 1842; adhered to the M. E. Ch. S. on the division of the Ch. 1844; settled at Nashville, Tenn.; visited Cal. on an episcopal tour 1853-54, and d. at Nashville Mar. 6, 1867.

**Soulé**, soo-la' (PIERRE), b. at Castillon, Fr., in 1801, took part in a conspiracy against the govt. of Louis XVIII.; had to flee; went to Paris; became a writer for a republican newspaper, *Le Nain*; was imprisoned in Ste. Pélagie for an attack on the ministry; escaped to the U. S.; settled at New Orleans 1825; studied law; took a high position at the bar; was U. S. Senator 1847-53, and distinguished for extreme Southern views; was appointed minister to Sp. 1853; favored the Sp. revolution of Aug. 1854; took part in the Ostend conference of Oct. 1854, intended to facilitate the acquisition of Cuba; returned to the U. S. 1855; visited Mex. soon afterward in the interest of the Tehuantepec canal project; opposed the secession of La., but ultimately adhered to the movement, and visited Europe as Confed. agent 1861; was imprisoned for disloyalty at Ft. Lafayette 1862; was released on condition of proceeding to Europe; returned to La. 1869. D. Mar. 16, 1870.

**Soulouque**, soo-look' (FAUSTIN), b. at Petit Goave, Hayti, about 1785, was by birth a slave, but freed by the Fr. decree of 1790; took part in the insurrections of 1803 and 1820; bore a prominent part in the c. war of 1844-45; was elected to the presidency Mar. 1, 1847; attached himself to the party of the blacks; inaugurated a period of decimation of prominent citizens; proclaimed himself emp. under the title of Faustin I. Aug. 26, 1849; created a nobility and promulgated a const., which he reserved the right to abrogate at any time; had himself crowned; invaded Santo Domingo with 10,000 men, but was completely routed, losing his treasure and throne 1855; was again unsuccessful in another invasion 1856; was overthrown by Geffard 1858; took refuge in Jamaica; Jan. 1859; returned to Hayti on the fall of Geffard 1867. D. Aug. 6, 1867.

**Soult**, soolt (NICOLAS JEAN DE DIEU), duke of Dalmatia, b. Mar. 29, 1769, at St. Amans-la-Bastide, dept. of Tarn, Fr., the son of a farmer; entered the army in 1785; became



lieut. in 1792, capt. in 1793, brig.-gen. in 1794, gen. of division in 1799, and marshal of Fr. in 1804; distinguished himself in the battles of Austerlitz and Jena; was made Duke of Dalmatia after the Peace of Tilsit; held the command in Sp. from 1808 to 1814. During his first term he baffled all Wellington's exertions, but during the second he was compelled to retreat into Fr., and was defeated at Orthez and before Toulouse; minister of war during the first restoration; joined Nap. during the Hundred Days; lived in exile at Düsseldorf from 1815 to 1819; reinstated in the army, he was made a peer of Fr. in 1827; between 1834 and 1847 he was several times minister of war, minister of foreign affairs, and finally marshal-gen. of Fr. D. Nov. 26, 1851.

**Sound.** See ACOUSTICS.

**Sounding.** See DEEP-SEA SOUNDINGS.

**Sound, The, or Oeresund,** is the narrow strait, 40 m. long and 3 m. broad, between Swe. and the Dan. island of Seeland, connecting the Cattegat with the Baltic. Until 1857 Den. demanded toll of every vessel passing the S.

**Sound-Waves.** See ACOUSTICS.

**Sour-Sop,** the fruit of *Anona muricata*, a beautiful tree of tropical Amer. The S.-S. often weighs 2 or 3 lbs. Its taste is sour and pleasant. It is very soft and white.

**South** (ROBERT), D. D., b. at Hackney, near Lond., Eng., in 1633, grad. at Chr. Ch., Ox., 1655; took orders in the Ch. of Eng. 1655; univ. orator 1660; chaplain to the earl of Clarendon; prebendary of Westminster 1663, canon of Chr. Ch. 1670; accompanied Lawrence Hyde on an embassy to John Sobieski, King of Poland, 1677; rector of Islip, Oxfordshire; chaplain to King Charles II. D. July 8, 1716.

**South Abington,** R. R. junc., Plymouth co., Mass., has important boot and shoe tack and other manufactories. Pop. 1880, 3024.

**South Amboy,** N. J. See APPENDIX.

**South America.** See AMERICA.

**Southampton,** a seaport town of Eng., at the head of Southampton Water, an inlet communicating with the seachannel which separates the Isle of Wight from the main. The situation of the port has made S. one of the most important steam-packet stations in the world. As a govt. emigration-port it is the port from which Australian emigrants depart. A large export and import trade is carried on, the latter in wines and brandies from Fr. and Port., of corn and provisions from Amer., etc. Pop. 60,235.

**Southampton, Earls of.** THOMAS WRIOTHESLEY, first earl, b. about 1490, in 1538 was made sec. of state by Henry VIII. after the fall of Thomas Cromwell was virtually first minister, and in 1543 was raised to the peerage; in 1544 became lord chancellor, taking the prescribed oath of abjuration of papal authority; joined in the persecutions of the Prots. under Henry VIII.; was made a knight of the Garter; one of the executors of the will of Henry; created earl of Southampton by Edward VI.; was deprived of the seals, having opposed the ambitious schemes of the protector Somerset. D. July 30, 1550.—HENRY WRIOTHESLEY, third earl, b. Oct. 6, 1573, was a patron of Shakespeare, who dedicated to him the poems *Venus and Adonis* and *The Rape of Lucrece*; took a prominent part in the early colonization of Amer., and became the gov. of the Va. Co. He d. Nov. 10, 1624.—THOMAS WRIOTHESLEY, fourth earl, b. about 1600, was made a privy councillor; in 1642 was sent by the king to convey to Parl. his proposals for accommodation; upon the restoration of Charles, in 1660, he was made lord high treas. D. in 1667.

**Southard,** suth'ard (HENRY), b. in New York Oct. 1759, removed to Baskingridge, N. J., in childhood; received an ordinary common-school education, but was a man of great memory and practical talent; served in the Revolutionary war; was for 9 yrs. a member of the State legislature; M. C. 1801-11 and 1815-21. D. June 2, 1842.

**Southard** (SAMUEL LEWIS), LL.D., son of Henry, b. at Baskingridge, N. J., June 9, 1757, grad. at Princeton 1804; taught school in N. J., and was a family tutor in Va. several yrs., during which time he studied law and was admitted to the bar; settled at Flemington, N. J., 1811; became law-reporter 1814, associate justice of the supreme court 1815; was U. S. Senator from Jan. 22, 1821, to 1823, serving a considerable time as pres. pro tem. of that body; was appointed by Pres. Monroe sec. of the navy 1823; was acting sec. of the treas. 6 months 1825, and for a short time acting sec. of war; was chosen atty.-gen. of N. J. 1829, gov. 1832, and was again U. S. Senator from 1833 to his death. He became a trustee of Princeton Coll. 1822. D. June 26, 1842.

**South Australia,** a Brit. colony, comprises a terr. of 908,690 sq. m. The interior consists of an elevated plateau, bounded S. and S. E. by ranges of wooded hills, between which fine valleys, running from N. to S., open into large, low plains toward the coast. The interior is only fit for pasturages. In the valleys and on the plains, when sufficiently watered, the soil is very productive. The climate, though healthy, is very hot and dry, and timber and wood are generally scarce. The mineral wealth is great. Gold has been found, and mines are worked. The copper and lead mines are rich. The prin. article of export is wool. Pop. 279,865. Prin. town, Adelaide.

**South Bend,** city and R. R. centre, cap. of St. Joseph co., Ind., 85 m. E. of Chicago, contains Notre Dame Univ., St. Mary's Acad., St. Joseph's Acad., and the Acad. of the Assumption. Pop. 1870, 7206; 1880, 13,280.

**South Berwick, Me.** See APPENDIX.

**South Bethlehem,** or R. R. and Lehigh River, Northampton co., Pa. In the immediate vicinity are very rich zinc accumulations. Between here and Mauch Chunk, in Northampton and Lehigh cos., are inexhaustible deposits of iron ore, and near by mts. of coal and slate. It has iron and steel manufactures, etc. Here are Lehigh Univ. and a young ladies' sem. Pop. 1870, 3556; 1880, 4925.

**South Boston.** See BOSTON.

**Southbridge,** on R. R., Worcester co., Mass., 70 m. S. W. of Boston. Pop. 1870, 5208; 1880, 6464.

**South Caroli'na,** one of the S. Atlantic States, lies between



Seal of South Carolina.

between 35° 13' and 34° 04' N. lat., and 78° 28' and 83° 18' W. lon. It is bounded on the N. and N. E. by N. C., on the S. E. by the Atlantic, on the S. W. and W. by Ga. Its coast-line is about 210 m., and its extreme length about 240 m. Its area is 30,570 sq. m. or 19,564,800 acres.

**Face of the Country and Topography.**

—The coast from 80 to 100 m. from the ocean is alluvial, low, and in some sections covered with swamps and marshes, through which sluggish streams flow and discharge their waters into the sounds and land-locked bays along the coast. Beyond it the land rises into a belt of low sand-hills, called the "middle country," which is moderately fertile; next to this comes what is known as "the Ridge," where the land rises abruptly in successive terraces till it reaches its greatest height in the Blue Ridge in the extreme N. W. of the State. S. C. is well watered. The Waccamaw winds sluggishly through the low lands in the N. E. portion of the State to Winyaw Bay; the Great and Little Pedee, 2 important rivers, discharge also into Winyaw Bay; Black River finds its way into the same bay; the Santee, the largest river of the State, with its tributaries, drains the central portion of the State, and forms an extensive delta where it enters the ocean; Cooper and Ashley rivers discharge into the bay and harbor of Charleston; the Edisto, the Ashepoo and the Combahee discharge into St. Helena Sound; the Coosawhatchie falls into Port Royal Inlet and Port Royal Sound; and finally the Savannah flows S. E. between Ga. and S. C. to its broad delta in lat. 32°. The islands along the S. C. coast are many of them of considerable size and of great fertility. They are the favorite region for the growth of the long-stapled or sea-island cotton, rice, etc. There are no lakes except those in the swamp region. The sounds and water-courses along the coast form a continuous navigable route.

**Mineralogy.**—The State is rich in mineral wealth. Gold is found in large quantities in the Abbeville and Edgefield dists. There are large deposits of excellent iron ores in Union, Spartanburg, Greenville, and Pickens cos. Copper, lead, manganese, and bismuth are found in different portions of the State. Granite of excellent quality abounds in the upper cos., and limestone of suitable quality both for burning and building is plentiful. The finest porcelain clays, sometimes in beds 60 ft. thick, are found in Aiken co. In the lower dists. of the State, and especially in the region extending from the Santee to the Savannah, valuable phosphate-marls of a peculiar character have been found in great abundance. They are treated with sulphuric acid, and are considered as the best of fertilizers.

**Soil and Vegetation.**—The soil of the State, though of every kind, may be said to comprehend 6 varieties, 3 of which belong to the low or swamp region and 3 to the uplands. The swampy soils are the tide-swamp or rice-lands; the inland swamp, on which rice, cotton, either long or short staple, corn, peas, etc. may be grown; and the salt marsh, like much of the soil of the islands, which is best adapted to the long-staple or sea-island cotton. The upland soils—the highest on the larger islands and the oak and pine lands of the Tertiary formation—are adapted moderately well to long-staple cotton, corn, sweet potatoes, etc.; the "middle country" or pine barrens are a good region for fruit and vegetables, though much neglected; and the higher lands, where the forests were mainly oak and hickory, but which, especially in the valleys, are well adapted to the growth of short-stapled cotton, corn, and the cereals. The vegetation of the low-lands is sub-tropical. The palmetto, smallest of the Amer. palms, the yucca or bayonet-leaved shrub, the magnolia, the bay laurel, the live-oak, and other evergreens, are abundant, and in the forests streamers of the gray S. moss float from pine and cypress trees. In the higher lands the trees of the Middle States are the chief forest growths.

**Zoology.**—Bears and wolves are not often seen. The raccoon, opossum, ground-hog, rabbit, and several species of squirrel are abundant. Deer are found throughout the forest portions of the State. Wild-turkeys, grouse, and other game-birds are plentiful, and the variety of aquatic birds along the coast is very large. There are also many birds of prey: the carrion vulture (turkey-buzzard) and 2 or 3 other vultures, 1 or 2 species of eagle, 5 or 6 species of hawk, gulls, etc. are abundant in the lowlands. The State is also distinguished for the number of its birds of fine plumage. Among the reptiles are found the alligator, lizards in great variety; tortoises and turtles, from the box and snapping turtles to the large marine turtles; 15 or 20 kinds of serpents, of which, however, only 2 or 3 are venomous, and batrachians of many species. Fish of excellent quality abound along the coast and frequent the rivers.

**Climate.**—The climate is like that of the S. of Fr. and N. Sp. On the coast the sea-breezes, and in the interior the mts., greatly modify the heat. In the N. W. portion of the



State Indian corn is not as sure a crop as it is in Minn., while in the S. and S. E. dists. the orange, the sugar-cane, the pomegranate, the fig, and the banana are largely cultivated. The mean annual temperature of Charleston for the past 30 yrs. has been 65.6°. The annual rainfall is greatest along the coast. The range on the lowlands is from 51 to 60 inches; on the middle and ridge lands, 44 to 52 inches; and in the mountainous dists. from 40 to 44 inches.

**Agricultural Products.**—The largest crops in point of value are cotton and rice. By the census of 1880 S. C. produced 522,548 bales of cotton on 1,364,249 acres; 52,077,515 lbs. of rice on 78,388 acres; also 229 hogheads of sugar and 138,944 gallons of molasses. Of cereals there were grown in S. C. 11,767,099 bushels of corn, 2,715,505 bushels of oats, 962,358 bushels of wheat, and 27,049 bushels of rye. The wool clip of 1880 yielded 273,758 lbs.

**Farm Animals.**—In 1880 there were in S. C. 60,660 horses, 67,005 mules and asses, 363,709 cattle, 118,889 sheep, and 628,198 swine.

**Manufactures.**—S. C. is not largely engaged in manufactures, the product of the few establishments outside of textile fabrics being insignificant. It had, in 1880, 1776 cotton-rooms, with 92,788 spindles, employing 2018 hands, and using 33,099 bales of cotton; value of product, \$2,895,769.

**Railroads.**—There were in operation, Jan. 1, 1882, 1484 m. of railway in S. C., costing \$36,740,932, with net earnings of \$1,288,182, paying in interest and dividends \$374,989. Several of these are through lines.

**Commerce.**—The direct foreign commerce of S. C. through its fine harbor of Charleston has always been important. Cotton forms the chief article of export. The total amount of imports at the 3 ports of entry in S. C. was \$737,632 in 1881. The exports aggregated \$29,169,382. The shipping of S. C. in 1881 numbered 173 sailing vessels and 49 steam vessels, with aggregate tonnage of 11,482. The internal commerce, chiefly by railway, is extensive.

**Finances.**—The assessed valuation in 1880 was—real estate, \$77,461,670; personal property, \$56,098,445; total, \$133,560,135, beside R. R. property of about \$36,000,000. Rate of State tax, 4½ mills on a dollar, producing \$811,940. The aggregate raised by taxation, State and local, was \$1,839,983. Public debt, Nov. 23, 1880, \$6,639,171; the debt of the State was "scaled" in 1873 at 50 cents on the dollar. Total indebtedness, State and local, 1880, \$13,345,998.

**Banks, Etc.**—In Oct. 1881 S. C. had 13 national banks, with capital of \$1,885,000; circulation, \$1,187,190; U. S. bonds to secure circulation, \$1,325,000; aggregate deposits, \$3,117,827. There are also 4 State banks and trust cos., with \$305,000 capital and \$1,553,145 deposits; 2 savings banks, with \$307,201 deposits; and 8 private bankers, with \$229,956 capital and \$53,921 deposits. The insurance cos. paid losses in 1881 of \$395,100.

**Education.**—The number of children of school age (6-16 yrs.) in S. C. was 228,128 in 1877, of whom 134,072 were enrolled in the public schools. Aggregate expenditure for common schools 1880, \$367,259, of which salaries of teachers required \$308,230. There are 8 univs. and colls., with 48 instructors and 664 students, paying in tuition \$5820 in 1880. There were pub. in 1882 in S. C. 76 newspapers and periodicals, 6 of which were daily. Of 667,456 persons of 10 yrs. and upward in 1880, 321,780 were unable to read, being a much larger proportion of illiterates than in any other State.

**Churches.**—The Bap. denomination leads numerically, having 130,939 members, 589 ministers, and 1022 chs.; M. E. South, 44,791 members, 160 ministers; M. E., 33,343 members, 86 ministers, 247 chs.; Presb., 11,340 members, 95 ministers, 160 chs.; R. Cath., 16 chs. and 16 priests, with about 10,000 pop.; 15 other denominations, 8000 to 30 members.

**Population.** In 1860, 703,708; 1870, 705,606; 1880, 995,577 (white 391,106, colored 604,472, including 131 Indians, 9 Chl.). **Principal Cities and Towns.** Pop. 1880.—Charleston, 49,984; Columbia (cap.), 10,036; Greenville, 6160; Spartanburg C. H., 3253; Georgetown, 2557; Beaufort, 2549; Newberry C. H., 2342; Orangeburg C. H., 2140; Sumter C. H., 2011; Chester C. H., 1899; Anderson, 1850; Aiken, 1817; Camden, 1780.

COUNTIES.	*Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
Abbeville.....	5-C	31,129	40,815	Abbeville C. H.....	1,543
Aiken.....	6-D	.....	28,112	Aiken.....	1,817
Anderson.....	4-C	24,049	33,612	Anderson C. H.....	1,850
Barnwell.....	6-D	35,724	39,857	Barnwell C. H.....	648
Beaufort.....	8-E	34,359	30,176	Beaufort.....	2,549
Berkeley.....	6-F	.....	.....	St. Pleasant.....	763
Charleston.....	7-F	88,663	102,800	Charleston.....	49,984
Chester.....	4-E	16,805	24,132	Chester C. H.....	1,899
Chesterfield.....	5-F	10,584	16,345	Chesterfield C. H.....	tp. 2,357
Clarendon.....	6-F	14,098	19,190	Manning.....	tp. 1,440
Colleton.....	7-E	25,410	36,388	Walterborough.....	691
Darlington.....	5-F	26,243	34,485	Darlington C. H.....	940
Edgefield.....	6-C	42,486	45,844	Edgefield C. H.....	808
Fairfield.....	5-E	19,888	27,765	Winnabow.....	1,500
Georgetown.....	6-G	16,161	19,613	Georgetown.....	2,557
Greenville.....	4-C	22,262	37,496	Greenville C. H.....	6,169
Hampton.....	7-D	.....	18,741	Hampton C. H.....	169
Horry.....	5-G	10,721	15,574	Conway.....	575
Kershaw.....	5-E	11,754	21,538	Camden.....	1,780
Lancaster.....	4-E	12,087	16,903	Lancaster C. H.....	651
Laurens.....	5-C	22,536	29,444	Laurens C. H.....	752
Lexington.....	6-D	12,988	18,564	Lexington C. H.....	262
Marion.....	5-G	22,160	34,107	Marion C. H.....	824
Marlborough.....	5-F	11,814	20,598	Bennettsville.....	243
Newberry.....	6-F	20,775	26,497	Newberry C. H.....	2,342
Orangeburg.....	4-B	10,536	15,236	Walhalla.....	749
Pickens.....	6-E	16,865	41,395	Orangeburg C. H.....	2,140
Pickens.....	4-C	10,269	18,873	Pickens C. H.....	212
Richland.....	5-E	25,925	28,574	Columbia.....	10,036
Spartanburg.....	4-C	25,754	40,409	Spartanburg C. H.....	3,253
Sumter.....	4-F	25,268	37,037	Sumter C. H.....	2,011
Union.....	4-D	19,248	24,080	Union.....	1,967
Williamsburg.....	6-F	15,489	24,110	Kingstree.....	384
York.....	4-D	24,286	30,713	Yorkville.....	1,330
Total.....		705,606	995,577		

\* Reference for location of counties. See map of South Carolina.  
† Organized since census of 1880.

**History.**—In May 1562 John Ribault, the leader of a party of Fr. Huguenots, entered a spacious inlet, to which he gave the name of Port Royal. On an island in that inlet he built a fort, which he named Carolina in honor of Charles IX. of Fr. Here he left 26 colonists, but in 2 or 3 months they became dissatisfied, and returned to Europe. In 1670 a party of English settled at Port Royal, but the same or the next yr. removed to W. bank of Ashley River, and in 1680 to present site of Charleston. In 1674 Joseph West was appointed gov. of the S. colony, though both N. and S. C. were nominally under one proprietary govt. Gov. West remained in office several yrs. In 1680 there was an Indian war, in which the colonists were victorious. Until 1720 both N. and S. C. were nominally governed under the const. prepared by John Locke, who had received a grant of the terr. The attempt to capture St. Augustine from the Spaniards in 1702 resulted in a defeat and very heavy expenses. In 1706 a Fr. fleet attacked Charleston, but was promptly repulsed and with heavy loss. The Indians were very troublesome to the colonists, but in 1715 they were expelled after a severe battle. This Indian war and the previous contests with the Fr. and Sp. had involved the colony in debt, and disturbances grew out of this which led to the expulsion of the gov. in 1718 or 1719, after which the people of the colony held a convention and proceeded to organize a govt. independent of the proprietaries. The Eng. Parl. solved the difficulty by purchasing the proprietary rights for about \$80,000. This was accomplished in 1720. But when the Brit. govt. began to pass oppressive laws and lay heavy and unjust taxes, the colonists took measures to resist the invasion of their rights. A provincial cong. was called in 1774, delegates were appointed to the Continental Cong. of 1774-75, and when in Sept. 1775 the royal govt. fled, the provincial cong. assumed all the powers not vested in the Continental Cong. S. C. suffered much from the invasion of her terr. by the enemy during the war of the Revolution. On May 28, 1788, the State ratified the const. of the U. S. On June 3, 1790, her first permanent State const. was adopted without submission to the people. In 1832 her leading men attempted to nullify certain acts of Cong. imposing a tariff, from the belief that it bore unjustly on the interests of the State: A convention was called by the State legislature, which on Mar. 11, 1833, passed a nullification ordinance. From 1820 the number of slaves in S. C. had exceeded the white pop. On Oct. 25, 1860, it was unanimously resolved that S. C. should at once secede from the Union in the event of Mr. Lincoln's election. The legislature ordered an election for a convention on Nov. 22, and appointed Dec. 17, 1860, as the opening day of the convention. It met on that day at Columbia, but adjourned at once to Charleston, and on Dec. 20 passed the ordinance of secession by a unanimous vote of 169 yeas. Coms. from S. C. were sent to the other S. States to urge their secession and the calling of a convention at Montgomery, Ala., to organize a confederacy. On the night of Dec. 26, 1860, Major Robert Anderson, in command of a battalion of Federal troops in Ft. Moultrie, moved his command to the new and stronger fort, Sumter, in the same harbor. The U. S. arsenal and its arms and munitions were seized by S. C. volunteers, as were also the custom-house, P. O., etc., and on Apr. 12, 1861, S. C. commenced the c. war by the bombardment of Ft. Sumter. After the surrender of this fort, it was at once put in order, for permanent occupation, by the Confeds. During the war which followed, S. C. suffered severely. On Nov. 7, 1861, the Federal squadron under Com. Du Pont captured Fts. Warren and Beauregard, and entered and took possession of Port Royal harbor and the town of Beaufort, S. C. Charleston harbor was closely blockaded. In June 1862 the severe battle of Secessionville was fought; in Oct. of the same yr. the action of Pocotaligo occurred; the naval attack on Ft. Sumter under Com. Du Pont took place Apr. 6, 1863, which was unsuccessful. This was followed in the ensuing summer by the siege of Charleston and demolition of Ft. Sumter under Gen. Gillmore. In Jan. 1865 Gen. W. T. Sherman commenced his march from Savannah through the Carolinas. What was left of Charleston, Columbia, and all the prin. towns of the State fell into the hands of the Federal troops almost without a struggle, and most of their track was left a desert. Soon after the close of the war reconstruction was attempted, a convention being called in Sept. 1865, which declared the secession ordinance null and void, repudiated the Confed. State debt, and framed a new const. for the State. The State was restored to the Union in June 1868.

**Governors.**  
Charles Pinckney..... 1789-92 B. K. Hennen (act'g) 1840  
Arnoldus Vanderhorst 1792-94 John P. Richardson..... 1840-42  
William Moultrie..... 1794-96 James H. Hammond..... 1842-44  
Charles Pinckney..... 1796-98 William Aiken..... 1844-46  
Edward Rutledge..... 1798-1800 David Johnson..... 1846-48  
John Drayton (acting) 1800-02 W. B. Seabrook..... 1848-50  
James B. Richardson. 1802-04 John L. Means..... 1850-52  
Paul Hamilton..... 1804-06 John H. Manning..... 1852-54  
Charles Pinckney..... 1806-08 James H. Adams..... 1854-56  
John Drayton..... 1808-10 Robert F. W. Alston..... 1856-58  
Henry Middleton..... 1810-12 William H. Gist..... 1858-60  
Joseph Alston..... 1812-14 Francis W. Pickens..... 1860-62  
David R. Williams..... 1814-16 M. L. Bonham..... 1862-64  
Andrew Pickens..... 1816-18 A. G. Magrath..... 1864-65  
John Geddes..... 1818-20 B. F. Perry (provis.)..... 1865  
Thomas Bennett..... 1820-22 James L. Orr..... 1865-68  
John L. Wilson..... 1822-24 Robert K. Scott..... 1868-72  
Richard J. Manning..... 1824-26 Franklin J. Moses, Jr. 1872-75  
John Taylor..... 1826-28 Dan'l H. Chamberlain. 1875-77  
Stephen D. Miller..... 1828-30 Wade Hampton..... 1877-78  
James Hamilton..... 1830-32 W. D. Simpson..... 1878-80  
Robert Y. Hayne..... 1832-34 Johnson Hagood..... 1880-82  
George McDuffie..... 1834-36 Hugh S. Thompson..... 1882-80  
Pierce M. Butler..... 1836-38  
Patrick Noble..... 1838-40



















**South Chicago, Ill.** See APPENDIX.

**South Deerfield, R. R. junc.** Deerfield tp., Franklin co., Mass., has important manufactures, and is locality of the famous Bloody Brook massacre in King Philip's war, at which Capt. Thomas Lothrop and 76 men, called the "flower of Essex," lost their lives Sept. 18, 1675 (O. S.). Pop. Deerfield tp. 1870, 3632; 1880, 3543.

**Southern Confederacy.** See CONFEDERATE STATES.

**South Evanston, Cook co., Ill.** See APPENDIX.

**Southey (CAROLINE ANNE Bowles),** second wife of Robert Southey, b. in Hants co., Eng., Dec. 6, 1787. At an early age she wrote for *Blackwood's Magazine* and other periodicals. In 1830 a collection of her pieces was made. Her pub. works are *Ellen Fitz-Arthur*, a poem; *The Widow's Tale*, and other Poems; *Solitary Hours*, prose and verse; *The Birthday*, a poem, etc. D. July 20, 1854.

**Southey (ROBERT),** b. at Bristol, Eng., Aug. 13, 1774, received his early education at Westminster School; in 1793 entered Balliol Coll., Ox., which he left after 2 yrs., and entered upon a career of authorship, his first pub. works being a small vol. of poems and the tragedy of *Joan of Arc*. In 1795 he married Edith Fricker; set out with his uncle for Port.; pub. the poem *Thalaba, the Destroyer*. From 1804 his life is mainly the hist. of his numerous writings in almost every dept. of lit. In early manhood he had imbibed strong radical ideas, and wrote a drama, *Wat Tyler*, which was denounced in the House of Commons as seditious. In the course of yrs. he went over to the opposite extreme of conservatism in Ch. and State, and came to be considered the exponent of high Tory opinions. He was named poet-laureate in 1813. His wife, who had for several yrs. been hopelessly insane, died in 1837, and 2 yrs. afterward he married Caroline Bowles. But S.'s own faculties had begun to give way, and on the day when he brought his wife to their home he fell into a state of mental prostration which soon grew into complete imbecility, that continued to his death, Mar. 21, 1843. S.'s prin. poems are *Madoc*, *The Curse of Kehama*, *Roderick, the Last of the Goths*, *A Vision of Judgment*, *A Tale of Paraguay*; wrote many prose works.

**South Frammingham, R. R. centre,** in Frammingham tp., Middlesex co., Mass., 21 m. W. of Boston, has manufactures of straw goods, etc. Pop. Frammingham tp. 1870, 4968; 1880, 6235.

**Southgate (HORATIO),** D. D., b. at Portland, Me., in 1812, grad. at Bowdoin Coll. 1832, and at Andover 1835; took orders in the P. E. Ch. 1836; travelled as a missionary in the E.; was chosen missionary bp. of Constantinople 1844; remained there until 1851, in which yr. he became rector of St. Mark's, Portland, of the ch. of the Advent, Boston, 1852, and in 1859 of Zion ch., New York. Author of *A Tour through Armenia, Kurdistan, Pers., and Mesopotamia; The War in the E.*, etc.

**South Hadley, Hampshire co., Mass.,** on Conn. River, which here makes a fall of 40 ft., around which a canal 2 m. in length has been constructed; is celebrated for the Mt. Holyoke Female Sem., the earliest collegiate inst. for females in the country. Pop. tp. 1870, 2840; 1880, 3538.

**South Hadley Falls, Hampshire co., Mass.,** named from the noted falls of Conn. River, which supply, by means of a magnificent dam, an unequalled water-power for flourishing manufactures, both at this point and at the thriving new city of Holyoke on the opposite bank of the river. Pop. 1880, 2750.

**South Haven, Van Buren co., Mich.,** on R. R. and Lake Mich., at the mouth of Black River, has a good harbor and a thriving lake-trade. Pop. 1870, 1576; 1880, 1442.

**Southington, on R. R., Hartford co., Conn.,** 30 m. N. of New Haven. Pop. tp. 1870, 4314; 1880, 5411.

**South Manchester, on R. R., Manchester tp., Hartford co., Conn.,** noted for extensive silk factories. Pop. Manchester tp. 1870, 4233; 1880, 6462.

**South Norwalk, city, seaport,** and R. R. centre, Fairfield co., Conn., on L. I. Sound, 42 m. from New York, has various manufactures. Steam freight-boats run to New York the year round; passenger-boats during the summer season. Pop. 1880, 3726.

**South Orange, on R. R., Essex co., N. J.,** 15 m. W. of New York, has a coll. Pop. tp. 1870, 2963; 1880, 3911, including 2178 in v.

**South Pueblo, R. R. centre,** Pueblo co., Col., 112 m. S. by E. of Denver, on S. bank of Ark. River, opposite Pueblo. Pop. 1880, 1443.

**South Sea Bubble,** a financial speculation which arose in Eng. about the same time with Law's Miss. Scheme in Fr. The S. S. Co. was established in 1711. The public debt was made the stock of the co., under an engagement of the govt. to pay 6 per cent. interest at the end of 5 yrs., and the grant of a monopoly of the trade to the S. or the coast of Sp. Amer. The company became so well established as to vie with the Bank of England in controlling the finances of the country. Under the extravagant expectation of profits from the Amer. trade and the prevalent rage for speculation, the stock of the co. was in great demand, the price of shares rapidly rising till £1000 was paid for a single share of £100. As the yr. 1720 closed the bubble burst, bringing ruin to the co. and to thousands of families, who had embarked their all on this treacherous sea of speculation.

**Southwell (ROBERT),** b. at Horsham, St. Faith's, Norfolk, Eng., in 1560, ed. in the R. Cath. sem. at Douay, Fr.; became a Jesuit at Rome 1578; prefect or rector of the Eng. Jesuits' coll. at Rome 1585; sent as a missionary to Eng. 1586; chaplain to Anne, countess of Arundel, and secretly administered the rites of his Ch. to the Eng. R. Caths.; was thrown into the Tower July 1592, on an accusation of complicity in a plot against Queen Elizabeth; was 10 times subjected to torture, and was condemned to death, and executed Feb. 21, 1595. Wrote *St. Peter's Complaint*, and other Poems; *Memoriana*, or *Certain Excellent Poems and Spiritual Hymns*, *The Triumph over Death*, etc.

**Souvarof.** See SUWAROW.

**Souvestre' (EMILE),** b. at Morlaix, dept. of Finistère, Fr., Apr. 15, 1806; after editing for some time a liberal newspaper at Brest, he settled in 1836 at Paris, where he attracted attention first by his sketches of Brittany, and became soon one of the most popular novelists and dramatists. The most remarkable of his novels are *Les Derniers Bretons*, *L'Homme et l'Argent*, *Confessions d'un Quaker*, *Un Philosophe sous les Toits* (the last named receiving in 1851 a prize from the Fr. Acad.); and of his dramas, *Henri Hamelin*, *L'Oncle Baptiste*, *La Mousse*, etc. All his works have a strongly marked tendency, representing morality and riches as incompatible. He is sometimes sad, and even bitter, but he often gives most delightful pictures of the innocence of simple surroundings and the cheerfulness of humble circumstances. D. July 5, 1854.

**Sovereign,** suv'er-in, the Brit. gold coin representing the pound sterling of 20 shillings. It first appeared in 1817, and now weighs  $7\frac{1}{2}$  of an ounce troy, and is worth \$4.839 in U. S. money.

**Sovereignty** [It. *sovrano*, *sovrantia*; Fr. *soveraineté*, from Lat. *super*, *superanus*, not in use; *superantias*, not in use] denotes possession of the highest power. The same word appears as *suzerain*, *suzeraineté*, in feudal Fr. Discussion touching the source of power under God led to the application of the word to the people or political body as being the sovereign, and to the latter as invested with power by the former, according to the will of God. In Eng. usage the king or queen may be called sovereign, although limited in authority on every side by the law.

Under our const. where does S. reside—in the single States or in the U. S.? (1) In the provisional articles of peace (1782) the 13 States are acknowledged to be free, sovereign, and independent States. This is taken in the international sense, that no one else had now within the terr. of the U. S. any claim of S. (2) By our const., to declare war, make peace, send and receive ambassadors, coin money, raise and support armies, call forth the militia of the States, interpret the meaning of the const. by the supreme court—whose decisions cannot be set aside—belong to the U. S. as a sovereign whole, and all judicial and executive officers are bound thereby, anything in the const. or of the laws of the States notwithstanding. The States thus have not a single attribute of S. belonging in international law to a sovereign state. (3) The question whether the States were sovereign between the acknowledgment of our independence by G. Brit. and the formation of our present const. is of very minor importance. If they were not, they were in a transition state; if they were, they gave up their S. In Gen. Jackson's proclamation of Dec. 1822 it is laid down that the States severally have not retained their entire S.

THEODORE D. WOOLSEY.

**Sower (CHRISTOPHER),** b. in Ger. toward the close of the 17th century, was a bookseller at Hesse-Darmstadt; emigrated to Pa. 1726; settled as a printer and bookseller at Phila.; established the first type-foundry and the first manufactory of printer's ink in Amer.; pub. the first quarterly magazine (1735) and the second Bible (1743), both being in Ger. D. Sept. 1758.—His son, CHRISTOPHER, b. at Hesse-Darmstadt Sept. 26, 1721, was the introducer of cast-iron stoves into Amer., and supposed to be their inventor; was noted for philanthropy during the war of the Revolution, when he merited the name of *Der Brod-Vater* ("the bread-father"). D. Aug. 1784.

**Sow'erby,** an Eng. family, several members of which have attained eminence in connection with nat. hist. and art: JAMES, b. at Lambeth Mar. 21, 1757, was originally a miniature and portrait painter, and later in life took up bot. in connection with his art; pub. *Botanical Drawing-Book*, *Eng. Bot.*, containing colored figures of all the native plants of G. Brit.; *The Florist's Delight*, *Eng. Fungi or Mushrooms*, with 440 colored figures, etc. D. Oct. 25, 1822.—JAMES DE CARLE, b. at Stoke Newington June 5, 1787, was sec. of the Royal Botanic Society 1839-70; made the designs for London's *Encyc. of Plants*. D. Aug. 26, 1871.—JOHN EDWARD prepared *The Ferns of G. Brit.*, *Fern Allies*, *Brit. Poisonous Plants*, *The Grasses of G. Brit.*, etc.—GEORGE BRETTINGHAM, b. at Lambeth Aug. 12, 1788, was one of the founders of the *Zoological Journal*, and pub. *Genera of Recent and Fossil Shells*, with 264 colored plates; *Species Conchyliorum*, *Conchological Illustrations*, etc. D. July 26, 1854.—GEORGE BRETTINGHAM, JR., b. March 25, 1812, pub. *Manual of Conchology*, with more than 650 figures of shells; *Popular Brit. Conchology*, *Popular Hist. of the Aquarium*, etc.

**Sowing-Machines** have been in use from time immemorial. Some scatter the seed broadcast; others dibble it into the ground in rows or drills, and then cover it. In the larger machines, often drawn by horse-power, the seed is placed in small cups, from which it passes through tubes so arranged as to suffer them to drop regularly into shallow furrows cut by coulters just in front of the escape-orifice of the tubes, the furrows being closed up by a kind of rake or harrow forming a part of the machine.

**Sowles (WILLIAM L.),** b. in Vt. in 1800, was member of the State legislature 1828-31, State senator 1841-42, and for many yrs. one of the leaders of the Rep. party in the State. D. May 1878.

**Soy Bean,** the *Soja hispida*, a bean extensively grown in Japan, Chl., India, and the Spice Islands, where it is much used as food. The sauce called "soy" is, when genuine, made of boiled soy beans, mixed with wheat-meal and fermented. It is then salted and mixed with water, and after daily stirring for a long time the supernatant liquid is poured off and preserved for use. Good soy is a spirited and excellent sauce, and is believed to improve with age.

**Spaight (RICHARD DOBBS),** JR., b. at Newberne, N. C., in 1796, grad. at the Univ. of N. C. 1815; studied law; was elected to the State assembly 1819, to the senate 1820-22; was M. C. 1823-24; again a State senator 1824-34; member of the State constitutional convention 1835, and gov. 1835-37. D. Nov. 1850.



**Spain, Kingdom of**, occupying the largest part of the Pyrenean peninsula, comprises an area of 195,767 sq. m., inclusive of the Balearic Isles and the Canaries. The surface consists principally of a large plateau walled in N., E., and S. by high mt. ranges, but sloping W. down to the Atlantic. On the N. rise the Pyrenees (average height, 7500 ft.; Maladetta, 10,722 ft.) and the Cantabro-Asturian Mts. (rising 8800 ft.). To the E. the mts. of Catalonia extend along the coast to Tortosa, where the Ebro breaks through them; they are rich in metals, coal, and salt. Divided by numerous rivers into insulated groups, they continue southward through Valencia and Murcia. The S. wall of the plateau is formed by the Sierra Morena, which rises 5000 ft. and runs from E. to W., ending in Cape St. Vincent; to the S. extends the Andalusian lowland, separated from the Mediterranean by the Sierra Nevada, which rises 11,000 ft. The plateau forming the main bulk of the peninsula is divided into 2 parts by a range running from the N. E. to the S. W. The N. part is the plateau of Leon and Old Castile; the S., the plateau of New Castile. The rivers which traverse the country flow mostly in very deep beds, and are thus less available for irrigation. To the Atlantic run the Douro, Tago, Guadiana, and Guadalquivir, all rising on the E. wall of the central plateau; to the Mediterranean, the Ebro, which rises between the Cantabrian Mts. and the N. E. wall of the plateau of Old Castile. Of the minor rivers, the Minho runs to the Atlantic, the Segura, Xucar, and Guadalquivir to the Mediterranean. The most important canals are the Aragonian, the San Carlos, and the Castilian. Noticeable are the immense establishments for irrigation found throughout the country, and generally founded by the Moriscos. The coast formation of the peninsula is not very favorable. Only one important maritime place is found on the S. coast—viz. Cadiz. The coast of Galicia has many small harbors; the N. coast offers good harbors at Santander and Bilbao. Along the E. coast Barcelona, Tarragona, Valencia, Alicante, and Cartagena are the most important harbors. In general, the climate of Sp., more than that of any other European country, resembles the climate of the tropical regions; nevertheless, it is very different in the different regions. A great diversity in the flora and fauna of the country corresponds to the diversity of its climate and surface.

The pop. consisted in the oldest times of 2 entirely different races—the Celts in the W. and the Iberians in the E. The Basques (*Vascones*) in Navarre, the Cantabrian Mts., and on both sides of the W. Pyrenees, form a pure stock of the Iberians. To these races many others were added by immigration: first the Phœnician and Gr. colonists; next the Carthaginians, after 230 b. c.; then the Romans. In 409 A. D. the Sueves, Alanes, and Vandals invaded the peninsula, and in 711 came the Arabs, who founded a powerful empire. The present race-distribution is the same as was apparent at the end of the Middle Ages. According to the census of 1881 the pop. amounted to 16,834,945. The old division of the country is characteristic both for the land and the people. It comprised (1) the kingdom of New Castile; (2) the terr. of Extremadura; (3) the kingdom of Leon; (4) the kingdom of Galicia; (5) the principality of Asturias; (6) the kingdom of Old Castile; (7) the Basque provs.; (8) the kingdom of Navarre; (9) the kingdom of Aragon; (10) the principality of Catalonia; (11) the kingdom of Murcia; (12) the terr. of Andalusia.

The sources of wealth which the country contains are very rich. No other country of Europe is so rich as S. in metals and useful minerals. Immense coal-deposits are found. The Tertiary and Diluvial deposits have an immense extension. They are rich in salt. Various kinds of porphyry and trachyte are very frequent, especially in the S. W. part. From this composition of the crust the wealth of the ground in metals, ores, etc., may be surmised. The cinabar-veins of Almaden and Almadenejos, which formerly produced the larger part of all the quicksilver consumed, are celebrated. Veins and whole masses of lead and iron ore are numerous. The copper-mines of Rio Tinto and the silver-veins of the Sierra Almagrera and Huelva are famous. Tin, zinc, antimony, nickel, cobalt, and graphite abound; salt is inexhaustible; natron, saltpetre, alum, sulphur, asphaltum, and petroleum occur; at Logroño in Extremadura is an entire mt. of phosphorite. Gold is found in many rivers; precious stones, such as diamonds, rubies, garnets, turquoises, topazes, amethysts, etc., occur in several places; splendid marbles of various colors, jasper, and alabaster; excellent building-stone and chalk abound.

The fertility of the soil is generally very great, and agriculture is the prin. occupation. Of the cereals, wheat is most generally cultivated; rye principally in the N., rice in Valencia, barley and maize in most parts of the country. Vegetables and other garden-plants are more largely cultivated here than in any other country of Europe. Orchards are numerous and extensive. Cattle-breeding is an occupation of great importance. Arboriculture is neglected, and the forests are much impaired; the country is nevertheless still very rich in timber. A peculiar item of exportation is cork. Manufacturing industry is by no means so important as it ought to be in order to correspond to the immense natural resources of the country; in general, however, it is increasing. Paper manufacturing, the spinning and weaving of cotton, the manufacture of leather and metal ware, especially iron goods, are the most prominent branches of Sp. industry. The cigar and tobacco manufacture is a gov't monopoly; other trade limitations were abolished long ago. The total imports and exports of Sp. in 1882 were—Imports, £24,590,000; exports, £25,690,000. The merchant navy of the kingdom consisted, on Jan. 1, 1880, of 2081 vessels, of a total burden of 596,664 tons, comprising 226 steamers of 135,814 tons.

The general standard of mental culture is lower in S. than in any other European country. Although a systematic organization of public education and instruction was

adopted in the 18th century, the influence of the clergy has proved stronger than the instinct of progress. Sanitary affairs are not so well regulated as in other European countries. The benevolent insts. are truly grand. The gov't. is a constitutional monarchy. The const. places the legislative power in the hands of the Cortes, consisting of a cong. elected for 3 yrs., and a senate elected for 12. The prin. points of the const. are—responsibility of the ministers, consent of the Cortes to the budget, foreign alliances and treaties, personal freedom, universal suffrage, the liberty of the press, right of assembly, association, and petition, freedom of exercise of worship for all denominations, etc. The administration is carried on by the king and a responsible cabinet comprising the depts. of war, foreign affairs, justice, navy, finances, interior, agriculture and commerce, and the colonies.

**Finances.**—By an arrangement of 1881-82 the whole Sp. debt was reduced to £240,000,000, but the interest on that sum represents one third of the total expenditure of the budget, and one half of the total value of the exports. Total revenue 1882-83, £31,319,889 and total expenditure £31,305,570.

The army of S. was reorganized in 1868, after the model of that of Fr., and by subsequent laws in 1877 and 1878. Under the new military law, the armed forces of the kingdom consist of—1. A permanent army (for which all Spaniards past the age of 20 are liable to be drawn, and in which they have to serve 4 yrs.); 2. a first or active reserve; 3. a second or sedentary reserve. The nominal strength of the armed forces of S., including those serving in Cuba, is stated at 180,000 men. The total of the navy consists of 124 vessels with 462 guns.

The colonies of S. formed in the 15th and 16th centuries a vast possession, the greater part of which has been lost. It still holds Cuba, Porto Rico, the Philippines, the Carolines, the Palaos, the Marianes, and Guinea.

**History.**—The peninsula was inhabited by Celtic and Iberian tribes when in olden times the Phœnicians founded colonies along its coasts. They were followed by the Grs., and then by the Carthaginians. Finally the Romans drove the Carthaginians out of the country in the 2d century B. C. At the beginning of our era the peninsula was a Rom. prov. Christianity was early introduced. The N. races which finally overthrew the decaying Rom. empire invaded also the Peninsula. The Vandals and Sueves conquered the country in the beginning of the 5th century. Toward the end of the century the Visigoths expelled both the Romans and the Germanic tribes, and made themselves masters of the whole country. The Visigoths were Arians, and their religious confession involved them in a war with the orthodox Franks. The war for the independence of the state was also a religious war, and this circumstance laid the first foundation of the power of the clergy. In 711 the Arabs invaded the peninsula from Afr., and conquered the country in 3 yrs., with the exception of the N. mt.-regions, where the Visigoths took a stand, and from hence they commenced the reconquest of the lost country. The war between the Sp. Chrs. and the Arab Mohammedans lasted for 800 yrs. At the beginning of the 12th century the Chrs. occupied  $\frac{1}{2}$  of the country—Leon, Castile, Aragon, and Navarre, each of which formed an independent kingdom. Soon, however, Castile and Aragon assumed a prominent position, increasing both by uniting other Chr. countries and by conquering Mohammedan terrs. At last a union of the 2 kingdoms took place in 1469 by the marriage between Ferdinand V. the Catholic, king of Aragon (1479-1516), and Isabella, queen of Castile. The war was carried on with success against the Arabs, and in 1492 they lost their last possession, Granada, to Ferdinand and Isabella. Their gov't. made the Ch. the foundation of the throne, endeavored to curb the nobility, and centralized the judicial authority in the crown. Immediately after the conquest of Granada they began to convert and expel the Moors and the Jews. This policy made S. mighty for a moment; then it ruined her. All the children of Ferdinand and Isabella died early, with the exception of one daughter, Joanna, who succeeded her mother on the throne of Castile in 1504. Joanna became insane. The states of Castile then appointed King Ferdinand, Joanna's father, guardian of his grandson Charles, who was declared heir of Aragon and Castile. He assumed the reins himself in 1517, and united to S. the Netherlands and Franche-Comté, which he had inherited from his father. In 1519 he was also elected emp. of Ger. During his reign S. reached the culmination of her prosperity. Vast conquests were made in Amer., and in Europe the S. armies defeated Fr., the Prot. princes of Ger., and the Turks. But liberty of any description was not tolerated. In 1556 Philip II. succeeded his father as king of S. Philip wished to rule over all Europe in order to propagate the true faith everywhere; but outside of S. he suffered several severe defeats. In 1581 he lost the Netherlands, and his contest with Eng. and the Barbary states was unfortunate. In 1599 Philip II. died, and was succeeded by Philip III., a weak and unsettled character. Under him the decline of the kingdom became singularly rapid. The minister, Count Lerma, entered into a close alliance with the Ch. The greatest error committed by his gov't. was the cruel expulsion of the Moriscos in 1609. Agriculture and industry were almost completely destroyed; large tracts of land became waste; all scientific research became stifled; but the clergy grew luxuriantly. In 1621 Philip IV. ascended the throne. He was entirely under the control of the clergy and his minister, the duke of Olivarez, and the country sank deeper and deeper. His son, Charles II. (1688-1700), was still more miserable. The decay of the country was nearly complete. A change for the better took place when at the death of Charles II. the Bourbon dynasty ascended the throne of S. and opened the way into the country for Fr. intelligence. Charles appointed Philip of Anjou, the grandson of Louis XIV., his successor, and he succeeded him as Philip V. Foreigners now decided all the most important affairs of the country, and although







**Spanish Grass.** See **ESPARTO.**

**Spanish Language and Literature.** The oldest known inhab. of Sp., the Iberians, a race of Ugro-Tartarian origin, coming from the N. parts of Asia and Europe, have left few distinct traces of their lang. in modern Sp. After a long and bloody war, they were conquered by invading Celts, who, united with their new subjects, became known as Celt-Iberians. The Phœnicians, who came by sea from their powerful colony of Carthage in Africa, founded Carthage, but the Romans drove them forever from Europe. The traces left by the Phœnicians in the pop. and lang. of Sp. are few and of slight importance. Lat. became the lang. of the favored prov. Lat. writers of eminence claimed Sp. as their native land, and Lucan and Martial, Columella and the 2 Senecas, with a host of others, bore evidence of the far-famed culture of Sp. The influence and popularity of Lat. derived new strength from the use of it by Christianity. This Lat. was, however, not classic Lat., but the *sermo rusticus*, the speech of the people, sadly corrupted by ignorance and admixture of foreign elements. For in the mean time a new race of N. barbarians had begun to invade Sp. The first tribes of this Ger. race, the Franks, Vandals, Alani, and Suevi, passed swiftly into Afr. The Goths, who succeeded them, had been converted to Christianity, and civilized in Italy, before they reached Sp., and as Visigoths established a beneficent reign. Their code of laws survived their memory, but their lang., a barbarous idiom, succumbed to the Lat. They played, however, sad havoc with the Lat. inflections, and thoroughly changed the gen. structure of that lang. Of comparatively trifling effect, as far as the lang. was concerned, was the invasion of the Arabs. During their long occupancy of Sp. they maintained numerous schools and libraries, which were frequented by Spaniards and Arabs alike. Arabic became the lang. of the majority of Spaniards; even the Scriptures had to be translated into it, and records and literary works were written in Arabic. Thus, when after 8 centuries, the Chr. Spaniards recovered possession of their native land, and the corrupted Lat. became once more the national lang., a considerable infusion of Arabic remained and gave to modern Sp. Oriental peculiarities. The new lang. became generally known as the *Castilian*. The oldest document in this lang. is a confirmation of privileges by Alfonso III. in the yr. 1155, and from that date Spanish begins its existence. By order of Alfonso X. (d. 1232) the Bible was translated into it from the Vulgate, and at the same time Sp. was made the lang. of all law proceedings and legal contracts.

The literature of Sp., as a national lit., begins only with the 12th century. As in the hist. of all nations, here also, poetry and, of all its branches, epic poetry, produced first permanent fruit, and playful songs and national romances became the representatives of the true national lit. of Sp. Adventures of love and achievements in war being the great topics of the day, these romances naturally sing mostly of love and war. The form varied, although they were generally written in *redondillas*, consisting of stanzas or couplets, each line containing 4 trochees. Rhymes occurred only in songs fashioned after Arabic models, and were then employed quite irregularly. Other romances, known as *versos de arte mayor*, consisted of dactylic stanzas of 11 to 14 syllables. Alexandrine verses and sonnets were mainly used by monks in their poems. The first and by far the most important of these works is *The Poem of the Cid*, composed about the yr. 1200. For a time the poems of the people remained anonymous, but already in the 13th century we meet with a well-known author, Gonzalo de Berceo (1290-60), who has left us a number of rhymed legends. A royal author, Alfonso X., surnamed *the Wise* (1221-84), was a true poet and a profound scholar, but his fame rests mainly on the great code of laws to which his labors gave the general character and finish—*Las Siete Partidas*. Juan Lorenzo Segura wrote toward the end of the 12th century a long poem on Alexander the Great, and Juan Ruiz, known as the archpriest of Hita (d. 1351), has left us poems, rather free in tone, but full of life and humor. In the mean time lyric poetry had brought forth its first fruits under the protection of King John II. of Castile. A courtly school of poets, following the example of the troubadours in the adjoining provs. of Fr., sprang up under that chivalric monarch and produced a large number of lyric poems. Divided into stanzas (*cançones*), they bore the impress of a strongly marked nationality in form and treatment. Cultivated almost exclusively by courtiers and knights, the *cançones* appealed only to certain classes of society; hence the popularity of the far more national ballads and songs, which kept the memory of the ancient glory of Sp. alive among the people at large. These romances, written by unknown authors, sang of the great deeds of chivalry performed by the paladins of Charlemagne or the Cid and his followers. They are extremely popular at home and greatly admired abroad.

Sp. poetry was not allowed long to remain independent of foreign influence. It. authors like Dante and Petrarch became the models which Sp. poets tried to imitate, and It. forms and measures were closely copied. Juan Boscan de Almogaver (d. 1543), after having in his youth written *Coplas Españolas*, tried his hand at the first sonnets in Castilian. His success was surpassed by that of his friend, Garcilaso de la Vega (d. 1536), whose genius excelled especially in pastoral poems. The most brilliant among the imitators of It. masters was Diego Hurtado de Mendoza (d. 1595); wrote sonnets and epistles after foreign models, and *redondillas* and *quintillas* in the anc. form of old Castilian verse. His *Cartas* are the first epistles in Sp. The 2 greatest lyric poets that Sp. has produced are Fernando de Herrera (d. 1575) and Luis Ponce de Leon (d. 1591). An Acuña (especially known as a translator) and a Gil Polo became more generally popular among the host of minor poets, while an attempt was made to counteract foreign influence and to bring back the old Sp. simplicity and national feeling. The

leader of this party was Castillejo (d. 1580?), whose love-songs are masterpieces. The 2 brothers Argensola (Bernardo, d. 1585; Bartolomeo, d. 1566) endeavored to imitate Horace directly, without following the example set by It. writers, while Vicente de Espinel (d. 1634) excelled in cançones and elegies. The gradual decline of poetry in the next century was aided by the division of poets into 2 schools—the Conceptistas, who resorted to metaphors and puns after the manner of It. *concetti*, and the Cultos or Cultoristas, whose endeavor to show a peculiarly high culture in form and thought led them into exaggeration and pedantry. The illustrious dramatist Lope de Vega wrote some of the best romances and sonnets that were produced during the reign of these 2 schools. The extreme affectation of Luis Góngora de Argote (d. 1627) makes him the representative poet of the Cultoristas. The most efficient resistance to this false taste was made by Francisco de Quevedo y Villegas. The writers of the 16th and 17th centuries endeavored either to imitate the anc. poems, or to regenerate poetry by imitating the works of the classic Fr. writers. The new dynasty of the Bourbons (1701) favored this tendency, and the brilliant talents of Ignacio de Luzan (1737) succeeded in applying the rules of Fr. critics to Sp. lit. The leader of his opponents, García de la Huerta (d. 1787), received immense applause for his poems written in the old Sp. form, but a number of men who in Salamanca formed a school characterized by moderation soon obtained the supremacy. Although the Fr. and the national party continued to contend for supremacy, the new school obtained great triumphs through men like Moratin (d. 1780), Cadalso (d. 1782), and Iriarte (d. 1791), whose *Fables* are a classic work in Sp.; while Melendez Valdez (d. 1807) surpassed all recent poets, and still enjoys universal admiration. The liberal and patriotic movements of the yrs. following Nap.'s downfall served to revive the national spirit and to give to lit. a more patriotic character. These influences infused new life into Sp. poetry, and the number of modern poets is very great, although but few of them have risen to eminence. This comparative failure is especially due to the cruel political persecutions to which almost every man of genius was subjected.

Epic poetry, as distinguished from the early romances, can hardly be said to have begun in Sp. before the days of Charles V. A nation possessed of such a vast treasure of popular ballads was not likely to encourage individual efforts, and the republication of the old national songs in the romancero made the competition still more difficult. The first epic poem of real merit is undoubtedly the *Araucana* by Alonso de Ercilla y Zúñiga (d. 1596). This remarkable work contains a graphic account of a military expedition sent out against the Araucanians, a tribe of S. Amer. Indians, in which the author took part. Its beautiful descriptions of natural scenery and the eloquent speeches which are plentifully inserted command admiration.

No trace of dramatic writing is found till the latter part of the 15th century. At that time the drama appears already under its double aspect—religious and humorous. A number of anonymous dramatic works, such as *Mingo Revulgo* (1472) and the *Celestina* (1490) were followed by the first Sp. dramas that were pub. They were written by Juan de la Encina (d. 1534). Gil Vicente (d. 1536) followed Encina's example in Port. The first comedias, so called, were produced by Naharro (d. 1517). He divided them not into acts, but into *jornadas* ("days"), and he introduced also the *gracioso* ("fool"). The true national drama of Sp. begins, however, only with the age of Charles V., after an interval during which the representation of dramas was forbidden by the Inquisition. It was Lope de Rueda (d. 1567) who re-established the popular drama. Juan de la Cueva (d. 1608) wrote a number of plays. Cristóbal de Virues (d. 1609) attempted to imitate the anc. Gr. masters in form and in spirit. Three tragedies by Luperco de Argensola (d. 1603) produced a great sensation. Cervantes wrote several dramatic works, which, however, were eclipsed by the greater achievements of the 2 great masters of the Sp. drama—Lope de Vega Carpio (d. 1635) and Calderon de la Barca (d. 1687). The former excelled in fertility, originality of conception, and promptness of execution. His rival, Calderon, was fully his equal in the number and value of his works, and his *autos* especially exhibit the imposing grandeur of Sp. religious zeal. These examples were followed by dramatic writers down to our day. Cándamo (d. 1709), Cañizares (d. 1750), and Zamora (d. 1732) are still favorites.

Sp. prose began early, Juan Manuel, duke of Peñafiel (d. 1362), having written in his *El Conde Lucanor* the first moral tales. Romantic novels abounded from the beginning, among which the *Amadís de Gaula*, perhaps by a Port., Vasco Lobeira (d. 1403). This led Miguel Cervantes de Saavedra (d. 1616) to write his immortal *Don Quixote*. His *Novelas Ejemplares* ("model novels") gave new vigor and great popularity to this branch of lit. It was much later when historical writings were developed, the Spaniards preferring their romances and ballads to prose-writings. In 1590, however, Perez de Hita pub. his famous *Hist. of the C. Wars of Granada*, which still holds its place by the side of Mendoza's *War of Granada*, and by Garcilaso de la Vega's (d. 1630) *Hist. of the Incas of Peru*. In more recent times this branch of lit. has become the most fertile, thanks to the tendency of Spaniards to turn from the sadness of their present condition to the glory of former days. (See GEORGE TICKNOR'S *Hist. of Sp. Lit.*) [From orig. art. in *J.'s Univ. Cyc.*, by PROF. SCHEIE DE VERE, LL.D.]

**Spanish Mackerel**, a name given to different kinds of fishes. (1) Along the E. coast of N. Amer. it is applied to the *Cybiom maculatum*, a very slender, compressed, fusiform fish, with many-rayed dorsal and anal fins, the lateral line slightly deflected under the second dorsal, and thence continued straight to the caudal fin, and the color bluish-green above, satin-like white below, with yellowish spots on the back and sides, and with the first dorsal fin blackish



before and along its margin. It attains a length of nearly 2 ft. (2) In Eng., along the Cornish coast, the name is conferred on the *Scomber colias*, a species nearly allied to the common mackerel, and having, like it, a stout fusiform shape, comparatively few-rayed dorsal and anal fins; the spinous dorsal has 7 spines, and there are 5 or 6 finlets above and as many below; the lateral line is slightly decurved and then straight, and the color dark-blue on the back, with irregular dark broad lines and grayish spots on the sides. It often reaches 14 inches or more in length. (3) The name is employed by Dekay and Storer for the *Scomber colias* or *Dekayi* in their works on the fishes of Mass. and N. Y.

**Spanish Main**, a name formerly applied to the S. part of the Caribbean Sea, through which the Sp. treasure-ships passed from Mex. and Central Amer. to Europe.

**Spanish War of Succession**. See SUCCESSION WARS.

**Span-Worm**. See CANKER-WORM.

**Spär**. See BARIUM, CALCAREOUS SPÄR, FELDSPÄR, FLUOR-SPÄR, and ICELAND SPÄR.

**Sparks** (JARED), LL.D., b. at Willington, Conn., May 10, 1789, grad. at Harvard 1815; was mathematical tutor there 1817-19, studying theol. meanwhile; became pastor of a Unit. ch. at Baltimore, Md., May 1819; was chosen chaplain to the U. S. House of Reps. 1821; conducted at Baltimore a periodical, *The Unit. Miscellany*, 1821-23; retired from the ministry on account of ill-health, and removed to Boston 1833; purchased the *N. Amer. Review*, of which he was sole ed. until 1830; pub. a *Collection of Essays and Tracts in Theol.* from various Authors, with Biographical and Critical Notices; issued a *Life of John Ledyard*; founded in 1830 *The Amer. Almanac*; edited for the U. S. govt. *The Diplomatic Correspondence of the Amer. Revolution*; pub. *The Writings of George Washington, with a Life of the Author*; *The Life of Gouverneur Morris*; conducted 2 series of a valuable *Library of Amer. Biography*, for which he wrote several of the lives; edited *The Works of Benjamin Franklin, with Notes and a Life of the Author*, and *The Correspondence of the Amer. Revolution*. Dr. S. was McLean prof. of hist. at Harvard 1839-49, and pres. of that inst. 1849-53. D. Mar. 14, 1866.

**Sparrow** [A. S. *spearwa*], a name applied in Eng. speaking countries to numerous small birds, chiefly belonging to the family Fringillidae. (1) The common S. of Britain is the *Pyrrhula domestica* or *Passer domesticus*. This is a rather strikingly colored bird. It is one of the most common and familiarly known of European birds, and is found all through Europe, as well as in N. Afr. and corresponding climatic regions in Asia. It is a sociable, fearless, and rather aggressive species, and seeks the haunts of men, being the most common bird of the cities. The species has been acclimatized in the U. S., and is now common in a number of cities. (2) Nearly allied to the common S. is the tree or mountain S. (*Pyrrhula montana*). In this the sexes are little differentiated. The species has not quite as extensive a range as the common S., and is comparatively rare in at least many parts of Britain. It is, on the whole, similar in its habits to its congener, but not so prone to settle in cities. It has been introduced into the U. S. to a small extent with the common S. All the indigenous Amer. "sparrows" have a more slender conic bill, whose lower mandible is as wide as the upper. The species to which the name is applied are numerous. The most familiar of these, at least in the E. States, is the *Spizella socialis*, called "chipping sparrow" or "chippy."

**Sparrow-Hawk**, a name given to several forms of the genus *Falco* and sub-genus *Tinnunculus*. They are comparatively small species, whose wings have each 2 primaries emarginated along their inner webs, the second to third longest, and the first shorter than the fourth; the tarsus longer than the middle claw; and the basal joints of the toes provided with transverse scutellæ; the color of the sexes is very different at all ages, but the old and young of each sex are alike. The common Amer. species is *Falco (Tinnunculus) sparverius*. It preys upon small birds as well as mice and reptiles. It breeds in the N. U. S. as well as farther N., and selects for its nest a hollow tree, in which it lays 5 to 7 dark cream-colored, nearly spherical eggs. It often makes incursions upon poultry-yards for chickens.

**Sparta**. The Greek name of the city signifies "sown land" (*σπαρτή*, so. γῆ), and it is characteristic of the city that it did not stand upon rocky heights, but upon a group of knolls, which are seen on the right bank of the Eurotas. The first glance at the surroundings makes it clear that the springing up of a city in this place was only accidental; it was the camp of the Dorians, who, coming from the N., gained a firm foothold first on this spot. The place was marked by an island which at this point divides the Eurotas into 2 arms, and thus forms a natural crossing. The centre of the Dorian city was upon the hill, whose S. slope still shows to view the imposing ruins of a marble theatre. Of all the hills this alone has a considerable level space at the summit, on which lay the sanctuary of the goddess of the acropolis, Athena Chalkioikos. The large space of low ground E. of the acropolis was occupied by the market-place, in which centred the traffic of all Laconia. A portion of this space, bearing the name Choros, was designed for the representation of festival dances. The most beautiful side of the market-place was formed by the Per. porch, the entablature of which was supported by figures of barbarians, among them portrait-statues of Mardonius and Artemisia. The market-place had 3 outlets. From the first led the street Aphetatis (i. e. "race-course," *κορσὸς*) toward the S. plain. By the second outlet was the Skias, a large pavilion-shaped rotunda, the work of Theodoros of Samos, arranged for assemblies. A third street led from the market-place past the theatre to the tombs of the Agiada. A hollow way passed through the group of hills to the Eurotas, where, extended the quarter of the Pitanate, esteemed the most beautiful and desirable portion of the city. Downstream, where the river-bank widened, stretched the dromos, constituting the training-school of the young Spartans.

Next to it was the so called Platanistas, where the young men executed their mock fights. To the left of the Eurotas extended the Menelaeon. The appearance of S. was different from all other Gr. cities. The situation is not imposing. The small hilly undulations by the Eurotas vanish in face of the enormous rocky walls of Taygetos, which rise steeply from the plain to a height of 7500 ft. No monuments exist which characterize the mistress of Hellas.

As S. was never destroyed in antiquity, and was uninhabited in the Middle Ages, it is reasonable to suppose that many antiquities will be found in the deep soil. Very remarkable reliefs of the old style have come to light in the last few yrs. Since the foundation of the kingdom of Gr. the capital city of the Eurotas Valley is no longer Mistra, situated near Taygetos, but has been removed again to the Eurotas, and New Sparta spreads itself out on the hills of the old city. [From orig. art. in *J's Unit. Cyc.*, by Prof. ERNST CURTIUS.]

**Sparta**, city, on R. R., Randolph co., Ill., 54 m. S. of St. Louis. Pop. 1870, 1305; 1880, 1754.

**Sparta**, R. R. June, cap. of Monroe co., Wis., in the heart of La Crosse Valley. Pop. 1870, 2314; 1880, 2387.

**Spartacus**, b. in Thrace, and ed. as a shepherd, became afterward chief of a gang of robbers, but was captured by the Romans, sold as a slave, and trained as a gladiator in a school at Capua. There he formed a conspiracy among the pupils, broke loose, gathered an army of runaway slaves, and opened the Servile War, 73 B. C., which took Rome 2 yrs to end, 71 B. C., and in which the city itself was more than once in imminent danger. He was killed in a battle 71 B. C., and his army cut to pieces and dispersed.

**Spartanburg C. H.**, R. R. June, cap. of Spartanburg co., S. C., contains Wofford Coll. and a female sem. Pop. 1870, 1080; 1880, 3253.

**Spasm**. See CHOREA, CONVULSIONS, EPILEPSY, HYSTERIA.

**Spathic Iron Ore**. See IRON ORES OF.

**Spaulding** (ELBRIDGE GERRY), b. at Summer Hill, Cayuga co., N. Y., Feb. 24, 1800, ed. at Auburn Acad.; studied law; was admitted to the bar in Genesee co.; removed to Buffalo 1834; became solicitor and counsellor in chancery, city clerk and alderman; was chosen mayor 1847, member of the State assembly 1848, M. C. 1849-51, and again 1859-63; State treasurer 1854-55; was member of the canal board and pres. of the Farmers' and Mechanics' Bank of Genesee at Buffalo.

**Spav'in** [It. *spavento*], certain swellings upon the hock-joint of the horse. In the parlance of the stable the name "spavin" is applied to 2 entirely dissimilar diseases. In "bog spavin" and "blood spavin" the swellings and lameness, if there be lameness, are due to undue secretion of *synovia* (the lubricating fluid of joints and parts subjected to friction) in the hock-joint or in the sacs which are located upon or near the hock. Bone S., or S. proper, is bony enlargement (exostosis) of the hock-joint, usually commencing at the lower part of the joint on the inside, and involving the heads of the splint and cannon bones, and of the small bones with which they articulate. It causes lameness, observable even in the early stages, and an imperfect action of the joint, gradually growing worse until finally the various bones become to a great extent united and solidified by the mass of fibrous bone which grows over them. The disease is caused by strains, to which the hock is particularly subject in work-horses drawing heavy loads, especially when starting them, and in race-horses and saddle-horses accustomed to leaping.

**Speaker of the House**, the presiding officer of the Brit. Houses of Parl., of the House of Reps. of the Cong. of the U. S., of the lower houses of State legislatures, etc. In the parliamentary bodies of many of the Brit. colonies the name and office of S. are also retained. In Eng. the title was first applied to Sir Thomas Hungerford in 1376, S. of the Commons. The lord chancellor is usually the S. of the House of Lords. In the U. S. House of Reps. the S. presides over the deliberations of that body, appoints its committees, supervises its journal, certifies to the amount of compensation due its members, signs its bills, resolutions, writs, warrants, subpoenas, etc., and appoints 3 regents of the Smithsonian Inst. He votes in cases of ballot, and has a casting vote in some other cases. He is chosen by the House from its own number, and can be removed from office by the House.

**Spear** (SAMUEL THAYER), D. D., b. at Ballston Spa, N. Y., Mar. 14, 1812, grad. as a M. D. Apr. 15, 1839, at the Coll. of Phys. and Surgeons in New York; studied theol. under Rev. Dr. Beman of Troy, N. Y.; ordained and installed over the Second Presb. ch. of Lansingburg, N. Y., 1835; in 1848 accepted a call from S. Presb. ch., Brooklyn, N. Y.; in 1870 became one of the eds. of *Independent*. Wrote *The Family Power, Religion and the State*, etc.

**Spear-mint** (*M. viridis*), a species of *Mentha* or mint, is frequently cultivated for the sake of its leaves, which are used as the chief ingredient in mint-sauce and in juleps; also for the volatile oil.

**Specific Gravity**. See GRAVITY, SPECIFIC.

**Spectacles** [Lat. *spectaculum*], a device for the improvement of defective sight, the invention of which is variously ascribed to Alexander da Spina of Florence, or to his contemporary and fellow-townsmen, Salvinus Armatus (d. 1317); also to Roger Bacon (d. about 1292). But it is more probable that the knowledge of them in Europe came through the Saracens Allazeni (d. 1088). The Chi., we are told, have for ages employed S. for the relief of defective eyesight. S. are of various kinds. For long-sighted (presbyopic) persons, whose imperfect vision is due to too great flatness of the lens and cornea, either plano-convex lenses or menisci are employed. Both of these magnify objects and render near objects more distinct. Near-sighted S. (for the use of myopic persons, whose whose cornea and crystalline lens are too convex) are either plano-concave, concavo-concave, or, in the case of the so called periscope glasses, the front is slightly convex and the inside deeply



concave. Plane glasses, colored blue, green, or smoky, are used by persons with eyes too sensitive to the light. Of late, considerable attention has been given to the examination of each eye, and the careful adaptation of each lens to the needs of the eye it is to serve; since it is very common, especially in myopic or near-sighted persons, to find different degrees of abnormality in the 2 eyes.

**Spectre**, applied to animals. See LEMUR.

**Spectroscope** [Lat. *spectrum*, "image," and Gr. *σκοπεῖν*, to "see"], an instrument designed for the formation and examination of spectra. By its means the light from a body, at whatever distance, can be made to show its chemical composition, phys. conditions, and motion.

**Newton's Experiment.**—If a beam of sunlight entering a darkened room be made to pass through a triangular prism of glass at the proper angle, the rays will be refracted out of their course, the different colors taking slightly divergent paths; if a white screen be now placed so as to receive the refracted beam, there will be formed upon it an elongated band of colored light, red at one extremity and violet at the other, with the remaining hues of the rainbow—orange, yellow, green, blue, and indigo—arranged in order between them. This colored band is called the solar spectrum.

**Projection of the Spectrum.**—The spectrum formed in this way is impure. But if the light be admitted only through a very narrow slit placed parallel to the edge of the prism, and then, before reaching the prism, be passed through a convex lens so adjusted that if the prism were absent it would form a distinct image of the slit upon the screen, we shall get a pure spectrum, with each tint completely isolated from every other.

The collimator is a tube closed at one end by a plate of metal perforated with a narrow slit, and at the other by a convex lens whose focal length equals its distance from the slit. The S. consists of 3 parts—a collimator (Fig. 1, C), a prism or train of prisms (P), and a small telescope to which the eye is applied in observation (T).

**Chemical Application.**

—The earliest use of the S. was in chemical analysis; by its means already 5 new elements have been discovered—the metals thallium, cesium, rubidium, indium, and gallium. The substance to be examined is introduced into the flame of a so called Bunsen burner, or used as one of the electrodes, between which a stream of electric sparks is made to pass, or placed between the carbon poles of an electric lamp under the action of a powerful continuous current, or finally, if gaseous, inclosed in a glass tube and illuminated by means of an induction coil.

**Application to Astronomy.**—It has been attempted to make the S. give quantitative results, and in other phys. sciences it has also important applications; it furnishes a delicate method of detecting blood even in the minutest quantity, and is also very valuable in technical applications. But it is in the domain of astronomical science that the S. has achieved its greatest triumphs.

**Chemical Constitution of the Sun.**—Its very first application was to the chemical analysis of the sun. In the dark lines of the solar spectrum Kirchhoff read clearly the names of many elements with which we are familiar upon the earth. Iron, titanium, calcium, manganese, nickel, cobalt, chromium, barium, sodium, magnesium, copper, hydrogen, and zinc are plainly indicated, and sulphur, cerium, strontium, aluminum, and iridium are pretty certain. These were the first fruits.

**Constitution of Stars.**—It has to a certain extent revealed also the chemical constitution of many of the stars, and has shown that they resemble the sun, with specific differences, each star presenting its own peculiar spectrum.

**Sun-Spots.**—It has confirmed the belief that the solar spots are cavities, and revealed the nature of the dense clouds of absorbing vapors which fill them.

**Nature of the Solar Prominences.**—By its means in 1868 the strange "red protuberances" which had been observed around the disk of the moon during a total eclipse of the sun, were shown to be immense clouds or flames thrown out from the sun and floating in its upper atmosphere—masses composed in the main of hydrogen gas.

**Nature of the Solar Corona.**—In 1869 the S. gave the first decisive evidence as to the nature of the sun's corona, by showing that its spectrum is characterized by a vivid line in the green; thus proving it to be constituted, in part at least, of some glowing gas, and therefore of solar and not lunar or terrestrial origin.

**Nature of the Nebulae.**—It has shown that some of the nebulae, at least, are gaseous masses, and not far-off groups of closely crowded stars.

**Self-luminosity of Comets.**—Directed upon the comets, it proved that they shine not merely by reflected sunlight, but with a brightness of their own.

**Atmosphere of Planets.**—It reveals to us in the atmospheres of our nearest neighbors, Mars and Venus, the vapor of water, and suggests phenomena and habitudes not unlike those of our own aerial ocean—shows that they may be habitable worlds like ours. On the other hand, it shows certain strange markings in the atmospheric spectra of Jupiter, Saturn, and Uranus, which indicate an extremely different air from ours.

**Motions of the Stars.**—Lastly, it measures certain movements of the solar atmosphere and of the stars—motions of

approach or recession with reference to the earth. If the source from which the light subjected to the examination of the S. proceeds has a motion either toward or from the instrument, then for any given ray the number of pulsations per second which reach the slit will be altered, and the position of the corresponding line in the spectrum will be changed; if the body be approaching us, all the lines in its spectrum will be displaced toward the blue end of the spectrum, and vice versa. [From orig. art. in *J.'s Univ. Cyc.*, by Prof. C. A. YOUNG, LL.D.]

**Spectrometer** [Lat., in optics, a colored image arising from the dissociation of a ray of light into its constituent tints. There are 2 modes of obtaining such images: (1) by dispersion, the prismatic S.; (2) by diffraction, the grating S. (See SPECTROSCOPE.)

**Spectrum Analysis.** See SPECTROSCOPE.

**Speculum** [Lat. "mirror"], **Speculum Metal**, or **Specula of Silvered Glass.** S. in optics and astron. signifies a reflecting surface, usually of metal, though the term has also been frequently applied to unsilvered glass since 1857. As the image formed by a concave S. is on the same side of the mirror as the object, some arrangement is necessary to prevent the observer's head obstructing the passage of light to the S., and hence we have 4 different forms of reflecting telescope: (1) the Herschelian or Le Mairean, in which the S. is so tilted as to bring the image to one side of the telescope tube; (2) the Gregorian, in which a secondary concave S. returns the rays through an aperture in the primary S. to the eye of the observer; (3) the Cassegrain, in which a convex secondary S. is used for the same purpose as the concave of the Gregorian; and (4) the Newtonian, in which a plane S. or right-angled reflecting prism turns the beam of light out to the side of the tube. The specula used in reflecting telescopes are of 2 kinds: (1) Those made of an alloy of copper and tin; (2) those of glass covered with a film of silver, about  $\frac{1}{500000}$  of an inch thick on the side turned toward the object. These latter must not be confounded with looking-glass mirrors, which are coated with tin-amalgam on the posterior side. Ever since the introduction of silvered glass, there has been an animated controversy as to its utility compared with S. metal, but it seems as if the balance had inclined finally to the former. A silvered S. is permanent; for even though the silver coating be tarnished, it may readily be repolished, or, if injured by dampness, be replaced without affecting the figure of the glass; it is many times lighter, and therefore demands less weight in the mounting, and is correspondingly more manageable; it is more reflecting, in the proportion of about 92 to 65, and in consequence a smaller aperture will give an equal brilliancy to objects, this being a great advantage in an unsteady atmosphere. Of course, under favorable atmospheric conditions the larger aperture will give greater penetrating power, but nothing prevents the construction of a glass mirror of as large dimensions as any S. For these reasons it is not expedient to describe at length the processes for casting S. metal. It is sufficient to say that it is composed of copper and tin in the proportion of 32 to 14.91; that it must be cast on a chill—that is, a slightly warmed iron surface; and that it must be annealed with the greatest care and for a long time.

**Speech.** See LANGUAGE.

**Speed** (JOHN), b. at Farrington, Cheshire, in 1552 (or 1542), pursued the business of a tailor in Lond., but at the same time was amassing an extensive knowledge of Eng. antiquities. He pub. anonymously about 1590 a treatise on the *Genealogies of the Scripts*, and in 1608 printed a collection of 54 maps of various countries, cities, and engravings of antiquities of Eng. and Wales, which were incorporated into *The Theatre of the Empire of G. Brit.* (folio, 1611). In the same yr. he pub. his *Hist. of G. Brit. under the Conquests of the Romans, Saxons, Danes, and Normans*. D. July 28, 1629.

**Speke** (JOHN HANNING), b. at Jordans, Somerset, Eng., May 4, 1827, entered the Brit. army 1844; served in India and in the Crimean war; accompanied Capt. Richard F. Burton in the expedition which resulted in the discovery of the great lakes in Central Afr., and afterward was at the head of another expedition (with Capt. Grant), which discovered the connection of the Nile with those lakes; pub. a *Journal of the Discovery of the Source of the Nile and What Led to the Discovery of the Source of the Nile*. D. Sept. 15, 1884.

**Spelman** (SIR HENRY), b. at Congham, Norfolk, Eng., in 1562, ed. at Walsingham School; grad. at Trinity Coll., Cambridge, about 1580; studied law at Lincoln's Inn, but devoted himself chiefly to archaeology; was in 1604 high sheriff of Norfolk; was employed by James I. upon important commissions, especially in determining land titles in Ire.; was knighted about 1612; pub. *De Non Temerandis Ecclesiis; of the Rights and Respects due to Churches*. Wrote *Glossarium Archæologicum, Concilia, Reliquia Spelmaniana*, etc. D. 1641.

—His son, SIR JOHN, was knighted 1641; edited the *Saxon Pealer and a Life of Alfred the Great*. D. July 25, 1643. EDWARD SPELMAN pub. a translation of Xenophon's *Anabasis* and of the *Rom. Antiquities* of Dionysius Halicarnassus. D. in 1767.

**Spelt**, the *Triticum spelta*, probably the far of the anc. Roms. and the *zea* of the Grs., is a grain of the wheat genus; it can be grown on poorer soils than are required for wheat. Lesser S., or St. Peter's corn (*Triticum monococcum*), called also "one-grained wheat," is raised on poor soils in Europe.

**Spelter**, name for zinc in pigs or blocks. (See ZINC.)

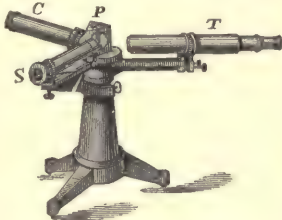
**Spencer**, Ind. See APPENDIX.

**Spencer**, on R. R. and Little Sioux River, cap. of Clay co., Ia. Prin. business, farming and stock-raising. Pop. tp. 1870, 594; 1880, 1392, including 824 in v.

**Spencer**, on R. R. Worcester co., Mass., 11 m. S. W. of Worcester. Pop. tp. 1870, 3952; 1880, 7466.

**Spencer** (AMBROSE), LL.D., b. at Salisbury, Conn., Dec. 13, 1765, grad. at Harvard Univ. in 1789; studied law; represented Columbia co., N. Y., in the State legislature 1798; appointed assistant atty.-gen. 1798; atty.-gen. 1802-04; became

FIG. 1.





a justice of the supreme court in 1804, and chief-justice 1819-23; member of the State constitutional convention 1821; was elected M. C. 1829-31; held the office of mayor of Albany; presided at the Whig national convention at Baltimore in 1844. D. Mar. 13, 1848.

**Spencer** (GEORGE E.), b. in Jefferson co., N. Y., Nov. 1, 1835, ed. at the coll. of Montreal, Canada; was admitted to the bar in Ia. 1856, sec. of the Ia. senate 1858; entered the Union army as capt. 1862; became adjutant-gen. of volunteers; recruited the 1st Ala. Cav. 1863; commanded a cav. brigade under Sherman 1864; was brevetted brig.-gen.; became register in bankruptcy in Ala. 1867; was chosen U. S. Senator as a Rep. 1868, and re-elected for the term expiring in 1879.—His wife, Mrs. BELLA Z. SPENCER, b. in Lond., Eng., about 1840, to whom he was married in 1862, was the authoress of *Ora, the Lost Wife, Tried and True, a Story of the Rebellion, and Surface and Depth*. D. Aug. 1, 1867.

**Spencer** (GEORGE JOHN), D. C. L., SECOND EARL SPENCER, b. at Wimbledon, Eng., Sept. 1, 1758, grad. at Cambridge about 1776; entered Parl. under the courtesy title of Lord Althorp 1780; was com. of the treas. 1782; succeeded his father in the earldom Oct. 31, 1782; became ambassador to Vienna, lord privy seal, and first lord of the admiralty 1794; resigned the latter office 1802; accepted the secretaryship of state for the home dept. for a few months in 1806; was the first pres. of the Roxburghe Club, formed for the reprinting of rare English books 1812, and accumulated one of the rarest and most costly private libraries in Europe. D. at Althorp Park Nov. 10, 1834.—GEORGE SPENCER, his youngest son, b. in Lond. Dec. 21, 1799, grad. at Cambridge 1819, and took orders in the Ch. of Eng.; joined R. Cath. Ch. 1830; was ordained priest 1832; took charge of the missions of W. Bromley and Dudley; entered the order of Passionists 1846; known as "Father Ignatius." D. Oct. 1, 1864.

**Spencer** (HERBERT), b. in Derby, Eng., Apr. 27, 1820, was attracted to nat. hist.; devoted himself chiefly to math., and in 1837 began work as a civil engineer. After this he was engaged several yrs. on R. Rs., but gave his spare time to inventions, scientific experiments, mathematical studies, and to writing for the *Civil Engineer's and Architect's Journal*; in 1842 contributed a series of letters to the *Nonconformist on The Proper Sphere of Govt.*; pub. his first book, *Social Statics*, a treatise on social science based upon the conception of the evolution of society through the operation of natural laws; took up the occupation of a writer, and from 1850 to 1860 pub. a series of essays, mainly devoted to the elaboration and application to various important subjects of the principle of evolution; wrote in 1855 *The Principles of Psychology*, in which work the doctrine of evolution was applied to the science of mind, and the ground was taken that mental faculties in the whole scale of animal life have been developed by experience, through the intercourse of living organisms with their surroundings, through the principle of heredity and variation, producing slow modifications in vast periods of time; in 1858 he reached the conclusion that evolution is a universal process dependent upon the laws of matter and force conformed to by all orders of phenomena and capable of being resolved and formulated. Believing that the time had come to attempt a comprehensive scheme of thought from the point of view of modern scientific results, Mr. S. resolved to undertake it. He began his work by drawing up the prospectus of a *System of Philos.* involving the full working out of the law of evolution and its application to the phenomena of life, mind, society, and ethics. The *Philos.* was divided into 2 parts: (1) *The Unknowable*; (2) *The Laws of the Knowable*. In the first part it is argued that in its knowing the human mind cannot transcend phenomena, but that it cannot escape the consciousness of an Unknowable Power, of which all phenomena are the manifestations, and which human thought can never grasp or understand. The initial treatise, *First Principles*, was pub. 1862; it is occupied with the foundations of his scheme, in which the law of evolution is broadly worked out and formulated in terms of matter, motion, and force. In 1867 he completed the *Principles of Biology*, devoted to the data and inductions of biological science from the point of view of evolution as expounded in *First Principles*. In 1872 appeared the *Principles of Psychology*, an exposition of mental science grounded in biology and in accordance with the theory of evolution. The fourth division of his system is the *Principles of Sociology*, outlined to occupy 3 vols. The same plan is here pursued as in the previous divisions, the data of the subject being first treated, to be followed by the inductions or general principles of social science derived from them, and elucidating the conditions and course of social evolution. The closing division of his undertaking will work out the *Principles of Morality*, and deduce the rules of human conduct from the laws of life, of mind, and of man's social relations. Independent of his "system" proper, but ancillary to the *Principles of Sociology*, he several yrs. ago drew up the plan of a series of publications under the title *Descriptive Sociology*, designed to be a comprehensive repository of facts representing the characters of human societies of all types and grades. Mr. S. visited the U. S. from Aug. to Nov. 1882. [From orig. art. in *J.'s Unit. Cyc.*, by PROF. E. L. YOUNG, M. D.]

**Spencer** (JESSE AMES), D. D., b. at Hyde Park, N. Y., June 17, 1816, grad. at Columbia Coll. 1837; studied theol. at the General Sem. of the P. E. Ch.; was ordained 1840; was rector of St. James's ch., Goshen, N. Y., 1840-42; travelled in Europe 1842-43, and again 1848-49, at which time he visited Egypt and Pal.; was prof. of Lat. and sec. of the Epis. S. S. Union and Ch. Book Society 1851-57; declined the vice-presidency of Troy Univ. 1858; was rector of St. Paul's, Flatbush, L. I., 1863-65, and has been prof. of Gr. in the Coll. of the City of New York since Oct. 1869. Wrote *Hist. of the Eng. Ref., Hist. of the U. S.*, etc.

**Spencer** (JOHN), D. D., b. at Bocton, Kent, Eng., in 1630, ed. at the King's School, Canterbury; grad. at Corpus

Christi Coll., Cambridge, about 1650; obtained a fellowship there 1652; took orders in the Ch. of Eng.; became rector of Landbeach, master of Corpus, and archdeacon of Sudbury 1667; prebendary of Ely 1672, and dean of Ely 1677. Author of *A Discourse concerning Prodiges, Dissertatio de Urim et Thumacum, and De Legibus Hebraeorum Ritibus et eorum Rationibus*. D. May 27, 1685.

**Spencer** (JOHN CANFIELD), LL.D., son of Chief-Justice Ambrose, b. at Hudson, N. Y., Jan. 8, 1788, grad. at Union Coll. 1806; was private sec. to Gov. D. D. Tompkins 1807-08; admitted to the bar at Canandaigua 1809; became master in chancery 1811, judge-advocate-gen. on the N. frontier 1813, P. M. at Canandaigua 1814, assistant atty.-gen. for W. N. Y. 1815, M. C. 1817-19, member State assembly 1819-30, being speaker the latter yr.; State senator 1824-28; com. to revise the statutes of N. Y. 1829; special atty.-gen. to prosecute the murderers of William Morgan; was sec. of state and sup. of common schools 1839-41; sec. of war under Pres. Tyler from Oct. 1841 to Mar. 1843, when he was transferred to the treas. dept.; resigned the latter post 1844 in consequence of his opposition to the annexation of Texas, and thenceforth devoted himself to practice of law. D. May 18, 1855.

**Spencer** (JOHN CHARLES), THIRD EARL SPENCER, better known as LORD ALTHORP, b. May 30, 1782, ed. at Harrow and at Trinity Coll., Cambridge; was elected to Parl. 1804; held office under Fox as junior lord of the treas. from Feb. 11, 1806, to Mar. 1807; sat in Parl. for the co. of Northampton from Dec. 1806 till the passage of the Reform bill 1832, being one of the leading members of the opposition; prominent in the attacks upon the financial policy of the Tory administrations; was chancellor of the exchequer in the cabinet of Earl Grey Nov. 1830 to Nov. 1834; was ministerial leader of the House of Commons during the debates on the successive Reform bills; succeeded his father as Earl Spencer Nov. 10, 1834, after which he devoted himself to scientific agriculture; was the first pres. of the Royal Agricultural Society 1838; vice-chairman of the Society for the Diffusion of Useful Knowledge. D. Oct. 1, 1845.

**Spencer** (JOSEPH), b. at E. Haddam, Conn., 1714, chosen judge of probate in 1753; was major in the N. army under Col. Whiting 1758; appointed brig.-gen. in the Continental army June 22, 1775, maj.-gen. Aug. 9, 1776; assisted in the expedition against R. I. 1778, also in Sullivan's retreat; resigned his command June 14, 1778; was elected to Cong. in 1779, and the following yr. saw him elected into the council, of which he had been a member in 1766; and to this office he was re-elected annually until his death, Jan. 13, 1789.

**Spencer** (WILLIAM ROBERT), son of Lord Charles Spencer and grandson of the second duke of Marlborough, b. in Eng. in 1769, ed. at Harrow and at Ox.; was for some yrs. a com. of stamps; became involved in pecuniary difficulties, and consequently fixed his residence in Paris, where he d. Oct. 23, 1834. Wrote *Beth Geierl and Too Late I Stayed; Urania, or the Illuminé, a Comedy, and The Year of Sorrow*, and translated Bürger's *Lenore*. Two of Mr. S.'s sons became bps.: AUBREY GEORGE, b. in Lond. Feb. 12, 1795, bp. of Newfoundland 1839, and of Jamaica 1839. D. Feb. 24, 1872.—GEORGE TREVOR, b. 1801, bp. of Madras 1837-49, became chancellor of St. Paul's cathedral 1860, and rector of Walton 1861. D. July 16, 1866.

**Spencer Rifle**, a breech-loading magazine gun, extensively used as an arm for the Union cav. during the war in the U. S., is characterized by having in the butt of the stock a magazine holding 7 cartridges, which are brought one by one into the chamber by a movement of the trigger-guard as a lever, which at the same time throws out the shell of the exploded cartridge.

**Spener** (PHILIPP JAKOB), b. at Rappoltsweiler, Upper Alsace, Jan. 25, 1635, studied theol. at Strasburg, Tübingen, and Bâle; began to preach at Strasburg in 1663; was appointed first pastor in 1666 at Frankfurt, where he instituted his famous *collegia pietatis* (prayer-meetings); became preacher to the electoral court of Dresden in 1686; was invited in 1695 to Berlin, where he was appointed provost of the ch. of St. Nicolai. He was the founder of the so called *pietism*, conceiving Christianity principally as a living duty and comfort, not as a science, and simply recommending his hearers to look at the Bible in the light of their own lives, and then to look at their lives in the light of the Bible. He wrote *Pia Desideria, Das geistliche Priesterthum, Des thätigen Christenthums, Nothwendigkeit, Evangelische Glaubenslehre*. D. Feb. 5, 1705.

**Spenser** (EDMUND), b. at E. Smithfield, near the Tower, London, Eng., in the year 1552; entered as a sizar at Pembroke Hall May 20, 1569, in which month he wrote a number of sonnets and epigrams; grad. Jan. 16, 1573; fell in love with a lady, whose charms he celebrated under the name of "Rosalinde" in a pastoral poem, *The Shepheard's Calendar*; printed soon afterward *Three Proper and Witty Familiar Letters lately passed between Two Universities Men* (1580); obtained in the autumn of 1580 the post of sec. to Lord Grey of Wilton, lord lieut. of Ire.; rendered in that capacity services which were rewarded in 1586 by a grant from the crown of an estate forfeited by the earl of Desmond, where he took up his residence and began the composition of his *Faerie Queene*; wrote in that yr. his *Astrophel*, a pastoral elegy on the death of Sir Philip Sidney; was in 1588 appointed clerk of the council of Munster; received in 1599 a visit from Sir Walter Raleigh, who persuaded the poet to accompany him to Lond. The publication of the first 3 books of the *Faerie Queene* in 1590 placed him in the front rank of poets. During this visit to Lond. he also pub. a vol. of *Complaints, containing Sundrie Small Poems of the World's Vanitie* (1591). His marriage in 1594 to a Miss Nangle inspired his love-sonnets entitled *Amoretti* and an *Epithalamium* (1595), which were shortly followed by *The Second Part of the come Home Again*. In 1596 he pub. *The Faerie Queene, containing the Fourth, Fifth, and Sixth Bookes, Faerie Queene, containing the Fourth, Fifth, and Sixth Bookes, and Four Hymnes*; he also presented the queen a MS. dialogue, *A View of the State of Ireland*, not pub. until 1633. S.



was appointed in 1598 sheriff of the co. of Cork, thus incurring the enmity of the insurgents of "the earl of Tyrone's rebellion," who toward the close of that yr. burned his house and plundered his estate, forcing him to fly to Eng. Reduced to poverty, S. passed a few miserable months in Lond., and d. Jan. 1, 1599.

**Speran'sky** (MIKHAIL), COUNT, b. in the govt. of Vladimir, Rus. Jan. 1, 1772, ed. at the Acad. of St. Petersburg, where he principally studied math. and physics, in which he became prof. in 1797; was appointed sec. to the imperial council in 1801, and charged with the reorganization of the ministry of the interior, the committee on laws, and the imperial council; carried through several improvements in the method of taxation, the system of public education, etc., but was banished in 1812 to Nizhne-Novgorod, and afterward to Perm. In 1814 he was allowed to settle on a small estate near St. Petersburg, and in 1816 he re-entered the public service; was made gov. of the prov. of Penza in 1817; gov.-gen. of Siberia in 1819; was recalled to the court in 1821, and made pres. of the chancery in 1825. His work, *Précis des Notions historiques sur la Réformation du Corps des Lois russes*, acquired a great reputation. D. Feb. 23, 1839.—His daughter, ELIZABETH BAGRIEW-SPERANSKY, b. at St. Petersburg Sept. 17, 1799, wrote *Les dernières Heures de l'Empereur Nicolas and Les Pèlerins russes à Jérusalem*. D. at Vienna Apr. 4, 1859.

**Spermace'ti** [Lat. *sperma*, "sperm," and *cetus*, "whale"], **Spermace'ti Fat**, or **Cetine**, exists ready formed in the cavities of the head of the sperm whale, and also in that of some other whales and of *Delphinus edentulus*. It crystallizes out of the sperm oil of the head-cavities after the vital heat is lost, forming a magna or mirole, from which in cold weather the sperm oil is expressed by hydraulic pressure, the S. being left behind. It is purified by melting it by steam to separate mechanical impurities, and recrystallizing. It then forms a lustrous, pearly, white mass of eminent crystalline texture, feeling soft and soapy to the touch; does not grease paper if quite freed from oil; is brittle; melts at 100°-116° F. If pure, it is without taste or odor, and reacts neutral. S. finds its chief use in the production of sperm candles. It burns with a bright, clear flame like wax. The standard sperm candle, which is the common unit of comparison for photometric experiments in G. Brit. and Amer., is taken to burn 120 grains of sperm in an hour.

**Spermatozo'a** [Gr. σπέρμα, "seed," and ζῶα, "living creatures"], minute animalcules found in the semen of living creatures, which are the essential agents in producing the fecundation of the ova. They consist of a small flattened oval extremity or body, to which is attached a long slender caudal filament; and in the centre of the body a little spot may be detected. They appear to be in constant motion in the seminal fluid, the movements being performed by a lashing or undulatory motion of the tail.

**Sperm Oil**. See OILS and SPERMACE'TI.

**Spermophile**. See PRAIRIE SQUIRREL.

**Sperm Whale**, or **Cachalot**, kash'a-lot, *Physeter macrocephalus*, a gigantic toothed cetacean hunted for the oil, the spermace'ti, and ambergris which it yields. Unlike the right-whale family, it affords no whalebone. The common cachalot has a wide geographical range. It may be said to inhabit all seas, except those near the poles, although most abundant in the S. hemisphere. The cachalot sometimes attains the length of 70 or 80 ft. The head is enormous, forming about one half of the entire bulk of the animal. The body tapers from the head to the tail. The color is dark gray, nearly black on the upper parts, but lighter beneath. Old males, or bull-whales, have a large gray spot on the front of the head. The muzzle is obtuse, as if suddenly cut off in front. In a protuberance on the front surface of the head is the blow-hole, which is single, and situated a little on the left side. The mouth is very large, and the throat is sufficiently wide to admit the body of a man. The upper jaw projects beyond the lower, and is destitute of teeth and whalebone; the lower jaw has from 20 to 25 teeth on each side. The dorsal fin is represented by a protuberance half way between the neck and the tail; and these parts are seen above water in the ordinary swimming of the animal. The pectoral fins are small, and seem scarcely to aid in progression, which is accomplished by the large and powerful tail-fin, which is very broad, and is divided into 2 lobes, called flukes. The head is in part occupied by a cartilaginous cavity in front of and above the skull, called by whalers the *case*, which is the chief receptacle for spermace'ti. This substance being light, the animal raises its head above the surface of the water. The case frequently holds as much as 10 large barrels of spermace'ti. The substance is a semi-fluid, but hardens on cooling; it consists of spermace'ti and oil; the oil is separated by draining and squeezing. Squids and cuttle-fishes appear to be its chief food. Its herds are called *schools* or *pods* by whalers. Five hundred or more have been seen in a single herd. Large herds generally consist of females, with a few males; herds of young males also occur; solitary individuals are almost always old males. Terrible conflicts take place among the males.

**Spe'zia**, or **La Spezia**, town of It., prov. of Genoa, on a Gulf of the same name. The construction of a great naval arsenal was begun here in 1861, and carried on with much energy and at an expense of about \$9,000,000. The Gulf of Spezia is formed by an offshoot of the Apennines, which forms the finest harbor in It. Pop. 30,732.

**Sphag'nium** [Gr. σφάγνιον], a large and interesting genus of mosses, several species of which grow in the U. S., mainly in bogs, forming deep, spongy masses, almost always damp. They are called peat-moss, being a prin. ingredient in pure peat. Peat-moss is best material for packing plants for transportation; retains moisture, and never heats or putrefies.

**Sphag'idæ** [Gr. σφίγξ "wasp"], a family of hymenopterous insects, including the well-known sand-wasp, so called

because all the females make their nests in the sand. The abdomen is connected by a slender stem with the thorax; the antennæ are filiform, and the feet adapted for digging. The species are numerous, of moderate size, and generally decorated with gay colors, often being banded with yellow. They are armed with a powerful sting; by means of this sting they provide food for their young. The victims (caterpillars, spiders, etc.) are paralyzed by the poison transmitted by the sting, and remain in a torpid condition until the young hatched from the eggs are ready to devour them. *Sphex ichneumon* is one of the largest and most common in the U. S. This family also contains the mud-wasps. (See DAUBEN.)

**Sphenograms**, or **Cuneiform Characters**. See CUNEIFORM INSCRIPTIONS.

**Sphere** [Gr. σφαῖρα], a volume bounded by a surface all of whose points are equally distant from a point within called the *centre*. It may be generated by a semicircle revolving about its diameter as an axis. Any line from the centre to a point of the surface is a *radius*, and any line drawn through the centre and limited by the surface is a *diameter*; all radii of the same S. are equal; also all diameters of the same S. are equal. Every plane section of a S. is a circle; if the plane passes through the centre, the section is called a *great circle*; if it does not pass through the centre, the section is called a *small circle*; the radius of a great circle is equal to that of the S.; the radius of a small circle may have any value from the radius of the S. to 0, in which case the cutting plane merges into a tangent plane.

**Spher'ical Angle**, an angle included between arcs of 2 great circles intersecting on the surface of a sphere.

**Spherical Lune**, a portion of the surface of a sphere included between 2 great semicircles. The angle between the planes of the semicircles is the angle of the lune.

**Spherical Polygon**, a portion of the surface of a sphere bounded by arcs of 3 or more great circles, called sides; if S. P. has but 3 sides, it is a spherical triangle. In a spherical triangle the sum of the 3 angles is always greater than 2 right angles, and less than 6 right angles.

**Spherical Pyramid**, a portion of a sphere bounded by a spherical polygon, called the *base*, and by 3 or more circular sectors with centres at the centre of the sphere.

**Spherical Trigonometry**, that branch of trigonometry which explains the method of solving spherical triangles when 3 parts are given.

**Spherical Zone**, a portion of the surface of a sphere included between 2 parallel planes. The lines in which these planes cut the surface of the sphere are the bases of the zone, and the distance between the planes is the altitude of the zone.

**Spher'ograph** [Gr. σφαῖρα, "sphere," and γράφειν, to "write"], an instrument for solving by inspection numerous practical questions in spherics, such as arise in navigation, geodesy, etc. It consists of 2 concentric circular paper disks, the upper one transparent, and capable of being turned around upon the centre as it lies upon the face of the lower disk. Suitable lines and figures are drawn upon each disk, the lines varying according to the special use of the instrument. Readings are obtained by rotating the upper disk upon its centre to a certain point indicated in the data of the problem to be solved.

**Spher'oid** [Gr. σφαῖρα and εἶδος], a volume resembling a sphere, and which may be generated by an ellipse revolving about one of its principal axes. If the ellipse is revolved about its conjugate axis, it generates a flattened volume called an *oblate S.*; if it revolves about its transverse axis, it generates an elongated volume called a *prolate S.*

**Sphingidæ**. See HAWK-MOTHS and LEPIDOPTERA.

**Sphinx** [Gr. σφίγξ], the combination of the body of a lion with a human or animal head, called in Egyptian *hu* or *akur*. Those with the human head (*androsphinx*) according to the Gr. represented the union of intellect and force, and the inundation in the time of the constellations Virgo and Leo; but in reality they symbolized gods or kings, of which their face was the portrait. The most remarkable S. is that placed before the second pyramid of Gizeh, sculptured partly out of the solid rock of the Libyan chain of hills, 40 ft. high above them, 51 ft. from the belly to the top of the head, and 110 ft. long. It is possibly as old as the 4th dynasty, and contemporaneous with Saffra or Chefn, the builder of that monument.

The myth of the S., which first appears in Hesiod, was especially Theban. The S. was supposed to have been brought by the anger of Hera to that part of Gr. from the farthest parts of Ethiopia. She lays waste the country and destroys many of the inhabs, whom she devours. This she was supposed to do by proposing a riddle for their explanation in her song called *Alyros*. The riddle asked was, What animal walks on 4 legs in the morning, 2 at noon, and 3 in the evening? This Œdipus explained as man, who crawls on all-fours in the morning of life, walks erect in the meridian of his days, but is compelled to use a stick in his evening or declining yrs. As a reward for his interpretation, Œdipus received the crown of Thebes and married Jocasta—unfortunately his own mother. [From orig. art. in *J.'s Univ. Cyc.*, by S. BIRCH, LL.D.]

**Spice** [remotely from the Lat. *species*, "kinds"—i. e. kinds of goods, put for the most highly esteemed of goods], a gen. name for certain aromatic seeds, barks, roots, dried fruits, etc., used in cookery for their flavoring qualities, and in med. as stimulants and carminatives. Such are cloves, ginger, allspice, nutmeg, pepper, mace, capsicum, cinnamon, cassia, etc.

**Spice Bush**. See FEVER BUSH.

**Spice Islands**. See MOLLUCCAS.

**Spid'er**. The Araneina, or S. proper, have mandibles formed exclusively for biting, a more or less spherical abdomen, which is not divided into segments, and this abdomen is attached to the cephalothorax by a slender pedicel. They perform their respiration by means both of lungs and



tracheae, and they undergo no metamorphosis in coming to maturity. The mandibles end in a powerful hook, in the end of which there is an opening to a duct which connects with a poison-gland situated in the head. The palpi resemble shorter legs; they are in fact the maxillae. In the female they are simple, but in the male the terminal joint is modified so as to be a sexual organ. Most species of *S.* have 8 ocelli, but some have only 6, some have only 2, and certain cave species are said to be blind. One of the most curious things about *S.* is their silk-spinning apparatus. On the abdominal extremity there are from 4 to 6 protuberances, each of which is perforated with a great number of minute holes—in some species as many as a thousand in each protuberance. From these minute holes passes the adhesive fluid or liquid silk, which has its origin in internal reservoirs; and as soon as the fine streams of this material come to the air they harden into silk. The eggs of *S.* are inclosed in cocoons spun from the same kind of material of which they construct their webs, and the form of the egg-cases or cocoons varies according to the species. The young remain in the cocoon for a long time, and grow to double the size which they have when hatched, apparently without food.

**Spider Crab**, a name given to several short-tailed decapod crustaceans or true crabs. Such are *Maia squinado* (Maiaide) and *Lithodes maia* (Homolidae) of Europe, and *Libinia canaliculata* of N. Amer. Atlantic waters, and others.

**Spiegelhaas** (F.). See APPENDIX.

**Spike** [Lat. *spica*], in bot., is a flower-cluster, of the centripetal order, in which sessile flowers are arranged along a lengthened axis. The spadix, ament, and cone are varieties of the spike.

**Spike-nard**, or **Nard** [Gr. *vápoc*; Lat. *nardus*, *spica nardi*; Heb. *nerd*; Sans. *nalada*, "perfume-giver"], (1) in the *E. the Nardostachys jatamansi*, a valerianaceous plant of India. Its strong odor is disagreeable to most Europeans, but it is considered very precious in the *E.* Its medicinal properties are precisely those of valerian. (2) Valerian roots of various species are exported from Europe to the Levant under the name of Frankish nard, Celtic nard, and mt. nard. Cretan nard is also valerian root. These are much used in the *E.* as substitutes for the true *S.* (3) In Eng. the fragrant oil of *Andropogon nardus*, an *E. I.* grass, is called oil of *S.*, and is used in perfumery. (4) In the U. S. the name *S.* is given to *Aralia racemosa*, and the *A. nudicaulis*, or false sarsaparilla, is called small *S.* They have each a limited use in domestic med.

**Spike, Oil of**, the volatile oil of *Lavandula spica*, the broad-leaved lavender of Europe. It has an odor much like that of oil of turpentine. It is used by artists in preparing their varnishes, and by veterinarians as a horse-medicine.

**Spinach**, or **Spinage**, the *Spinacia oleracea*, a chenopodiaceous Old-World herb, much cultivated as a potherb. There are several varieties.

**Spinal Curvatures**, two kinds—(1) lateral curvature; (2) angular curvature. Lateral curvature is a deviation of the spinal column at one or several points from the position which it occupies in health in the median line of the back. It occurs in children, in young, imperfectly developed, feeble, and growing adults, more especially women, and less often in men. Habitual use of one arm to the exclusion of the other may cause deviation of the spine, a common occurrence in weakly children at school, housemaids, and in some confining mechanical vocations. Disease of one lung, as phthisis, chronic pneumonia, pleuritic adhesions, and chest contraction, by limiting respiratory movement on one side, often causes curvature. Shortening of one limb, hip-joint disease, persistent limping from any cause, by tilting the pelvis, throw the spine out of centre and develop curvature. Lateral curvature is curable by correcting bad habits, as favoring one side in standing, sitting, or sleeping, resort to light gymnastics and special passive movements, and the use of apparatus. General tonic treatment, cod-liver oil, and phosphates, out-of-door life, warm clothing, stimulating baths, and regulated diet are indicated in all cases.

Angular curvature is of more serious nature. It is termed Potts's disease, and is usually an expression of a tubercular or scrofulous blood-taint. Exceptionally, it may arise in previously vigorous persons, starting from a local injury of the vertebrae, followed by disintegration. Caries of the spine usually develops a local abscess; the pus may finally point under the skin of the back or side, or travel around to the front of the abdomen, appearing as a soft tumor in the groin, or even below the flexure of the thigh; in these latter positions erroneously taken for hernia. The early arrest of angular curvature is secured in various ways—by rest on the side, with ice-bags to the irritated congested spine, rest with extension and counter-extension; but, when admissible, the plaster-of-Paris bandage may be applied to the body, and the patient may exercise. Cod-liver oil, phosphates, Peruvian bark, iron, and concentrated diet are to be faithfully administered. When abscess has developed, it may be "aspirated"—subcutaneously removed by needle-tube and pump. Where angular curvature is fully developed, apparatus is employed to place the body erect, remove the angular protrusion in the back, and permit the spinal column to become "anched" or rigidly united.

E. D. HEDSON.

**Spinal Diseases**. See INFANTILE PARALYSIS, MENINGITIS, PARAPLEGIA, PROGRESSIVE MUSCULAR ATROPHY, SPINAL CURVATURES, TABES DORSALIS.

**Spinel** [Fr. *spinnelle*], a mineral, of which the finest specimens, often very beautiful, are employed as gems. It is an impure anhydrous aluminate of magnesia, sometimes white or black, but commonly of some red tint.

**Spinello** (ARETINO). See ARETINO (SPINELLO).

**Spin'ner** (FRANCIS ELIAS), b. at German Flats (now Mohawk), Herkimer co., N. Y., Jan. 21, 1802, was successively apprentice to a confectioner in Albany and to a saddle

and harness maker at Amsterdam, N. Y.; read all the books in the circulating library at the latter place, giving especial attention to natural science; became in 1824 a merchant at Herkimer; was deputy sheriff of Herkimer co. 1829-34, and sheriff 1835-37; was chosen lieut. of militia 1825; passed by election through all the intermediate grades up to maj.-gen. of the third division of art. 1834; was appointed in 1838 com. for building the State lunatic asylum at Utica; accepted the cashiership to the newly organized Mohawk Valley Bank at Mohawk; was subsequently pres. of that inst. and for 30 yrs. was its executive officer; was auditor and deputy naval officer of the port of New York 1845-49; was a Dep. member of the 34th Cong., sitting on the committee on elections, on the special committee to investigate the assault upon Senator Sumner, and on the famous "conference committee" that disagreed on the army appropriation bill; was an original member of the Rep. party, and re-elected by it to Cong. in 1856, and again in 1859; chairman of committee on accounts 1859-61; treas. of the U. S. from Mar. 1861 until July 1875.

**Spin'ning**, the art of producing from vegetable or animal fibres an even and compact thread suitable for sewing or weaving. It is one of the most anc. of industries, and still practised in many parts of the globe by the spindle and distaff in the same manner that the process is pictured on Egyptian monuments.

**Spinola**, spee'no-lah, de (AMEROSIO), MARQUIS, b. in Genoa, It., in 1569, took service at an early age under his brother, an admiral in the Sp. navy; participated in the war against the Dut. and Eng. 1588; raised and equipped a corps of veterans, at whose head he proceeded to the Sp. Netherlands 1603; became chief commander of the Sp. armies in Flanders 1603; effected the capture of Ostend after a siege of 3 yrs., Sept. 1604; conducted the war until the truce of 12 yrs. (1609), which he favored; commanded in the interval the Sp. forces in Ger.; took Aix-la-Chapelle, Wesel, and Jülich 1622; was repulsed from Bergen-op-Zoom 1623; captured Breda after a protracted siege 1625; was subsequently commander of the Sp. army in It. D. Sept. 25, 1630.

**Spinollic Acid**. See SALICYLIC ACID.

**Spinosa**, spe-no'zah (BARUCH), (BENEDICT), [Sp. *D'Espinoza*], b. Nov. 24, 1632, at Amsterdam; a member of the Portuguese-Jewish community at that place, then the chief seat of European Judaism; enjoyed a good education; entered upon the customary path of a Jewish scholar, passing through all the steps of the ordinary rabbinistic school, from the elements of Heb. to the holy writings of the O. T., thence to the Talmud, the Jewish commentaries, and the scholastic writers of the Middle Ages; became a sceptic, and had no other resource left than the so called "pantheism" of Substantiality. This rupture with Jewish theol. brought about a dispute between him and his rabbinistic teachers, which finally led to his expulsion from the synagogue at Amsterdam (July 1656). S. changed his name from Baruch to Benedict Spinosa, and when he discovered that he was still persecuted, he retired to the country-house of a friend in the vicinity of Amsterdam, with whom he lived in deep seclusion from 1656 to 1661. He subsequently accompanied him to Rynsburg, where he remained till 1664, in May of which yr. he removed to Voorburg, where he remained in the house of the painter Tydenau till 1669. He then, at the entreaty of his friends, removed in 1671 to the Hague, where he remained till his death, on Feb. 21, 1677.

The ground of the extraordinary interest taken in S.—while Leibnitz, in all respects so infinitely his superior, remains comparatively unnoticed—is to be found in the pantheistic view of the universe which he has carried out in the completest of extant forms in his *Ethica*. S.'s view of the other works of S. claim special notice. Hence, none of the universe may be very concisely described as follows: Taking hold of the category of substantiality, he altogether abandoned the Jewish conception of a First Cause, and adopted in its place the Oriental notion of an unconscious substance of the universe as a whole, of which all the separate phenomena of that universe were but so many attributes. In his scheme there was no God, no Freedom, no Immortality.

**Spinozoism**. See SPINOZA.

**Spirit-Buck**. See GARROT.

**Spirit, Holy**. See HOLY GHOST.

**Spirit Lake**, Ia. See APPENDIX.

**Spirit Plant**. See HOLY-SPIRIT PLANT.

**Spirit-Rapping**. See SPIRITUALISM.

**Spiritualism** expresses the doctrine of those who believe that communion between this world and the next is a reality. S. may be said to date from Mar. 31, 1848. On evening of that day, in a small village in W. N. Y., a family of Ger. ancestry, who had been disturbed for several months with inexplicable noises, discovered, in the knockings that had alarmed them, an element of intelligence. They obtained pertinent answers to various questions by raps.

Spiritualists hold that if we admit the probability of another life of which the present is a novitiate, we must also admit the likelihood that means should be afforded us to obtain assurance touching a world for which we have to prepare ourselves. They allege, further, that experimental proof in regard to these matters is needed to arrest the increase of scepticism. They do not believe in miracles, asserting that natural law is universal, invariable, persistent, and that all spiritual epiphanies are natural phenomena. There can, of course, be no unbelievers in another world among Spiritualists, but as regards the person and office of Christ there is, for the present, diversity of opinion. As a general rule, Spiritualists do not regard Christ as one of the Persons of the Godhead, but a large number among them may be called Christian Spiritualists, while others term themselves radical. The former regard Christ with reverence as the great spiritual and ethical Teacher of mankind; the latter speak of him but as one of the anc. philosophers. Spiritualists, as a rule, reject the idea of a personal devil.



Some believe in the occasional agency and influence of evil spirits, amounting, now and then, to what might be called possession; while others hold that such influences may, in almost all cases, be explained by human agency. Both, however, agree in this—that spiritual communications are by no means infallible, and that great care should be taken to accept nothing, come whence it may, until it has been submitted to the scrutiny of reason and conscience.

There are certain leading principles on which all Spiritualists substantially unite. They are: (1) This is a world governed by a God of love and mercy, in which all things work together for good to those who reverently conform to his eternal laws. (2) In strictness there is no death. Life continues from the life which now is into that which is to come, even as it continues from one day to another. (3) The earthly phase of life is an essential preparation for the life which is to come. (4) The phase of life which follows the death-change is, in strictest sense, the supplement of that which precedes it. (5) Our state here determines our initial state there. (6) We do not, either by faith or works, earn heaven, nor are we sentenced, on any day of wrath, to hell. (7) There is no instantaneous change of character when we pass from the present phase of life. (8) The sufferings there, natural sequents of evil-doing and evil-thinking here, are as various in character and in degree as the enjoyments, but they are mental, not bodily. There is no escape from them except only by the door of repentance. (9) In the next world love ranks higher than what we call wisdom, being itself the highest wisdom; there deeds of benevolence far outweigh professions of faith; there simple goodness rates above intellectual power; there the humble are exalted; there the meek find their heritage; there the merciful obtain mercy. (10) A trustful, childlike spirit is the state of mind in which men are most receptive of beneficent spiritual impressions; and such a spirit is the best preparation for entrance into the next world. (11) There have always existed intermundane laws, according to which men can occasionally obtain, under certain conditions, revelations from those who have passed to the next world before them. (12) When the conditions are favorable, and the sensitive individual through whom the manifestations come is highly gifted, these may supply important materials for thought and valuable rules of conduct. In their highest phases they furnish proof of the reality of another life better and happier than this. (13) The chief motives which induce spirits to communicate with men seem to be—a benevolent desire to convince us that there is a world to come; the attraction of unpleasant memories, such as murder or suicide; sometimes the earth-binding influence of cumber and trouble; the divine impulse of human affection, seeking the good of the loved ones it has left behind. (14) Under unfavorable or imperfect conditions spiritual communications often prove vapid and valueless; and this chiefly happens when communications are too assiduously sought or continuously persisted in, brief volunteered messages being the most trustworthy.

While there is very little variance of opinion among the enlightened class of Spiritualists as to the above propositions, there are local differences as to other matters of speculation, one of which is of a remarkable character. The majority of Fr. Spiritualists seem to have adopted a phase of the old Pythagorean doctrine of transmigration of souls, believing in pre-existence and re-incarnation; while on the other side of the Brit. Channel such a belief scarcely finds a place, nor has it been accepted, except perhaps by an insignificant minority, in the U. S.

There are some 8 or 10 periodicals in the U. S. devoted to the cause of S., the 2 having the largest circulation being the *Banner of Light*, issued in Boston, and the *Religio-Philosophical Journal*, pub. in Chicago. [From orig. art. in *J.'s Univ. Cyc.*, by HON. ROBERT DALE OWEN, LL.D.]

**Spiritualists.** See SPIRITUALISM.

**Spit-head**, the name by which is known the important roadstead off Portsmouth, Eng., being the E. portion of the sea-channel separating the Isle of Wight from the Eng. main. Its security as an anchorage confers upon it paramount importance in reference to the naval power of Eng. and to the defence of her coast.

**Spitting of Blood.** See HÆMOPTEYSIS.

**Spitzberg'en**, a group of 3 large and several small islands, situated midway between Greenland and Nova Zembla, and the northernmost known land on the globe. The islands are mountainous, the peaks often rising between 4000 and 5000 ft., and mostly covered with perpetual snow and ice. Only along the shore between the ocean and the mts. are in some places found patches of land, where during the 2 summer months, when the thermometer rises 5° above the freezing-point, the snow melts and a few herbs appear. The mts. contain granite, marble, and coal. Bears, reindeer, and foxes are found, and innumerable whales, seals, and sea-fowl gather along the shores.

**Spitz Dog** [Ger. *Spitz*, "pointed"], a small variety of the Pomeranian dog, which is thought to be a cross between some of the Arctic wolf-dogs and the Arctic fox, like the Esquimaux, Siberian, Lapland, and Iceland dogs. It is characterized by short and erect ears, a pointed muzzle, a curved bushy tail, and long hair, usually pure white.

**Spint** (Ger.), a bony growth, generally upon the inside of the fore leg of the horse, below the knee. It is usually caused by overworking a young horse.

**Spitzgen**, a mt.-pass of the Alps leading from the Swiss canton of the Grisons into It. over an elevation of 6939 ft. It is on the It. side covered at many places with galleries of solid masonry to protect travellers from avalanches.

**Spoford** (AINSWORTH R.), LL.D., b. at Gilmanton, N. H., Sept. 12, 1823, became prin. librarian of Cong. 1865, after having been previously employed in publishing and editing; is a member of many historical and philosophical societies; has written much for the press, and enjoys a wide fame for the universality of his knowledge, which he renders very

serviceable to members of Cong. and to students generally. He has pub. *Catalogues of the Library of Cong.*, *The American Almanac and Treasury of Facts* (1878-83), *The Library of Choice Literature* (1881), etc.

**Spohr**, spör (LUDWIG), b. at Brunswick, Ger., Apr. 5, 1784. His father was a phys. His masters on the violin were Maurer and Eck; visited Rus.; in 1804 began his professional career in Ger.; was concert conductor under the duke of Saxe-Coburg-Gotha; in 1813 was in Vienna, in 1816 in It., in 1817 in Frankfurt and Lond. A residence of some yrs. in Dresden followed, and continued till he was called to the office of chapel-master at Cassel. As a violinist he has scarcely been equalled. He composed in nearly every style. His best pieces are the symphony *The Conservation of Tones* and the oratorio *The Last Judgment*. D. Oct. 22, 1859.

**Spokane Falls**, W. T. See APPENDIX.

**Spole'to** [Spole'tium], town in Italy, prov. of Perugia, about 60 m. N. N. E. of Rome, on a slight elevation, the crater of an extinct volcano. The old castle, whose foundations date from the time of Theodorice, is the most striking object to be seen in S. The old Rom. arched gateway, known as the Porta della Fuga, is, according to Livy, a monument of Hannibal's time. The grand Palazzo Comunale has a tower of the 11th century. The number of less important ruins is very large. Pop. 21,507.

**Spondias**. See HOG PLUM.

**Sponges** [Gr. σπγγρία] belong to the animal kingdom. They (Fig. 1) consist internally of a mass or layer of mesoderm containing a number of true cells, and have an ectoderm and endoderm of cellular tissue. The exterior is perforated by innumerable pores leading into channels in the interior, which enlarge and join with groups of neighboring channels, forming large branches. These in turn form junctions with other branches, and finally all of them unite into one or several large trunks, which open outward like minute craters on the external surface. These are

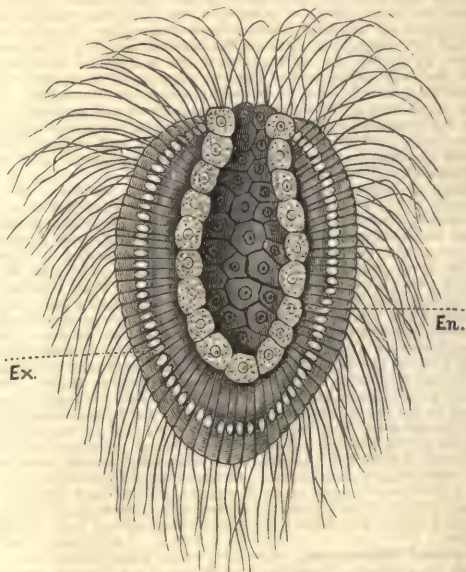
FIG. 1.



*Tethya gravata*, Hyatt (N. S.).

lined with another membrane, of minute cells furnished on the free side with a long whip or flagellum surrounded by a collar. Their interiors contain a nucleus and digestive vacuoles. They take in and digest food in the same manner, and eject excrements in great profusion from the area inclosed by the membranous collar. The eggs and spermatozoa are derived from modified cells of the mesoderm, whereas the skeleton is either built up partly from the external membrane and partly from the sarcodae by exogenous

FIG. 2.



Gastrula of *Luculmis echinus*, Haeckel: En, endoderm; Ex, ectoderm. (From *American Naturalist*.)

growth, or by the transformation of the loose cells of the sarcodae into spicules. The function of the smaller external pores is to admit the water, which is thus strained and deprived of its coarser floating material. It is then carried along the canals by the motion of the cilia, and conveys its load of minute food to the ampullaceous sacs and zooidal cells. The hydraulic pressure occasioned by the inward

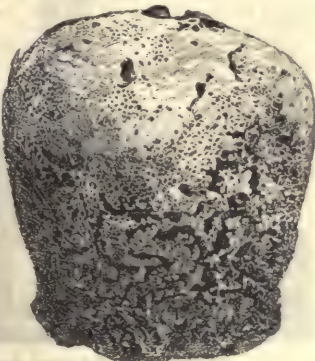


flow of the innumerable minute streams forces it through the larger trunks and out at the craters or ostioles with great rapidity. The excrements of the zooidal cells and other fecal matters are thus cast out of the ostioles at such a distance from the body that they are not affected by the inward currents through the pores, and are carried away by the water. They have true eggs, derived from the mesodermic layer. These undergo segmentation, and a single layer of cells is formed around the exterior. Those on one hemisphere of the lava of the *Calci-spongia* speedily acquire the collars and flagellil and elongated forms of the mature zooidal cells, but those of the other hemisphere remain simple. The next stage is a gastrula made by the invagination of the simple-celled membrane (Fig. 2). Subsequently, the opening of the bag-like stomach becomes filled again by an extension or evolution of the same cells, and the lava penetrates through the endoderm into the channels, and from thence into the water. The *S.* are hermaphroditic, developing both eggs and spermatozoa in the same individual. Beside this means of propagation, they also possess another class of reproductive bodies known as gemmules, which are usually protected by a leathery or horny case, in most cases strengthened by spines or spicules of various shapes. These contain a cellular mass. The earlier stages of the development of the gemmule are not well understood, but the result is the same as in the development of an egg, the first form of the *S.* being a body with a ramifying cavity and ostiole, permeated on the sides by pores leading into a system of canals and ampullaceous sacs.

The structural evidence leads to the following anomalous conclusions: that the *S.*, though developed like other individual animals from a single egg or bud, eventually acquires a membrane, either partially or wholly lining the interior, which is partly composed of cells functionally and structurally homologous with flagellate Infusoria. It is therefore in its simplest adult form homologically a single animal with the internal structure and functions of a colonial organization. This transmutation is so complete that the distinguishing characteristic of the group, the water-systema with its innumerable pores and oscules, and all the modifications of the form and skeleton, are directly subordinate to the function of supplying the zooidal cells with floating food of suitable size and the efficient exportation of the excrements.

When living, the commercial *S.* have the general aspect of a piece of beef's liver, but the color is darker. They are

FIG. 3.



Aspect of a specimen of *Spongia corlosia* (yellow sponge) when dried, before the animal matter is washed out. Near the top of the figure the outer membrane, ectoderm, is unbroken except by the pores and the large ostioles, but below it is much torn.

When living, the commercial *S.* have the general aspect of a piece of beef's liver, but the color is darker. They are gathered by means of hooks on long poles, or directly by the hands of divers, or, as in case of some of the coarser kinds, dragged up roughly by dredges. When secured they are exposed to the air for a limited time, either in the boats or on shore, and then thrown in heaps into the water again, in pens or tanks built for the purpose. Decay takes place with great rapidity, and they are soon fished up again and the animal matter squeezed and washed out, leaving the cleaned skeleton ready for the market. In this condition, after being sorted, they are sold to the dealers, who have them trimmed, re-sorted, and put up in bales or on strappings ready for exportation. The order Silicoides has the greatest range in all respects. Those forms like *Venus's* flower-basket excel all others in the beauty and regularity of their spun-glass skeletons. They are found on all kinds of bottom, in all climates and at all depths, in both salt and fresh water, and contain the only species known to occur in situations periodically exposed to the air. They are best known by the mud-dwelling forms belonging to the sub-order Hexactinellæ, or spun-glass *S.*, so called on account of the long fibres, which spring out in all directions from the base of the mass, and serve to anchor them in the mud. These are almost exclusively found in the deeper waters and on muddy bottoms. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. A. HYATT.]

**Spontaneous Combustion.** Before an ordinary body will unite with oxygen in the energetic manner, attended usually with evolution of both light and heat, which is commonly known as *combustion*, it must be heated to a certain point. Frequently, however, this union begins without any external influence, and it is then called *spontaneous combustion*. Phosphorus will often take fire at the temperature of the hand on account of its affinity for oxygen, and it is this same readiness to combine with oxygen which causes spontaneous combustion in the case of other bodies, so that anything which will increase it will increase the tendency to such combustion. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. H. B. CORNWALL.]

**Spontaneous Combustion of the Human Body.** There are very grave doubts in the minds of the best scientific authorities whether the human body is, under any conceivable circumstances, liable to inflame spontaneously. The analogy between cases of *S. C.* in vegetable or mineral materials and cases of so called *S. C.* of the human

body fails in several important particulars. Those who believe in its possibility urge that the human body is largely made up of hydrocarbonaceous materials—oils and fats—which are highly inflammable; that under certain circumstances, and as the result of long-continued habits, another highly combustible substance, alcohol, may be largely distributed throughout the tissues, not only increasing the natural combustibility, but forming an inflammable atmosphere around the body by its evaporation from the surface; and that as a result of the varied and rapid chemical processes of life it is quite possible that heat enough may be engendered to inflame the tissues, or that, as the result of these chemical changes, gases may be evolved or formed which inflame at a very low temperature, or even spontaneously upon coming in contact with the air, or which may be inflamed by some electrical influence.

On the other hand, while admitting the combustibility of the body when dried, we must remember that about 70 per cent. of it consists of water, so distributed as to repress combustion in its inception, and that experiments show conclusively that the human body (undried) is a very incombustible substance, even when thoroughly impregnated with alcohol. We must also consider that the chemical processes going on in it, although varied and rapid, cannot be proved to evolve such an amount of heat as to make it probable that the combustion could be spontaneous, even if the material to be consumed were highly inflammable; and, finally, that the production and distribution throughout the tissues of spontaneously inflammable, or even of highly combustible gases, is a theory resting only upon the fact that the materials out of which these gases might be formed exist in the living body, and not upon a demonstration of their formation. [From orig. art. in *J.'s Univ. Cyc.*, by S. B. ST. JOHN, M. D.]

**Spontaneous Generation.** See GENERATION, SPONTANEOUS.

**Spoonbill** (the bill of the European kind is sometimes made into a spoon), a name applied to several birds of the heron family and of the genus *Plataea*, remarkable for the curious shape of the large bill. The windpipe has a singular convolution.

**Spoon'er** (ALDEN JERMAIN), b. at Sag Harbor, L. I., Feb. 2, 1810, became a resident of Brooklyn, where he edited the *Evening Star* and the *Long Island Star*; contributed for many yrs. to the *Knickerbocker* and to *Colman's Magazine*, and was ed. of *Furman's Notes, Geographical and Historical, relating to the Town of Brooklyn*, and Wood's *Sketch of the First Settlement of the Several Towns on L. I.* D. Aug. 2, 1881.

**Spore** [Gr. σπόρος, "seed"], a small embryo-cell or cell-mass produced by cryptogamous plants, and functionally representing the seeds of the higher plants, while structurally it more nearly corresponds with the pollen-cell of the higher vegetation. *S.* are often so fine as to be quite invisible to the naked eye. Familiar examples of *S.* are the "spawn" of mushrooms, the inflammable dust of *Lycopodium*, and the "smoke" of the common puff-ball.

**Spotswood, or Spotswood** (JOHN), b. in Scot. in 1565, was ed. at Glasgow, and in 1601 went to Fr. as chaplain to the Scot. ambassador; in 1603 was made abp. of Glasgow and a member of the privy council for Scot.; in 1615 was made abp. of St. Andrew's and primate of Scot. In 1638 he crowned Charles I. at Holyrood, and in 1635 became chancellor of Scot. He drew great obloquy on himself for the active part he took in the prosecution of Lord Balmoring, his personal enemy. In 1637 he endeavored to introduce the new liturgy and book of canons into Scot., urged on by the king and Laud, and, as is said, contrary to his own wish. Deposed from his bishopric by the assembly convened at Glasgow in Nov. 1638, excommunicated, and declared infamous, he fled to Lond., where he d. Nov. 26, 1639. Wrote a *Hist. of the Ch. of Scot.*

**Spot'swoode** (WILLIAM), LL.D., F. R. S., b. in Lond., Eng., Jan. 11, 1825, grad. at Balliol Coll., Ox., 1845; gained univ. mathematical scholarships 1846 and 1847; became manager of the office of the queen's printer; devoted much study to Oriental langs. and philos., as well as to astron., math., art, and the phys. sciences; is a contributor to scientific periodicals, Eng. and foreign; was public examiner in math. at Ox. 1857-58, afterward examiner, under the civil service commission, for the Society of Arts, and for the middle-class schools, and became treas. of the Royal Society 1871. Author of *Meditations Analyticæ, Elementary Theorems relating to Determinants, A Tarantasse Journey through E. Rus.*, and *The Polarization of Light*. D. June 27, 1883.

**Spottsylvania C. H. Battles.** See WILDERNESS.

**Sprague, W. T.** See APPENDIX.

**Sprague, sprāg** (CHARLES), b. at Boston, Mass., Oct. 26, 1791, ed. at the Franklin School, Boston; became a mercantile clerk at 13, partner with his former employer 1816, teller in the State Bank 1820, and cashier of the Globe Bank from 1825 to 1868. He early displayed a talent for poetry; delivered a Phi Beta Kappa poem, *Curiosity*, at Cambridge 1829, and a centennial ode at Boston 1830, on the 20th anniversary of the settlement of that city. D. Jan. 14, 1875.

**Sprague** (PELEE), LL.D., b. at Duxbury, Mass., Apr. 28, 1793, grad. at Harvard Univ. 1812, and at once entered Litchfield Law School; was admitted to Plymouth co. bar Aug. 1815; practised several yrs. in Augusta, Me., and afterward settled in Hallowell; was a member of the Me. legislature 1820-21, M. C. 1825-29, U. S. Senator 1829-35; removed to Boston in 1835; U. S. dist. judge of Mass. 1841-65. He pub. *Speeches and Addresses, Decisions*, etc. D. Oct. 13, 1880.

**Sprague** (WILLIAM), b. at Cranston, R. I., 1800, was a member of the assembly and speaker in 1822; M. C. 1836-38, gov. of R. I. 1838-39, Senator 1842-45, and subsequently again member of the State assembly. D. Oct. 19, 1851.

**Sprague** (WILLIAM), b. at Cranston, R. I., Sept. 12, 1830, engaged in the print works established by his grandfather, and carried on by his father and uncle; was gov. of R. I. 1860-63; in 1861 offered a regiment and a battery to the



Pres., with which he took the field, having a commission as brig.-gen.; was present at the battle of Bull Run, and in several other actions during the Peninsular campaign; in 1862 was chosen U. S. Senator, and was made chairman of the committee on manufactures; was re-elected in 1868, his term closing in 1875, and served as chairman of the committee on public lands.

**Sprague** (WILLIAM BUELL), D. D., b. at Andover, Conn., Oct. 16, 1796, son of Benjamin Sprague, a farmer, and descended from the Spragues of Duxbury; grad. at Yale 1815; was tutor in the family of Major Lawrence Lewis in Va. 1815-16; grad. at Princeton Sem. 1819, in which yr. he settled at W. Springfield, Mass., as colleague pastor with Rev. Dr. Joseph Lathrop over the First Congl. ch.; became pastor 1821; was installed pastor of the Second Presb. ch. at Albany, N. Y., 1826, retaining that post until 1869; visited Europe 1828 and 1836; made the most extensive collection of religious pamphlets and of autographs known in Amer., the former of which he presented to the N. Y. State library at Albany; was widely known as possessing a most exact biographical knowledge of Amer. celebrities, especially clergymen. In 1869 he settled at Flushing, L. I., where he d. May 7, 1876. Wrote *Lectures illustrating the Contrast between True Christianity and various other Systems, Aids to Early Religion*, etc. The great work to which the labor of a life was given was the *Annals of the Amer. Pulpit*.

**Sprain** [O. Fr. *espreindre*], a stretching or wrenching of a joint, without displacement of the bones, and either with or without lesion of ligaments or tendons. Severe S. are sometimes quite as serious and lasting in their effects as dislocations. Perfect rest, cold or sometimes hot lotions (if the latter be more agreeable to the patient), with the use of splints for mechanical support and opiates to relieve pain, are required in the treatment. The removal of swelling and stiffness may be hastened by "massage," gentle and protracted kneading.

**Sprat**, or **Garvie**, the *Harengulus sprattus*, a little herring of the European seas. S. are spiced, salted, dried, and potted in many ways, and are very good fresh, but are generally eaten by the poorer classes. The S. is seldom over 6 inches long.

**Sprat** (THOMAS), b. in Devonshire in 1636, was ed. at Ox., where he was made D. D.; became chaplain to the duke of Buckingham, and afterward to Charles I.; prebendary of Westminster in 1668, dean in 1683, and bp. of Rochester in 1684. He was a member of the ecclesiastical commission created by James II., and read the famous declaration of indulgence in Westminster Abbey. He took the oath of fealty to William and Mary. He was one of the first members of the Royal Society; wrote a *Life of Cowley*, a *Hist. of the Royal Society*, an *Account of the Rye-House Plot*, and poems. D. May 30, 1713.

**Spreng'er** (ALOYS), b. at Nasserent in the Tyrol Sept. 3, 1813; studied med., natural science, and Oriental langs. at Vienna; went in 1836 to Lond., where he assisted the earl of Munster in his work on the *Military Science of the Mohammedan Nations*; entered the service of the E. I. Co.; pres. of the coll. of Delhi, lecturing in Hindostani on logic, math., political economy, etc.; issued a Hindostani weekly, *Kiran alsadain*, and the *Bibliotheca Indica*; was govt. interpreter, sec. to the Asiatic Society, assistant resident at Lucknow, director of the Mohammedan coll. in Calcutta, etc.; in 1857 was appointed prof. of Oriental langs. at Bonn. He pub. *Das Leben und die Lehre des Mohammed*.

**Spring**, one of the four seasons of the yr., properly the first, so called because it is the time when vegetation "springs," as it were, to life. In the temperate regions of the northern hemisphere it includes the months of March, April, and May; in the temperate regions of the S. hemisphere it includes September, October, and November.

**Spring** [A.-S.], a fountain or a stream of water flowing out of the earth, and fed by rains on higher lands, frequently quite distant. As the water of S. often flows through subterranean channels which are beyond the reach of changes in surface temperature, it is little affected by the seasons, and is often maintained at about the average annual temperature of the locality. When it emanates from a deeper source, it is sometimes highly heated, producing thermal S. When the water is impregnated with chemical substances, such springs are called mineral springs.

**Spring** (GARDINER), D. D., son of Samuel, b. at Newburyport, Mass., Feb. 24, 1785, grad. at Yale in 1805; studied law at New Haven; was admitted to the bar in 1808; abandoned law for theology, which he studied at Andover; became pastor of the Brick ch. in New York; remained in this pastorate until the close of his life. Wrote *Essays on the Distinguishing Traits of Chr. Character*, *The Mercy Seat*, *First Things*, etc. D. Aug. 18, 1873.

**Spring** (SAMUEL), D. D., b. at Northbridge, Mass., Feb. 27, 1746, grad. at Princeton Coll. 1771; became chaplain in the army, and accompanied Arnold's expedition to Canada in 1775; was ordained pastor of the Congl. ch. in Newburyport in 1777, and continued there until his death. He was prominent in his denomination, a recognized leader of the Hopkinsian party; aided in founding the theological sem. at Andover, and in the establishment of the A. B. C. F. M. D. Mar. 4, 1819.

**Spring-Bok** [Dutch for "spring-buck," so called from its habit of leaping when alarmed], a very beautiful and active antelope of S. Afr., *Gazella euncho*. It goes in immense herds upon the plains. Its flesh is in some estimation as food, and the hides are much sought for by tanners.

**Spring'er**, a name given by sportsmen to several varieties or sub-varieties of the hunting spaniel, used for starting birds from bushy coverts. The Clumber, Sussex, and Norfolk breeds are the best.

**Springfield**, city and important R. R. centre, cap. of Ill. and of Sangamon co., was selected as cap. of the State in 1837. Six coal-shafts are operated on the verge of the city, where superior coal in inexhaustible quantities is mined.

S. has gas-works, water-works, and important manufactures of woollen goods, paper, watches, etc.

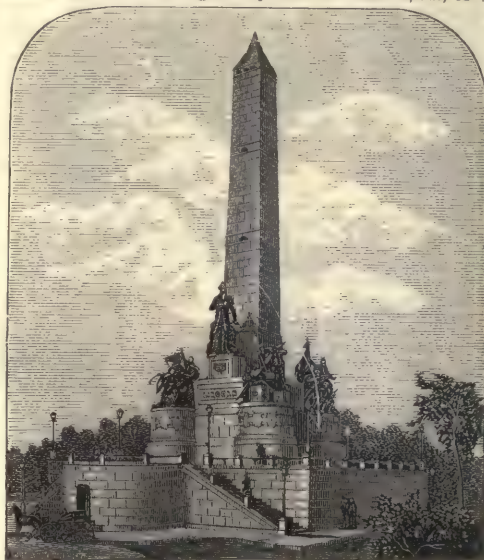
*Lincoln's Home, Etc.*—S. was the home of the late Pres.



Lincoln's Home, Springfield, Ill.

Lincoln; adjoining it is the beautiful Oak Ridge Cemetery, in which he was buried.

*National Lincoln Monument*.—This is situated in Oak Ridge Cemetery, and was designed by Larkin G. Mead, Jr., of Vt.



National Lincoln Monument, Springfield, Ill.

The design includes a statue of Lincoln, 10 ft. high; a group of inf., containing 8 figures with appropriate accessories; group of cav., 1 horse and 2 horsemen with accessories; group of artill., 3 figures; marine group of 3 figures; and a



State Capitol (Springfield, Ill.).

coat-of-arms of the U. S. All the human figures in the above groups are 7½ ft. high. The monument proper, excepting the statuary, is built of granite from Quincy, Mass. The shaft or obelisk from ground-line to apex is 98 ft. 4½



**Squid**, a popular name for many decapod cephalopods, particularly those of the family Teuthidae (calamaries), but also extended to the Sepiidae or true cuttle-fishes, and even to the poulpes or Octopodidae. The S. proper are found in nearly all seas; they form an important part of the food of



many fishes and crustaceans, are extensively used as fish-bait, and in many countries are much used as food.

### Squid, Flying. See FLYING SQUID.

**Squ'ier** (EPHRAIM GEORGE), b. at Bethlehem, N. Y., June 17, 1821, was brought up on a farm; subsequently taught school, edited several local newspapers, and studied engineering. Removing to O., he undertook, in conjunction with Dr. E. H. Davis, an exploration of the aboriginal monuments in the Valley of the Miss., the results of which were issued in 1848 in the *Smithsonian Contributions to Knowledge*, and in the following yr. appeared his *Aboriginal Monuments of the State of N. Y.* In 1848 he was appointed *chargé d'affaires* to the republics of Central Amer., and in 1853 he went again to that region to examine the proposed line for an interoceanic railway. For several yrs. he was engaged in literary labor in New York. In 1863 he was appointed U. S. com. to Peru. Wrote *Nicaragua, its People, Etc., Notes on Central Amer., Peru, etc.*

**Squ'ler** (MILES POWELL), D. D., b. in Cornwall, Vt., May 4, 1792, grad. at Middlebury Coll. in 1811 and at Andover Theological Sem. 1814; ordained first pastor of the First Presb. ch. of Buffalo, N. Y., May 3, 1816; in 1824, financial agent of Auburn Theological Sem.; from 1825 to 1833 Western agent of the Amer. Home Missionary Society; founded Geneva Lyceum in 1831; elected prof. of intellectual and moral philos. in Beloit Coll. in 1849; retained that connection till he d. June 22, 1866. Wrote *The Problem Solved, Reason and the Bible, The Being of God and Moral Government.*

**Squill** (Gr. *σκόλλα*), a drug, being the bulb of *Scilla maritima* (sea-onion), a perennial plant of the natural order Liliaceae, growing on the Mediterranean coast. The bulb is pear-shaped, of the size of a man's fist, or even larger. It is made up of concentric scales, like other tunicated bulbs, of which the outer are dry and dark-colored, but the inner fleshy and juicy, and either colorless or of a pale roseate tint. For use in med. the bulbs are dried and sliced, and offer the varieties known as white and red S., according to the tint of the bulb. S. has but little smell, but an acrid, nauseous, bitter taste. It is an acrid irritant, affecting the mucous membranes and glands, and in large dose causes vomiting, purging, strangury, and may even prove fatally poisonous. Its medicinal use is from its producing, in small dose, an increased flow of urine, and also modifying in some unknown way the morbid condition of a mucous membrane affected with catarrh, and especially of the bronchiae.

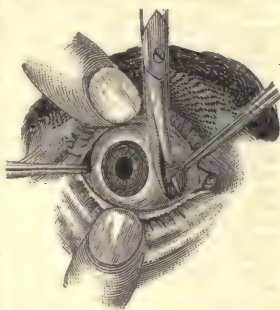
**Squilla** [the old Lat. name for one of its species], a genus of stomapod crustaceans of the family Squillidae. They are voracious and active creatures, all marine, and



Squilla.

mostly found at a distance from shore. The best known of the numerous species is the mantis shrimp (*S. mantis* of the Mediterranean), so called from its resemblance in form to the insects called mantis.

**Squint'ing** [Dut. *schuinte*], technically termed **Strabismus** [from Gr. *στραβισμός*, "squinting"], obliquity of the



Operation for Strabismus.

axis of one eye; inability to bring both visual lines to bear simultaneously upon one point, one always deviating from the object. Internal S. may be checked by use of larger letters or by checking the bad habit of approximating objects. Children suffering from indigestion, worms, or debility often suffer from convergent S. In disease of the brain, convulsions, meningitis, hydrocephalus, etc. S. may occur. Divergent S. is most often present in myopic or near-sighted persons in efforts to see distant objects, the S. disappearing when the object is approximated or by the use of spectacles for distance. Periodic strabismus may yield to correct use of the eyes, the aid of spectacles, galvanizing the weak muscle, and improving the general health. When marked and persistent, it calls for operation—incision of the ocular conjunctiva or mucous membrane, hooking up the tendon of the muscle close to the cornea and severing it.

E. D. HUDSON.

**Squire** (SAMUEL), D. D., b. at Warminster, Wiltshire, Eng., in 1714, ed. at St. John's Coll., Cambridge, where he obtained a fellowship; chancellor of the diocese and canon of Wells 1730; prebendary of Wells and archdeacon of Bath 1743; rector of Topsfield, Essex, 1748, and of St. Anne's, Westminster, 1750; vicar of Greenwich and clerk of the closet to Frederick, prince of Wales; dean of Bristol 1760; bp. of St. David's 1761. Wrote *The Anc. Hist. of the Hebrs. Vindicated, An Enquiry into the Foundation of the Eng. Const.*, etc. D. in 1766.

**Squirrel**, skwir'el or skwur'el [Gr. *σκιουρος*, from *σκιὰ*, "shade," and *οὐρά*, "tail"], the name given to certain spe-

cies of the family Sciuridae, and sometimes employed as the vernacular equivalent of the family name—i. e. the squirrel family. It is, however, more properly applicable to the slender arboreal forms constituting the genus *Sciurus* of most naturalists, and in this sense it will be here used. These animals are of moderate or small size, have a rather slender head, no cheek-pouches, rather long ears, no lateral wing-like extension of the skin, a large distichous tail. The species are numerous, and representatives are found in almost every region, Australasia and Polynesia, the S. extremity of S. Amer., and the W. I. being the only considerable bodies of land in the temperate or tropical zones destitute of them. In habits the species are all essentially similar. Most of their life is spent among the trees. Their prin. food consists of the nuts of trees; they also eat to some extent the larvae of insects, and attack the nests of birds for their eggs, and even for their young. In the colder countries they lay up stores of provisions in holes and nooks in or near the trees in which they live.

### Squirrel, Flying. See FLYING SQUIRREL.

**Sta'bat Ma'ter**, the first words, and hence the name, of a Lat. hymn ranked among the 7 great hymns of the medieval Ch. (*The Celestial Country, Dies Ire, Stabat Mater, Veni Sancte Spiritus, Veni Creator Spiritus, Vexilla Regis, The Ascension Sequence*). It commences—

Stabat Mater dolorosa, By the cross, sad vigil keeping,  
Juxta crucem lacrymosa, Stood the mournful mother weeping.

**Sta'dium** [Lat.; Gr. *στάδιον*], the prin. Gr. measure of length for journeys, used in later times also for other linear measurements, especially by the Romans; equal to 606½ Eng. ft.—STADIUM was originally the name of the foot-race course in which running and other athletic exercises took place.

**Stadt'holder** [Dut. *Stadhouder*, "city-holder"], a title given by the United Provs. of Hol. to William, prince of Orange, upon beginning their memorable rebellion against Sp. The title was intentionally a modest one. It involved, however, the chief civil and military command.

**Staël-Holstein, de** (ANNE LOUISE GERMAINE), BARONESS, b. at Paris Apr. 22, 1766, a daughter of Jacques Necker, was married in 1786 to the Swe. ambassador at Paris, Baron de Staël-Holstein, to whom she bore 3 children. The marriage was not happy, and she separated from her husband, but when he became old and sick she returned to him, and stayed with him till he died, at Poligni May 9, 1802. In 1810 she married a Fr. officer, De Rocca, a man much younger than herself, to whom she bore a son, but the marriage was kept secret till after her death, July 14, 1817. She made her début in lit. in 1786 by her *Lettres sur les Écrits et le Caractère de J. J. Rousseau*. Her first celebrity, however, she owed less to her writings than to the powerful personal impression she made. Her salon was the centre around which all the most prominent talents of Fr. gathered, and during the first stage of the Revolution she was a political power. But she was a decided adversary of Nap. He tried to gain her over by offering to pay the two million francs which the treas. owed to her father, but she refused to be reconciled. In 1802 he banished her from Paris, and when, after a journey in Ger., she returned to Fr. and settled in the neighborhood of Paris, she was ordered to remove to Coppet, where she actually lived in a sort of confinement. Her 2 most prominent works are *Corinne, ou l'Italie*, and *De l'Allemagne*.

**Sta'fa**, a small island of Scotland, one of the Inner Hebrides, belonging to the co. of Argyre, celebrated for its curious caverns, among which that called Fingal's cave is the most remarkable. The cave of Fingal is 227 ft. long and 66 ft. high from the sea to the entablature.

**Sta'ford** (EDWARD), son of Henry, b. in Eng. about 1470, was restored to his titles and estates by Henry VII. 1486; commanded the guard at the "battle of the Spurs," 1515; freely asserted his claim to the throne as next heir to Henry VIII., in case of his death without issue; was accused of treason May 1521; tried, condemned, and beheaded on Tower Hill May 17, 1521.

**Stafford** (HENRY), duke of Buckingham, son of Humphrey, b. in Eng. about 1440, succeeded to the title 1460; was the most prominent supporter of the duke of Gloucester (Richard III.) when Protector in his plot to obtain the throne 1483; was appointed chief-justice and constable of the royal castles in Wales May 16, and constable of Eng. July 15; changed his allegiance, conspiring with the Lancastrians; was betrayed to the king, attainted, and beheaded at Salisbury Nov. 1, 1483.

**Stafford** (HUMPHREY), earl of Stafford, b. in Eng. in 1404, was present at the coronation of Henry VI. as king of Fr. at Paris Dec. 1481; was in command at Calais 1440; married a daughter of Prince Thomas of Woodstock, duke of Gloucester, whose estate he inherited; was thereupon created duke of Buckingham Sept. 14, 1444; was declared first peer of the realm; made first constable of Dover and warden of the Cinque Ports; was killed at the battle of Northampton, July 10, 1460.

**Stafford** (WILLIAM HOWARD), VISCOUNT, twentieth earl of Arundel, b. in Eng. Nov. 20, 1612, was brought up a R. Cath.; was knighted in early life; married, about 1634, Mary, a sister of Henry, 13th Baron Stafford; created Baron Stafford 1640, and in order to settle in his favor a question of precedence among the barons made a viscount the same year; adhered during the c. war to the royal cause, but after the Restoration often opposed the measures of the court; was, on account of his religion, selected by Titus Oates as one of his victims; accused of participation in the "Popish plot" by Oates Oct. 23, 1678, S. surrendered himself; was committed to the Tower Dec. 7, and executed on Tower Hill Dec. 29, 1680.

**Stafford Springs** (Stafford station), on R. R. and Willimantic River, Tolland co., Conn., 50 m. N. by W. of New London, has noted medicinal springs; was incorporated in 1873. Pop. 1880, 2081.



**Stag**, or **Red Deer**, the largest deer of Europe, the *Cervus elaphus*. The male is called the *hart*, the female the *hind*; strictly, in sporting parlance, a stag is a red deer 5 yrs. old. At 6 yrs. he is a *hart of ten*, and when 7 yrs. old he is a *hart crowned*, and is considered fair game.

**Stag-Beetle** and **Horn-Bug** are popular names for *Lucanus dama* of the U. S., *L. cervus* of Europe, and of many other *Lucanidae*, large coleopterous insects, noted for the great size of the head and for the large horn-like mandibles.

**Stag-Coach**. See **CARRIAGES**.

**Staggers**, a popular name for some diseases of horses and sheep, is, like many popular names, a very vague one.

"Blind S." in horses is a sort of epilepsy; "mad S." an inflammation of the brain; "grass S." is an acute and dangerous gastritis. S. in sheep is caused by grubs in the nostrils.

**Stag-hound**, a dog formerly kept in Europe for the chase of the red deer, is now nearly extinct; is a large rough-haired dog, like the foxhound, but longer in the legs.

**Stained Glass**. See **GLASS**.

**Stair** (JAMES **Dairymple**), SEVENTH BARON AND FIRST VISCOUNT, b. at Drummurich, Ayrshire, Scot., in May 1619; prof. of philos. at Glasgow (1641-47); was admitted an advocate at the Scot. bar Feb. 1648; was sec. to the coms. sent to treat with Charles I. at Breda 1649-50; became a lord of session July 1, 1657; was knighted by Charles II. 1660; was made a baronet June 1664; became lord pres. of the court of session Jan. 1671; refused to take the new test oath, and was removed from his offices 1681; pub. in that yr. his *Modus Litigandi* and *The Inst. of the Law of Scot.*; was accused of complicity in the Rye-House plot, and outlawed, but escaped to Hol. Oct. 1682; prepared there his *Decisions of the Lords of Council and Sessions 1661-81*; pub. *Physiologia Nova Experimentalis*; received a pardon 1686; accompanied the prince of Orange to Eng. 1688; was reinstated as pres. of court of session, and made Viscount Stair Apr. 21, 1690; pub. an *Apology*. D. Nov. 25, 1695.

**Stair** (JOHN **Dairymple**), FIRST EARL, or, b. in Scot., about 1648, was admitted as advocate in the court of session Feb. 1672; was one of the council for the earl of Argyll on his trial for treason 1681; was twice imprisoned between 1681 and 1685; made lord advocate 1685, and lord of session and lord-justice clerk 1686; supported the revolution 1688; was a leading Scot. member of the "Convention Parliament" Mar. 1689; was one of the 3 coms. sent to Lond. to offer the crown of Scot. to William and Mary, May 1689; was reappointed lord advocate 1690; became one of the secs. of state for Scot. 1691; plotted the "massacre of Glen-coe" Jan. 1692, for which act he was dismissed from office 1695; succeeded his father as Viscount Stair Nov. 25, 1695; was sworn of the privy council on the accession of Anne 1702; was created earl of Stair Apr. 8, 1703; was one of the coms. who negotiated the treaty of union between Scot. and Eng. 1706. D. Jan. 8, 1707.

**Stair** (JOHN **Dairymple**), SECOND EARL, or, b. at Edinburgh July 20, 1673, ed. at the Univ. of Leyden; entered the army as a volunteer and commanded the Cameronian regiment at the battle of Steinkirk 1692; was aide-de-camp to the duke of Marlborough at Venlo and Liege 1702; succeeded to the earldom 1707; was commissioned gen.; distinguished himself at Ramillies and Oudenarde 1706, and at Malplaquet 1709; withdrew from the army in 1711; became privy councillor and representative peer for Scot. 1714; was appointed commander-in-chief of the forces in Scot. 1715; was ambassador to Fr. 1715-20; was made field-marshal commander-in-chief of Brit. forces in Flanders and ambassador extraordinary to the States-General of Hol. 1741; won the battle of Dettingen June 26, 1743. D. May 9, 1747.

**Stalactite** (Gr. *σταλακτιν*, to "drop"), icicle-like masses of lime, limonite, chalcidion, pyrites, etc. which depend from the roofs of caverns; they are formed from the evaporation of water holding these substances in solution. S. sometimes form columns reaching from floor to roof of high chambers; sometimes they imitate curtains, waterfalls, etc., which constitute notable features in some of the famous caves in the world. The name *stalagmite* (Gr. *σταλαγμα*, a "drop") is given to the material which composes S., only accumulating on the floor. This sometimes forms continuous sheets over the surface, or rises into columns, which meet and blend with the S. above. S. are often tubular, because the drops of water from which they are precipitated by evaporation form rings of solid matter at their bases, and these rings are prolonged into hollow cylinders.

**Stambool**. See **CONSTANTINOPLE**.

**Stamen** [Lat., from the Gr. *στήμων*, the warp or its threads in the upright loom of the ancies.], the botanical name of the male organ in flowers. It consists of 2 parts, viz. a stalk, called the *filament*, and of a terminal body, called the *anther*. This normally is 2-celled, or is formed of a pair of sacs placed side by side, with a prolongation of the filament between them (the *connective*), filled with *pollen*, a powder composed of minute grains. This is the fertilizing material. The pollen is discharged from the anther through openings, generally by a slit from top to bottom of each cell.

**Stamford**, R. R. centre, Fairfield co., Conn., 34 m. N. E. of New York, has 2 military insts. and is a summer resort. Pop. tr. 1870, 9714; 1880, 11,297, including 2540 in v.

**Stammering** [A.-S. *stamern*], a general term for all disorders of speech involving a defective formation of words, whether due to organic disease of the nervous system, to mechanical defects of the vocal and articulating apparatus, to bad habits, or faulty education—all included under *dys-lalia*, lisping, for example—or to imperfect co-ordination of functional nervous origin. In common parlance, under S. is included only the latter form, more properly termed *stuttering*, a spasmodic muscular action resulting in imperfect control of the air in expiration, imperfect subordination of the consonant to the vowel sounds, and irregularity of rhythm in articulation. The defect is usually on the first syllable, frequently on the second or third, the consonants,

particularly the explosives (*p, b, f, v, etc.*), being held too long, expressed too forcibly, or repeated too frequently. Phrases which have become automatic by frequent repetition, as in singing or declamation, are spoken without S. The force of example, timidity, emotional excitability, are important factors in the cause and aggravation of S. The treatment of S. consists, aside from improving the general health and increasing the will-power and self-confidence, in systematic training in breathing, vocal gymnastics, and the articulation of consonants and vowels. S. is most frequent and decided about the age of puberty, and is much more frequent among males than females. It is said not to occur among the Chf. (See **HUNT, Stammering and Stuttering**, Lond. 1861; KUSSMAUL, *Die Störung der Sprache*, Leipzig, 1877.)

W. R. BIRDSALL.

**Stamp Act**, a law passed by the Brit. Parl. Mar. 22, 1765, "for granting and applying certain stamp duties and other duties in the Brit. colonies and plantations in America," took effect Nov. 1, 1765. It was repealed Mar. 18, 1766.

**Stamp-Mill**. See **GRINDING AND CRUSHING MACHINERY**.

**Stanberry**, Mo. See **APPENDIX**.

**Stanbery** (HENRY), b. in New York, Feb. 20, 1803, grad. at Washington Coll., Pa., in 1819; admitted to the bar in O. in 1824; became atty.-gen. of the State in 1846, and atty.-gen. of the U. S. in 1866, under the administration of Pres. Johnson, for whom he acted as leading counsel in the impeachment trial of 1868.

**Standard Time**. See **APPENDIX**.

**Standing Stones**. See **STONES, STANDING**.

**Standish** (MILES), b. in Lancashire, Eng., about 1584, claimed to be descended from the knightly family of Standish of Duxbury Hall; became a soldier in the Netherlands, attaining the rank of capt., and accompanied the Pilgrims of the Mayflower to N. Eng. 1620; employed John Alden to negotiate his marriage with the fair Priscilla Mullins, with the result that Alden married the maiden; preserved the colonists from the hostilities of the Indians, having with his own hand killed, at Weymouth (1623), Pecksnot, an Indian chief who had planned a massacre; visited Eng. as agent for the colony 1625, returning with supplies 1636; was one of the original proprietors and settlers of Duxbury; was for the remainder of his life either magistrate or a member of board of assistants to the gov., and took part in settlement of Bridgewater 1649. D. Oct. 3, O. S., 18 N. S., 1656.

**Stanfield** (CLARKSON), R. A., b. at Sunderland, co. of Durham, Eng., in 1736; began life as a sailor, thus acquiring the practical knowledge of the sea that has given him his fame. He first exhibited in 1827; was elected an associate in 1832, academical in 1835; was scenic artist at Drury Lane, theatrical decorator, and painter of landscape. His masterpiece is *The Battle of Trafalgar*. D. in 1867.

**Stanford**, cap. of Lincoln co., Ky., on R. R. and Logan Creek. Pop. 1870, 752; 1880, 1213.

**Stanford** (LELAND), b. at Albany, N. Y., Mar. 9, 1824, received a common-school education; studied law, and was admitted to the bar in 1849; soon afterward removed to Port Washington, Wis., where he practised law till 1852, when he went to Cal. He was a delegate to the convention at Chicago in 1860 which nominated Abraham Lincoln for the Presidency; was elected gov. of Cal. in 1861; a company for the purpose of building the Pacific R. R., with him for pres., was formed on July 1 of that yr.

**Stanhope** (CHARLES MAHON), F. R. S., THIRD EARL, STANHOPE AND VISCOUNT MAHON, b. in Lond., Eng., Aug. 3, 1753, ed. at Eton and Geneva; manifested great mechanical talent; married Lady Hester Pitt, daughter of the earl of Chatham, 1774; was elected to Parl. 1780; lost his wife 1780; married Louisa, daughter of Henry Grenville, 1781; succeeded to the peerage 1786; was noted for his radical opinions; declared himself a republican, laid aside the insignia of nobility, and defended the French revolution; constructed 2 calculating-machines; suggested improvements in canal-locks; was a close student of electricity; made known in 1779 his theory of the "return stroke" of lightning; invented a monochord for tuning musical instruments, a vessel for sailing against wind and tide, made many improvements in the art of printing, and in 1816 the "Stanhope printing-press." Wrote *Principles of Electricity, A Letter to Edmund Burke on the Fr. Revolution*, etc. D. Dec. 15, 1816.

**Stanhope** (GEORGE), D. D., b. at Hertshorn, Derbyshire, Eng., Mar. 5, 1660, studied at Eton, grad. at King's Coll., Cambridge, about 1680; was successively rector of Tewling, vicar of Lewisham and of Deptford, and dean of Canterbury; was chaplain to William and Mary about 1690, and Boyle lecturer 1701. Translated the *Imitation of Christ*, the *Meditations of Marcus Aurelius*, and of St. Augustine, etc. Pub. *Paraphrase on the Epistles and Gospels*. D. Mar. 18, 1728.

**Stanhope** (JAMES), FIRST EARL STANHOPE, b. at Paris, Fr., in 1673, entered the army 1694; was wounded at the siege of Namur 1695; served in Flanders until the Peace of Ryswick; was elected to Parl. 1702; took part in the expedition of 1702 and 1704 in Sp.; was a brig.-gen. at the siege of Barcelona 1705, maj.-gen. 1707; commander-in-chief in Sp., and took Parl. Mahon, Minorca, 1708; defeated the Spaniards at Almerara and Saragossa (Aug. 1710), but was forced to surrender to the duke of Vendôme at Brihueza Dec. 8, 1710; was appointed sec. of the exchequer 1717; was lord of the treas. and chancellor of the exchequer 1717; was created Viscount Stanhope of Mahon July 2, 1717, and Earl Stanhope Apr. 1718; was again sec. of state, and took part in negotiating Quadruple Alliance 1718. D. Feb. 5, 1721.

**Stanhope** (PHILIP HENRY), D. C. L., F. R. S., FIFTH EARL STANHOPE, better known as **Lord Mahon**, b. at Walmer, Kent, Eng., Jan. 31, 1805, grad. from Christ Ch., Ox., 1827; was elected to Parl. 1830; was under-sec. of state for foreign affairs in the first Peel ministry 1834; was sec. to the board of control in the last yr. of the second Peel ministry 1845-46; introduced and carried the copyright act of 1842; was chosen pres. of the Society of Antiquaries 1846; succeeded to the earldom Mar. 2, 1855; was chosen lord rector of the Univ. of



Aberdeen 1858, and one of the 6 foreign members of the Acad. of Moral and Political Sciences at Paris May 11, 1872; was instrumental in the establishment of the National Portrait Gallery (1857), and in the creation of the Historical Manuscripts Commission. Wrote *The Life of Belshazzar, Hist. of the War of Succession in Sp. Hist. of Eng. from the Peace of Utrecht to the Peace of Versailles, 1713-83*, etc. D. Dec. 24, 1875.

**Stanislas Augustus.** See PONIATOWSKI.

**Stanislas Leszczyński**, iesh-chin'ske, b. at Lemberg, Galicia, Oct. 30, 1677, of one of the oldest and wealthiest families of the Fr. nobility; was palatine of Posen when the war broke out between Charles XII. of Swe. and Augustus II. of Poland and Sax.; won the friendship of the former, and was, after the defeat of Augustus, elected king of Poland in 1705; after the disaster of Charles at Poltava in 1709 he was compelled to flee from Poland; joined his friends at Bender, and was in 1714 made gov. of the duchy of Zweibücken, but after the death of Charles in 1718 he was bereft also of this position; found refuge in Fr.; in 1725 his daughter, Marie Leszczyńska, was married to Louis XV., and at the death of Augustus II. (in 1738) he was re-elected king of Poland by Fr. influence; but by the intervention of a Rus. army Augustus III. was raised to the Polish throne; fled for the second time from his native country, but by the peace of Vienna (1735) he received the duchy of Lorraine as a pension, and retained the title of king of Poland; resided at Lunéville or Nancy, where he held a brilliant court, founded splendid educational instns., and was generally called *Le Bienfaisant*. Wrote *Œuvres du Philosophe bienfaisant*. D. Feb. 23, 1766.

**Stanley** (ARTHUR PENRHYN), D. D., LL.D., b. at Alderley, Cheshire, Dec. 13, 1815, was a student at Rugby School 1829-34; gained a scholarship at Balliol Coll., Ox., 1834; took several prizes for poems and essays; grad. in 1838 at Univ. Coll., where he was fellow tutor for 12 yrs., and examiner 1841; took orders in the Ch. of Eng.; was select preacher to Ox. Univ. 1845-46, sec. to the Univ. commission 1850-52, canon of Canterbury 1851-58, regius prof. of ecclesiastical hist. at Ox. 1856-64, and canon of Christ Ch. 1858-64; became chaplain to Prince Albert 1854, to Dr. Tait, bp. of Lond., 1857, and to Queen Victoria and the prince of Wales 1862; was installed dean of Westminster Jan. 9, 1864, and was elected lord rector of the Univ. of St. Andrew's Nov. 1874. He made a tour in the East, visiting Egypt and Pal. 1852-53, and again as chaplain and *cicerone* to the prince of Wales 1862; was prominent as a defender of free thought in the Ch. of Eng.; has been an active promoter of charitable, missionary, and educational enterprises, and of biblical, antiquarian, and scientific researches, and has been for some yrs. regarded as the best representative of the progressive school of Brit. theol. In Dec. 1862 he married Lady Augusta Bruce, daughter of the late earl of Elgin, and the most intimate friend of the queen (d. in Feb. 1876). Author of *The Life and Correspondence of Thomas Arnold, D. D., Sind and Pal. in connection with their Hist., Lectures on the Hist. of the Ch. of Scot.* (1872), etc. He was a member of the N. T. company for the revision of the translation of the Bible. D. July 18, 1881.

**Stanley** (DAVID SLOANE), b. at Chester, Wayne co., O., June 1, 1823, grad. from the U. S. Military Acad. July 1, 1852, when appointed brevet second lieutenant in the 2d Dragoons; frequently engaged with hostile Indians; in 1861 he had attained the rank of capt., and was at once sent to Mo., and Sept. 23 was commissioned a brig.-gen. of volunteers, and commanded the second division of the army of the Miss. at the capture of Island No. 10; in the Corinth campaign; at the battles of Iuka (Sept. 19) and Corinth (Oct. 3-4). In Nov. 1862 he was appointed chief of cav. of the Army of the Cumberland, and was engaged in the battle of Murfreesboro', the Tullahoma campaign until Sept. 1863; was assigned to the first division of the 4th army corps, succeeding to command of the corps July 1864, which he held until the close of the war. In Sherman's invasion of Ga. he bore a conspicuous part in the fighting from Dalton to Atlanta, being wounded at the battle of Jonesboro' (Sept. 1); was detached from the army of Gen. Sherman to strengthen Gen. Thomas at Nashville. With numerous skirmishes the 4th and 23d corps had arrived at Franklin, Tenn., Nov. 30, where, being closely followed by the enemy, a stand was made and a notable victory gained. During the fight Gen. S. was severely wounded. He was brevetted lieutenant-col., col., brig.-gen., and maj.-gen. Became brig.-gen. U. S. Army, 1884.

**Stanley** (EDWARD), D. D., F. R. S., b. in Lond., Eng., Jan. 1, 1779, grad. at St. John's Coll., Cambridge, 1802; took orders in the Ch. of Eng.; was rector of Alderley, Cheshire, from 1805 to 1837, when he was made bp. of Norwich, in which post he displayed zeal as a liberal and a reformer. Author of *A Familiar Hist. of Birds, their Nature, Habits, and Instincts*, etc. D. Sept. 6, 1849.

**Stanley** (EDWARD), b. at Newberne, N. C., early in the present century, studied at the military acad. at Middletown, Conn.; became a lawyer; was a member of the State legislature of N. C.; M. C. 1836-42, and again 1849-53; went to Cal. in 1853; in 1857 was the unsuccessful Rep. candidate for gov. In 1862 he became military gov. of N. C., acted for several months, and returned to Cal. D. July 26, 1872.

**Stanley** (EDWARD JOHN), SECOND BARON STANLEY OF ALDERLEY, b. at Alderley Park, Eng., Nov. 13, 1802, studied at Eton, grad. at Christ Ch., Ox., 1823; entered Parl. as a Liberal 1831; was under-sec. for the colonies 1833-34; patronage sec. of the treasury 1835-41, paymaster-gen. of the forces several months in 1841; under-secretary of state for foreign affairs in the Russell administration 1846-51; was raised to the House of Peers as Baron Eddisbury 1848; succeeded to his father's title 1850; held the conjoint offices of paymaster of the forces and v.-p. of the board of trade a few weeks in 1852, and again 1853-55; was pres. of the board of trade 1855-58, and P. M.-gen. 1860-66. D. in Lond. June 16, 1869.—His son, HENRY EDWARD JOHN, third Baron Stanley of Alderley, b. July 11, 1827, was employed many

yrs. in the diplomatic and consular service, and is author of *Rumanian Anthology, a Collection of the National Ballads of Moldavia and Wallachia*, etc.

**Stanley** (E. H. SMITH). See DERBY, EARL OF.

**Stanley** (HENRY M.), b. near Denbigh, Wales, in 1840, of humble parentage; shipped as cabin-boy for New Orleans, where he was adopted by a merchant; enlisted in the Confed. army; was taken prisoner; volunteered in the U. S. N., and became acting ensign on an iron-clad; went as a newspaper correspondent to Tur. and Asia Minor, and in 1868 accompanied the Brit. expedition to Abyssinia as correspondent of the New York Herald; in Oct. 1869 he was employed by the Herald to head an expedition to learn the fate of Livingstone, the Afr. explorer; reached Zanzibar in Jan. 1871, and toward the end of Mar. set out for the interior. In Nov. he found Livingstone, who was living near Lake Tanganyika. After having explored the N. portion of the lake, S. set out on his return journey in Mar. 1872, reaching Eng. in July, where he was received with distinguished honor; pub. *How I Found Livingstone*. Tidings having been received of the death of Livingstone in Central Afr., S. was placed at the head of an expedition, the cost of which was jointly undertaken by the New York Herald and the London Telegraph, to explore the lake-region of Equatorial Africa. He left the coast in Nov. 1874, reached Lake Victoria N'yanza Feb. 27, 1875. He circumnavigated it, and found it to be a single large lake. He started, Apr. 17, 1875, to continue his explorations in the direction of Lake Albert N'yanza. He arrived at the mouth of the Congo River Aug. 12, 1877, having explored its whole course. Wrote *Through the Dark Continent* (1878). Returned to the Congo 1879, at the head of a Belgian international expedition, and wrote *The Congo*, 1885. (See Congo.)

**Stanley** (JOHN), b. in Eng. in 1713, lost his sight at the age of 2 yrs.; at 11 was elected organist of All Hallows ch., Bread st., Lond., and 2 yrs. later of St. Andrew's, Holborn; became organist to the Middle Temple 1734, and master of the king's band 1779. D. May 19, 1786.

**Stanley** (JOHN THOMAS), FIRST BARON STANLEY OF ALDERLEY, b. at Alderley, Cheshire, Eng., in 177-, was for many yrs. an active Whig M. P., rendering services for which he was created Baron Stanley of Alderley in 1839. D. in 1850.

**Stanley** (THOMAS), b. at Comberlow, Hertfordshire, Eng., in 1625, grad. at Pembroke Hall, Cambridge, 1641; studied law at the Middle Temple; pub. *Poems and Translations, The Hist. of Philos., containing the Lives, Opinions, Actions, and Discourses of Philos. of every Sect*, etc. D. Apr. 12, 1678.

**Stan-ton**, on R. R., cap. of Montcalm co., Mich. Pop. 1870, 600; 1880, 1760; 1884, 1740.

**Stanton** (EDWIN McMASTERS), b. in Steubenville, O., Dec. 19, 1814, admitted to the bar in 1836, reporter of the supreme court of O. 1842-45. In 1847 Mr. S. became the law-partner at Pittsburg, Pa., of the Hon. Charles Sharler. In 1856 he removed to Wash. to attend to his practice before the U. S. supreme court. In 1858 Mr. S. went to Cal., and remained nearly a yr. as counsel for the U. S. in certain land cases, involving many millions of dollars. In Dec. 1860, after Mr. Lincoln's election, and before his inauguration, and when active preparations were making for secession, and the indications as to the political future of the country were appalling, Mr. S. was appointed atty.-gen. Acceptance of the office involved relinquishment of profitable professional business and assumption of great responsibility, with little prospect of personal distinction. He accepted the office, and in it his attitude was that of resolute maintenance of national honor and determined opposition to treason. Every dept. then contained traitors and spies; only a handful of U. S. troops was assembled at Wash., and the residents of the capital were mainly in sympathy with secession. On Mar. 4, 1861, Mr. S. retired with the outgoing administration and resumed his profession. After the c. war had existed several months, patriotic citizens and eminent capitalists, without Mr. S.'s knowledge, urged Pres. Lincoln to place him in charge of the war dept. On Jan. 20, 1862, he became sec. of war. The characteristics of Mr. S.'s administration were integrity, energy, determination, singleness of purpose, and capacity to comprehend the magnitude of the rebellion and the labor and cost in blood and treasure involved in suppressing it. Exercising indefatigable industry, courage, and self-devotion himself, he visited the slightest indolence, indifference, or cowardice in others with punishment prompt and severe. Honest to the last degree himself, he required the utmost integrity from others.

After Mr. Lincoln's assassination and Mr. Johnson's accession to the Presidency, Mr. S. was connected with the latter's administration for 3 yrs. He supported many measures which were vetoed by the Pres. and re-enacted by Cong. These differences of opinion led the Pres. on Aug. 12, 1867, to notify Mr. S. of his suspension from office. The Senate refused its concurrence in the suspension, and Mr. S. resumed his office. On Feb. 21, 1868, the Pres. undertook to remove him and to appoint Lorenzo Thomas sec. of war *ad interim*. The Senate resolved that the Pres. had no power to remove the sec. of war and designate another officer to perform the duties of that office. The House of Reps. immediately decided to impeach the Pres., and Mr. S. refused to relinquish control of his dept. The President's trial followed, and he was acquitted. Mr. S. immediately relinquished his office. The Senate on May 28 again resolved that Mr. S. had not been legally removed, and based its confirmation of his successor, Gen. Schofield, upon Mr. S.'s voluntary retirement. With his health shattered by his labors in the war dept. he resumed his profession and argued several important cases. On Dec. 30, 1869, he was nominated by Pres. Grant as an associate justice of the U. S. supreme court, and was immediately confirmed by the Senate. But on Dec. 24 he died of the dropsy. [From orig. art. in *J. A. Univ. Cyc.*, by SURGEON-GEN. J. K. BARNES, M. D.] **Stanton** (ELIZABETH CADY), b. at Johnstown, N. Y., Nov.



12, 1815, daughter of Judge Daniel Cady and Margaret Livingston, had her attention turned to the disabilities of sex; married in 1840 to Henry B. Stanton; accompanied him to the World's Anti-Slavery convention at London; there made the acquaintance of Lucretia Mott; signed with her the call for the first woman's rights convention, which met July 19-20, 1848, on which occasion the first formal claim of suffrage for women was made; addressed the N. Y. legislature in 1854 on the rights of married women, in 1860 in advocacy of divorce for drunkenness, and in 1867 both the legislature and the constitutional convention, maintaining that during the revision of the const. the State was resolved into its original elements, and that all the citizens had therefore a right to vote for members of that convention. Since 1869 she has frequently addressed Congressional committees and State constitutional conventions. She canvassed Kan. in 1867, and Mich. in 1874, when the question of woman suffrage was submitted in those States; was one of the eds. of *The Revolution*. She was pres. of the national committee 1855-65, of the Woman's Political League 1863, and of the National Association until 1873.

**STANTON (HENRY BREWSTER)**, b. at Griswold, Conn., June 1805, ed. at Lane Seminary, O.; was closely identified with the anti-slavery cause from 1833 till the adoption of the 15th amendment to the const.; was sec. of the World's Anti-Slavery Convention at Lond. 1840; admitted to the bar 1842 at Boston, Mass.; removed to Seneca Falls, N. Y.; was elected to the N. Y. senate 1849, and re-elected 1851; deputy collector of New York 1861; practised law 12 yrs. in that city; author of *Reforms and Reformers of G. Brit. and Ire.*; 15 yrs. a leading editorial contributor to the *New York Tribune* and the *New York Sun*.

**Stan'wix (JOHN)**, b. in Eng. about 1690, entered the Brit. army 1706; became lieut.-col. 1745; equerry to Frederick, prince of Wales, 1749; was gov. of Carlisle and its representative in Parl. 1750; became deputy quartermaster-gen. of the forces 1754; was made col. commanding the first battalion of the 60th regiment (Royal Amers.) Jan. 1, 1756; was in command of the S. dist. of the Amer. colonies, with head-quarters at Carlisle, Pa., 1757; was appointed brig.-gen. Dec. 27, 1757; was relieved by Gen. Forbes early in 1758, and intrusted (1758) with the erection of Ft. Stanwix at the "Oneida carrying-place;" returned to Pa.; was appointed maj.-gen. June 19, 1759; repaired and fortified the old Ft. Duquesne at Pittsburgh; returned to Eng.; was appointed lieut.-gen. Jan. 19, 1761; was made lieut.-gov. of the Isle of Wight and col. of the 8th Foot, and was elected M. P. for Appleby. He was lost at sea in Dec. 1765.

**Sta'ples (WILLIAM READ)**, LL.D., b. at Providence, R. I., Oct. 10, 1798, grad. at Brown Univ. in 1817, was admitted to the bar 1819; was associate judge of the supreme court of the State 1835-54, and chief-justice 1854-56. He was one of the founders of the R. I. Historical Society; for many yrs. its sec. and librarian, and a v.-p. at his death. Wrote *R. I. Book of Forms*, and left unfinished a *Hist. of the Criminal Law in R. I.*, *E. I. in the Continental Cong.*, and a *Hist. of the State Convention* of 1790. D. Oct. 19, 1868.

**Sta'pleton**, Richmond co., N. Y., 8 m. S. of New York, on Staten Island, contains the Seamen's Retreat, Old Ladies' Home of the Mariner's Industrial Society, and Keutgen Observatory. The heights are occupied by elegant mansions. Pop. not given in census of 1880.

**Stapleton (Sir ROBERT)**, LL.D., b. at Carleton, Yorkshire, Eng., about 1615, was ed. in the R. Cath. coll. at Douay, Fr., but became a Prot. on his return to Eng.; became gentleman usher to the prince of Wales, afterward Charles II.; fought at Edgehill under Charles I., by whom he was knighted; accompanied Charles II. on his entry into Lond. 1660. He translated *Museus Juvenal*, etc., and wrote comedies and poems. D. July 11, 1669.

**Stapleton (THOMAS)**, D. D., b. at Henfield, Sussex, Eng., in 1535, ed. at Canterbury and Winchester perpetual fellow 1554; took orders in the Ch., turned R. Cath.; was appointed by Queen Mary prebendary of Chichester; retired on the accession of Elizabeth to Louvain; became regius prof. of divinity at the Univ. of Douay and canon of the ch. of St. Armour; was for a short time a Jesuit; returned to Louvain, where he was appointed divinity prof., canon of St. Peter's, and dean of Hilverbec, near Bois-le-Duc. Translated Bede's *Hist. of the Ch. of Eng.*; wrote *Propugnaculum Fidei Primitivæ Anglicanæ*, *Principiorum Fidei Doctrinæ*, *Tres Thomæ*, etc. D. Oct. 12, 1598.

**Star**. See STARS, by P. A. SKECH.

**Star-Apple**, the large, handsome and agreeable fruit of *Chrysophyllum candito*, a W. I. shrub of the order Sapotacæ.

**Starch, Pecula, Amidon, Amylum, or Stärke**, a substance widely diffused in the vegetable kingdom, being found in almost every plant, at least at some period of its development. It is especially abundant in some families of plants, and often occurs in large quantities in the seeds, pith, stalks, bark, bulbs, tubers, roots, etc.

**Preparation**.—S. is extracted from a great variety of plants, chiefly from wheat, Indian corn, rice, potatoes, the root of manioc or cassava, *Jatropha manihot* (tapioca), the root of several species of the *Maranta* (arrowroot), and the pith of a great variety of palms (sago).

**Properties**.—S. is a white shining powder, soft to the touch, grating between the fingers or the teeth, sometimes consisting of amorphous masses, but more frequently of granules recognizable by the microscope. Specific gravity, air-dried, 1.50; dried at 212° F. 1.56 to 1.63. These granules, of various diameter and various form, have commonly a small eccentric nucleus, surrounded by layers arranged concentrically one over the other. These envelopes increase by the successive deposition of new layers within the old ones, so that each layer is younger and less compactly aggregated than the one which immediately surrounds it; and since the layers are for the most part of variable thickness, they cause the granule to deviate gradually in form

from the originally spherical nucleus, and assume for the most part an ovoid form. Heated to 160° C. S. is converted into dextrine, first passing through the condition of soluble S., which is rendered blue by iodine S., so long as it retains its natural state of aggregation, is insoluble in water, alcohol, and ether; but when it is placed in contact with hot water, the water penetrates between the different layers of which the granules are composed, swelling them up, and forming a gelatinous mass known as starch-paste, and used for stiffening linen, etc. S. is converted into dextrine and glucose by the diastase of malt, yeast by saliva, pancreatic juice, gelatine, mucous membrane, urine, bile, spermatic fluid, blood-serum, animal tissue, and by watery infusions of the heart, brain, lungs, liver, kidneys, spleen, and muscles, and by boiling with dilute acids.

**Applications of Starch**.—S. is used for stiffening cotton and linen cloth, paper, etc. Corn S. possesses the highest, wheat the next, and potato S. the most inferior stiffening qualities. It is used for food in the form of arrowroot, tapioca, sago, etc., for making paste, for powdering the hair, for the manufacture of dextrine, glucose ("corn syrup"), etc.

C. F. CHANDLER.

**Star-Chamber Court** [*Curia Camera Stellata*; probably so called from the starred ceiling of the hall in Westminster Palace, in which at one time it sat], in Eng. hist. is mentioned as early as Edward III.'s time, when it was composed of the members of the privy council. It was remodelled in 1486, under Henry VII. In 1529 it was again modified. It had important criminal and equity jurisdiction. Odious to the Commons and the people, it was abolished by statute in 1640.

**Star-Fishes**, animals of the class Echinodermata and order Asteroidea, organisms more or less star-shaped, and having a disk which gradually merges into the rays, and locomotive suckers along the whole length of the rays. The skeleton is calcareous and made of movable pieces. In some the arms are merged into one.

**Star-gazer**, a popular name for the marine fishes of the genus *Uranoscopus* and family Uranoscopidae, acanthopteron fishes of the group Trachinoidea. They are ugly and spiny fishes, having the eyes on top of the head, whence the name.—STARGAZER is also a popular name for cyprinodont fishes of genus *Anableps*, found in Guiana, and popularly named "four-eyes," each eye having a double pupil.

**Starke (JOHN)**, b. at Londonderry, N. H., Aug. 28, 1723, became a farmer; in 1752 was taken prisoner by the St. Francis Indians; after 6 weeks was ransomed; had gained so much favor with his captors that he was adopted into their tribe. In 1755 he was appointed a lieut. in Rogers's Rangers; in Jan. 1757 distinguished himself in an engagement with the Fr. and Indians near Ticonderoga; took part in Abercrombie's campaign in 1758, and in Amherst's reduction of Crown Point and Ticonderoga in 1759; in 1775 was chosen a member of the N. H. committee of safety; as col. of the N. H. troops took part in the battle of Bunker Hill; accompanied Montgomery's expedition to Canada 1775-76; joined Washington at Newton, N. J., Dec. 1776, and took part in the battle of Trenton. Upon the advance of Burgoyne from Canada in the spring of 1778, the authorities of N. H. commissioned him to raise a force for the defence of the State, which was then held to include Vt. He attacked the Hessian col. Baum near Bennington Aug. 16, 1777, routed him, and later in the day defeated a force under Col. Breyman; became brig.-gen.; served under Gates in the Saratoga campaign; was with Gates in R. I. in 1778-79, and in 1780 joined Washington at Morristown; was a member of the court-martial for the trial of Major André, and in 1781 was placed in command of the N. dept. D. May 8, 1822.

**Starkville**, Miss. See APPENDIX.

**Star'ling**, the *Sturnus vulgaris*, a common European song-bird of family Sturnidae, now partly naturalized in the U. S. It is a great favorite, especially with the Gers.

**Star of Beth'lehem**, the *Ornithogalum umbellatum*, a common spring garden-flower of the order Liliaceæ, is a native of Europe, and sparingly naturalized in the U. S.

**Star of India, Order of**, was instituted by Queen Victoria in 1861, and reorganized in 1866. There are 3 classes of knights: 1, knights grand commanders (G. C. S. I.); 2, knights commanders (K. C. S. I.); and 3, companions (C. S. I.).

**Starrs (WILLIAM)**, D. D., b. at Drumquin, co. Tyrone, Ire., received a classical education; studied theol. at Maynooth Coll.; came to the U. S. 1828; ordained priest Sept. 1834, at St. Patrick's cathedral, New York, of which he was curate 10 yrs.; pastor of St. Mary's from 1844 until 1853, when he was appointed rector of St. Patrick's and vicar-gen. of the diocese of New York; administrator of the diocese from the death of Abp. Hughes until the consecration of Abp. McCloskey (1864); 20 yrs. pres. of the board of trustees of St. Vincent's Hospital, and theologian to Abp. McCloskey in the plenary council at Baltimore 1866. D. Feb. 6, 1873.

**Stars** [Gr. ἀστέρις]. The stars, which gem the sky on a clear night, which transport and enchant the gazer by the continual twinkling of their light, by their capricious disposition, by the constancy of the figures they compose, are a subject rather of contemplation than of study. Fancy loses herself in the search after a trace of law which unites them; the eye is wearied in the effort to count them; the mind finds itself before an immeasurable abyss: it is not a mere surface, but a boundless width and depth whose mystery is to be fathomed. Science, however, does not shrink before the difficulty of the problem, but addresses herself to the investigation of its secrets; armed with the most powerful instruments which art has been able to construct, she has already made no small rent in that thick veil which seemed impenetrable by the human intellect.

Stellar astron. as a science, in so far as relates to its geometrical aspect, may be said to be the work of little more than a century, and researches into its physics are of a still more recent date; nevertheless, it has already made such



progress that its labors fill many vols. We shall endeavor to compress the results into a few pages, and to bring together what may suffice to give an idea of the variety and the immensity of the subject.

*The Constellations.*—From the necessity of distinguishing the different parts of the heavens, the stars have, in all ages, been distributed into groups called "constellations." They correspond to the geographical divisions which constitute the states and nations of the terrestrial globe. The most ancient stellar groups are those through which the sun passes in his annual course, and which constitute the *zodiacal zone*, through the midst of which passes the apparent orbit of the sun, the *ecliptic*. They are familiarly known to all under the names of Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpio, Sagittarius, Capricornus, Aquarius, Pisces. The extent of these groups is very unequal, and their forms have no analogy with the objects whose names they bear. The outlines of these and of the other constellations are so arbitrary that it has been considered by astrons. whether it would not be worth while to abolish them altogether, and make a new division of the heavens. But, considering that the effect of this might be only to increase the confusion, it has been thought better to remove from the constellations the exoroscences introduced by the moderns, especially in the N. hemisphere. This has been done by the very laborious Heis. As to the S. hemisphere, the difficulty is irremediable, these groups still retaining the names originally given them. Many stars have proper names which are very anc., as Sirius, Regulus, Capella, etc.; others have names of Arabic origin, as Betelgeuse, Rigel, etc. Most of these names are derived from portions of the body of the animal by which the constellation was represented; for the anc. indicated the various stars of the same constellation by the part of the body of the animal within which they fell. Thus, Sirius was called "that which is in the mouth of the dog;" another, as Rigel, "the knee of Orion;" Aldebaran, "the eye of the bull," etc. A Ger. astron., Bayer, began to note the prin. stars by the letters of the Gr. alphabet, and, when these were not sufficient, he employed those of the Lat. Practically, it would seem his intention to indicate by these letters the order of magnitude, but the order is now found not to be fully preserved. The moderns, however, have scrupulously retained these letters for the facility they afford of designating objects without citing their co-ordinates, which are more difficult to remember. The best modern works for the description of the heavens are—the *Atlas* of J. E. Bode, a magnificent vol. in large folio, with illustrations of great artistic merit, but in which the very perfection of the shaded figures somewhat diminishes the distinctness of the smaller stars; and for the N. hemisphere, and for all that is visible in Europe, the *Uranometria* of Argelander and the *Atlas* of Heis. In these last two the stars visible to the naked eye are carefully classified according to their magnitude, and they form a true *uranometry*—that is, a precise measure of the stellar magnitudes. Good celestial maps are very important for the *falling stars*; Prof. Dorna of Turin has made an atlas which, projected upon the horizon of the middle N. lat., is very convenient. In other charts intended for this purpose the gnomonic projection is introduced, because thus every great circle is represented by a straight line, by means of which every trajectory of the meteors is a straight line.

*Magnitudes of the Stars, and Principles of Uranometry.*—The division of the stars into groups remounts to the remotest antiquity, as also their distribution into various orders of magnitude. The most beautiful and brilliant were classed as of the first magnitude, those next to these in brilliancy as of the second, and so on to the number of 6 visible grades. Here the naked eye fails; instruments must do the rest. The limits by which these grades of brightness are defined are not fixed and distinct, but are arbitrary and conventional only. The *Atlas Coelestis Novus* of Heis shows the stars which are visible in middle N. lat., arranged according to their magnitudes. From this it appears that, to an acute eye, like that of Heis, though unaided, stars are perceptible which by common usage would be referred to the 7th order. The total number down to this limit would be 5421 in the heavens as visible at Münster—that is to say, in  $\frac{1}{10}$  of the entire sphere—whence, supposing the distribution in the remaining part to be in similar proportion, the grand total would amount to 6900. It being impossible to divest the matter of its arbitrary element, astrons. have reversed the problem, and sought to determine in what ratio the brilliancy of the stars increases according to the various orders of conventional magnitude. The following are the results to which these inquiries have led. From the labors of Sir William Herschel upon the greater stars, it is inferrible that the ordinary magnitudes are related to each other in splendor according to the following law, viz.:

Magnitudes,	1	2	3	4	5 to 6
Splendors,	1	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{64}$

It results from this, that a star of the first magnitude, at a distance double, triple, or quadruple, would appear of the second, third, or fourth; but the law fails of precision for the fifth and sixth.

*Colors of the Stars.*—The stars are commonly called white, but to the most inattentive eye many appear diversely colored; some are yellow, some are orange, and not a few are decidedly red. The tints of the stars called white are for the most part blue; from this color there is a passage by insensible degrees to true white, then to yellow, to orange-red, and finally to blood-red. Sirius, Lyra, Castor, Regulus, are azure; Procyon,  $\alpha$  Aquila, white; Capella, Pollux,  $\alpha$  Ceti, yellow; Aldebaran, Arcturus, Betelgeuse,  $\alpha$  Orionis, orange; Antares,  $\alpha$  Herculis, red; the blood-red stars are  $\alpha$  small. The shade of color in the yellow and the orange is different at different epochs, as in Betelgeuse, Antares, Aldebaran, Arcturus, etc. In the double stars occurs frequently the curious phenomenon of 2 different colors, very often complementary. In certain constellations

certain special colors predominate; as in the Pleiades, blue; in Orion, greenish; in Eridanus, the yellows. The azure stars are rare, though we may say generally that a tint of azure prevails in most. Sirius has certainly changed in color. Seneca says that Sirius was redder than Mars, while now it is notoriously azure-white. Until very recent times these colors were only vaguely estimated; but the spectroscope has taught us how to define their tints with greater precision. Observations of stellar spectra are, however, quite difficult, because of the feebleness of their light. All stellar spectra can be distinguished into 4 categories, or types. The first is that of the white or azure-tinted stars, like Sirius, Lyra, etc.,  $\beta$ ,  $\gamma$ ,  $\delta$ ,  $\epsilon$ ,  $\zeta$ ,  $\eta$  of the Great Bear, etc. The spectra of these are almost continuous, only that they are furrowed by 4 strong black lines, which are absorption-lines of hydrogen. All the 4 can be seen in the most brilliant, as Sirius, Lyra, etc.; in the feeblest only the H $\beta$ , or the F of the sun, is ordinarily visible; but in general this is broad and dilated, and frequently diffused at the edges, especially in Sirius. This is an indication of a very high temperature, and of great density in the hydrogen atmosphere of the stars of this order. There are also seen traces of other lines, as of magnesium, sodium, and some of iron; but these are extremely feeble, and require an atmosphere of exquisite purity. Many stars appear of uniform light, without lines, which studied with care are found to belong to this type. The second type is that of the yellow stars. They have very fine lines, and their spectra are perfectly similar in character to that of the sun. Capella, Pollux, and many others feebly yellow have such a character. The fineness of the lines requires that in these researches the atmosphere should be very clear and quiet. Sodium, hydrogen, and iron are very conspicuous in them. The third type is that which is exhibited by the orange and red stars. It is formed of lines and zones or nebulous bands. A specially striking example is  $\alpha$  Orionis, the prototype of this class, to which belong also  $\alpha$  Scorpius,  $\alpha$  Ceti,  $\beta$  Pegasi,  $\alpha$  Herculis, and many other beautiful examples. In some variable red stars, in the period of feebleness, is seen a spectrum of a few lively bright lines; as, for example, in  $\alpha$  Ceti. The black reversion-lines of hydrogen are quite feeble, and sometimes not present at all in these spectra; while instead of them the sodium, iron, and magnesium lines are very strong; hydrogen is truly there, but is difficult of detection, because the lines are not perfectly reversed. The fourth type embraces some quite curious stars, for the most part of a blood-red color. They have only 3 bands, coinciding in limits with those of the third type, but having twice the breadth; and they are quite bright notwithstanding the minuteness of the stars. There are lucid lines in some of them, but in general these are feeble and few. They have the bright and well-defined side of their channellings turned toward the violet, while those of the third type turn it toward the red. They appear to give a spectrum similar to that of carbon as it is seen in the central part of the voltaic arch projected between 2 carbon points; except that, in the stars, the shading off is in the opposite direction—that is, the maximum light is turned toward the violet, while in the carbon arch it is turned toward the red. Many of these stars exhibit only a few luminous lines, and are without the channelled and cloudy spaces. All the stars of this type are of a deep-red color, and among them are found the most beautiful spectra.

*Variability of the Stars.*—The stars do not all of them preserve the same magnitude, but many change in brilliancy with time. Perhaps not even a single star is perfectly constant; but the attention of astrons. has been especially fixed upon some which are extremely singular, and which for this reason have received the name *variable*. One of the most famous of these is Omicron Ceti, which in a period of 331 days 8 hours dwindles from the 2d magnitude down to the 12th. After decreasing for about 3 months, it remains for 5 almost totally invisible, and then in turn increases for 3 more. Argelander believes that with the short period is associated a longer one of 88 yrs. in which the maxima vary, their duration being about 25 days. The stars whose colors are orange-yellow or red can be said generally to be all variable. Such are  $\alpha$  Orionis, which changes irregularly by about one magnitude, and  $\alpha$  Tauri, which also varies to the same extent. Arcturus even is not constant. A well-ascertained fact connected with this variability is the corresponding variation of the spectrum. When the stars are at their maximum brightness, their black spectral lines are fine, and the spectra approach the second order; but when they are at their minimum, these spectral lines become broad, with a specially large dilatation of those of sodium, magnesium, and iron. Beta Lyrae, a star of the first type, and a famous variable, has a double period—that is to say, a period formed of 2 maxima separated by 2 minima, unequal in quantity, but approximately equal in time. The general period is 12d. 21h. 53m. At its maximum it is of the order 3.4; at the first minimum, 4.3; and at the second 4.5; the period moreover of this seems to be variable in duration. Algol, or  $\beta$  Persei, in the head of Medusa, is quite an important star. Being ordinarily of the second magnitude, it remains at its maximum splendor for 2d. 13h., and then begins to decline slowly to such a degree that, in 3 hours and 30 minutes, it is reduced to a minimum of hardly the fourth magnitude. In this condition it remains but for a very short time—say 7 or 8 minutes at most—and in another 3 hours and 30 minutes it resumes its former state. The total duration of the complete period is 2d. 20h. 48m. 55s. To the category of the variables belong the temporary stars. A famous object of this kind, which appeared in Cassiopeia in the time of Hipparchus (125 B. C.), determined that astron. to construct his catalogue, in order that he might leave to posterity a record, which should enable them to judge whether even the stars called fixed are not liable to change their places or to disappear. Another presented itself in 1572, in the time of Tycho, in the same constellation, and



excited unbounded admiration. Resplendent as Venus for 17 months, it afterward passed from white to yellow, and then to red, and finally disappeared altogether, or left at least but a doubtful trace. In the time of Kepler, in 1604, also, a star of this class, which appeared in the foot of Serpentarius, lasted 15 months with the brilliancy of Venus, and after passing from white to yellow, and then to red, finally vanished. It was situated in A. R. 17h. 23m. 8.9s., decl. S.  $21^{\circ} 22' 16''$ , in which place there is no star now, though there is a small one at less than  $2\frac{1}{2}$ ' distance.

**Number of the Stars.**—The stars pass for innumerable. To the ancients, judging by the naked eye, it appeared nothing less than miraculous that Hipparchus should have made a catalogue of only a little over a thousand of them. The very diligent Heis avers that, for an observer in Middle Europe, it is not possible, with the naked eye alone, to count more than four or five thousand. The telescopic enumeration of the stars was attempted by both the Herschels—Sir William in the N. hemisphere, and Sir John in the S. The method employed by the elder Herschel was only indirect. He used for the purpose his 20-foot reflector with 18 inches aperture, directing it successively to various points of the heavens disposed in a certain regular order, of which he recorded the right ascension and declination. These points were so distributed as, in the end, to cover the heavens with a kind of network, sensibly uniform in every direction. The field of the telescope was of  $15' 4''$  diameter, and the magnifying power 120. He counted in each field the number of stars visible, and, where this was impossible because of their multitude, or where to count the whole would have occupied too much time, he counted a part, and made a proportionate estimate for the rest. These enumerations he called "star-gauges," or soundings of the heavens. Having united several of these gauges in a determinate part of the sky, he divided the sum by the number of gauges, and took the quotient to represent the density of the stars in the neighboring region. The number visible in the telescope of Herschel is computed to amount to 30,374,304. In the S. hemisphere, the phenomena are found to present a perfect similarity with those of the N. A catalogue of stars is a list in which the stars are entered by their names and magnitudes, together with their co-ordinates of position. The catalogue of Flamsteed, constructed in 1725, reduced to 1890, contains 3310 stars; the catalogues of Lacaille—viz. 1, that of 1750, containing 308 stars; 2, that of the zodiacal stars, containing 515; 3, that of 1924 S. stars observed at the Cape of Good Hope; the catalogue of Bradley, made at Greenwich and reduced to 1760—a work regarded as surpassing in precision all the preceding, on account both of the exquisite perfection of the instruments employed and of the accuracy of the observer. The catalogue of Argelander, pub. at intervals in 8 parts, embraces stars between the 2d degree of S. declination and the N. pole to the number of 324,188. The catalogue of Weiss, constructed on the zones of Bessel between  $15^{\circ}$  S. and  $45^{\circ}$  N., pub. in 2 parts at different dates, contains 62,530 stars, observed at Königsberg. The catalogue of circumpolar stars by Groombridge, pub. 1838, reduced by Airy to 1810, embraces 4243.

**Proper Motions of the Stars.**—In the infancy of science, when the celestial sphere was conceived to be a solid dome, the stars were believed to be permanently and mechanically affixed to the dome. It was only after a gigantic advance in science that it became possible to grasp the conception of an earth stable in mass, and at the same time revolving round the sun. But after the mind had succeeded in comprehending that the stability of things upon the surface of a celestial body is compatible with the translation of the body in space, the suggestion naturally occurred that the sun himself might be in motion, and with him all the stars. The mobility of the stars was thus a corollary of the prevalent theory of the *cosmos*, and it remained only to verify it by observation. In this, as in so many things, the genius of Halley displayed its superiority. Comparing the actual positions of Sirius, Arcturus, Aldebaran, and other stars with those given in the primitive catalogues, he saw that, after taking account of all the progressive variations, of precession, and of the annual periodic motions, there remained differences of  $37'$ ,  $42'$ , and  $33'$ —quantities entirely too great to be ascribed to errors of copyists. It was reserved to modern times to give to observation a precision adequate to form a firm foundation on which to establish laws and deduce consequences, even when the intervals between the observations are by no means great. The difficulty of the subject will be understood by simply reflecting that, for most of the stars, the motions in question do not amount to so much as a single second of space per annum; and that the largest—which, moreover, occur in only a very few exceptional cases—do not exceed 6 or 7 seconds. Mr. Proctor has graphically represented the proper motions of many stars, and has deduced the conclusion that the directions of these motions are identical in many of the individuals of certain natural groups. Thus, in the group of the 7 principal stars of Ursa Major,  $\alpha, \beta, \gamma, \delta, \epsilon, \zeta$ , and some companions of these, tend all in the same direction, while the other 2 are moving in the direction opposite. This shows that the first 5 form a common system, to which the other 2 do not belong. In the Pleiades, one half move in one direction, and the other half in the other. In Gemini, very many groups have the same direction, which differs for the different groups. From this systematic distribution of signs, it follows that there ought to be some common cause which gives them such laws, and which could not *a priori* be supposed to control the proper motions of the individual stars severally, since these should naturally be distributed impartially throughout all directions.

**Distances of the Stars.**—The distances of celestial objects in general are computed by means of their parallaxes; but, for the stars, it was perceived, even by the early astronomers, that the diurnal parallax must necessarily be excessively minute, and hence they sought to find an annual parallax.

Bessel, on studying with his heliometer the star 61 Cygni, and comparing this with others neighboring, detected an annual difference of position of seven tenths of a second, and fixed the parallax at  $0.3''$ . The distance of this star is hence concluded to be equal to 589,043 mean radii of the earth's orbit, and the time required for its light to reach us is no less than 12 yrs. Astronomers were encouraged, by the success of Bessel, to make similar trials upon other stars, especially upon those of the superior magnitudes and those which exhibit the greater proper motions, naturally supposing these to be the least distant; but their success has been inconsiderable. In the list following, we give the probable parallaxes of several of the stars; but we warn the reader at the same time that authorities regard the values here given with distrust.

#### PARALLAXES ATTRIBUTED TO CERTAIN STARS.

Star.	Parallax.	Authority.	Star.	Parallax.	Authority.
$\alpha$ Centauri...	$0.913''$	Henderson.	1570 Groombridge....	$0.226''$	Peters.
61 Cygni....	$0.348$	Bessel.	1 Ursa Maj....	$0.133$	Peters.
$\alpha$ Lyrae....	$0.361$		Arcturus....	$0.127$	Peters.
Sirius....	$0.230$	Henderson.			

**Proper Motion of the Sun.**—If the stars have motions of translation in space, it is quite natural to suppose that the sun has a similar motion, and that consequently his entire attendant system is in movement with him. But though this conclusion on the part of astronomers was inevitable, the verification of the motion and the determination of its magnitude are problems demanding an inheritance of observations of a much higher degree of precision than have belonged to any which they possessed. Sir William Herschel made, nevertheless, a bold attempt to resolve it, and was successful not only in marking out the method, but even in applying it with satisfactory results. He simply traced in the celestial sphere the great circles apparently described by various stars having large proper motions, and saw that the intersections of their planes, when taking 2 and 2, tended to converge toward the constellation Hercules, and that the most nearly central point in the area of convergence, had for co-ordinates the values A. R. =  $245^{\circ} 52'$ , decl. N. =  $49^{\circ} 58'$ ; confessing this, nevertheless, to be but a rough approximation. The astronomer who, next after Herschel, occupied himself with this problem was Argelander. Comparing his own observations with those of Bradley, he deduced the proper motions of many stars, and from them inferred the co-ordinates of the vertex of translation to be A. R. =  $257^{\circ} 40'$ , decl. N. =  $29^{\circ} 50'$ . And, from very elaborate investigations, Otto Struve found the values A. R. =  $261^{\circ} 23'$ , decl. N. =  $37^{\circ} 25'$ .

**Double Stars.**—Many stars which to the naked eye appear simple are found, when observed with instruments, to be composed of 2, and occasionally of 3 or more, extremely close together, of magnitudes sometimes equal and sometimes very different. These are called double or multiple stars. The close approximation of the bodies in these instances may either be a simple effect of perspective, in virtue of which 2 stars widely distant from each other are projected upon very nearly the same point of vision, or, in the second place, may be owing to a physical connection existing between them, the consequence of some sort of force binding them together, as is true of the planets and the sun. In the first case, the objects are called optically double; in the second, physically so. To determine whether, in a particular instance, such a bond of union exists is a work exacting delicate observation and laborious calculation. The characteristic which decides the question is the fact that one star of a pair revolves around the other in a closed curve, described according to the laws of central forces. The grand discovery of this fact is due to Sir William Herschel. After several yrs. of assiduous investigation, he was enabled, in 1802, to announce to the scientific world that some of the stars have really luminous satellites revolving round them in periods comparatively brief; as, for example,  $\zeta$  Herculis in 36 yrs.;  $\gamma$  Corona Borealis in 44 yrs.;  $\zeta$  Cancri, a triple star, of which the lesser revolves in 59 yrs.;  $\epsilon$  Ursa Majoris in 63 yrs.; and so on. Since the time of Sir William Herschel, this investigation has been prosecuted by his son, Sir John, and also by South, Dawes, and many others, but especially by Struve, who with the superb refractor of Dorpat, early constructed an exceedingly rich catalogue, embracing no fewer than 3112 double stars; a number which has continued to grow with time, and at present amounts to more than 6000, one tenth part of at least are in motion. Struve says that of 72,500 stars of at least the 10th magnitude, 1793, or 1 to 26.7, were found by him to be double. Of these, 1792 are physically and 271 optically double, or 1 optical to 6 physical. This was true of his time, but recent measures have considerably increased the number of the physically doubles.

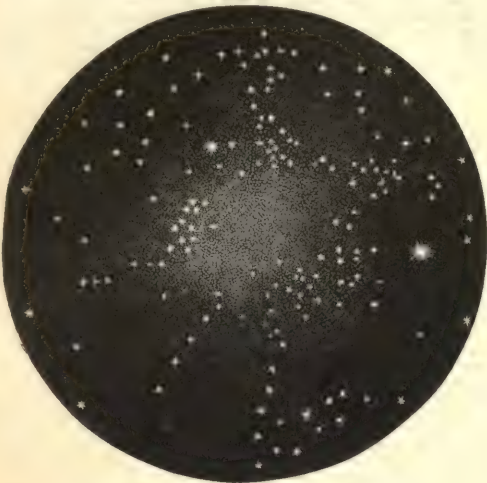
**Of the Apparent Distribution of the Stars in the Celestial Sphere.**—It is commonly said that the stars of the larger magnitudes are scattered over the celestial vault so irregularly as to suggest no certain principle of arrangement. Yet it has been long since noticed that the brightest of them occupy a broad zone which embraces Taurus, Orion, and the Southern Cross. This obscure indication we have endeavored to examine a little more particularly, with the following results: If a celestial globe be so adjusted that the bright star of the Southern Fish, called Fomalhaut, be in the zenith, the horizon of the globe will mark a great circle, such that a quite narrow zone above and below this plane will embrace the larger number of the conspicuously bright stars. The distribution of the minor stars is also well remarked, so long as we are careful to regard only mean results without descending to particular cases. The larger number of minute stars is evidently in the Milky Way. The course of this zone, with all its cloudlets, has been diligently traced by Heis through the N. hemisphere, in his *Novus Atlas Coelestis*, and for the S. by Sir John Herschel in his observations at the Cape. The soundings of the stars, insti-



tuted by Herschel for the purpose of learning the apparent distribution of those bodies, have already been described. The data thus obtained have led to the following results: (1) The stars are more abundant the nearer we approach the Milky Way, where their density is maximum. (2) The minimum density is found at the pole of the same zone.

*The Nebulae.*—Not only in the Via Lactea, but also outside of it, there are in the heavens many spots which, even to

FIG. 1.



Globular Cluster in Aquarius.

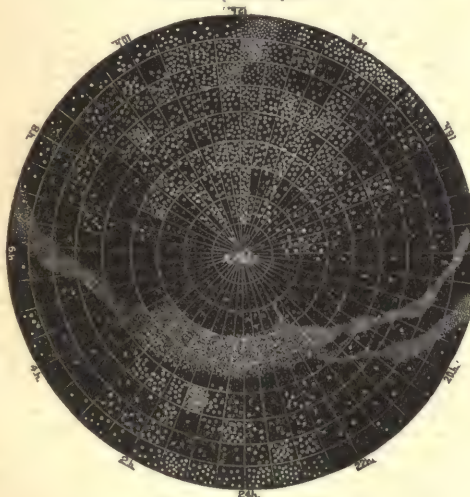
the naked eye, seem luminous clouds, such as the Pleiades, the Beehive in Cancer, the hilt of Orion's sword, and the Hair of Berenice. These spots, from the earliest antiquity, have been called "nebulae;" but since the time of Galileo it has been proved, by the aid even of imperfect instruments, that they are in the most instances formed of aggregations of minute stars so close together that, though easily

separated by instruments, the naked eye fails to distinguish them individually. The improvement of telescopes opened a much more extensive field of objects of this kind, though of smaller dimensions. Messier and Lacaille in their time detected an admirable list, some separable in their instruments into stars, and others not. It was reserved for the elder Herschel to study exhaustively this branch of astron. also, and to gather from it marvels without end. As a first result, many of the objects believed by his contemporaries to be irresolvable were perfectly resolved by his powerful instruments. But the power of Herschel's instruments was not sufficient to resolve into stars all the objects characterized as nebulosities, and the name of nebula is now restricted to the unresolved. Of these nebulae there are 3 categories: (1st) the planetary nebulae; (2d) the elliptic nebulae; (3d) the irregular nebulae. The first receive their name from the fact that, in the field of the telescope, they appear as disks more or less well defined, and with a light like that of a planet, nearly uniform. Some are cloudy on the edges, while they also present a neatly defined central part, and others again have decidedly the aspect of a true ring, the interior being wholly vacant. The oval nebulae are elliptic masses, mostly faint and extremely diffuse at the borders. A remarkable example of this class is in the girdle of Andromeda, discernible to the naked eye, and resembling in appearance a light seen through a thin plate of horn; it was so described by its discoverer, Fabricius. Its extent is very remarkable, being in length a degree and a half, and in breadth a quarter of a degree. The irregular nebulae are not less numerous or celebrated than those already mentioned. The most remarkable among those visible in our hemisphere is that in the hilt of Orion's sword, involving the multiple star  $\theta$ . The portion of the heavens which surrounds this star seems to be formed of loosely heaped locks of cotton. There are many other irregular nebulae in the heavens which were designed by Herschel. One of the most important is that of Vulpecula, called by the English the Dumb-bell Nebula, and another is that of Canes Venatici. In this last is manifested a spiral structure; and a similar configuration has been found, under the scrutiny of the powerful instruments of Lord Rosse, to be repeated in other nebulae also. The number of the nebulae is countless. Herschel discussed 3812 in his statistics, and in the great catalogue pub. by him in 1844 were included 5079. Since this epoch not a few others have been discovered at Rome, and several hundred at Marseilles, with the great reflector, of 90 centimetres diameter, of that observatory. Probably the number will increase with the increasing di-

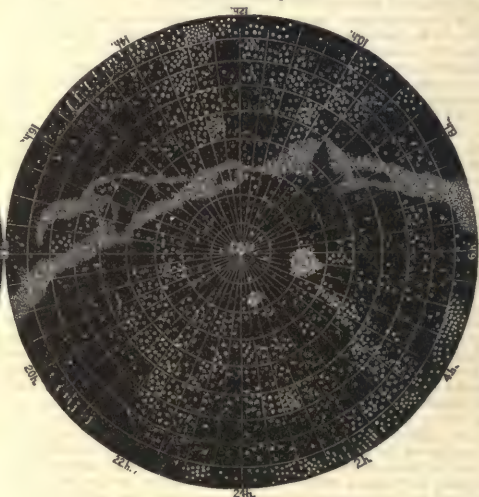
FIG. 2.

Northern Hemisphere.

Southern Hemisphere.



Distribution of the Nebulae.



The Northern and Southern Nebulae.

mensions of instruments, but all the later discoveries are of objects too faint to promise to future speculators matter of important interest. The order of distribution of the nebulae is clearly shown on the chart by Proctor. From it we see that the richest region of nebulae is near the N. pole of the galactic circle. [From orig. art. in *J.'s Univ. Cyc.*, by P. A. SECCHI, Director of Observatory at Rome, Italy; translated by PRES. F. A. P. BARNARD, LL.D.]

**Starstone**, a variety of sapphire, the *asteria* of Pliny and the *ancus*, is found in Ceylon. It presents a peculiar reflection of light in the form of a star.

**Starvation** [A.-S. *steorfan*, to "die" or "perish"], or **Inanition**, the condition of tissue-waste, exhausted vitality, and death resulting from prolonged privation of food. A slower S. ensues when food is scanty and impure. Animals have been fed experimentally on single classes of food—one upon albuminoid matter, another partaking of only farinaceous substances, a third only of the hydrocarbons or fats. Such exclusive diet, of whichever kind, proved disastrous: emaciation, enfeeblement, and death by S. ensued. Rigid exclusion of food and drink causes death, as an average, in from 5 to 8 days. Water, freely supplied, with exclusion of solid food, may prolong life 2 or 3 weeks, exceptionally longer. If desiccated food alone be supplied, with no drink, death will result in a few days. S. at the outset produces urgent hunger; this may gradually lessen, be replaced by faintness, loss of appetite, and even loath-

ing. The strength fails, the body wastes, the mind becomes enfeebled; in some cases there is listlessness and stupor, in others marked nervous excitement and delirium—phenomena excited by non-excreted effete matter accumulated in the blood. The starving person is liable to intercurrent disease, and the community suffering privation is often visited by epidemics of contagious and infectious diseases, which assume an unusually malignant and fatal type, consequent upon the nervous depression and vitiated blood of the persons attacked.

**Stassfurt**, town of the Prus. prov. of Saxony, on the Bode, is noted for the immense layer of rock-salt in its vicinity, discovered in 1837 at a depth of 826 ft., with thickness of about 1000 ft. The mine is one of the largest in the world.

**State**. The Latin word *status* never means what *state* means—a self-governing community organized under permanent law, having for its aim justice and public security. *Nation* implies common origin, although the Grs., of whom Cicero uses the word *nation*, were never united. Many modern states are such, although consisting of several nationalities, as Belg., Aus., and even G. Brit. And the Brit. *nation* is spoken of, although its parts are not entirely homogeneous. The political sense of *estates* (from *status*, *estat*, *etat*), as forming 3 or 4 groups or classes in the political assemblies, is peculiar to the feudal system. There is great confusion from the name of *United States* given to this coun-



try, as a whole, and the name *state* to single constituent parts of it, which now nothing can alter. T. D. WOOLSEY.

**State Centre**, on R. R. Marshall co., Ia., in an agricultural and stock-raising region. Pop. 1870, 559; 1880, 880.

**Stat'en Island** [named by the Dutch in honor of the States-General], the island which constitutes nearly all of Richmond co., N. Y., is bounded on the E. by New York harbor, New York Bay, and the Narrows, N. by the Kill van Kull, W. by Staten Island Sound, and S. S. E. by Raritan Bay and the Lower Bay of New York. It is 14 m. long, and greatest breadth 8 m. Area, 58½ sq. m. It is traversed by Staten Island R. R., and is connected with New York by lines of ferry-boats.

**State Rights**. See SOVEREIGNTY.

**States-General**. See ESTATES, THE THREE.

**States of the Church**. See PAPAL STATES.

**Statesville**, R. R. junc., cap. of Iredell co., N. C. Pop. 1870, 644; 1880, 1062.

**Statice**. See MARSH ROSEMARY.

**Statics** [Gr. *statikē*] is that branch of mechanics which treats of the properties and relations of forces in equilibrium; and by equilibrium it is meant that the forces are in perfect balance, so that the body upon which they act is in a state of rest. According to the classification presented in most text-books on the subject, the word "statics" is used in opposition to "dynamics," the former being the science of equilibrium or rest, the latter of motion, and both together constituting mechanics. The influence of Fr. lit. has, however, produced among recent writers a tendency to a stricter and better use of these words. In this new classification the word "mechanics" is used as expressing not only the theory of force and motion, but its applications to the arts; the portion of this which may be regarded as pure science is then divided into kinematics and dynamics, the former being the pure geometrical theory of motion independent of notions of force and matter, and the latter the theory of forces as acting upon and producing either the rest or motion of bodies. The word "dynamics" is thus employed nearly in its etymological sense, as expressing the science which treats of the laws of force or power, and it is divided into statics and kinetics, the one being the science which treats of forces considered as producing rest, and the other as producing motion.

**Statistics**, a branch of political science having for its object the collection and classification of facts illustrative of the social, moral, and industrial condition of a people. As a basis for the operations of govt., attempts more or less rude to obtain such information have been made in every civilized country from time immemorial. It is, however, only in comparatively modern times that the great importance of the subject has been appreciated.

**Status**, *stā'sh-us* (PUBLIUS PAPINUS), b. about 61 A. D., lived at one time in Rome and enjoyed the favor of Domitian, but d. about 96 A. D., in retirement at Naples. Of his works are still extant *Silvarum Libri V.*, *Thebaidos Libri XII.*, and *Achilleidos Libri II.*

**Statuary**. See SCULPTURE AND ROMAN ARCHEOLOGY.

**Staubach**, *stōwb'bahk* ["dust-stream"], a celebrated waterfall of Switz., in the canton of Berne, has a descent of between 800 and 900 ft. Before the water reaches the bottom it is dissolved into spray and carried away by the wind, which gives it a singularly beautiful resemblance to a lace curtain floating in the air.

**Staughton** (WILLIAM), D. D., b. in Coventry, Eng., Jan. 4, 1770, emigrated to Amer. 1793, and became pastor of a Baptist ch. in Georgetown, S. C.; preached subsequently in Phila. (1805-23), acting at the same time as sec. of the Bap. Board of Foreign Missions; from 1823 to 1827 pres. of Columbian Coll. D. Dec. 12, 1829.

**Staunton**, *stan'ton*, city and R. R. junc., cap. of Augusta co., Va., 136 m. from Richmond, has State insts. for the insane, deaf and dumb, and blind, and 4 female sems. Pop. 1870, 5120; 1880, 6664.

**Staunton** (Sir GEORGE LEONARD), BART., D. C. L., b. at Cargin, Galway, Ire., Apr. 19, 1737, ed. at Dublin and at Montpellier, Fr., where he grad. in med.; wrote for Lond. periodicals; settled in 1762 as a phys. in the island of Grenada in the W. I., where he held several official positions, including that of atty.-gen., and acquired a considerable fortune, which he invested in landed estates; formed in 1774 an intimate friendship with Lord Macartney, the new gov. of the island, with whom he was sent prisoner to Fr. on the capture of Grenada in 1779, and whom he accompanied as sec. during his governorship in Madras (1781-84) and his celebrated embassy to Chi. (1792), of which he pub. in 1797 an interesting narrative. D. Jan. 14, 1801.

**Staunton** (HOWARD), b. in Eng. in 1810, ed. at Ox.; travelled extensively; settled in Lond.; became noted as one of the most skilful of chess-players and as an eminent Shakspearian scholar; edited the *Chess-Player's Chronicle* and the chess column of the *Illustrated Lond. News*; pub. several manuals of the game of chess and an edition of Shakspeare's *Plays and Poems*. D. June 22, 1874.

**Staunton** (WILLIAM), D. D., b. at Chester, Eng., Apr. 20, 1803, came to the U. S. at 15; was ordained deacon in the P. E. Church June 9, 1823, and priest Sept. 7, 1824; was a missionary preacher at Palmyra and Lyons, N. Y., 1824-35; rector of St. James's ch., Roxbury, Mass., 1835-40, of St. Peter's ch., Morristown, N. J., 1840-47; founded and became first rector of St. Peter's ch., Brooklyn, N. Y., 1848; was subsequently for 7 yrs. rector of Trinity ch., Potsdam, N. Y. Author of *A Dict. of the Ch.*, *An Ecclesiastical Dict.*, *The Book of Chants, Songs, and Prayers for the Family Altar*. He was one of the associate eds. of *J.'s Univ. Cyc.*

**Staupitz**, *stōw'pits*, *von* (JOHANN), descended from a noble family in Meissen, studied theol. at Tübingen; took a very active part in the foundation of the Univ. of Wittenberg, and was appointed its first prof. of theol.; became acquainted with the young Luther, on whom he exercised considerable influence; procured his appointment as prof.

in Wittenberg, approved fully of his theses against the sale of indulgences, and gave him, during the first stage of his contest with the R. Cath. Ch., his effective support. Subsequently, however, when an open breach with the Ch. took place, he retired from Wittenberg, and lived after 1539 at Salzburg as court-preacher to the abp. and abbey of a Benedictine monastery. Wrote *De Amore Dei* and *De Fide Christiana*. D. Dec. 28, 1524.

**Steam** [A.-S. *stēm*]. The substance which in the solid condition is known as ice, and in the liquid condition as water, assumes under certain circumstances of heat and pressure the vaporous condition known as *steam*. Water exposed continuously to a temperature below 32° F., or 0° Centigrade, becomes converted into ice. At temperatures above 32° F., or freezing-point, and between this temperature—called the melting-point—and 212° F. and under a pressure of one atmosphere, the liquid state is exhibited. If the temperature be increased to 212° F. under a pressure of one atmosphere, the liquid rapidly disappears, and is dissipated in the form of steam or vapor. This transformation, which is rapid at the temperature of 212° F., takes place *slowly* at all temperatures above the freezing-point when the liquid is freely exposed to the atmosphere, the change being more rapid as the temperature rises, until the limiting temperature, 212°, is reached, above which, under a pressure of one atmosphere, the substance can no longer retain its liquid form. The ordinary "boiling-point" of water, 212° F., is thus a limiting temperature, above which it assumes the vaporous condition under a pressure of one atmosphere.

This formation of vapor at lower temperatures in the atmosphere is a phenomenon of great importance in the economy of nature, the slow evaporation from the surface of the sea, from lakes, and from rivers forming a part of the cycle of changes by which rainfall and dew supply moisture to the dry land. The laws of this natural *evaporation* are not well known, the quantity of water converted into vapor in a given time from a given surface of a lake or river being an almost indeterminate quantity, depending as it does on the removal of the vapor already formed by winds, the temperature of the water, the pressure of the atmosphere, and the quantity of vapor already existing in the air brought from other regions. When water is confined in a close vessel, however, a part of the inclosed space being left free or vacant, the effects of heat may be more definitely determined. If under these circumstances the water be heated to 212°, the space above the water will become filled with S. or vapor with an elastic force of one atmosphere, or 14.7 lbs. per square inch. If more heat be applied to the mixture of water and S., the volume of the vessel remaining constant, an additional quantity of S. will be formed, the quantity of liquid water being correspondingly diminished, an increase of elastic force or pressure will be observed, and these new relations will remain fixed and permanent for any given higher temperature as long as that temperature is constant. If the vessel be then cooled, reverse phenomena will occur; a certain portion of the S. will be condensed to a liquid form, and the elastic force will be diminished. If the S.-space be enlarged, the temperature remaining constant, an additional quantity of vapor will be formed, and the elastic force will remain constant. If the space be contracted, the temperature remaining constant, condensation of vapor will occur, the pressure still remaining constant.

It is thus observed that for every temperature there is a corresponding elastic force or tension, which cannot be changed without causing either evaporation or condensation. S. in this condition is said to be saturated. If the quantity of water in the vessel be small relatively to the size of the vessel, and heat be continuously applied, the last element of liquid will finally be converted into vapor. At this instant the vessel will contain saturated S. only, unmixed with liquid water. If, now, additional heat be applied, or if the space be enlarged, the temperature remaining constant, the S. will assume what is termed the *superheated* condition. If the volume of the vessel be increased, the temperature remaining constant, the pressure will diminish, but it will no longer be solely proportional to the temperature, as in the case of saturation; it will depend also upon the volume, and the vapor begins to partake of the properties of the permanent gases. Superheated vapor has thus always an elastic force inferior to that which belongs to saturated vapor of the same temperature; and if a quantity of saturated S. and another quantity of superheated S. exist under the same pressure, the temperature of the superheated S. will be the greatest.

S. unmixed with particles of water is transparent and colorless, its ordinary cloudy appearance as it issues from vessels containing it arising from suspended particles of water. Its uses as a medium for the transfer of heat in heating buildings or heating other bodies, and also as a medium for the transformation of heat into useful work in the steam-engine, have become almost universal, and render it one of the most important agents in modern civilization. In its superheated condition it obeys the general laws of the permanent gases; but saturated S., as well as the saturated vapors of other liquids, possesses peculiar properties which have been determined mainly by experimental investigations. No theoretical mode of ascertaining the relation between the pressure and temperature in the case of saturated vapors is at present known, but for some of the most common, and especially for S., the celebrated experiments of Regnault furnish the most reliable means of calculating by empirical formulas this relation for a wide range of pressures. W. P. TROWBRIDGE.

**Steamboat**. See STEAM VESSELS.

**Steam-Engine**. The S.-E. may be defined to be a prime mover or motor in which the force of heat is caused to perform useful work through the medium of steam. The



most simple form of the apparatus possible embraces at least 2 distinct organs—one for the production and supply of the steam, called the *boiler*, and the other for the utilization of the steam, called the *engine*. The engine consists of 2 combinations of mechanism—the *cylinder*, with its *piston* and *piston-rod*, its *connecting-rod* and *crank*, by means of which the elastic force of the steam is caused to produce a motion against the useful resistances to be overcome; and the *valve-gearing*, by which the proper distribution of the steam is made to and from the cylinder at certain periods of the motion of the piston. A third organ is often attached to the engine or connected with it by a pipe, called the *condenser*, which performs a special and important office when it is employed, its introduction giving rise to a general classification of engines into *non-condensing* and *condensing* engines, the distinction being that in non-condensing engines the steam after having performed its work in the cylinder is ejected from the cylinder into the atmosphere, while in condensing engines the steam is exhausted into the condenser, where the condensation is effected by cold water supplied to the condenser, and the condensed steam may be resupplied to the boiler. In such an arrangement, where the condenser is of the kind called a surface condenser, the cooling water does not become mixed with the condensed steam, and the latter may be pumped directly back to the boiler. The steam-engine as a whole will then consist of the following parts: the *boiler*, with its *attachments*; the *cylinder*, with its *valve-gear*; the *condenser*, and the necessary *feed-pumps*. There are also often combined with the apparatus certain regulators of the motion, such as fly-wheels in stationary engines for regulating the momentary resistances against which the elastic force acts; and governors, for controlling the flow of steam to the cylinder, and thus regulating the average pressure of the steam on the piston. The fly-wheel in such cases is often made in the form of a band-pulley for transmitting the power of the engine to other machines.

**The Boiler.**—To whatever use heat is to be applied through the medium of steam, the apparatus for generating and retaining the steam is constructed on the same general principles for all purposes, and is popularly termed a *boiler*. It may be described as a closed metallic vessel, kept partly filled with water, with arrangements for imparting heat to the water by means of the combustion of fuel. The steam generated is confined in the vessel above the water until it is required for use, when it is drawn off through pipes. This metallic vessel, with its compartments and openings, takes the name of "boiler" in the shops where it is manufactured. But in many classes or forms of boilers the steam-generating apparatus is not complete until the boiler is set up in brick-work, with an external furnace constructed for the combustion of the fuel, and external flues made for conducting the heated gases to the chimney along the sides of the boiler. In others the boiler is ready for use as it comes from the manufacturer, having within its external shell all these necessary arrangements for combustion and draught. In all cases certain adjuncts and appurtenances are necessary, such as the feed-pump or other means of supplying water, with the necessary pipes and attachments, the safety-valve, the steam and water gauges, and grate-bars for the furnace. The primary conditions which steam-generators should fulfil are—(1) strength to sustain the internal pressures to which they will be subjected; (2) durability; (3) economy or efficiency in evaporating qualities; (4) economy of construction in materials and workmanship; (5) adaptation to the particular circumstances of their use. (6) To these conditions must be added safety, which depends on form, construction, strength, and qualities of materials, as well as upon management.

The first condition—strength to sustain the internal pressures—requires the consideration of the materials to be employed, the static pressures or strains to which these materials will be subjected, and the proper forms and devices to resist those strains. The condition of durability involves the action of these materials, and their preservation under the varying influences of heat, pressure, and the chemical reactions to which they will be subjected in use. Economy in evaporative qualities calls for such arrangements for the combustion of fuel and the transfer of heat as shall utilize the greatest possible proportion of the heat which is evolved by the combustion of the fuel. Economy in materials and construction requires the employment of the least amount of costly materials, and the least labor in the construction, that shall be consistent with the other conditions. Adaptation to various uses gives rise to various forms, in which the special use controls or modifies to some extent some of the other conditions; while safety of life and property demands that strength of parts, quality of materials, excellence of workmanship, and skilful management shall not only meet the requirements of economy, durability, and adaptation, but shall place beyond contingencies, as far as possible, the occurrence of explosions. As far as they relate to construction alone, the conditions of *economy* and *safety* stand, to a certain extent, in constant antagonism, the least amount of material that will bear the internal pressures being the extreme limit of economy of construction, while a near approach to this limit is always attended by excessive risk. But as true economy includes permanence and durability under continuous use, it may be said that all the essential conditions are involved in *strength, economy of construction and use, durability, and adaptation*.

In regard to forms and adaptation to various uses, boilers may be classified under a few types. Considered merely in reference to strength and internal capacity, combined with the least weight of material, the spherical form is that which fulfils the theoretical requirements of strength and safety. A vessel of this form possesses the advantage, in regard to strength, that every point of the shell or external envelope is exposed to a strain of extension. No cross-

strain is produced in any part of the material, and no distortion can occur from the internal pressures. The spherical form is not, however, the best adapted for the application of heat externally, nor is it the form of cheapest construction. Those conditions are obtained by modifying this form and extending it to the cylindrical shape, which gives the same advantages in transforming all the strains into tangential strains, while it permits of the most extensive variety of arrangements for the application of heat. The cylinder is the form best adapted for cheapness of construction, strength, permanence of shape under both internal and external pressures, and for the flow of fluids; and it thus forms a basis for nearly all constructions, modifications or departures from this form being adopted only in exceptional cases, such as the boilers of steam-vessels. The most common types of steam-generators may be arranged under the following designations: (1) The plain cylinder boiler; (2) the cylinder-flue boiler; (3) the cylinder-tubular boiler; (4) the return-flue boiler; (5) the return-tubular boiler; (6) the water-tube boiler; (7) the locomotive boiler; (8) the sectional boiler. Each of these types appears under various forms, and the modifications often present such peculiar and distinct characteristics that they would scarcely be classed with either of the above-named types. But for a general discussion these forms comprehend the largest proportion of boilers at present in use, or which have been in use during the last quarter of a century.

The plain cylinder boiler (B, Fig. 1), as it comes from the manufacturer's hands, is a plain cylinder, formed of

Fig. 1.

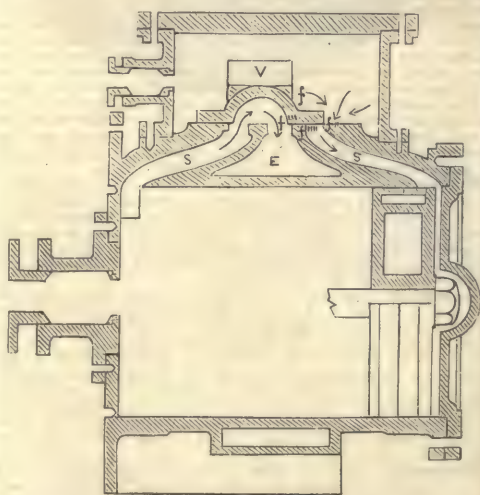


Plain Cylinder Boiler set in brick-work.

wrought-iron plates of  $\frac{3}{16}$  to  $\frac{1}{2}$  inch thickness, according to the size of the boiler, the ends of the cylinder being closed by cast-iron heads or by wrought-iron plates hammered into the form of a segment of a sphere. The plates forming the body of the cylinder are shaped to a cylindrical form in a cold state by rollers, the sections thus formed being riveted together longitudinally, and afterward joined end to end. The cylinder is surmounted at some point by a cylindrical chamber, called the *steam-dome* or *steam-drum*, which is closed at the top by a cast- or wrought-iron head, on which the castings for attaching the steam-pipes and the safety-valve are usually fitted. This cylindrical structure is called in the shops a boiler, but the complete apparatus to which this term appropriately belongs requires other parts, which, for this class of boilers, is usually supplied by the brick-work setting in which it is mounted. Fig. 1 represents a cylinder boiler set in brick-work. The front end of the cylinder rests upon a cast-iron frame, called the *front*, shown in section and partly in the end elevation of the figure. The rear end of the cylinder rests upon a brick wall, a roller being placed under this end to permit a slight movement when the cylinder expands or contracts, the object being to prevent the shattering or breaking of the walls by the expansions and contractions when the boiler is alternately heated and cooled.

The cylinder, as applied to the S.E., comprises all forms of the chamber or working space in which the steam, by acting upon a movable surface, produces motion against a resistance. This working chamber is almost universally

Fig. 2.



cylindrical, and the movable surface is usually the end of a piston of a cylindrical form accurately fitted to the interior of the cylinder, and moving in the direction of the axis of



the cylinder. This most common form of a cylinder is shown in Fig. 2, which represents a longitudinal section of a cylinder, with its piston and piston-rod. Fig. 3 represents a section of the cylinder of the Corliss engine. It shows a different arrangement of openings for the entrance and exhaust of steam. Fig. 4 represents the piston with its packing-rings; these rings serve to prevent the escape of steam past the piston. Figs. 5 and 6 are sketches illustrating the rotary forms of engine as invented by Watt

FIG. 4.

FIG. 5.



and Bramah respectively. In these engines the cylinders are truly cylindrical, but the pistons revolve about the axes of the cylinders. Of many hundreds of devices of rotary engines these are the prin. types.

The following cut (Fig. 7) exhibits the mechanism of the ordinary non-condensing stationary S.E. by which the reciprocating rectilinear motion of the piston and piston-rod is converted into continuous rotary motion. In this cut, C represents the cylinder, C' the cross-head moving in guides, C'' the crank, C''' the connecting-rod, F the fly or band-wheel, S the steam-pipe. Fig. 8 represents generally the corresponding features of the Corliss engine, and Fig. 9 the mechanism of the Amer. beam engine, as designed for large steamships and river boats. In this sketch C represents the cylinder, C' the condenser, B the working- (or "walking-") beam, C'' the connecting-rod, C''' the crank, A the air-pump, V valve-gearing. Fig. 10 exhibits an arrangement of mechanism of a compound engine for a propeller.

FIG. 6.

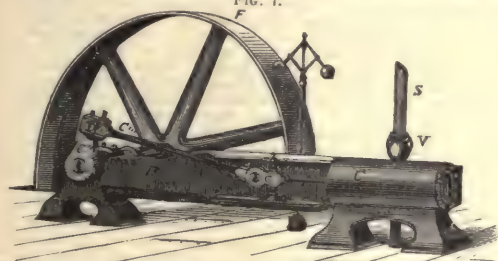
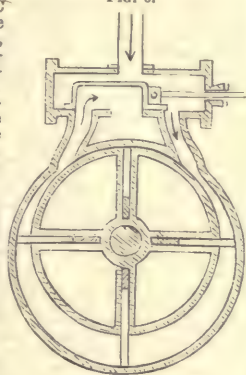
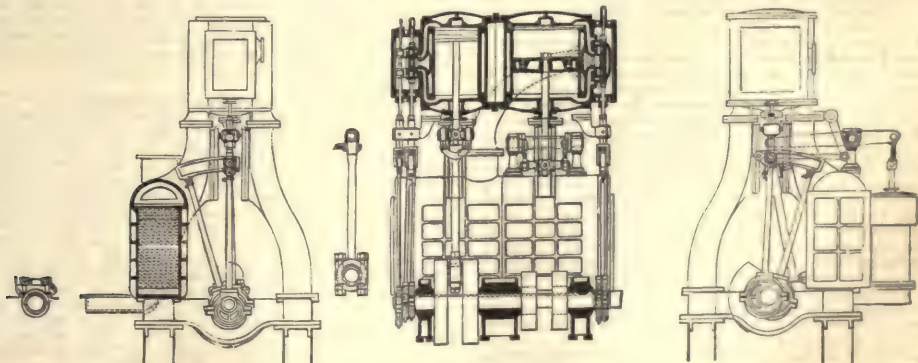


FIG. 7.

Babcock and Wilcox Horizontal Stationary Engine.

impossible in a brief sketch to describe minutely even these general forms, much less to mention all the various com-

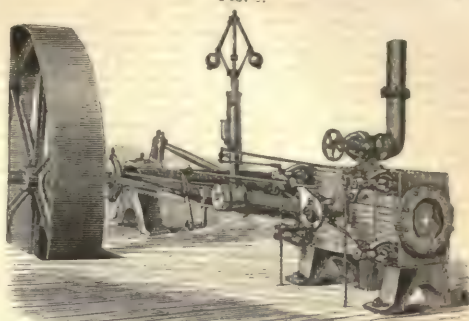
FIG. 10.



in other engines is in this the shaft on which the piston revolves. No piston-rod, connecting-rod, or crank is required; and thus, as far as these parts are concerned, the mechanism

assumes. A few general classifications only can be given. A *single-acting* engine

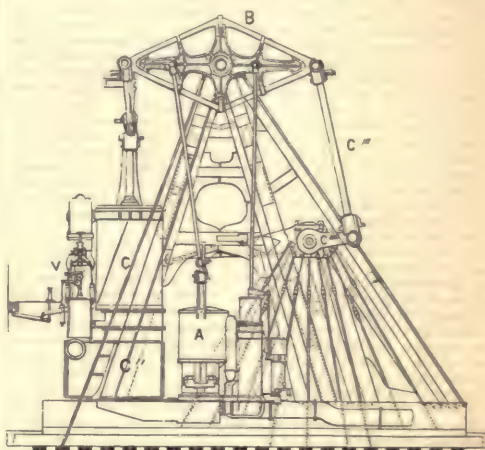
FIG. 8.



The Corliss Steam-engine.

(e. g. the Cornish pumping engine) is one in which the steam acts upon one side of the piston only, the opposite end of the cylinder being open. A *double-acting* engine is one in which the steam acts on both sides of the piston alternately. A *direct-acting* engine is one in which the connecting-rod extends beyond the cross-head, away from the cylinder,

FIG. 9.



and a *back-acting* engine one in which the connecting-rod is brought from the cross-head back toward the cylinder or beyond it. Engines are also classed as *vertical* or *horizontal*, according as the cylinder is vertical or horizontal. An *oscillating* engine is one in which the cylinder is mounted on trunnions, the steam being received and discharged through the trunnions. Such engines have no connecting-rod, the piston-rod being directly connected with the crank. Nearly all marine engines, except the beam engine, have 2 cylinders, connecting with cranks at right angles to each other (see Fig. 10), in order to equalize the action of the power.

Another mode of descriptive designation of engines relates to the general nature of the machine and kind of work which it performs; for example, *marine engine*, *stationary engine*, *portable engine*, *locomotive engine*, *hoisting engine*, *pumping engine*, etc., each of these varieties having its characteristic mechanism and connections. In the rotary engine the motion of the piston or its equivalent is circular and continuous in one direction, and what is the crank-shaft

is the most simple and compact of all engines. The difficulty of providing a perfectly steam-tight working-space for the steam in this class of engines, with freedom from exces-



sive friction, and the existence of other defects which no inventor has yet remedied, render this form very inefficient, notwithstanding its compactness.

The cylinder and common piston, with the piston-rod, connecting-rod, and crank, may therefore be regarded as the elements of the mechanism in universal use, whatever may be the other parts of any particular combination. To this form we shall refer in discussing the subject of *valve-gearing*. The term *valve-gearing* comprises all the special mechanism attached to the cylinder, which, deriving its motion indirectly from the motion of the piston, acts in such a manner as to open and close, at proper times, the passages by which the steam enters and is discharged from the cylinder. Those pieces of this mechanism which act directly to close the passages are called valves. The mechanism by which they are moved is properly the *valve-gearing*. A full description of the common slide-valve, with the principles of mechanism involved in its use, will illustrate the subject; other kinds of valves and their special mechanisms will then need only a passing notice.

Fig. 2, already given, shows a section of a cylinder by which the action of the common D slide-valve (so called from the shape of its section) may be explained. In this section V represents the valve, situated in a rectangular box or casing, which is in full communication with the boiler when the engine is running. This box, called the *steam-chest*, situated on the side of the cylinder and forming part of it, is constantly full of steam at nearly the boiler-pressure when the engine is in motion. S S are passages called steam-passages leading from this chest to the ends of the cylinder; E, a passage called the exhaust-port leading to the open air or to the condenser. The ports are long rectangular openings in a plane surface on the side of the cylinder. The valve V has such form and dimensions that it covers all these ports when in its neutral or middle position, and is caused to slide back and forth just enough to uncover alternately the steam ports S S, the amount of this sliding, even in the largest engines, in which the valve may have a superficial area of several square feet, being only 3 or 4 inches. In small engines the extent of sliding in one direction may be only a fraction of an inch. This movement of the valve to the right and left is produced by means of an eccentric or small crank and a special connected rod attached to the valve, by which its motions are made to correspond in point of time with the motions of the piston; but the eccentric and main crank being keyed to the shaft in different positions, these motions, although taking place in the same times, will not at each moment correspond in direction or velocity.

It will be seen from the figure that the piston is at the end of its stroke, and its return to the opposite end depends on its receiving the impulse of steam admitted from the steam-chest just at this moment to drive it back. It will be observed, also, that the valve has been moved from its central position, covering all the ports, already sufficiently far to open the steam-port on the right a small amount, and steam is already admitted and fills the narrow space to the right of the piston. Thus, the full boiler-pressure, or nearly so, is already acting on the right of the piston to drive it back. The condition of things on the left of the piston at this moment is quite different. The steam which has been confined in that part of the cylinder to the left, and which by its expansive action has driven the piston toward the right, is now free to pass from this space into the atmosphere back through the steam-port S, through which it came, but not into the steam-chest—the port S now leading through the hollow of the valve to the exhaust-port; and this opening is by the movement of the valve already larger than the opening for admission on the right. The phenomena which now take place while the piston moves from the right to the left are as follows: The valve completes its excursion to the left, and returns, so as to shut off the supply of steam on the right of the cylinder, while the piston is still in motion to the left. After the supply is cut off, the confined steam continues to act by its expansion alone, no more being admitted. The point at which this occurs is called the point of *cut-off*. The fraction of the stroke at which this occurs depends on the dimensions of the valve and the arrangement of the mechanism by which it is moved. It may happen, also, that by the same movement of the valve on its return to the right, and while the piston is still moving to the left, the exhaust-passage is closed so as to confine a portion of the steam in the left-hand part of the chamber, to act as a sort of cushion. This will occur at the moment the inner edge of the hollow part of the valve on the left reaches the inner edge of the steam-port.

W. P. TROWBRIDGE.

#### Steam Fire-Engine. See FIRE-ENGINE.

#### Steam Navigation. See NAVIGATION, OCEAN STEAM.

**Steam Vessels.** The idea of the possible adaptation of steam for the propulsion of vessels was suggested at a very early period. But the earliest practical effort appears to be that of Papin, who in 1707 applied his steam-engine to the propulsion of a model vessel on the Fulda River at Cassel. About 1763 William Henry of Pa. built a small model steamboat, which he tried with success on the Conestoga River; this experiment is specially notable as having furnished the hint to the successful efforts made 40 yrs. later by Robert Fulton. During the last quarter of the 18th century the problem of steam navigation had begun to engage many minds in Europe and Amer. In Amer. James Rumsey of Md. was engaged in experiments, and in 1786 built a boat which was propelled upon the Potomac by steam at the rate of 4 m. an hour by means of a jet of water forced out at the stern; a society was formed to aid him in his project, of which Dr. Franklin was a member, and he went to Lond., where he built a boat with which a successful experiment was made on the Thames in 1792; but he died before any thorough success was attained. In the mean while John Fitch had been also trying experiments in steam navigation

upon the Del. River. His first boat, built in 1786, was propelled by paddles moved by a steam-engine. Simultaneous experiments were also carried on in G. Brit. About 1790 Robert Fulton left Amer. for Eng. to study his profession of a painter, but he soon turned his attention to mechanics, and especially to steam navigation. He made some experiments in Fr., which were only partially successful, but he secured the confidence and aid of Robert R. Livingston, the Amer. ambassador, and in 1806 returned to New York, bringing with him a powerful Boulton & Watt steam-engine, for which a hull was built. The vessel, named the *Clermont*, after Livingston's manor on the Hudson, made a successful trial-trip to Albany, Aug. 7-9, 1807, returning on the 2 following days, her average running speed being 5 m. an hour. The *Clermont* was 130 ft. long, 18 ft. beam, 7 ft. deep, with a burden of 160 tons. She soon commenced making regular trips between New York and Albany, and for all practical purposes must be considered the first steamboat adapted for the conveyance of passengers and freight, all previous ones having been experimental models, or at most only designed as tugs. Fulton and Livingston obtained from the State of N. Y. the monopoly for using S. V. in the waters of the State. John Stevens of New York was even earlier than Fulton as an experimenter in steam navigation, and narrowly missed anticipating him in practical success. The *Phoenix*, his first steamboat, properly so called, was completed in 1807, following hard upon Fulton's *Clermont*. Prevented by the monopoly of Fulton and Livingston from navigating the Hudson, he sent his boat by sea to the Del. S. V. in Amer. were now an assured success. Fulton and his coadjutors soon placed a fleet of them upon the Hudson River and L. I. Sound, while Stevens and his sons placed their steamers upon the Del. and the Conn., and upon the Hudson after Fulton's monopoly had expired.

**Stearic Acid** [Fr. *acide stéarique*; Ger. *Talgssäure*] is the most abundant of the solid fat acids, and is obtained in the saponification of all the fats containing stearine, and especially of beef's tallow, mutton suet, hog's lard, etc. Many vegetable fats contain S. A. as shea-butter of Mungo Park, cacao-butter, olive oil, oil of black mustard, oil of ben, oil of madia, Chi. wax, and the oil of *Bassia latifolia*. The so-called S. A. (or stearine) of commerce, which is found in "star candles," is a mixture of stearic, palmitic, and margaric (and often also oleic) acids. But this acid is never pure. Pure S. A. is colorless, and without odor or taste, and insoluble in water. It reddens blue litmus when warm and in its cold alcoholic solution, but water, which precipitates the acid, also restores the blue color. It melts at 157°-159° and solidifies at 150° F. By cooling it crystallizes in brilliant needles, greasy to the touch, and after fusion it is very friable. It is insoluble in water, but dissolves in boiling alcohol in all proportions, the cooling solution depositing nacreous crystals. It is very soluble in ether. It burns with a clear and white flame. S. A. is the least soluble in different solvents of all the fatty acids.

**Decomposition.**—When larger quantities of S. A. are subjected to dry distillation, not *in vacuo*, the greater part passes over unchanged, while a small portion is resolved into carbon-dioxide, water, and stearone. The distillate contains also acetic and butyric acids, and an acid of lower melting-point than S. A.; also hydrocarbons and ketones richer in carbon than stearone. Chlorine and bromine both attack melted S. A., replacing hydrogen and producing chlorinated and brominated species, substitution-products. Concentrated sulphuric acid at a gentle heat dissolves in S. A. without coloration; the addition of water throws down the fatty acid in white flocks. When the sulphuric acid solution is heated, sulphurous oxide is evolved, and a new fatty acid is formed, resembling elaidic acid. Boiling nitric acid attacks S. A., and transforms it successively into suberic, pimelic, adipic, succinic, capric, and ceanthic acids. Cold nitric acid changes S. A. after some days into margaric acid, and if crude S. A. is used, suberic and succinic acids are produced. With phosphoric oxide S. A. yields the elements of water, and is transformed to a yellowish brittle mass, which melts between 130° and 140° F. With platinum-black, S. A., in an atmosphere of oxygen, at a temperature of 212° F., evolves carbon-dioxide, and at 392° F. is converted entirely into water and carbon-dioxide. Permanganate of potassium converts S. A. completely into stearate and carbonate of potassium. Distilled with aniline, S. A. yields phenyl stearamid—stearanilide. With methylic, ethylic, and homologous alcohols, with carbohydrates, with glycerine, meconine, and cholesteroline, S. A. yields with heat ethereal compounds, formed from the acid and the other body, with elimination of water. Stearate of lime subjected to dry distillation gives off marsh-gas, olefant gas, or other olefines, and the distillate contains abundance of stearone and other ketones in smaller quantity, calcic carbonate being the residuum.

**Stearates.**—S. A. combines with many metallic bases, forming bodies of the consistence of hard soaps and plasters which are mostly insoluble in water. The stearates are mostly decomposed by other acids, the S. A. floating as an oil on the surface of the warm liquid. S. A. displaces carbon-dioxide from a mono-carbonate of sodium or potassium only at 212°, and it dissolves in a cold solution of alkaline carbonate, forming bicarbonate. The neutral stearates of the alkalis dissolve without dregs in 10 to 12 parts of warm water, but are decomposed by a large quantity of water, with separation of an acid salt, and the liquid becomes alkaline. The alkaline stearates are soluble in alcohol, better if warm. Ether does not dissolve the stearates, but extracts the excess of acid from the bi-stearates and transforms them into neutral salts. Saline waters dissolve only a trifling quantity of alkaline stearates. The neutral salts of other metallic oxides decompose the alkaline stearates, forming insoluble stearates of the other metals. Dilute mineral acids also decompose the alkaline stearates, with separation of S. A.



There are 3 stearates of potassium—mono-, bi-, and tri-acid salts, and a mono- and bi-acid stearate of sodium, all more or less soluble salts. A soluble neutral salt of ammonia with S. A. also exists. The stearates of baryta, strontia, lime, magnesia, lead (bi-plumbic and mono-plumbic), copper, mercury (mercurous and mercuric stearates), and silver are all insoluble salts. The mixture of S. A. with lauric, myristic, palmitic, and margaric acid gives bodies varying in their melting-points and other relations.

**Stearic Ethers.**—Ethyl stearate may be obtained by boiling together for half an hour a mixture of S. A., alcohol, and concentrated sulphuric acid. Ethyl stearate is a transparent, odorless solid; melts at  $88^{\circ}$  to  $93^{\circ}$ ; distills at  $435^{\circ}$  F., with decomposition. It crystallizes from the alcoholic solution in white silken needles. Its ethereal solution gives no crystals. It is partially decomposed by boiling water, and completely by chlorhydric acid and alcoholic potassa, but not by watery solution of potassa.

The S. A. industry dates from the yr. 1831, when the first manufactory by lime-saponification was opened in Paris near the Barrière de l'Étoile; hence the name, now accepted of the world over, of *bougies de l'Étoile*, or *star candles*. From that date the development of this important industry was very rapid and assumed great importance—not in Fr. alone, but all over Europe and in the U. S. This industry is naturally divided into 2 quite distinct sections:—(1) the chemical and (2) the mechanical. [From orig. art. in *J. U. S. Cyc.*, by PROF. B. SILLIMAN, M. D.]

**Stearine**, stea'-rin, is a glyceride or ether of glycerine, as shown by the formula *tristearine*. In commercial parlance, *stearine* is a term applied to the impure stearic acid obtained by the saponification of fats in the preparation of star candles. Tristearine is the natural form of stearine in the hard fats of both kingdoms. From the seeds of *Brindonia indica* S. of absolute unity can be obtained. Pure S. from this source is perfectly white, and crystallizes in mammillary radiations of a nacreous lustre, ending in very delicate needles. This S., when fused, is much more transparent than that from animal fats, which obstinately retain traces of oleine and other fat acids. It is very brittle.

**Stearns**, sturnz (ASAHEL), LL.D., b. at Lunenburg, Mass., June 17, 1774, grad. at Harvard 1797; was co. atty. for Midsex, M. C. 1815-17, prof. of law at Harvard Law School 1817-29, and subsequently com. for revising the statutes of Mass. Wrote *Summary of the Law and Practice of Real Actions*, with an *Appendix of Practical Forms*. D. Feb. 5, 1839.

**Stearns** (REV. WILLIAM AUGUSTUS), D. D., LL.D., fourth pres. of Amherst Coll., b. at Bedford, Mass., Mar. 17, 1806, grad. at Harvard 1827; studied theol. at Andover, and was ordained to the gospel ministry, and installed pastor of the ch. at Cambridgeport Dec. 14, 1831. In 1854 he accepted the presidency of Amherst Coll., which he held till the time of his death, June 8, 1876. Pub. papers in the *Bibliotheca Sacra*, *Biblical Repository*, and *New Englander*, etc.

**Stearone** was derived by Bussy from the decomposition of stearic acid by quicklime. S. is insoluble in water, soluble in boiling alcohol, in fat-acids, and in concentrated acetic acid. It burns with a very brilliant flame, and becomes highly electric by friction. Alkalies do not attack it. Hot sulphuric acid burns it with evolution of sulphuric acid. Hot nitric acid does not attack it, but hot nitro-sulphuric acid decomposes it, with formation of acid volatile oil.

**Steatite**, or **Soapstone**, a kind of stone which receives its name from its unctuous quality. It is a compact form of talc, and is an impure hydrated silicate of magnesia. It has some use in the porcelain manufacture. A soft white sort is the Fr. chalk of the tolet and of the tailors' shops.

**Stedman** (EDMUND CLARENCE). See APPENDIX.

**Steedman** (CHARLES), U. S. N., b. Sept. 24, 1811, in S. C., became a midpn. Apr. 1, 1828, a lieutenant, 1841, a commander 1855, a capt. 1862, a com. 1866, a rear-admiral 1871; retired in 1873. Served in the naval battery at Vera Cruz during Mex. war, and commanded the Blenville at battle of Port Royal, and the Ticonderoga in both the Ft. Fisher fights.

**Steedman** (JAMES BARRETT), b. in Northumberland co., Pa., July 13, 1818, went to O. in 1837, and in 1843 was elected to the State legislature; in 1851 became member of O. board of public works, and subsequently printer to Cong. At the outbreak of the c. war he was appointed col. of an O. volunteer regiment; served with credit in W. Va. and Ky.; was made brig.-gen. July 1863, and for services at Chickamauga was made maj.-gen. in April, 1864. He was actively engaged in Sherman's Atlanta campaign; afterward was with Thomas in Tenn., and took part in the battle of Nashville. Resigned July 1865, and was appointed by Pres. Johnson collector of port of New Orleans. D. Oct. 18, 1883.

**Steel** is a compound of iron which has been cast from a fluid state into a malleable mass.

**Nature and Composition.**—The grand structural characteristic of steel is homogeneity due to fusion; also, that its chemical constituents are very various. The important chemical qualities of tool-steel are: (1) the tempering quality, which is due, first, to the presence of say  $\frac{3}{4}$  to  $\frac{1}{4}$  per cent. of carbon; second, to the mechanical mixture of this carbon with the metal by means of slow cooling from a red heat, which makes the metal comparatively soft; third, the extreme hardening of the metal, when, by means of sudden cooling, the carbon is chemically dissolved in the iron. (2) An important condition of tool-steel is its freedom from ingredients which induce brittleness. The more important qualities of structural steels vary with their precise uses. In general, great resistance to static strains, or to those gradually applied, is accompanied by comparative brittleness and unfitness to resist strains suddenly applied. High resistance, resilience, hardness, and brittleness increase, up to certain limits, with the amount of impurities, chiefly carbon, contained in the metal. Low resistance, softness, ductility, and toughness become more marked, within certain limits, as the impurities become less. But too little as well as too much impurity makes

steel weak and unsuitable for structural purposes. It requires what is called "body" to give it resistance to either statical or sudden strains. This "body" is imparted by carbon, manganese, silicon, phosphorus, and by other ingredients; but too much of either of them, or of certain compounds of them, weakens the metal.

**The Manufacture of Steel.**—(1) **The Pot-Steel Process.**—This is the oldest and simplest. It at first consisted in melting wrought iron with carbon in clay crucibles. In the present manufacture other ingredients beside carbon, chiefly manganese, are added. Sometimes substances intended to combine with and remove the impurities in the wrought iron are introduced, but generally these impurities remain in the steel. The finest steel must therefore be made from wrought iron which has been purified by reworking with pure fuel, and which was originally made from pure ores. The melting-point of wrought iron is so high that it has been usual to carburize it by cementation in order to fuse it at a convenient temperature in crucibles. This cemented or blistered bar was the steel of commerce until Huntsman melted it in a crucible in 1770, producing a true cast steel. Steel for boiler-plates and some other uses would be too highly carburized if made of melted cemented steel, so that wrought iron, a very little charcoal, and some manganese are now fused together to make the softer pot-steels. The use of the Siemens furnace and the modern improvement of crucibles render the melting of wrought iron practicable and cheap. Pot-steel has been experimentally made from spongy iron produced by deoxidizing iron ore without fusing it. (Sponge steel will be further referred to.) The cheaper grades of pot-steel are largely made from Bessemer and Martin steel rail-ends and other scrap. This material, being made directly from cast iron, without that purification from silicon and phosphorus to which wrought iron could have been subjected in puddling, produces an inferior steel to that made from the purest wrought iron for purposes, like tool-steel, requiring both hardness and toughness. By melting wrought iron and a little cast iron together, especially cast iron containing manganese, the cheaper grades of steel are produced. The impurities of the cast iron remain in the steel. Although pot steel has been cheapened by using the materials mentioned, and by means of the gas-furnace, the less refined grades of steel are made at so much less cost and with so much greater uniformity by the Martin process, and within certain limits by the Bessemer process, that the pot-process is becoming gradually confined to the finer grades of tool-steel; and here it must probably long retain its superiority, chiefly because it can begin with a highly refined iron, from which especially phosphorus, silicon, and sulphur have been more or less completely eliminated. Pot steel is also the more suitable for castings to be used without further working, as it remains for some time "dead melted" in the pots, and so parts with the gases which give porousness to ingots made by more rapid processes. Manganese, however, promotes sound casting in all processes.

(2) **The Siemens-Martin (or open-hearth) Process.**—The melting of the ingredients of cast steel in large quantities and cheaply on the open hearth of a reverberatory furnace, rather than in small quantities and expensively in pots, having been often unsuccessfully attempted, was patented in a more scientific form by the eminent metallurgist Heath in 1845, and was then experimentally carried out with limited success. The Siemens regenerative gas-furnace, by means of the intensity and uniformity of its heat, first furnished practical conditions to the open-hearth process about 1862. It was also demonstrated by Messrs. Martin that the addition of manganese at a certain stage was necessary to the production of sound and practically malleable steel. By common consent, the process has been called, for the above reasons, the Siemens-Martin process. The hearth or bed of the furnace consists of a shallow iron tank, ventilated below to prevent the concentrated heat of the hearth and the regenerators from endangering the structure, and lined with a very refractory material, generally silica, nearly pure, and so fusible enough to set into a solid mass. The red-hot air and gas entering and burning at, say, the right-hand end of the furnace, play upon the materials placed on the hearth, and pass down into the regenerators at the left end, where they give off their heat to a checker-work of fire-bricks. The current being reversed after some 30 minutes, the air and gas enter at the left end through the newly heated regenerators and pass out at the right end. The materials employed are various, and consequently the process various, although the decarburization of pig iron is always a part of it. In order to obtain a sufficiently intense combustion there must be a slight excess of air; the flame is therefore oxidizing, and would seriously waste wrought iron or the ingredients usually melted in pots. A bath of cast iron, which on account of its carbon can be melted without serious loss, is first necessary; in this are immersed and protected the more readily oxidizable materials for the production of steel. The amount of cast iron varies from 10 to 38 per cent. of the total charge. For fine steels it should be as small as possible, so as to introduce the least amount of phosphorus, silicon, etc.

The more common process is known as the scrap process, and this again is divided into (1) the fusion of pig and scrap wrought iron or steel charged together, the former melting while the latter is heated preparatory to melting; (2) the dissolving of either hot or cold scrap in a bath of pig previously melted; (3) the dissolving of wrought-iron pig in a cast-iron bath. The operation in all these cases is chiefly the melting of the decarburized iron forming the bulk of the charge, and the oxidation of the greater part of the carbon and silicon in the crude cast iron, and also, to a certain extent, of the phosphorus and other impurities. A portion of the iron is also oxidized, and this oxide of iron makes the product unmanageable or red-short. To remove the oxygen something must be added which has



a greater affinity for it than the iron has. Manganese is such a thing, and it is easily and cheaply introduced in the form of pig iron called spiegeleisen, which contains 10 to 15 per cent. of manganese, or of an artificial ferro-manganese containing as high as 60 per cent. By this means an excess of manganese can be introduced, so that any desired proportion of it shall remain in the steel. If the decarburization of the cast iron and the dilution of the carburized and uncarburized portions of the charge are carried only to such an extent that a highly carburized product remains, less manganese is needed to make it malleable, and this may be supplied by melting a manganiferous pig iron with the charge. Dissolving scrap in the bath is the more common process; the scrap is fed in a little at a time, so as not to chill the charge and cause it to set on the bottom of the furnace, and also to maintain uniformity in the temperature and working of the furnace. In order to save part of the stress on the steel furnace, an auxiliary furnace is employed in many works to heat the scrap and spiegeleisen before charging them into the bath. Wrought-iron sponge is charged like scrap, either cold or hot, although it is difficult to prevent it from rapidly oxidizing when hot until it is protected by the bath. Wrought-iron sponge is simply iron ore heated in the presence of carbon to such a degree that the carbon will remove the oxygen from the iron ore, but not from the silica or other metalliferous ores present. When sponge is melted in the bath, the silica and the phosphorus (if it is combined with lime instead of iron) and some other impurities, being lighter than iron, float off with the slag. The blast furnace, on the contrary, smelts more or less of the metalloids, and incorporates them with the pig iron, from which they are imperfectly removed by subsequent processes. The manufacture of sponge-steel is not fully developed nor largely practised, but it offers many theoretical advantages.

The pig-and-ore process, as developed by Mr. Siemens, consists in decarburizing a bath of pig iron by iron ore, and then adding ferro-manganese in the usual manner. The ordinary proportions are 5½ tons of pig and more or less ore in proportion to its richness, usually about 30 cwt. The iron in the ore is added to the bath, and a little limestone is thrown in to facilitate its separation. The theory is to use ore enough to make good the waste of the iron by oxidation. Although pig and ore may be employed alone with success, there is usually 10 or 15 per cent. of scrap made in rolling and forging, and this scrap is returned to the steel furnace. Sometimes 25 per cent. of scrap is added. The process thus partially takes the character of the pig-and-scrap process, although the use of ore as a rapid decarburizer of the large amount of pig employed gives it a distinctive character. The pig and scrap are first melted, the time being 4 or 5 hours. During this period an inch or more of slag forms over the bath. Then the ore, in lumps up to 3 or 4 inches in diameter, is charged a little at a time, until the bath is nearly ready for the manganese, when it is allowed to stand, so that the iron may work out of the ore and slag. The usual amount of ferro-manganese finally added is 7 per cent. of the metal containing 12 to 15 per cent. of manganese. After the charging of the ore begins, there are 2 distinct periods: first, the rising of slag; this increases in weight, but much more in volume, and is covered with large and heavily moving blotches or bubbles; second, the boiling of the metal, when the slag settles and becomes thinner, and the whole surface of the bath is covered with a lively spouting of the metal and slag, sometimes of the metal through the slag. These periods represent the following operations: (1) The silicon in the pig, having at this temperature a higher affinity for oxygen than the carbon has, is burned out first, partly by the flame, which is somewhat oxidizing, and partly by the oxygen in the ore. Thus, slag is rapidly formed and also thickened by the release of the silica and other impurities in the ore. (2) When the silicon of the pig is nearly consumed, its carbon begins to burn freely and to throw off carbonic oxide, which makes the now hotter and thinner slag boil violently.

*The Bessemer Process.*—The chemical part of the Bessemer process may be generally stated as the oxidation of the carbon and silicon in melted crude cast iron, so as to make it malleable, by means of air-blasts. This definition, to some extent, describes puddling and the earlier processes of making malleable iron. In all these processes the air oxidizes a portion of the iron, and the oxide of iron thus formed undoubtedly oxidizes a part of the carbon and silicon. In puddling, however, the mixing of the oxidizing agent, so that it may come in contact with all parts of the iron successively, is promoted by stirring the melted mass by manual power; but so slow is the process, and so small are the masses that can be treated by a workman, that not even the heat of the combustion thus promoted, nor even the additional heat of the burning coal, can keep the iron fluid when deprived of its carbon. The purified iron is withdrawn in a plastic condition, mixed with slag. It requires compression, piling, heating, and recompression to reduce it to a solid bar. The radical and essential difference between this process and the Bessemer process is a mechanical difference, and it consists in the *intense and violent stirring* of the Bessemerized iron. To this alone is due the production and maintenance of a temperature, without any other fuel than the carbon and silicon contained, that keeps the metal fluid, so that it can be cast into homogeneous, malleable ingots. In puddling, the iron is agitated by the power of one man; in Bessemerizing, it is torn into spray by a 500-horse engine. In the one case it is stirred by a single iron bar; in the other it is pierced by innumerable bars of iron, squeezed solid, like rods of glass, penetrating every part, and enveloping every atom of iron in an atmosphere of oxidizing material. The combustion thus takes place not in successive sections of the mass, but throughout the whole of it, at the same time,

and in the shortest possible time; and the heat arising from such combustion has not time to escape from the mass until purification is completed. The quantity of iron that can be treated, in comparison with the mass of heat-conducting surroundings, is also an important feature. The individual reactions are, as far as we can judge, as rapid and complete in one case as in the other; the fluid condition of Bessemer metal is due simply to the vastly greater number of these reactions that are compelled to occur in a given space of time by the mechanical force and distribution of air-blasts.

The Bessemer process as first performed, and as still practised to a very limited extent abroad with irons rich in manganese, consists in applying the blast until all but  $\frac{1}{4}$  to  $\frac{1}{2}$  of 1 per cent. of the carbon is burned out, and then casting the product. Stopping the blast at this point, however, is very uncertain; hardly any irons contain the right amount of manganese for this treatment, and the process has certain mechanical objections. Hence, the nearly universal practice is to blow the iron until *all* the carbon is exhausted—a point readily determined. But the product now, as in the open-hearth process before described, contains so much oxide of iron that it is red-short and crumbles in working. To reduce this oxide of iron, manganese, which has a stronger affinity for the oxygen than the iron has, is added by running into the converter 8 to 10 per cent. of melted spiegeleisen, which is a pig iron containing 10 to 15 per cent. of manganese, or by otherwise adding ferro-manganese to the charge. Any desired amounts of carbon and manganese are also thus added to the product. No phosphorus is removed from the iron in the Bessemer process. Only the carbon and the greater part of the silicon are oxidized. It is therefore important to start with pig irons having a little less phosphorus, sulphur, and copper than the steel may safely contain. But it is not usually practicable to use irons low in silicon, for the oxidation of this element produces the high temperature necessary to keep the mass fluid. Manganese is to a certain extent a substitute for silicon in this respect, and always a valuable ingredient, but the greater part of the irons of the world do not contain it in important quantities. Usually, a pig containing from 2 to 2½ per cent. of silicon is required. This will heat the charge to such a degree that 10 to 15 per cent. of scrap may be worked with the pig-iron charge. If there is more silicon than this, too much of it is likely to be left in the steel. One reason why silicon has greater heating power than carbon (it is stated by Akerman to have 9 times as much) is because the product of its combustion, slag, remains in the converter, while the product of the combustion of carbon goes out in gaseous form, and carries much heat with it. [From orig. art. in *J.'s Univ. Cyc.*, by A. L. HOLLEY, C. E.]

**Steele** (FREDERICK), b. at Delhi, N. Y., 1819, grad. at the U. S. Military Acad. July 1, 1843; at the outbreak of the c. war he was engaged in Mo.; in Sept. 1861 appointed col. 8th Ia. Volunteers, and at the battles of Dug Spring and Wilson's Creek in command of a brigade; brig.-gen. of volunteers Jan. 29, 1862; commanded a division in the Army of the S. W.; promoted to be maj.-gen. of volunteers and assigned to the 13th army corps, which he led in the Yazoo expedition and capture of Arkansas Post (Dec. 1862-Jan. 1863); transferred to the 15th corps, he was engaged in the Vicksburg campaign, when his division was sent to Helena, Ark., and captured Little Rock Sept. 10; in 1864 commanded the dept. of Ark., and on Nov. 29, 1864, went to the aid of Gen. Canby in the reduction of Mobile; after commanding various dists. in the S. W. was assigned (Oct. 1865) to the command of the dept. of Columbia, and retained in the volunteer service until Mar. 1867; brevetted brig.-gen. and maj.-gen. U. S. A. Jan. 12, 1868.

**Steele** (SIR RICHARD), b. in Dublin in 1671, the son of an Eng. barrister; ed. at the Charter-house and at Ox., where he enlisted as a private in the horse-guards; rose to be ensign; wrote the *Christian Hero* (1701); started as a dramatist, his first comedy being *The Funeral, or Grief à la Mode* (1702), followed by *The Tender Husband* (1703) and *The Lying Lover* (1704); appointed court gazetteer and usher to Prince George of Den., the husband of Queen Anne; was successively appointed com. of the stamp-office, surveyor of the royal stables, gov. of the royal comedians, justice of the peace for Middlesex, and com. of forfeited estates in Scot. In 1713 he was returned to Parl. for Stockbridge; was expelled in the following yr. on account of political articles; was knighted by the king; returned to Parl. for Boroughbridge in 1715. In 1730 his patent as gov. of the royal comedians was revoked; in the following yr. he brought out his comedy of *The Conscious Lovers*. His first wife brought him a plantation in the W. I., and his second wife was a Welsh heiress, but he squandered his large income, and being attacked with a paralytic stroke he retired to his estate at Llangunor in Wales, where he d. Sept. 1, 1729. His chief fame rests upon his connection with the *Talbot* and the *Spectator*.

**Steell** (JOHN), b. at Aberdeen, Scot., 1804, studied art at Edinburgh and sculpture at Rome; produced the sitting statue of Sir Walter Scott, forming part of the monument to that novelist in Edinburgh; the colossal statue of Queen Victoria placed above the Royal Inst. Edinburgh; the bronze equestrian statue of the Duke of Wellington erected in 1850 in front of the Register House, Edinburgh, etc.

**Steellon**, Pa. See APPENDIX.

**Steel-yard, or Roman Balance** [Ger. *Schnellwaage*], a form of the balance in which the object to be weighed is counterpoised by a smaller weight which may be moved upon the longer arm of a suspended lever. The weight is indicated by readings at the place on the lever where the movable weight is when equilibrium is produced.

**Stein**, stn. von (HEINRICH FRIEDRICH KARL), BARON, b. at Nassau-on-the-Lahn Oct. 26, 1757, studied jurisprudence at Göttingen 1773-77; entered the civil service of the Prus. gov't. in 1780, and was made chief of the dept. of commerce,



manufactures, and indirect taxation in 1804; was dismissed Jan. 4, 1807, but recalled immediately after the Peace of Tilsit (July 20, 1807), and made pres. of the cabinet. His internal reforms were a complete reorganization of the Prus. state. Serfdom was abolished, and universal obligation of military service introduced; the manorial estates of the nobility were taxed, all citizens made equal before the law, a liberal municipal system established, etc. But a letter in which he criticised the policy of Nap. fell into the hands of the Fr. police, and was pub. in the *Moniteur* Sept. 8, 1808. On Nov. 24 S. was compelled to resign, and on Dec. 16 Nap. sent a decree from Madrid which outlawed him and confiscated his property. He went to Aus., thence to Rus., but once again was at the head of the political affairs of Ger. during the period between Nap.'s disaster in Rus. and the Peace of Paris, when he actually was the leader of the diplomatic coalition against Fr. After peace had been concluded his influence soon became comparatively small. He retired to his estates, where he d. June 29, 1831.

**Steinbok** (i. e. "stone-buck"), a name applied to different species of the family Bovidae. (1) The Ger. designation *Steinbock* was originally conferred on the ibex or bouquetin of the mts. of S. Europe, a species of goat, and to that animal it properly belongs. (2) The Dutch settlers of S. Afr. applied the name to a species of antelope of that region (*Neotragus tragulus*). It is an animal of graceful form, with the head well proportioned, having a bovine nose and large muffle; the horns, developed only in the males and over the orbit, erect; the legs long and slender; the feet are a fulvous ash above and on the sides, and white beneath. The length is generally rather less than 3½ ft., and the height at the shoulder somewhat more than 1½ ft.

**Steinmetz, von** (KARL FRIEDRICH), b. at Eisenach, grand-duchy of Saxe-Weimar, Dec. 27, 1796, entered the Prus. army in 1813 as a lieutenant; fought against the Fr.; became a capt. in the regiment of Kaiser Franz in 1835; fought at the head of 2 battalions of the 2d Inf. regiment in Mar. 1849. In the streets of Berlin he was gov. of the acad. of cadets at Berlin; commander-in-chief of the 5th army corps in the campaign against Aus. in 1866. On June 27, 28, and 29, 1866, he made a stand at Nachod, Skaltitz, and Schweinschädel, defeated the enemy, and drove him back. In the war against Fr. in 1870 he was appointed commander-in-chief of the 1st army, consisting of the 1st, 7th, and 8th army corps, but he held this position only for a short time, as he came in conflict with the supreme command; in Sept. 1870 was appointed gov.-gen. of Posen and Silesia. D. Aug. 3, 1877.

**Steinwehr, stin'war, von** (ADOLPH WILHELM FRIEDRICH), baron, b. at Blankenberg, Brunswick, Ger., Sept. 25, 1822, ed. in the military acad. at Brunswick, became a lieutenant; resigned his commission 1847; came to the U. S. in that yr.; and unsuccessfully offered his services to the gov't. in the Mex. war; married at Mobile, and went back to Ger.; returned to the U. S. 1854; bought a farm and settled at Wallingford, Conn.; raised the 25th N. Y. regiment 1861, and commanded it in the first battle of Bull Run; became brig.-gen. of volunteers Oct. 12, 1861; was commander of the 2d division of the 11th corps in the campaign on the Rapidan and the Rappahannock, and took part in battles of Chancellorsville and Gettysburg. D. Feb. 25, 1877.

**Stejneger** (LEONARD). See APPENDIX.

**Stel'io**, a genus of lizards of the family Agamidae. The best-known species is *S. Cordylina* of the Levant.

**Sten'house** (JOHN), LL.D., F.R.S., b. at Glasgow, Scot., Oct. 21, 1809, ed. at Glasgow gram. school, at the Andersonian Univ. of Glasgow, and at the Univ. of Giessen; was lecturer on chem. at the med. school of St. Bartholomew Hospital, Lond., 1851-57, and assayer to the royal mint 1865-70; has pub. above 80 papers on chemical subjects and on sanitary science, and was awarded a royal medal of the Royal Society Nov. 30, 1871. D. Jan. 1881.

**Stenography** [from Gr. *στενός*, "narrow," and *γραφειν*, "to write"]. This is a generic term, which, like "short-hand," embraces every system which seeks the rapid representation, by means of written characters, whether upon alphabetic, phonetic, or hieroglyphic principles, of the words of speech. To those systems which are based upon the phonetic principle is given the name *phonography*, which therefore indicates a species of S.

The great value and need of some method of representing in legible characters spoken words as fast as uttered was appreciated in the earliest times, and traces of short-hand writing may be found among the Grs. not very many centuries later than the introduction and diffusion of the art of writing. Among the Roms. it is probable that the first efforts at brief writing were reflected in the representation of certain frequently recurring words by contractions in the ordinary spelling, as by their initial letters. The next step was the representation of certain frequently recurring terminations of words by arbitrary contractions or signs; and the next the representation by arbitrary characters of words and phrases. Among the Fr. few traces of S. are found previous to the end of the 18th century. The credit of the first introduction of short-hand into Ger. (1666) is given to one Mars-hof. His system was rapidly followed by others. The systems at present generally in use are those of Gabels-berger and Stolze. But probably in no other nation have so many systems of short-hand been put forth as in Eng. The earliest of any prominence was that of Timothy Bright (Lond. 1588)—*Characterie, an Art of Short, Swift, and Secret Writing by Character*. Two yrs. later appeared the system of Peter Bales, under the curious title, *The Writing School-master, in three parts*. The more prominent of the succeeding systems have been those of Willis (1692-23), Rich (1654-69), Mason (1672-1707); republished with improvements by Gurney in 1763 and by Byrom in 1767; Taylor (1786), Lewis (1815), Harding (1823-28), and Pitman (1837), with many new editions to date. Pitman's system is now practically the only system used in G. Brit.

*Stenography in the U. S.*—But few stenographic systems have ever received even temporary encouragement in the U. S.; and this is due to the striking superiority of such as have found favor, as well as to their comparative earliness in the field. The first system introduced here was that of Keyes A. Bayley (New York, 1831). This was followed by several Amer. editions of Isaac Pitman's (Eng. system, by Andrews and Boyle, Booth, Paterson, and Benn Pitman (1847-54). Lindsey's tachygraphy (which is slow, and has the feature of writing in the vowels, and the merit of inequality) was introduced 1864-69. Graham's system was introduced in 1858, and rapidly found favor all over the country. Munson's system (introduced in 1866) is very similar to Graham's, both being founded on that of Isaac Pitman, and has received a considerable degree of support. [From orig. art. in *J.'s Univ. Cyc.*, by JOHN FRANCIS MEYER.]

**Stephen**, the name of 3 saints of the R. Cath. Ch.: (1) STEPHEN THE DEACON, the first of all Chr. martyrs. His festival is held on Dec. 26.—(2) STEPHEN THE POPE. His festival is celebrated Aug. 2.—(3) STEPHEN THE KING (of Hungary).

**Stephen**, the name of 10 popes. The most remarkable is STEPHEN III. (752-757); he crowned Pepin le Bref king on the condition that he should expel Astolphus, the Lombard king, from the exarchate of Ravenna and bestow these terts. on the see of St. Peter. Pepin forced the Lombards to retreat from the above terts., which he then gave to the papal see, thereby laying the foundation of the temporal power of the pope.—STEPHEN VII. (896-897) had the corpse of his predecessor, FORMOSUS, exhumed, stripped of the papal insignia, mutilated, and thrown into the Tiber, annulling all his ordinances.—STEPHEN VIII. (929-931) was the tool of Theodora and Marozia.—STEPHEN X. (1057-58) was elected pope through the influence of Cardinal Hildebrand, who was the real master of the Ch.

**Stephen**, king of Eng., b. in Normandy about 1100, son of Stephen, count of Blois, by Adela, daughter of William the Conqueror. William, the only son of Henry I., was drowned in 1120, and the heir-presumptive to the crown was his daughter Matilda, who was married, in second nuptials, to Geoffrey Plantagenet, earl of Anjou. Upon the death of Henry I. (in 1135), S. claimed the succession, and was chosen by a party of the prelates and nobles. The cause of Matilda was taken up by another party, headed by her natural brother, Robert, earl of Gloucester, and after a contest of several years Stephen was made prisoner at Lincoln Feb. 2, 1141. But a revolt broke out, and Robert was in turn captured at the battle of Wilton, Sept. 1143, but was exchanged for S. The civil war now raged with varying fortunes for 10 yrs. In 1153 Prince Henry Plantagenet, son of Matilda, arrived in Eng. at the head of a considerable force, but an agreement was concluded by which S. should retain the crown during his life, and that after his death Henry should succeed him. D. Oct. 25, 1154.

**Stephen** (Sir George), b. in 1794, studied med.; entered Magdalen Coll., Cambridge; entered the office of a Lond. solicitor; was called to the bar; was appointed by the gov't. to collect evidence against Queen Caroline; was active in the cause of police and parochial reform; was knighted by Queen Victoria in 1837. In 1840 he took up his residence in Liverpool; in 1855 emigrated to Australia; was an earnest advocate of the abolition of slavery in the Brit. colonies, and pub. *Adventures of a Gentleman in Search of a Horse, Adventures of an Attorney in Search of Practice, The Niger Trade and the Afr. Blockade*, etc. D. June 20, 1879.

**Stephen** (HENRY JOHN), cousin of Sir James and Sir George, b. in Eng. in 1787, was called to the bar at the Inner Temple 1815; became com. of bankruptcy; was a distinguished practitioner at the Lond. bar, and became sergeant-at-law 1827. D. at Clifton Nov. 28, 1864. Wrote *Treatise on the Principles of Pleading in Civil Actions*, *Summary of the Criminal Law in its Present State*, and *New Commentaries on the Laws of Eng.* In this work he enjoyed the assistance of his son, JAMES STEPHEN, LL.D., b. in Eng. in 1820, prof. of Eng. law at King's Coll., Lond., recorder of Poole, registrar of bankruptcy at Leeds, and circuit judge at Lincoln, who wrote on *Bar Etiquette*, *The Common-Law Procedure Act*, and *A Digest of the Law of Evidence*.

**Stephen** (JAMES), b. at Poole, Dorsetshire, Eng., in 1759, was ed. at Winchester; became a barrister and a parliamentary reporter; received an appointment in the prize court, and acquired an intimate knowledge of colonial law; obtained a large practice as advocate in prize cases before the prize council; pub. *War in Disguise, or the Frauds of Neutral Flags*; was returned to Parl.; appointed under-sec. for the colonies, and was made a master in chancery for his services in drawing up the system of continental blockade against Nap.; pub. *Hist. of Toussaint l'Ouverture and Slavery of the Brit. W. I.* D. Oct. 10, 1832.

**Stephens, or Stephanus** [Fr. *Etienne* or *Étienne*], a family of Fr. printers and scholars.—HENRY (b. about 1460, d. in 1520) established himself in 1502 as a printer in Paris, aided, and succeeded by his 3 sons, the most distinguished of whom was ROBERT (b. 1503, d. Sept. 7, 1559), who in 1531 began the publication of *Dictionarium, seu Thesaurus Lingue Latine*. He also pub. editions of the Bible, with notes, censured, and afterward prohibited by the Sorbonne; he was obliged to take refuge in Geneva, where he died. He pub. nearly a dozen complete editions of the Bible in Heb., Gr., Lat., and Fr., and numerous separate editions of the N. T. into verses was made by him.—The business in Paris was continued by his younger brother, CHARLES (b. 1504, d. 1564), who put forth numerous classical and scientific works.—HENRY, son of a Gr. scholar. He ruined himself, financially, by the publication of his immense *Thesaurus Lingue Græcæ*; travelled from place to place, visiting all the prin. libraries, collecting materials for various works.—PAUL, the son of Henry (b. 1506, d. 1627), carried on for many yrs. the printing-business at Geneva.—ANTHONY, the son of Paul (b. 1592,



d. 1674), removed from Geneva to Paris, where for nearly half a century he conducted a printing-house.

**Stephens** (ALEXANDER HAMILTON), LL.D., b. near Crawfordville, Ga., Feb. 11, 1812, was grad. at the Univ. of Ga. in 1832; came to the bar in 1834; entered upon political life in 1836 as member for Tallahassee of the State house of reps.; in 1842 was chosen State senator by the same constituency. The Western and Atlantic R.R., which links Atlanta with Chattanooga, owes its construction greatly to him. In 1848 he was elected member of the House of Reps. of the U. S. The Compromise measures passed by the Cong. of 1850, which for a time gave peace to the sections, had no bolder, abler, or more eloquent champion than Mr. S. He was chosen a delegate to the State convention of that yr.—the convention which established the celebrated "Georgia platform." In 1855 he united with the Dems. to defeat the Know-Nothing party. In the Presidential campaign of 1860 he was placed at the head of the Douglas-Johnson electoral ticket. He was a delegate to the State convention of 1861 which passed the ordinance of secession. While he advised against the policy of secession for existing grievances, he maintained the right of a State to peaceably secede from the Federal Union for sufficient cause. When a majority of the convention passed the ordinance of secession, he readily acquiesced in their decision. He was a member of the Confed. provisional cong.; was chosen V.-P. of the provisional govt. of the Confed. States; was appointed com. to the convention between their govt. and the State of Va.; was elected by the people to the Vice-Presidency of the Confederacy under the permanent const.; and when, in Feb. 1865, the fortunes of the Confederacy were desperate beyond the reach of hope, he was placed at the head of the commission on the part of the Confed. States govt. In the famous Hampton Roads conference. After the collapse of the Confederacy he was arrested and confined a prisoner of state in Ft. Warren for 5 months; he was released on his own parole in Oct. 1865. In Feb. 1866 the general assembly elected him to the office of U. S. Senator, but Cong. ignored the restoration of Andrew Johnson; so Mr. S. was not allowed to take his seat in the Senate. M. C. 1878-82; elected gov. of Ga. 1882. Wrote *Constitutional View of the War between the States* and a *Compendium of the Hist. of the U. S.* He was one of the associate eds. of *J. S. Unit. Cyc.*, and in 1882 pub. his comprehensive *Hist. of U. S. from the Early Settlements down to the Present Time*. D. Mar. 4, 1888.

**Stephens** (HENRY), b. at Keerpooy, Bengal, Brit. India, in 1793, studied agriculture at the Univ. of Edinburgh, and in 1815 commenced practical farming, undertaking researches which were pub. in his standard works, *The Book of the Farm*, *Manual of Practical Draining*, *Catechism of Practical Agriculture*, and *Book of Farm-Buildings*. He was ed. of the Scot. *Journal of Agriculture* 1832-54, and was awarded at the great Exposition of Paris 1855 a gold medal for his very useful writings.

**Stephens** (JOHN LLOYD), b. at Shrewsbury, N. J., Nov. 28, 1805, grad. at Columbia Coll. 1822; studied law at Litchfield, Conn.; practised his profession 8 yrs. in New York; travelled extensively, and wrote *Incidents of Travel in Egypt, Arabia Petraea, and the Holy Land*, and *Incidents of Travel in Gr., Tur., Russ., and Poland*; was appointed in 1839 a special com. to Central Amer. for the purpose of negotiating a treaty with that republic; proceeded to Costa Rica; journeyed northward by land through Nicaragua, Honduras, and San Salvador to Guatemala; proceeded through N. Guatemala to Chiapas, Tabasco, and Yucatan, and wrote *Incidents of Travel in Central Amer., Chiapas, and Yucatan*, and *Incidents of Travel in Yucatan*. In 1846 Mr. S. was a delegate to the convention for revising the const. of N. Y.; became in 1847 an active organizer and officer of the first Ocean Steam Navigation Co.; took part in the enterprise projected after the discovery of gold in Cal. for the construction of a R. R. across the Isthmus of Panama; travelled over the Isthmus inspecting the route; visited Bogotá, and negotiated with the govt. of New Granada the contract for that work 1849, and personally superintended its construction during winters of 1850-52. D. Oct. 10, 1852.

**Stephens** (LINTON), b. near Crawfordville, Ga., July 1, 1823, was grad. at the State Univ. 1843; his professional studies in the law were prosecuted at the univs. of Va. and Harvard. He represented for a series of yrs. the cos. of Tallahassee and Hancock in the house of reps. or in the senate of Ga.; was appointed to fill a vacancy on the supreme court bench. He was a delegate to the convention of 1861 which passed the ordinance of secession. He voted against that measure, but when it was carried by a decided majority he elected to share the fortunes of the people of Ga. D. July 14, 1872.

**Stephens** (WILLIAM), b. on the Isle of Wight, Eng., Jan. 28, 1671, grad. at King's Coll., Cambridge; M. P. 1696-1722; settled at Charleston, S. C., about 1730; sec. of the colony of Ga. 1737; "president" of the co. of Savannah 1741, gov. of Ga. 1749-50. Wrote *A Journal of the Proceedings in Ga.* D. Aug. 1753.

**Stephenson** (GEORGE), b. at Wylam, Northumberland, Eng., June 19, 1781, the son of a poor colliery laborer; was in childhood an engine-boy; was promoted to be a fireman, and in time was placed in charge of an engine, which he studied until he had mastered its construction so as to be able to take it apart and put it together again; in 1812 he was made engine-wright at Killingworth Colliery, with a salary of £100 a year; in 1814 he was the first to construct a locomotive steam-engine which would move upon a common road; in 1815 he introduced into his second locomotive the steam-blast, and in the same yr. he devised, simultaneously with Sir Humphry Davy, his safety-lamp, still in use in some Eng. collieries. S. now turned his attention to improvements in railways as well as engines. The first railway built by him, opened in 1825, 8 m. long, was so successful that in the next yr. he was appointed engineer of the

railway recently authorized to be constructed between Stockton and Darlington, and in 1825 of the Liverpool and Manchester line, which was commenced in 1826. He had in the mean time set up an establishment at Newcastle-upon-Tyne for the manufacture of locomotives. In 1829 devised a locomotive which attained an average speed of 14 m. an hour, and for a short distance was driven at the rate of 29 m. D. Aug. 12, 1848.

**Stephenson** (ROBERT), son of the preceding, b. at Wylington, near Newcastle-upon-Tyne, Oct. 16, 1803, studied chem., math., and geol. at the Univ. of Edinburgh; assisted his father in railway surveying and in his locomotive-works; from 1824 superintended the working of the Colombian Mining Association in S. Amer.; returned to Eng.; aided his father, partly in laying down the line of the Liverpool and Manchester railway; to him belongs the honor of the practical development of the locomotive railway-engine; appointed engineer of the Lond. and Birmingham Railway, which was built wholly under his direction; constructed the high-level bridge crossing the Tyne at Newcastle, the viaduct over the valley of the Tweed at Berwick, the Conway tubular bridge, the Britannia tubular bridge crossing the Menai Straits, the Victoria tubular bridge over the St. Lawrence in Canada, and those crossing the Nile at Benah and Kaffre Azzayat in Egypt; in 1847 he became M. P. for Whitby; pub. a *Description of the Locomotive Steam-Engine*, *Report on the Atmospheric Railway System*, and *The Great Exhibition, its Palace and Contents*. D. Oct. 12, 1859.

**Steppe**, step, the name given by the Tartars to the plains of Central Asia. They are usually covered with grass, and correspond in their aspects and relations to the prairies of the U. S. and the llanos and pampas of S. Amer.

**Steppe Murrain**. See RINDERPEST.

**Step'toe** (EDWARD JENNER), b. in Va. in 1816, grad. at W. Pt. 1837; was distinguished in the Fla. war 1838-42; was assistant instructor of inf. tactics at W. Pt. 1842-43; commanded a battery of light artil. in the Valley of Mex. 1847; was brevetted for gallantry at Cerro Gordo and at Chapultepec; declined the governorship of U. Terr. 1854; became major of the 9th Inf. 1855; was in command of an expedition against the Indians of Wash. Terr. Apr. 1856; was made lieutenant-col. of 10th Inf. 1856, and resigned Nov. 1, 1861. D. Apr. 1, 1865.

**Stereoscope** [Gr. στερεός, "solid," and σκοπεῖν, to "view"], a modern optical instrument by means of which 2 plane representations of a natural object, taken from different points of view, may be so united as to form a single impression of the object in relief. In stereoscopic vision the 2 pictures superimposed differ from each other, but at a certain focal distance all corresponding points in the two are made to unite. The distance of the point of union is estimated by the eye, and so in turn each point has its distance from the spectator estimated, and the stereoscopic image stands out in as clear relief as the solid from which the two impressions were derived. The lenticular S., which is the most common form, generally consists of a pyramidal wooden box, blackened on the inside and having a lid to admit the light from above if the pictures are opaque. The bottom of the box is made of fine ground glass for transparent pictures; in the top of the box are fitted 2 lenses (or half or quarter lenses, as the case may be). The bottom, holding the "slide," and the top, with the lenses, may be made to approach or recede from each other to suit different eyes.

**Stereotyping**. See PRINTING.

**Ster'let** (*Acipenser ruthenus*), a small species of sturgeon found in various Russ. rivers and the Caspian and Black seas, into which they empty, and esteemed for its flesh. It rarely or never attains a length of 3 ft., and a common size is 2 ft. in length and 3 lbs. in weight. It leaves the sea in May and June, and ascends the rivers, sometimes very high up, for the purpose of spawning. It has not only a superior reputation as a table-fish, but from its roes is made the best caviare, which constitutes a noteworthy article of trade in Russia.

**Sterling**. See POUND STERLING.

**Ster'ling**, city and R. R. Junc., Whiteside co., Ill., 110 m. W. of Chicago. Pop. 1870, 3998; 1880, 5067.

**Sterling**, city, on R. R., Rice co., Kan. Pop. 1880, 1014.

**Sterling**, Neb. See APPENDIX.

**Sterne** (LAURENCE), b. at Clonmel, Ire., Nov. 24, 1713, son of a lieut. in the Brit. army, was ed. at Jesus Coll., Cambridge, where he grad. in 1740; entered into holy orders, and was presented by his uncle with the valuable benefice of Sutton, Yorkshire, to which that of Stillington was soon after added. Wrote *Tristram Shandy*, *The Sermons of Mr. Yorick*, *The Sentimental Journey*, etc. D. Mar. 18, 1768.

**Stern'hold** (THOMAS), b. in Awre, Gloucestershire, Eng., about 1500, was ed. at Ox., and became groom of the chamber to Henry VIII. and Edward VI.; with John Hopkins was joint author of the first version of the Psalms into Eng. metre. D. Aug. 1549.

**Stesich'orus**, b. at Himera in Sic. 632 B. C., attained a great reputation as a lyrical poet. D. 560 or 552 B. C. His poems consisted of choral odes composed of strophes, antistrophes, and epodes, like the chorus of the tragedy—a form which he is said to have invented. Only fragments of his works remain.

**Steth'oscope** [Gr. στήθος, the "breast" or "chest," and σκοπεῖν, to "examine"], an instrument employed by phys. for the physical exploration of the chest. The scientific study of the sounds elicited by the heart and lungs, and to a minor degree by other organs, as the stomach and intestines, is termed *auscultation*. Direct application of the ear is termed *immediate* or *direct auscultation*, as distinguished from *mediate auscultation*, in which conducting media—instruments—are interposed to isolate, convey, and intensify sound.

**Stettin**, town of Pruss., cap. of the prov. of Pomerania, on the left bank of the Oder, at its entrance into the Stettiner-Haff, is strongly fortified. The site it occupies is hilly,



and its streets are uneven, but the houses are neat, and many buildings are very handsome. Its sugar-refineries, oil-mills, glass-works, breweries, distilleries, and manufactories of anchors, sailcloth, rope, tobacco, soap, candles, hats, etc. are important, and as a place of commerce it is the second port of Prus. Pop. 91,756.

**Steuben**, stü'ben; Ger. stöi'ben, **VON** (FRIEDRICH WILHELM AUGUST HEINRICH FERDINAND), BARON, b. Nov. 13, 1750, in the fortress of Magdeburg, Prus., where his father was an officer; served as a volunteer when 14 yrs. of age in the campaign of 1744; ed. in the Jesuit colls. of Neisse and Breslau; entered the Prus. army as a cadet 1747; became lieut. 1753; was wounded at the battle of Prague, and distinguished at Rossbach, 1757; became adjutant-gen. 1758; wounded at Kunersdorf 1759; was aide to Gen. Knoblauch in his march into Poland 1761; was taken prisoner and carried to St. Petersburg; was exchanged; made capt. (1762), and placed on the staff of Frederick the Great; took part in the siege of Schweidnitz 1763; withdrew from the army at the Peace of 1763; was appointed in 1764 grand-marshal to the court of the prince of Hohenzollern-Hechingen; in the spring of 1777 was induced to offer his services to the Amer. insurgents; embarked for Amer. in the autumn of that yr. with several other officers; landed at Portsmouth, N. H., Dec. 1; proceeded overland to the Amer. encampment at Valley Forge, Pa.; received the appointment of inspector-gen. (with the rank of maj.-gen.) Mar. 29, 1778; took part as a volunteer in the battle of Monmouth in the following June; rendered memorable services, which can scarcely be overrated, in drilling the officers and men of the Continental army into efficiency; prepared a manual of instruction for the army, adopted by Congress and printed 1779; was a member of the court-martial on Major André; took command of the forces in Va. 1780, and rendered good services at the siege of Yorktown 1781. Remaining as a citizen of the U. S. after the war, it was with difficulty that he procured an adjustment of his claims upon Cong., but was ultimately assigned a pension of \$2500 and received grants of land from several States. On the tract given him by N. Y., in Oneida co. (now called Steuben), he settled, built a log hut 1789, and passed the closing yrs. of his life as a farmer. D. Nov. 28, 1794.

**Steubenville**, city and R. R. centre, cap. of Jefferson co., O., on O. River, 70 m. below Pittsburgh. Rich deposits of bituminous coal exist here. Pop. 1870, 8107; 1880, 12,093.

**Stevens** (ABEL), D. D., b. in Phila. Jan. 19, 1815, studied at the Wesleyan Univ., Middletown, Conn.; joined the Meth. ministry, and in 1834 was stationed at Boston; in 1837 at Providence, R. I.; in 1840 became ed. of *Zion's Herald*, a denominational journal, at Boston, and in 1852 of the *National Magazine*. In 1855 he was elected by the conference as ed. of the *New York Chr. Advocate and Journal*. He subsequently became joint ed. of the *Methodist*, an independent journal in New York, retaining this position till 1874. Wrote *Memorials of the Introduction of Methodism into N. Eng.*, *Memorials of the Progress of Methodism in the E. States*, *Chr. Polity*, *The Preaching required by the Times*, etc. He was one of the associate eds. of *J.'s Univ. Cyc.*

**Stevens** (ALEXANDER HODGSON), M. D., LL.D., son of Gen. Ebenezer, b. in New York in 1789, grad. at Yale 1807; studied med. in Lond. and Paris; was prof. of surgery in Queen's (now Rutgers) Coll. 1814-16, in the New York Coll. of Phys. and Surgeons 1826-37, and again 1840-44; was pres. of that inst. 1843-55, of the Amer. Med. Association 1848, and of the State Med. Society for several yrs. He edited Cooper's *First Lines of Surgery*, and wrote *On Inflammation*, *Cases of Fungus Hematodes of the Eye*, etc. D. Mar. 30, 1869.

**Stevens** (ALFRED GEORGE), b. at Blandford, Dorsetshire, in 1817, went to It. in 1833; upon his return to Eng. was employed in decorative work for archs., founders, and manufacturers. In 1850 he went to Sheffield, where under his influence the Sheffield School of Art rose to the highest place of any in the kingdom. His finest decorative work is at Dorchester House, Park lane, Lond. In 1856 he received the commission for the Wellington Monument, in St. Paul's, Lond. D. May 1, 1875.

**Stevens** (EBENEZER), b. at Boston, Mass., Aug. 25, 1751, was one of the "Boston Tea-Party" Dec. 1773; removed to R. I.; raised 2 companies of artil. and one of artificers for the expedition against Que.; became capt. of Knox's regiment Jan. 11, and brevet-major Nov. 9, 1775; commanded the artil. at Ticonderoga and at Stillwater; was appointed lieut.-col. Apr. 30, 1778; was assigned to Lamb's regiment; served under La Fayette in Va.; was in command of the artil. during the siege of Yorktown; was one of the founders of the Society of the Cincinnati; and became after the war a leading merchant of New York in the W. I. and Mediterranean trade; agent of the war dept., and a maj.-gen. of militia. D. Sept. 2, 1822.

**Stevens** (EDWARD), b. in Culpeper co., Va., in 1745, became col. of the 10th Va. regiment 1776; distinguished himself at Brandywine and Germantown, and as brig.-gen. at Camden, Guilford C. H., and Yorktown; was a member of the Va. senate. D. Aug. 17, 1820.

**Stevens** (EDWIN AUGUSTUS), b. at Hoboken, N. J., in 1795, son of John and brother of Robert L. Stevens, took part in their steamboat experiments and enterprises. At the breaking out of the c. war he urged the govt. to put in service the iron-clad floating battery of which his brother had undertaken the construction, offering to complete it at his own risk; this offer being declined, he expended considerable sums on the vessel, and bequeathed it to the State of N. J., together with \$1,000,000 for its completion; this, however, proved insufficient. He had early purchased the entire site upon which the city of Hoboken has been built, by which he amassed an immense fortune; endowed the Hoboken high school, and bequeathed nearly \$1,000,000 to establish at Hoboken the Stevens Inst. of Technology. D. Aug. 7, 1868.

**Stevens** (ISAAC INGALLS), b. at Andover, Mass., Mar. 25,

1818, grad. from the U. S. Military Acad. July 1, 1839; served in the war with Mex. at Contreras, Churubusco, and Chapultepec. From 1849 to 1853 he was prin. assistant and in charge of the office of the U. S. Coast Survey at Wash.; gov. of Wash. Terr.; conducted a pioneer survey of the route for the N. Pacific R. R.; delegate to Cong. from Wash. Terr. 1857-61; on the outbreak of hostilities was made col. of the 79th N. Y. Volunteers; became a brig.-gen. of volunteers Sept. 28, and attached to the Port Royal expedition. On July 4, 1862, he was made a maj.-gen. of volunteers; at the second battle of Bull Run his division (9th corps) was hotly engaged. Near Chantilly on the morning of Sept. 1, 1862, S. was shot and instantly killed.

**Stevens** (JOHN), b. in New York in 1749, became interested in the question of navigation by means of steam; in 1804 launched a small vessel worked by steam with screws, and in 1807 built a steamboat which he called the *Phoenix*; he sent his vessel to the Del. River. In 1812 he planned a revolving steam-battery to be plated with iron, and involving essentially the principles afterward embodied in the monitors, and in the same yr. put forth an essay on railroads, indicating the methods of operating them by steam, and suggested the construction of a railway from Albany to Lake Erie. The Camden and Amboy R. R. was planned by him. D. in 1838.

**Stevens** (JOHN AUSTIN), b. in New York Jan. 22, 1795, son of Gen. Ebenezer, grad. at Yale 1813; became a partner in his father's mercantile house 1818; was a delegate to the Phila. free-trade convention; an early member (from 1820) of the New York chamber of commerce; was one of the founders and the first pres. of the Merchants' Exchange, pres. of the Bank of Commerce from 1839 to 1866, pres. of the associated banks of New York, Phila., and Boston, and chairman of the treas. note committee; long gov. of New York Hospital; combined Whig with free-trade principles. D. Oct. 19, 1874.

**Stevens** (JOHN AUSTIN), JR., son of John Austin, b. in New York Jan. 21, 1827, grad. at Harvard 1846; became a merchant in New York; was sec. of the chamber of commerce of New York 1862-68; prominent in patriotic organizations during the c. war, and wrote *The Valley of the Rio Grande, Memorial on Ocean Steam-Navigation, Colonial Records of the N. Y. Chamber of Commerce, with Historical and Biographical Sketches*.

**Stevens** (ROBERT LIVINGSTON), b. at Hoboken, N. J., in 1788, the son of John Stevens, became early interested in the steam-navigation ideas of his father, and made many improvements in the construction of vessels, among which was that of giving concave water-lines to the hull, and subsequently engaged largely in the building of steamboats. In 1813 he invented and made for the govt. elongated percussion shells for smooth-bore guns, and in 1822 used anthracite coal in a furnace, and soon after in his steamers; in 1836 introduced the T-rail on the Camden and Amboy R. R., of which he was pres. D. Apr. 30, 1856.

**Stevens** (THADDEUS), LL.D., b. at Peacham, Vt., Apr. 4, 1793, grad. at Dartmouth in 1814; went to Gettysburg, Pa.; studied law; was admitted to the bar in 1816. In the Presidential canvass of 1828 he was a strong opponent of the election of Gen. Jackson; in 1833 he was a member of the State legislature, in 1836 a member of the convention to revise the State const., canal com. in 1838. In 1842 he removed to Lancaster; in 1848 was elected M. C.; was re-elected in 1850, 1853, 1862, and thereafter to each Cong. until his death. He was one of the most active managers in the impeachment trial of Pres. Johnson. D. Aug. 11, 1868.

**Stevenson** (SIR JOHN ANDREW), MUS. DOCT., b. in Dublin, Ire., in 1790, became vicar-choral at St. Patrick's cathedral, Dublin, 1783; composed the music for 2 of O'Keefe's popular farces, Dr. Holton's opera, *The Contract*, and Mrs. Atkinson's *Lore in a Blaze*; produced various original operas and glees, the fine oratorio, *The Thanksgiving*, and various pieces of sacred music, but won his chief celebrity by the musical arrangement of Moore's *Irish Melodies*. D. Sept. 14, 1833.

**Stevenson** (JOHN W.), son of Andrew, b. at Richmond, Va., May 4, 1812, grad. at the Univ. of Va. 1834; studied law; settled at Covington, Ky., 1841; became co. atty., member of the State legislature (1845-47), and of the constitutional convention 1849; was one of the revisers of the civil and criminal codes of practice; Presidential elector 1852 and 1856, M. C. 1857-61; lieut.-gov. 1867, acting gov. 1867-68, gov. 1869-71, and U. S. Senator 1871-77.

**Stevenson** (ROBERT), b. at Glasgow, Scot., June 8, 1772, was engineer to the board of coms. for Northern light-houses 1797-1842, during which time he erected no less than 23 light-houses; was employed on numerous engineering works, chiefly bridges, river and harbor improvements, and railway surveys; pub. *An Account of the Bell-Rock Light-house*. D. July 12, 1850.

**Stevenson** (THOMAS G.), b. in 1836 at Boston, Mass., where he was ed.; became an active member of the State militia, rising from the ranks to be major. In the fall of 1861 he was commissioned col. of the 24th Mass. Volunteers, which he led in the Burnside expedition, resulting in the capture of Roanoke Island and Newbern, N. C. In the subsequent events in N. and S. C. the regiment bore an honorable part. His appointment as brig.-gen. of volunteers was made in Nov. 1862; he was engaged in the operations against Charleston, S. C., including the descent upon Morris Island and siege of Ft. Wagner. In the Richmond campaign of 1864 he commanded a division of the 9th corps (Army of the Potomac) through the "Wilderness" battles, but fell on the second day of the struggle around Spottsylvania, May 10, 1864.

**Stevens Point**, city and R. R. centre, cap. of Portage co., Wis., on Wis. River, at the base of one of the most valuable pine dists. in the W. Pop. 1870, 1810; 1880, 4449.

**Steward** (or **High Steward**) of Scotland, an ancient hereditary office of great dignity and power at the Scot. court from the 12th to the 15th century. The incumbent



not only exercised a real jurisdiction over the royal household, but collected and controlled the royal revenues, and was assigned in war the post nearest to the sovereign.

**Steward of England, Lord High**, anciently the first officer of state at the Eng. court. This office must be distinguished from that of LORD STEWARD OF THE HOUSEHOLD, anciently intrusted with the control of the royal servants, over whom he exercised a civil and criminal jurisdiction, not entirely repealed until about 1850.

**Stewart** (ALEXANDER), b. about 1740, became capt. in the Brit. army 1761, lieutenant-col. of the 3d Foot July 1775; succeeded to the command of the Brit. forces in S. C. May 1781, and was defeated by Gen. Greene Sept. 8, 1781, at Entaw Springs; became maj.-gen. 1790. D. in Feb. 1793.

**Stewart** (REV. ALEXANDER), LL.D., b. in 1781, was minister of the parish of Douglas, Scot.; one of the foremost Scot. literati, and a leading contributor to the *Edinburgh Encyc.* He pub. several text-books which were widely used and passed through many editions. D. Nov. 14, 1862.

**Stewart** (ALEXANDER TURNER), b. near Belfast, Ire., Oct. 27, 1802, entered at Trinity Coll., Dublin, where he did not graduate; emigrated to New York about 1818, bringing with him a few hundred pounds. Having invested his ready money in a small mercantile venture, he found himself left alone in the business with the rent of the shop on his hands, and forced to become a trader. Returning to Ire., he sold his property, invested the proceeds in Irish laces and similar goods, and in 1823 opened a small store in Broadway, and commenced the business which afterward became the most extensive dry-goods establishment in the world, with branches in Eng., Scot., Ire., Fr., and Ger., beside large manufactories of woollens, carpets, and hosiery in the U. S., Eng., and Scot., the whole employing about 8000 persons. In addition to his manufacturing and mercantile business, he came to be a large holder and improver of real estate in New York and vicinity, Saratoga, and other places. Among his enterprises was the establishment of Garden City, L. I. Here he purchased a tract of 10,000 acres, upon which he built more than 100 dwellings adapted for persons in moderate or comfortable circumstances, all of which would be rented furnished if desired, he paying all the expenses of grading, lighting, and watering the streets and building a railway to connect Garden City with Brooklyn. He was pres. of the honorary commission sent by the U. S. govt. to the Paris Exposition of 1867. During the Irish famine of 1846 he chartered a vessel which he freighted with breadstuffs at his own expense for gratuitous distribution among the sufferers, and brought back, free of charge, as many emigrants as the vessel would carry, stipulating that all should be of good character, and taking care that situations should be ready for them. D. Apr. 10, 1876.

**Stewart** (BALFOUR), LL.D., F. R. S., b. at Edinburgh, Scot., Nov. 1, 1828, ed. at the Univ. of St. Andrew's and Edinburgh; settled in Australia, where he was engaged in business in Melbourne 1852-54; devoted himself exclusively to the study of science; returned to G. Brit. 1855; was appointed director at Kew Observatory July 1, 1859, and prof. of natural philos. at Owens Coll., Manchester, July 7, 1870; is the discoverer of the law of equality between the absorptive and radiative powers of bodies; author of *Researches in Solar Physics*, of papers on *Heating produced by Rotation in Vacuo*, and of a religio-scientific treatise, *The Unseen Universe* (1875), etc.

**Stewart** (CHARLES), U. S. N., b. in Phila. July 28, 1778, went to sea as cabin-boy in a merchant-vessel; became capt. of an Indianan. In 1798 he entered the U. S. N. as a lieutenant, and in July 1800 was appointed to the command of the Experiment, with which he captured the Fr. privateer Deux Amis, and soon after the Diana. In 1804, in command of the brig Siren, he took part in the naval operations against Tripoli. He was made capt. in 1806; in the summer of 1813 took command of the frigate Constitution, and in Dec. sailed from Boston for the W. I., making several captures of Brit. vessels. In Dec. 1814 he sailed on a second cruise, and on Feb. 20, 1815, captured the Brit. ships Cyane and Levant. In 1816-20 S. commanded the Mediterranean squadron, in 1821-23 that of the Pacific. He was placed on the retired list in 1837, but resumed service in 1859, and was placed in command of the Phila. navy-yard with the rank of senior naval officer, and in 1862 was made rear-admiral on the retired list. D. Nov. 7, 1869.

**Stewart** (CHARLES SAMUEL), D. D., b. at Flemington, N. J., in 1795, grad. at the Coll. of N. J. in 1815; studied law at Litchfield, Conn., and theol. at Princeton, and in 1822 was ordained as missionary to the S. I. In 1828 he was appointed chaplain in the U. S. N. Wrote *Private Journal of a Voyage to the Pacific Ocean and Residence in the S. I., Visit to the South Seas, Sketches of Society in G. Brit. and Ire.*, etc. D. Dec. 14, 1870.

**Stewart** (DAVID), duke of Rothesay and earl of Carrick, son of Robert III., king of Scot., b. about 1377, received the above titles from his father Apr. 28, 1398; became regent of Scot. Jan. 27, 1399, and defended Edinburgh against Henry IV. of Eng. 1400, but was soon after seized by the opposite party and imprisoned in Falkland Castle, where he soon d. by starvation 1401.

**Stewart** (DUGALD), b. at Edinburgh Nov. 22, 1753, was in 1774 appointed assistant prof., and in 1785 prof. of math., in the same yr. receiving the chair of moral philos., which he resigned in 1810, and passed the remainder of his life in literary labor. Wrote *Elements of the Philos. of the Human Mind*, *General View of the Progress of Metaphysical, Ethical, and Political Philos.*, etc. D. June 11, 1828.

**Stewart** (ESME), lord of Aubigny, earl and duke of Lennox, b. in Fr. about 1555, arrived in Scot. in Sept. 1579; created earl of Lennox Mar. 5, 1580, duke of Lennox and earl of Darnley Aug. 5, 1581; secured the condemnation and execution of the ex-regent Morton for the murder of Darnley; quarrelled with the Ch., and was accused of treason and expelled from Scot. Dec. 1582. D. May 26, 1583.

**Stewart** (MATTHEW), earl of Lennox, b. in Scot. about 1510, had 2 sons, of whom the elder became the well-known Earl Darnley, the husband and victim of Mary Queen of Scots; succeeded to the earldom in 1526; became a rival of Bothwell at the court of the infant queen; took at first the R. Cath. side in the c. war, but soon went over to the party of the Eng. king; was banished, declared guilty of treason, and his estates confiscated Oct. 1545; conducted unsuccessful invasions of Scot. 1545-47; was imprisoned for having planned the marriage of the Queen of Scots with his son Darnley 1562; was restored to his estates and honors 1564; took part in the plot against Riccio 1565; was prominent in the movement which resulted in the imprisonment of the queen at Lochleven Castle June 15, 1570; was the next day declared lieutenant-gov. of Scot. in behalf of his grandson, the infant prince James VI.; was elected regent July 12; conducted the war against the partisans of Mary; took Dumbarton Castle Apr. 1571; held a Parl. at Leith May 9, 1571; was attacked and mortally wounded by a party of the queen's friends. D. Sept. 4, 1571.

**Stewart** (ROBERT M.), b. at Truxton, N. Y., Mar. 12, 1815, went to Ky. in boyhood, and in 1838 emigrated to Mo., settling in Buchanan co.; was a member of the State constitutional convention of 1845; sat 10 yrs. in the State senate; was gov. 1857-61; inaugurated the R. R. system of Mo., and was an officer of the Union army 1861. D. Sept. 21, 1871.

**Stewart** (ROBERT). See CASTLEREAGH, VISCOUNT.

**Stewart** (WILLIAM M.), b. in Wayne co., N. Y., Aug. 9, 1827, spent 18 months at Yale 1848-49, after which he left coll. for the gold-fields of Cal.; commenced the study of law 1852; was appointed dist. atty. for Nevada co.; was acting atty.-gen. of Cal. 1854; was a lawyer in San Francisco 1854-56; afterward resided at Nevada City and Downville; removed to Utah (now Nevada) 1860; sat in the legislature 1861; was a member of the constitutional convention of 1863; was elected as a Rep. one the first U. S. Senators from Nevada, and was re-elected 1869 and 1875.

**Stick'leback** (i. e. "back with spines"), a name applied to the species of the family Gasterosteidae. The popular designation is given on account of the stout rigid spines with which the back is armed. Several quite distinct generic types exist. (1) *Gasterosteus*, which has 2 or 3 free dorsal spines; (2) *Pygosteus*, which has 7 to 9 free dorsal spines; (3) *Apeltes*, and (4) *Spiñachia*, peculiar in the family for its elongated form and the large number (15) of dorsal spines. The species are all small, rarely exceeding 6 inches. Although so small, they are nevertheless extremely pugnacious, and attack animals many times larger than themselves. The females are plain-colored, but in the breeding season the males assume resplendent hues, which render them quite attractive. The most notable peculiarity about them is the care which they take of their young. The species are all, so far as known, nest-builders, and construct quite elaborate receptacles for their eggs; but the males do all the work. The nests are all formed of particles of grass, roots, sticks, or leaves, which are united together by a viscid mucus or kind of silk-like thread exuded from the body and wound round the material collected. After the nest is ready, the male seeks out a gravid female, conducts her to the nest, and she deposits a few eggs, and then escapes by an aperture already made or which she herself makes opposite to the one she entered by. This is repeated day after day until a considerable number of eggs is accumulated. Each time the male rubs himself against the female and passes over the eggs. For about a month, while the eggs are maturing, the male watches over them with jealous care, and only leaves when the young are hatched and ready to care for themselves.

**Stigmatization** [from Gr. *stigma*, a "puncture"], a term employed in the legendary literature of the R. Cath. Ch. to denote the miraculous impression upon certain saints of marks similar to the 5 wounds of Christ (*stigmata*) or of the crown of thorns. The most remarkable instances are those of St. Francis of Assisi and Veronica Giuliani.

**Stiles** (EZRA), D. D., LL.D., b. at North Haven, Conn., Dec. 15, 1727, grad. at Yale 1746; studied theol.; was ordained a Congl. minister June 1749; was tutor at Yale 1749-55; made the first electrical experiments in N. Eng.; preached for a short time to the Stockbridge Indians 1750; studied law; was admitted to the bar 1753, and practised 2 yrs. in New Haven; was pastor of a ch. at Newport, R. I., 1755-77; was inaugurated pres. of Yale June 23, 1778; acted also as prof. of divinity after 1780; was author of a *History of three of the Judges of King Charles I. and an Account of the Settlement of Bristol*. D. May 12, 1795.

**Stilicho**, still'i-ko, son of a Vandal chieftain in the Rom. service; the emp. Theodosius gave him his niece and adopted daughter, Serena, in marriage, made him commander-in-chief of the whole military force of the W. empire, and appointed him guardian to the young Honorius; after the death of Theodosius in 394 (A. D.) S. was the actual ruler of the W. Rom. empire; he married his son to Placidia, the daughter of Theodosius, and his daughter Marla to the emp. Honorius. The earlier part of his career was mostly occupied by rivalries with Rufinus, guardian of Arcadius, who had received the E. Rom. empire, and the feuds ended with the assassination of Rufinus. In 403 Alaric invaded N. It., and the empire was in imminent danger. S. defeated Alaric first at Pollentia, then at Verona, and drove him out of It. Vandals, Alans, Sueves, etc. invaded It. in 406, and besieged Florence. With a small army of Visigoths and Huns S. routed them completely. While S. was encamped at Bologna a number of his friends were put to death at Pavia under a riot which was instigated by the young emp. and Olympius, a eunuch, who turned his mind from his guardian by exciting his fear. In the camp S.'s friends demanded, for the sake of their own safety, that he should march immediately against Pavia and punish Olympius, and when he hesitated they rebelled against him. He fled from the camp, but was assassinated at Ravenna Aug. 23, 408.



**Stillé**, still'e (CHARLES JANEWAY), LL.D., b. in Phila. in 1819, grad. at Yale in 1839; became prof. of Eng. lit. in the Univ. of Pa. in 1866, and provost of the univ. in 1868. Wrote *How a Free People Conduct a Long War, Northern Interest and Southern Independence, The Historical Development of Amer. Civilization*, etc.

**Stillingfleet** (EDWARD), D. D., b. at Cranbourne, Dorsetshire, in 1635, ed. at Cambridge; entered holy orders; became rector of Sutton in 1657, preacher at the Rolls 1664, rector of St. Andrew's, Holborn, and lecturer at the Temple 1665, prebendary of St. Paul's 1687 and of Canterbury 1669, chaplain to Charles II. 1670, archdeacon of Lond. 1677, and bp. of Worcester 1689. Wrote *Irenicum, a Weapon-Salve for the Ch. Wounds; Origines Sacrae, or a Rational Account of the Chr. Faith; Rational Account of the Grounds of the Prof. Religion*, etc. D. Mar. 27, 1699.

**Stillingia** [named for Dr. Benjamin Stillingfleet, 1702-71], an interesting genus of euphorbiaceous plants. *S. sylvatica*, or queen's root, is an herb of the S. States whose root has a good reputation as an antisyphilitic remedy. The tallow tree of China (*S. sebifera*) is naturalized in the S. States. It is a beautiful tree, and from its seeds the Chi. extract large amounts of a white tallow-like fat, very useful for candles.

**Stillman** (SAMUEL), D. D., b. in Phila. Feb. 27, 1737, was settled at Bordentown, N. J., and in 1765 as pastor of the First Bap. ch. in Boston, where he remained until his death. He was a delegate to the constitutional convention of 1788, and one of the original incorporators of Brown Univ. in 1764. Wrote *On the Repeal of the Stamp Act, Anc. and Honorable Art. Sermon, Election Sermon*, etc. D. at Boston Mar. 12, 1787.

**Stillwater**, city and R. R. centre, cap. of Washington co., Minn., at the head of navigation on St. Croix Lake for large steamers, 25 m. from Miss. River, 18 m. from St. Paul. A regular line of small steamers plies between S. and Taylor's Falls, 30 m. above, on St. Croix River. Pop. 1870, 4124; 1890, 9055.

**Stillwater**, tp., Saratoga co., N. Y., on Hudson River and on Saratoga Lake. The tp. includes the incorporated v. of Mechanicsville and the p.-v. of Bemis's Heights, notable for the 2 battles of Sept. 19 and Oct. 7, 1777 (sometimes called the battles of Stillwater), which led to the surrender of Burgoyne. Pop. tp. 1870, 3401, including 737 in S. v.; 1890, 3412, including 837 in S. v.

**Stilt**, a name applied to birds of the genus *Himantopus*, and related to the avocet. They are distinguished by the excessively long legs, the straight, slender bill, which is slightly compressed, the feet with the middle and outer toes connected by a small web and destitute of a hind toe, and the tail projecting beyond the wings. Six species of the genus are recognized as inhab. of various parts of the world. One species is found in Amer., and ranges from the N. U. S. to Paraguay.

**Stingray**, a name applied to the species of the family Trygonidae. They have the body rhombic and moderately broad, the skin smooth and without tubercles, the nasal valves coalescent into quadrangular flaps, the teeth flattened, and the tail long and tapering, and destitute of a true fin, and at most with cutaneous folds, which, however, do not extend to the extremity; the tail is armed with an elongated spine compressed from before backward, and with teeth or serratures at each side directed downward. These spines are the "stings" which have insured the popular name to the forms in question.

**Stinkstone**, a name applied to certain bituminous limestones which on being struck emit the smell of sulphuretted hydrogen. The British Islands abound in stones of this character.

**Stink-Wood**, the hard, durable wood of *Oreodaphne fatida* (order Lauraceae). It grows in S. Afr., and is handsome and valuable, but possesses a disagreeable smell, even when seasoned. *O. fatens*, a tree of the Canaries, has wood of a vile odor, but others of this widespread genus are of pleasing fragrance.

**Stirling** (LORD). See ALEXANDER (WILLIAM).

**Stirling** (Sir THOMAS), BART., of Ardoch, b. in Scot. about 1735, became a capt. in the Royal Highlanders July 1757; served under Abercrombie at Lake George 1758, and Amherst at Lake Champlain 1759, at the siege of Niagara, and the invasion of Lower Canada 1760; was stationed in 1765 at Ft. Chartres, Ill., whence he marched to Phila. 1766; became lieut.-col. 1771, col. 1779, and maj.-gen. Nov. 1782; served throughout the war of the Revolution; was made a baronet and lieut.-gen. 1796, and full gen. Jan. 1. 1801. D. May 9, 1808.

**Stith** (WILLIAM), b. in Va. in 1689, was ed. in Eng., where he studied theol. and took orders in the Ch. of Eng. 1731; became in that yr. master of the gram.-school of William and Mary Coll.; chaplain of the Va. house of burgesses 1738, and pres. of William and Mary Coll. and rector of Henrico parish from 1752 to his death, Sept. 27, 1755. Wrote *Hist. of the First Discovery and Settlement of Va.*

**Stoat**. See ERmine.

**Stock**. See GILLFLOWER.

**Stockbridge**, Berkshire co., Mass., on R. R. and Housatonic River, is noted for picturesque mt.-scenery; the tp. includes the beautiful Lake Mahkeenc, and has numerous villa residences. Originally called Housatonic, this tp. was the chief residence of the tribe of Indians of same name, also called Stockbridge Indians. Pop. 1870, 2003; 1890, 2357.

**Stockbridge** (HENRY), b. in Hampshire co., Mass., Aug. 31, 1822, grad. at Amherst Coll. in 1845; studied law in Baltimore, and was admitted to the Md. bar in 1848. During the c. war he took an earnest part in favor of the Union; in 1864 was a member of the legislature, and drafted the act by which a constitutional convention was convened for the abolition of slavery in Md.; was a member of that convention, took an active part in its proceedings, exerted himself to secure the adoption of the const. framed by it, and de-

fended it before the court of last resort. He instituted and conducted to a successful issue in the Federal courts proceedings by which were annulled the indentures of apprenticeship by means of which the effect of the emancipation clause was sought to be evaded, and thus secured the enfranchisement of more than 10,000 colored children in the State.

**Stock-Dove**, the *Columba oenas*, a wild European pigeon, named from its habit of nesting in hollow stocks or tree-stumps, although it often builds in rabbit-burrows, etc. It is a handsome gray bird, with a purplish breast, scarlet eyes, orange bill, and red toes and legs.

**Stock-Exchange**, an association of brokers and dealers or jobbers in stocks, bonds, and other securities, created either under national, State, or municipal authority, or by corporations concerned with the business of common carriers, with mining, manufacturing, banking, or other commercial or industrial pursuits. In the U. S. such securities, when evidences of debt, importing an engagement to pay a sum of money on a future day, are denominated bonds; while under the name of stocks are included shares in the stock of corporations, representing money contributed to the particular enterprise at the outset, at the risk of the business. But State bonds are also called stocks, and sometimes stock, in the singular. In Eng. R. R. bonds are known as debentures, and seldom have the security of a mortgage, while the word "stock" is there applied: (1) to the public funds or govt. securities, representing money lent to the nation; and (2) to the capital stock of railway or other companies when it is not divided into shares, but is indicated as so much money, at the original par value.

Joint-stock companies, having the privilege of a limited liability of the shareholders, are among the most efficient of all the devices of modern ingenuity for the furtherance of undertakings far beyond the resources of any single individual or firm. It is a truism to say that without the aid of associated capital the grand engineering works which are a principal boast of our times would never have been possible; and it is obvious that the S.-E. acts as a powerful auxiliary to the principle of association, by attracting capital from hoards or passive investments, familiarizing the public with the comparative merits of different undertakings, holding up its attractive prizes as the rewards of judicious adventure, though, by its occasional disasters and panics, pointing out the ruinous nature of the unsound or unwarranted enterprise, and the peril which constantly attends upon over-construction and over-trading. Affording a market always at the service of any who desire to discontinue or change their investments, it has enormously enlarged the circle of investors, which would else almost have been limited to the small number of people who can hold on for a lifetime. Furnishing a demand for money on call loans, repayable at the lender's option, and secured by a deposit of pledges immediately convertible into cash, it has rendered serviceable the vast mass of floating capital always present at the chief commercial centre awaiting permanent employment. A seat in the S.-E. was recently sold for \$35,000—the number being limited. [From orig. art. in *J.'s Univ. Cyc.*, by STRONG WADSWORTH.]

**Stockfish**, a term used in commerce for salted and dried codfish and related species. The fishes are taken care of as soon as convenient after being caught, split from head to tail, and the vertebral column in part taken out; they are then thoroughly washed and rid of the blood; after the water has been drained off, they are put in large vats, salted, and heavy weights are imposed; they are next washed and brushed, laid out on the sandy shore and rocks, and afterward put in heaps for a time.

**Stockholm**, the capital of the kingdom of Swe., beautifully situated at the outlet of Lake Mälaren in the Baltic, is divided into (1) *Staden*, (2) *Norrmalm*, (3) *Ladugårdslandet*, (4) *Kungsholmen*, (5) *Södermalm*, and (6) *Saltjö-barne*, which complete the picture of an island city cut up and traversed in all directions by water. In *Staden*, which mostly consists of narrow and irregular streets, and is surrounded with a quay, the most prominent building is the royal palace, one of the most beautiful in Europe (built 1697-1754). In the island of Riddarholmen stand the Riddarholm ch., containing the royal tombs; the new house of deputies, and the statue of the founder of S., Birger Jarl. *Norrmalm* has the finest streets, especially the Drottninggata, and the most remarkable public squares. *Södermalm* and *Norrmalm* are connected by a railway which for boldness in construction hardly has any equal in the world. Djurgården, a park of considerable size, is the general resort for amusement and recreation of the city. Communication between the various parts of the city is generally carried on by *ångslupar* (small steamboats). Pop. 168,775.

**Stockmar** (CHRISTIAN FRIEDRICH), b. at Coburg Aug. 22, 1787, studied med.; became phys. to Prince Leopold of Coburg in 1816, and subsequently private sec.; was very active in various diplomatic negotiations, and was the intimate friend of Prince Albert and Queen Victoria; received the title of baron. D. July 9, 1863. Left *Notabilia from the Papers of Stockmar*.

**Stockport**, town of Eng., co. of Chester, at the confluence of the Mersey and the Tame, is one of the centres of the cotton-manufacturing industry of Eng. Pop. 59,544.

**Stocks** [A.-S. *stoc*], a machine for the punishment of petty offenders, in which the culprit was made to sit for a time with his ankles confined in holes made in timber.

**Stockton**, city and R. R. centre, cap. of San Joaquin co., Cal., at the head of a navigable channel of the same name connecting it with San Joaquin River, 3 m. therefrom, and 100 m. from San Francisco. It was laid out in 1849. Being at the head of navigation and a convenient point of departure for the gold-mining regions of Calaveras, Tuolumne, and Mariposa cos., it soon became a place of considerable business importance. After the decline of the



mining interest came the development of the agricultural resources of the great San Joaquin Valley, for which S., on account of its location, became the natural business-center, a distributing-point for farmers' supplies, and is now the most important interior wheat-market in Cal. S. has several large warehouses for the storage of grain, with an aggregate capacity for 3,000,000 bushels. Sailing vessels of 150 tons and steamers of 500 tons burden reach her wharves at all seasons of the yr., while the main line of Central Pacific R. R. passes through the city, affording means of speedy communication with San Francisco, and ample facilities for the shipment of the immense crops of grain and other agricultural products of the surrounding country. The Cal. insane asylum is located within the city limits, occupying a handsome site of 100 acres. The business portion of the city is principally constructed of brick, and has many fine buildings. Pop. 1870, 10,066; 1880, 10,282.

**Stockton** (JOHN P.), son of Com. Robert F. Stockton, b. at Princeton, N. J., Aug. 2, 1826, grad. at Princeton Coll. 1843; licensed to practice law 1846; com. to revise the laws of N. J.; reporter to the court of chancery; minister resident at Rome 1868-61; U. S. Senator as a Dem. in 1865 for the term ending in 1871; unseated for alleged informality in the election; Senator 1869-75; returned to the practice of his profession.

**Stockton** (RICHARD), b. at Princeton, N. J., Oct. 1, 1730, grad. at Princeton Coll. in 1748; was admitted to the bar in 1754; became member of the executive council in 1768, and judge of the supreme court of the prov. of N. J. in 1774. In 1776 he was chosen a delegate to the Continental Cong., and was one of the signers of the Dec. of Ind. In Sept. 1776 he was captured by royalists, who threw him into prison in New York; he was finally exchanged. D. Feb. 28, 1781.

**Stockton** (RICHARD), LL.D., son of the preceding, b. at Princeton Apr. 17, 1764, grad. at Nassau Hall in 1779; studied law, and was admitted to the bar in 1784. He was a Presidential elector in 1792 and 1801, U. S. Senator 1796-99, and Rep. in Cong. 1813-15. D. Mar. 7, 1828.

**Stockton** (ROBERT FIELD), son of Richard (1764-1828), b. at Princeton, N. J., in 1766, studied at N. J. Coll., but left in his 15th yr. to enter the navy as a midn. Sept. 1, 1811; became a lieut. 1814; captured an Algerine corsair with a boat's crew 1815; negotiated in 1821 the purchase from Afr. native chiefs of the terr. now constituting the republic of Liberia; captured many slavers and a Port. privateer on the coast of Afr.; took part in the extermination of piracy in the W. I.; surveyed the Atlantic coast of the S. States 1823-24; became commander 1830 and post-capt. Dec. 8, 1838; was flag-officer of the Ohio in the Mediterranean 1838-39; was an early advocate of a steam navy; superintended the construction of the sloop Princeton, the first successful war-steamship, 1842; was seriously injured by the explosion of one of her guns Feb. 28, 1844; was the bearer to Texas of the resolution of annexation 1845; proceeded to the Pacific as com. of the U. S. Squadron on the coast of Cal. Oct. 1845; took possession of Cal. for the U. S. govt. and formed a provisional govt. 1846; was elected U. S. Senator 1851; resigned his seat in the Senate 1853; was nominated in 1856 for the Presidency by the "American party," but the ticket was withdrawn before the day of election. D. Oct. 7, 1866.

**Stockton** (THOMAS HEWINGS), D. D., b. at Mount Holly, N. J., June 4, 1808, became a Meth. preacher, and in 1830 was stationed at Baltimore; was chaplain of the U. S. House of Reps. 1833-37, again 1859-61, and of the Senate in 1862. While in Baltimore he compiled a hymn-book and edited the *Methodist Protestant*. In 1850-56 he was associate pastor of St. John's ch., Baltimore, and temporary pastor of a Presb. ch., and in 1860-68 of the ch. of the New Testament. Wrote *Floating Flowers*, *The Bible Alliance*, *Stand up for Jesus*, etc. D. Oct. 9, 1868.

**Stoddard** (AMOS), b. at Woodbury, Conn., Oct. 26, 1762, was a soldier in the war of independence 1779-82; became clerk of the supreme court of Mass.; was a lawyer at Hallowell, Me., 1792-98; appointed capt. of artil. June 1, 1798; gov. and civil commander of Mo. Terr. 1804-05; became major June 30, 1807, and deputy quartermaster July 12, 1812; was dangerously wounded by a shell at the siege of Ft. Meigs, O., and d. of tetanus May 11, 1813. Wrote *The Political Crisis and Sketches, Historical and Descriptive, of La.*

**Stoddard** (DAVID TAPPAN), b. at Northampton, Mass., in 1819, grad. at Yale 1838; went as a missionary to the Nestorians of Per. 1843, and d. at Oromiah, Per., Jan. 22, 1857. Wrote *A Gram. of the Modern Syriac Lang.*

**Stoddard** (RICHARD HENRY), b. at Hingham, Mass., in July 1825, became a mechanic in an iron-foundry in New York; contributed poems to various periodicals, and in 1849 privately printed *Footprints*, a small vol. of poems, which was followed in 1852 by a larger vol. of poems. In 1852 he received an appointment in the New York custom-house, which he retained till 1870, still pursuing his literary labors. Pub. *Adventures in Fairy Land*, *Songs of Summer*, *Town and Country*, etc.

**Stoddard** (SOLOMON), b. at Boston, Mass., Oct. 4, 1643, grad. at Harvard 1662; became fellow and librarian of Harvard 1667-72; spent 2 yrs. in Barbadoes for his health, acting as chaplain to Gov. Serle and preaching to the dissenters, and was ordained Sept. 11, 1672, pastor of the ch. at Northampton, where he remained until his death, Feb. 11, 1729. Pub. *The Trial of Assurance*, *The Doctrine of Instituted Ch.*, *An Appeal to the Learned*, etc.—His son, Col. JOHN, b. at Northampton in 1681, grad. at Harvard 1701, took part as capt. in an expedition against Canada; was for many yrs. member of the council of Mass., chief-judge of common pleas, and col. of militia. D. June 19, 1748.

**Stoddard** (SOLOMON), b. in 1800, grad. at Yale 1820, became prof. of langs. at Middlebury Coll., Vt., and co-author with E. A. Andrews, LL.D., of a *Gram. of the Latin Lang.* D. in 1847.

**Stoddard** (SIR JOHN), LL.D., b. at Westminster, Eng., in 1773, grad. at Christ Ch., Ox., 1794; studied theol. and law;

was admitted to the bar 1801; was king's advocate and admiralty advocate at Malta 1803-07; began writing for the *London Times* 1810; was political editor of that paper 1812-16; started the *New Times* (1817-28) in opposition to it; was a voluminous political, historical, and philological writer; was knighted 1826, and held the office of chief-justice and judge of the vice-admiralty court at Malta 1826-39. Wrote *Universal Gram.*, or *The Pure Science of Lang.*; *Glossology*, or *The Historical Relations of Langs.*, and *An Introduction to Universal Hist.* D. Feb. 16, 1856.

**Stoeve** (MARTIN LUTHER), Ph. D., LL.D., b. at Germantown, Pa., Feb. 17, 1820, grad. at Pa. Coll., Gettysburg, 1838; was tutor in Pa. Coll. 1839-40, afterward prin. of its preparatory dept. and prof. of Lat., hist., and political economy until his death, July 22, 1870. He was for many yrs. sec. of the General Synod of the Lutheran Ch. and ed. of the *Evangelical Quarterly Review*; edited the *Literary Record* (1847-48); wrote the *Brief Sketch of the Lutheran Ch. in the U. S.*

**Stoics** [Gr. *Στωϊκοί*], an anc. philosophic sect, deriving its name from the *στωά* (*Stoa*, "Painted Porch"), in which its founder, Zeno of Citium in Cyprus (flourished about 350-258), kept his school. This school he founded about a. c. 310. Stoicism was an offshoot from Cynicism, of which it dropped some of the most objectionable elements, and became a civilized philosophy. It was divided by its adherents into 3 parts—logic, ethics, physics.

(A) Under *logic* the S. included dialectic and rhetoric, the former of which was in reality a theory of cognition. They attached great importance to what they called a criterion of truth, although they were never able to fix upon any that would satisfy them as absolute. Their theory of sense-perception was essentially the same as that of Locke, the sentient soul being considered as a *tabula rasa*, impressed or otherwise affected by external objects. Perception was followed by memory and conception. Under *dialectic* they included gram., in the development of which they did some very good work.

(B) Under *physics* the S. included theol. They replaced Aristotle's quaternity of cause by a duality—viz. force and matter, inseparable. Everything, even God, contains both. At the base of all lies necessity or providence. With periodical conflagration, individual immortality was of course incompatible. The individual, a mere temporary emanation, returns at last to his source.

(C) In their *ethics* the S. maintained that the end of life was virtue for virtue's sake. What virtue was they found it difficult to define, their "living agreeably to nature" being very vague. Man exists for society, for only in that is virtue possible. Virtue is sufficient for happiness; and pleasure, which naturally accompanies activity, is not to be sought for its own sake. The cardinal virtues are practical wisdom, courage, self-restraint, and justice, and it requires the possession of them all to constitute the truly wise man. The S. drew a broad distinction between acts and motives, and made the moral quality of acts depend entirely upon motives. [From orig. art. in *J.'s Univ. Cyc.*, by THOMAS DAVIDSON.]

**Stokes** (GEORGE GABRIEL), D. C. L., F. R. S., b. in Ire. in 1819, ed. at Bristol Coll.; grad. 1841 as senior wrangler at Pembroke Coll., Cambridge, where he was elected to a fellowship; has been since 1849 Lucasian prof. of math. in that univ.; was elected to the Royal Society, and made in 1851 the brilliant discovery of the change in the refrangibility of light (since known as "fluorescence"); pub. the experiments and inductions on which his discovery was based in the *Philosophical Transactions* (1852); made a series of careful experiments at the Kew observatory, for determining the index of refraction in different gases; made by experiment the rediscovery of the fact that the luminiferous ether is, in relation to the transmission of light, an elastic solid, although, of course, a fluid in relation to the motions of the heavenly bodies.

**Stokes** (JOHN), C. B., b. at Cobham, Kent, co., Eng., June 17, 1825, ed. at the Royal Military Acad., Woolwich, and commissioned second lieut. royal engineers Dec. 20, 1843, first lieut. 1846, capt. 1854, lieut.-col. 1867; served in the Kafir wars of 1846-47 and 1850-51 (medal); instructor in surveying and field-works at Royal Military Acad., Woolwich, 1852-55; appointed in 1855 chief engineer to the Tur. contingent engineers, with which he constructed the lines round Kertch in the Crimea during the winter of 1855-56, and Lord Panmure's com. for breaking up the Tur. contingent May-July 1856; Brit. com. for improving the navigation of the mouths of the Danube and carrying out the terms of the Treaty of Paris of Mar. 30, 1856, Aug. 1856-Dec. 1871; Brit. delegate to the international conference held at Constantinople (1873) for the purpose of agreeing to an international system of measuring the tonnage of ships, and for the settlement of the Suez Canal dues; commanding royal engineer at Chatham since Jan. 1875, where (Nov. 1, 1875) he was appointed, also, commandant of the school of military engineering.

**Stokes** (WHITLEY), b. in Dublin, Ire., about 1830, ed. at Dublin Univ.; became a distinguished barrister in Lond.; was for some yrs. sec. to the Philological Society, assistant sec. to the govt. of India, home dept., and legal adviser to the vice-regal govt. of India at Calcutta, and is a high authority upon Celtic and Oriental philology, Irish hist., and the hist. of the growth of legal and social insts. Wrote *Irish Glosses*, *The Play of the Sacrament*, a *Middle Eng. Drama*, *Old Irish Glossaries*, etc.

**Stolberg, von** (CHRISTIAN), COUNT, b. at Hamburg Oct. 15, 1748, studied (1769-74) at Göttingen, where he was one of the prin. members of the so called *Dichterbund*; held an office in Holstein under the Dan. govt. 1777-80, and lived afterward on his estate, Windeby, near Eckenförde, in Schleswig, where he d. Jan. 18, 1821. He wrote love-poems, patriotic songs, dramas with choirs in Gr. style, and translated Sophocles.—His younger brother, FRIEDRICH LEOPOLD, count von Stolberg, b. at Bramstedt in Holstein Nov. 7,



1750, studied also at Göttingen, held different court offices, and retired in 1800 from public life. D. Dec. 5, 1819. Wrote *Geschichte der Religion Jesu Christi*, odes, dramas, etc.

**Stomach, Diseases of.** See CANCER, INDIGESTION, and HEMATEMESIS.

**Stomach-Pump,** a form of the syringe which has a flexible tube, designed to be passed down the esophagus into the stomach, after which water is injected through it into the stomach and then withdrawn by reversing the action of the syringe. The operation may be repeated until the stomach is thoroughly washed clear of its contents.

**Stone.** See GALL STONES, URINARY CALCULUS, and LITHOTOMY.

**Stone,** in G. Brit., is a weight of 14 lbs. avoirdupois, but 24 lbs. of wool and 8 of butcher's meat make a stone. In other European countries there are weights called stone differing in lbs. avoirdupois.

**Stone** (CHARLES P.), b. at Greenfield, Mass., in 1826, grad. at the U. S. Military Acad. 1845. In the war with Mex. he served from Vera Cruz to the capture of the City of Mex., gaining the brevets of first lieutenant and captain; ordered to Cal. in 1851, he constructed the Benicia arsenal. In Nov. 1856 he resigned and engaged in the banking business for a yr. in San Francisco, when (1857) appointed by the Mex. govt. chief of a commission to survey and explore its lands in Sonora and Lower Cal.; was appointed Jan. 1, 1861, to organize and drill the D. C. militia for defence of the capital; served under Gen. Patterson in the Shenandoah in July, receiving in Aug. 1861 an independent command of a "corps of observation" guarding the upper Potomac. In Feb. 1862 he was placed in confinement in Ft. Lafayette, New York harbor, and held until Aug. 9, when released. In May 1863 he was ordered to duty in the dept. of the Gulf, participating in the siege and capture of Port Hudson. Gen. Banks soon after selected him as his chief of staff, which position he held until Apr. 1864, being engaged in the battles of Sabine Cross-roads and Pleasant Hill, Apr. 8 and 9. In Aug. 1864 he was assigned to command of a brigade in the Army of the Potomac, but on Sept. 13, 1864, he resigned his commission in the regular army. In military service of the khedive of Egypt 1870-83. Engineer for pedestal of Bartholdi statue, N. Y., 1884-85.

**Stone** (JAMES KENT), D. D., b. in Boston, Mass., in 1840, grad. at Harvard 1861; studied in It. and at the Univ. of Göttingen 1861-63; served in the Union army; became prof. of Lat. in Kenyon Coll., Gambier, O., 1863, of math. and soon afterward pres. 1867; pres. of Hobart Coll., Geneva, N. Y., 1868; became a R. Cath. 1869.

**Stone** (JOHN HASKINS), b. in Md., entered the army as captain; rose to be col. in 1776; distinguished himself at the battles of L. L. White Plains, Princeton, and Germantown. In 1781 became clerk in the office of Robert R. Livingston, sec. of foreign affairs; was subsequently a member of the executive council of Md., and gov. of the State 1794-97. D. Oct. 5, 1804.

**Stone** (JOHN SEELY), D. D., b. at W. Stockbridge, Mass., in 1795, grad. at Union Coll. in 1823; studied at the General Theological Sem., N. Y., and took orders in the Epis. Ch. 1826; was rector of chs. at Litchfield, Conn., Frederick, Md., New Haven, Conn., Brooklyn, N. Y., Brookline, Mass., and of St. Paul's, Boston; became lecturer in the Phila. Divinity School, and in 1867 was chosen dean of the faculty of the Mass. Theological Sem., to reside at Cambridge. Wrote *Life of Ep. Griswold*, *The Mysteries Opened*, *The Ch. Universal*, etc. D. Jan. 12, 1882.

**Stone** (LUCY), b. at W. Brookfield, Mass., in 1818, grad. at Oberlin Coll., and became an agent and lecturer for the Amer. Anti-Slavery Society, and was also an early advocate of the cause of woman's rights. In 1835 she was married to Mr. Henry B. Blackwell, still, however, retaining her own name. In 1867 she canvassed the State of Kan., and established the *Woman's Journal* in Boston 1870.

**Stone** (SAMUEL), b. at Hartford, Eng., about 1600, studied at Emanuel Coll., Cambridge, 1625-27; took orders in the Ch. of Eng.; attached himself to the Puritan section of that Ch.; embarked for N. Eng. on the Griffin with 200 emigrants, headed by Hooker, Cotton, and Haynes, 1633; became colleague pastor with Hooker at Newtown (now Cambridge) 1633, and removed with the ch. to the banks of the Conn. River 1636, at which time the present city of Hartford was founded and named in honor of S.'s native place. After the death of Hooker, in 1647, he succeeded to the pastorate. D. July 20, 1663.

**Stone** (THOMAS), b. at Pointon Manor, Charles co., Md., in 1743, studied law at Annapolis, and in 1764 commenced practice at Fredericktown, whence in 1771 he removed to Charles co. He was a member of the Continental Cong. 1775-79, and was one of the signers of the Dec. of Ind.; was again elected to Cong. in 1783, and was a member of committee to draft a plan of confederation. D. Oct. 5, 1787.

**Stone** (THOMAS TREADWELL), D. D., b. at Watford, Me., Feb. 9, 1801, grad. at Bowdoin Coll. 1820; studied theol.; was pastor of the Congl. ch. at Andover, Me., 1824-30, prin. of Bridgeton (Me.) Acad. 1830-32, pastor of the Congl. ch. at E. Machias 1832-46, of the First ch. (Unit.) at Salem, Mass., 1846-52, of the First Congl. ch. at Bolton, Mass., 1852-60, and of the First ecclesiastical society at Brooklyn, Conn., 1863-71. Wrote *Sermons on War*, *Sketches of Oxford Co.*, *The Rod and the Staff*, etc.

**Stone** (WILLIAM MURRAY), D. D., b. in Somerset co., Md., in 1789, was ed. at Washington Coll., Md.; took deacons' orders in the Epis. Ch. in 1802; was for many yrs. pastor of his native parish, and in 1830 was consecrated bp. of Md. D. Feb. 26, 1838.

**Stone, Artificial.** Several kinds of A. S. have come into use within the last 25 yrs. for architectural and artistic purposes, and for the pavements of cellars, footpaths, areas, and other localities not subjected to the tread of heavy animals. Some of them possess very considerable merit.

*Hydraulic concrete or béton* is a species of A. S. admirably

adapted to a variety of most important uses. For foundations in damp and yielding soils and for subterranean and submarine masonry it is superior to brick masonry in strength, hardness, durability, and economy.

*Béton-Colignet* is an A. S. of superior quality which was introduced by M. François Colignet of Paris. Its usual ingredients are Portland cement, silicious hydraulic lime, and clean silicious sand, mixed together with a little fresh water. It is deemed essential that only materials of the first excellence of their kind, whether common or hydraulic lime, and Portland cement, should be used for the matrix; that the quantity of water should not exceed what is just sufficient to convert the cement and lime into a stiff viscous paste; and that the sand be incorporated with the matrix by a thorough and prolonged mixing or trituration, producing an incoherent mixture in which every grain of sand is completely coated over with a thin film of the paste, leaving only a very little, if any, of the paste in excess to compensate for imperfect manipulation. A handful of this mixture, when pressed together between the fingers and the palm of the hand, will retain its form without being at all plastic, and if dropped upon the floor will fly apart, resuming its state of incoherency. The mixing of the ingredients having been accomplished in such manner that each and every grain of sand is coated all over with a thin film of the matrix, the material is compacted by ramming in successive layers in a mould of the form and dimension required for the stone. The mould should be capable of sustaining a heavy pressure from within, and of being taken apart and removed from the stone. If the mould be for a detached building-block, and not for monolithic masonry, a quantity of the mixed material is thrown in and roughly spread out with a shovel to the thickness of 1½ to 2 inches. It is then thoroughly compacted by the repeated and systematic blows of an iron-shod rammer until the layer is reduced to about ½ its original thickness. Its surface is then scratched or roughened up with an iron rake, in order to secure a perfect bond with the succeeding layer, and then more of the material is added and compacted in the same manner. This process is continued until the mould is full. The upper surface is then struck with a straight-edge and smoothed off with a trowel, after which the full mould may be at once turned over on a bed of sand and the bottom, side, and end pieces removed. The block is then finished. The construction of monolithic masonry is conducted in essentially the same manner as when common concrete is used. When a pug-mill cannot be procured for mixing the materials, tolerably good results can be obtained by the use of a cubical box of planks rigidly attached to a horizontal axis passing through diagonally opposite corners. The box is provided with a trap-door for charging and emptying. The ingredients—the cement, sand, and water—are first roughly mixed together on a platform, and then passed into the box with shovels or wheelbarrows. *Béton-Colignet* was used for the fluted columns and other interior finish of the R. Cath. cathedral in Fifth avenue, New York, and for a handsome carriage-way bridge spanning a footpath in Prospect Park, Brooklyn. It has been extensively used in the cities of New York and Brooklyn, and to some extent elsewhere in the U. S., for sills, lintels, steps, and platforms, and for facing the exterior walls of houses.

*Ramsome's Patent Silicious Concrete Stone.*—The process of making this stone consists in forming in the interstices of sand, gravel, or any pulverized stone a hard and insoluble cementing substance or matrix by the mutual decomposition of 2 chemical compounds in solution. The compounds employed are silicate of soda and chloride of calcium. These, when mixed together, form almost instantaneously, by double decomposition, silicate of lime and chloride of sodium (common salt), and the value of the artificial stone thus produced depends on the strength, hardness, and durability of the silicate of lime which binds the particles of sand together. The raw materials employed are principally sand, gravel, flints, chalk, limestone, caustic soda, chloride of calcium, and water. The silicate of soda is made by boiling and dissolving flints in a strong solution of caustic soda, under pressure. To every bushel of sand about 1 gal. of the prepared silicate of soda is added, and the mass is then thoroughly mixed together in a mill until it attains a putty-like, semi-plastic condition. The prepared material is then compressed into moulds of wood or metal. When the material is once compacted in moulds, it may be taken out immediately. The moulded blocks are then at once drenched with a solution of cold chloride of calcium, which acts rapidly upon the silicate of soda, producing insoluble silicate of lime, whereby the mass is hardened and solidified to such degree that it can be removed and handled without danger of breaking during the remaining steps of the process. The blocks are then conveyed into a tank or cistern containing a solution of chloride of calcium of a specific gravity of about 1½, heated to a temperature of 212° F. In this bath the chemical action is completed, resulting in the formation of silicate of lime through the mass, and the production of a homogeneous A. S. After this the blocks are removed from the cistern and thoroughly drenched with cold water. By this the chloride of sodium formed during the operation is washed out. The work is then finished.

*The Sorel Artificial Stone* is formed by adding a solution of the chloride of magnesium, of the proper strength and in the proper proportions, to the oxide of magnesium obtained by proper calcining carbonate of magnesia, or *magnesite*. There are several steps in the process, which may be briefly stated as follows: *First.* The magnesite is burned in ordinary lime-kilns at a dark cherry-red heat for about 24 hours, producing protoxide of magnesium. This is then reduced to a fine powder between horizontal millstones. *Second.* For making stone the burned and ground magnesite is mixed dry in the proper proportion with the material to be imitated and bound together, of which the stone to be imitated or



reproduced is composed. *Third.* After the mixing they are moistened with chloride of magnesium, for which bittern-water (the refuse of sea-side salt-works) has been found to be a cheap and suitable substitute. The moistened material is then passed through a mill, which subjects it to a kind of trituration by which each grain of sand or other solid material becomes entirely coated over with a thin film of the cement formed by a combination of the chloride with the oxide of magnesium. *Fourth.* The mixture is formed into blocks of the required shape and size by ramming or tamping it in strong moulds made of iron, wood, or plaster, in the manner already described for *béton-Coignet*. The block may be taken out of the mould at once, and nothing further need be done to it.

The *Frear Artificial Stone* consists of a mixture of silicious sand and hydraulic cement, to which gum-shellac is added in order to increase its strength and hardness. The cement is first thoroughly incorporated with the sand in the proportion of about 1 measure of cement to  $2\frac{1}{2}$  measures of sand, and the mixture is then moistened with a solution obtained by dissolving 1 lb. of gum-shellac in from 2 to 4 ounces of concentrated alkali in aqueous solution. This is diluted with water to such degree that about 1 ounce of the shellac is distributed through the cement and sand used in making one cubic foot of the stone. The dampened mixture, after thorough incorporation, may be compacted in moulds by the method already described for *béton-Coignet*.

*Portland Stone* is the name given to a mixture of Portland cement and sand, or sand and gravel, compacted into form by tamping or otherwise. When properly made, it possesses the essential requisites of strength and hardness proportionate to the value of the cement employed.

The strength and hardness of all varieties of A. S. which owe their induration to the hydraulic properties of the cement or lime used in their manufacture vary directly with the ultimate strength and hardness attainable by the hydraulic ingredients of the stone. An obvious means of improving their quality, therefore, is the employment of the highest grades of cement and hydraulic lime. [From *orig. art. in J. S. Univ. Cyc.*, by GEN. Q. A. GILLMORE.]

**Stone-borer**, a name applied to certain species of bivalve or conchiferous mollusks, which have the faculty of perforating stone. All of them belong to the order *Dimyaria*, and have the mantle behind prolonged into siphons, but otherwise they differ considerably. They have scarcely any one character in common, and it is possible that their excavations into rocks may be effected in different ways. It is, however, tolerably certain that most, at least, effect their labors by mechanical means and by grinding away the rock with the anterior portion of their shells. This is frequently mutilated or file-like.

**Stone** [A.-S. *stān*]. **Building.** The varieties of B.-S. most generally employed are granite, marble, sandstone, and limestone. Trap, serpentine, porphyry, alabaster, and other rarer stones are also used in certain localities. The most important qualities in stone used for construction are (1) cheapness, (2) strength, (3) durability, (4) beauty.

The elements that contribute to the cheapness of a stone are abundance, proximity of quarries to the place of use, facility of transportation, and the ease with which it is quarried and worked.

The durability of a stone is a quality of primary importance in all expensive and permanent structures. The most durable of all B.-S. are granite and the stronger and more silicious sandstones.

The strength of a stone is in some instances a cardinal quality, as when it is to form piers or columns that are to support great weights, or capstones that span considerable intervals. This is also an indispensable attribute of stone that is to be exposed to mechanical violence or unusual wear, as in steps, lintels, door-jambs, etc. The strength of a B.-S. is generally tested by applying measured force to cubes of it until they are crushed. The strongest of all B.-S. now in use in this country are the traprocks of N. J., which sustain a pressure of from 20,000 to 24,000 lbs. to the cubic inch. With these should be placed the so called granite of Staten Island.

*Trap*, although exceedingly durable, is little used for architectural purposes from the great difficulty with which it is quarried and wrought. It is, however, sometimes used with excellent effect in cyclopean architecture.

*Granite* is the strongest and most durable of all the stones in common use. It generally breaks with regularity, and may be quarried in simple shapes with facility; but it is extremely hard and tough, and therefore can only be wrought into elaborate forms with a great expenditure of labor. For this reason the use of granite is somewhat limited. Its strength and durability commend it, however, for foundations, docks, piers, etc., and for massive buildings; for these purposes it is in use the world over. Excellent granites are found in N. Eng., throughout the Alleghany belt, in the Rocky Mts., and in the Sierra Nevada.

*Marble* is the most beautiful of all building materials. It was highly esteemed by the Grs., and all their masterpieces of arch., as well as sculpture, were wrought from it. In modern times it has retained something of its anc. repute, and is still the favorite material for the construction of the finest buildings. Inexhaustible supplies of the coarser marbles are known to exist in Westchester co., N. Y., and at various points farther S. in the Alleghany belt. Of the finer marbles every desirable variety may be found in Rutland co., Vt.

*Limestone* presents the greatest diversity of qualities as a building material. Sometimes it is jet black, compact, and capable of receiving a high polish; sometimes gray, of a delicate dove or cream-color, or very light-colored and soft. All the different kinds have their excellences and defects as building materials. The limestones most esteemed for building purposes in the U. S. are the Dayton stone, quarried at Dayton, O., and largely used in Cin. and other W. cities,

and the Athens marble, found in N. Ill. Both these are derived from the Niagara group, are light-brown or dove-colored, and are very strong and handsome. Excellent B.-S. are also obtained from the Corniferous limestone about Sandusky and Charlot, O., and Louisville, Ky., and from the Carboniferous formation at Bowling Green, Ky., and Ellettsville, Ind.

*Sandstones* vary much in color and fitness for architectural purposes, but they include some of the most beautiful, durable, and highly valued materials used in construction. Whatever their differences, they have this in common, that they are chiefly composed of sand—that is, grains of quartz—to a greater or less degree cemented and consolidated. They also frequently contain other ingredients, as lime, iron, alumina, manganese, etc., by which the color and texture are modified. The value of sandstones as building materials depends on several qualities, such as their color, texture, strength, durability, and facility of working. The color of sandstones is frequently bright and handsome. It is usually caused by iron—when gray, blue, or green, by the protoxide, as carbonate or silicate; when brown, the hydrated; and when red, the anhydrous oxide. The purple sandstones usually derive this shade of color from a small quantity of manganese. The texture of sandstones varies with the coarseness of the sand of which they are composed and the degree to which it is consolidated. The durability of sandstones varies with both their physical and chemical composition. Taken as a whole, they may be regarded as among the most durable of building materials. In the U. S. we have a large number of sandstones which are extensively used for architectural purposes. Among these may be mentioned—(1) The *Dorchester stone*, which comes from the coal-measures of N. B.; a pale, olive-green sandstone. (2) The *brownstone* is derived from the Triassic series, and the most important quarries which furnish it are located at Portland, Conn., Bellevue and Newark, N. J. This stone varies much in quality, but on the whole we regard it as lacking in durability. (3) The *Ohio stone*, derived from the Berea grit, a member of the Lower Carboniferous series in N. Ohio. The prin. quarries are located at Amherst and Berea. (4) The *Waverley sandstone* comes from S. Ohio. This is a fine-grained, homogeneous stone of a light-drab or dove-color, works with facility, and is very handsome and durable. (5) The *Lake Superior sandstone*, a dark, purplish-brown stone of Potsdam age, quarried at Bass Island, Marquette, etc. (6) The *St. Genevieve stone*, a fine-grained sandstone of a delicate drab or straw-color, very homogeneous in tone and texture, is quarried at St. Genevieve, Mo. (7) The coal-measures of Pa., O., and other W. States supply excellent sandstones for building purposes. (8) The *Medina sandstone*, which forms the base of the Upper Silurian series in W. N. Y., furnishes a very strong and durable stone.

*Serpentine* occurs in numerous localities in the Alleghany belt and in the Coast Mts. of Cal. It is generally a soft rock, unfit for architectural purposes. J. S. NEWBERY.

**Stone-Chat**, a European bird of the family of warblers (Sylviidae) and genus *Pratincola*, the *Pratincola rubicola* or *Saxicola rubicola* of authors, about  $5\frac{1}{4}$  inches in length. The male, in the breeding season, has the head, neck above, and back nearly black; the chin and throat black, and the neck on the sides white; breast chestnut in front and lighter backward; the wing-coverts of the tertials white, but partly hid by the other coverts, which are blackish-brown, edged with lighter brown; upper tail-coverts white, and tail-feathers blackish; bill and legs black. The female, as usual, is distinguished by duller colors. The species is common in most parts of Middle Europe and N. Africa.

**Stone-Fly**, a name sometimes given to neuropterous insects of the family *Perlidae*. These have long flattened bodies, whose sides are parallel; the antennae are elongated; the wings are unequal in size, the anterior comparatively small, the posterior broad, triangular, and generally extending beyond the abdomen. The adults mostly inhabit damp lowlands.

**Stone Fruits**, a popular name for those fruits which are known in bot. as drupes. Most of them belong either to *Amygdalæ* or *Chrysobalanæ*. The first group includes plums, prunes, apricots, peaches, nectarines, and cherries.

**Stoneham**, on R. R., Middlesex co., Mass., 9 m. N. of Boston. The manufacture of shoes and leather forms the prin. industry. Pop. tp. 1870, 4513; 1880, 4890.

**Stonehenge** [from the A.-S. for "hanging stones"], an interesting mass of the remains of rude stone structures, usually referred to Druidical times, though the tendency among recent archaeologists is to assign it to some prehistoric race. It stands on Salisbury Plain, 2 m. from Amesbury, Wiltshire, Eng.

**Stone Lilly.** See CRINOIDEA.

**Stoneham (GEORGE)**, b. at Busti, N. Y., Aug. 8, 1822, grad. at the U. S. Military Acad. in 1846; entered the 1st Dragoons; conducted a supply-train to Santa Fé, N. M., where he became acting quartermaster of the Mormon battalion, which he accompanied to Cal. in 1847; became a capt. in 2d Cav. 1855, and served mainly, until 1861, in Texas, and was in command at Ft. Brown when ordered to surrender by order of Gen. Twiggs in Feb., but refused to do so, and evacuating the fort reached New York in a steamer chartered for the purpose; promoted major 1st Cav. May 1861; served on the staff of Gen. McClellan in W. Va. until Aug. 13; appointed brig.-gen. of volunteers and chief of cav. of the Army of the Potomac; succeeded to command of 1st division, 3d corps, and of the 3d corps Nov. 15, 1862; promoted maj.-gen. of volunteers Nov. 20, 1862, and led his corps at the battle of Fredericksburg; commanded cav. raid to Richmond Apr.-May 1863; chief of cav. bureau July 1863-Jan. 1864; in command of 23d corps Jan.-Apr. 1864; of cav. corps dept. of O. Apr.-July 1864, participating in the Atlanta campaign May-July 1864; conducted a raid for the capture of Macon and Andersonville and liberation of prisoners, but



was compelled himself to surrender July 31, and held prisoner until Oct. 27; in temporary command of dept. of O. Nov. 1864; conducted raid to S. W. Va. Dec. 1864; in command of various dists. and depts. until mustered out of volunteer service Sept. 1, 1866. Became col. 21st Inf. July 28, 1866; brevetted col., brigadier and major gen.; retired from active service Aug. 16, 1871; gov. of Cal. 1883.

**Stone River, Battle of.** See MURFREESBORO', BATTLE OF.

**Stones, Standing.** Large, unhewn monoliths raised to an erect position have been found in almost all parts of the world. They are notably numerous in the British Isles, where they sometimes stand singly and sometimes are arranged in groups. It was long supposed that they were in some manner connected with the Druidical worship of the Celtic races, but the results of modern investigation throw much doubt on this theory. Sometimes they were clearly erected as monuments to preserve the memory of some remarkable event. A religious idea is certainly connected with many of them. There are several remarkable groups of standing stones, the arrangement of which evinces a definite purpose, but what that purpose was is as yet wholly a matter of conjecture. The most noted of these groups is that of Stonehenge. (See **STONEHENGE**.)

**Stoneware.** See POTTERY and PORCELAIN.

**Stonington,** seaport of New London co., Conn., on R. R. and L. I. Sound, the terminus of Stonington and Providence steamship line. Sealing-vessels are fitted out every yr. for the S. Shetland Islands, this industry and whaling being the prin. business engaged in. Pop. tp. 1870, 6313; 1880, 7355, including 1755 in v.

**Stony Point,** Rockland co., N. Y., on R. R. and W. bank of Hudson River, at the entrance of the Highlands, opposite Verplanck's Point, takes its name from a small rocky peninsula now crowned with a light-house and fog-bell tower, and connected with the shore by a marsh. The Brit. fortifications here were captured by Gen. Wayne July 16, 1779, and the garrison, 543, taken prisoners.

**Stor'er (BELLAMY), LL.D.,** b. at Portland, Me., about 1798, grad. at Bowdoin Coll. 1818; studied law at Cin.; was M. C. 1835-37; subsequently judge of the superior court, and prof. in the Cin. Law Coll.; at the time of his death was a v.-p. of the Evangelical Alliance. D. June 1, 1875.

**Storer (DAVID HUMPHREYS), M.D.,** b. at Portland, Me., in 1804, grad. at Bowdoin Coll. in 1825; devoted himself especially to nat. hist., and pub. *Genera, Species, etc. of Recent Shells, Ichthyology, etc. of Mass.*

**Storer (FRANCIS HUMPHREYS),** b. in Boston in 1832, grad. at the Lawrence Scientific School in 1855, and is prof. in the Mass. Inst. of Technology; Amer. ed. of *Barreswill's Répertoire de Chimie appliquée*; pub. *Alloys of Copper and Zinc, Manufacture of Paraffine Oils, First Outlines of a Dict. of the Solubilities of Chemical Substances.*

**Storer (HORATIO ROBINSON), M.D.,** b. in Boston in 1830, was prof. of obstetrics and med. jurisprudence in Berkshire Med. Coll.; wrote *Why not? a Book for every Woman; Is it? a Book for every Man; Decrease of the Rate of Increase of the Pop. in Europe and Amer., etc.*

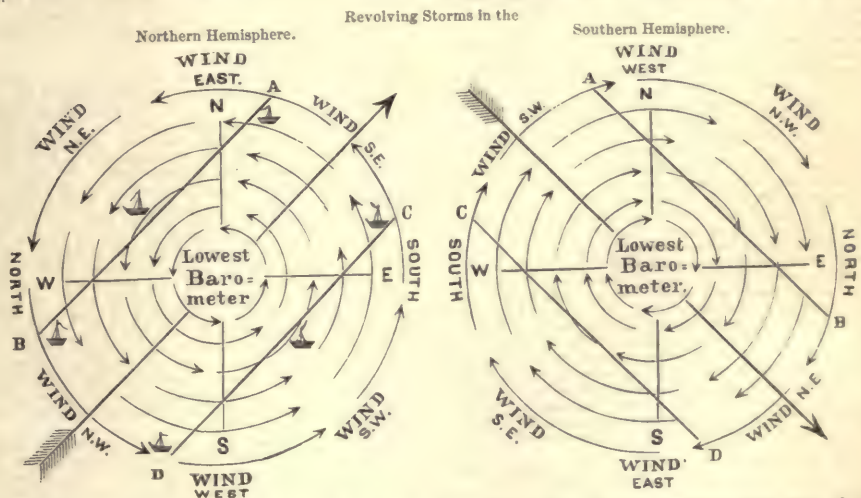
**Stork (A.-S. stork),** a name given to the birds of the genus *Ciconia* and of the family Ciconiidae, but especially to *Ciconia alba*. This is a large bird, about 3½ ft. long; the head, neck and body above, as well as below, are white, the wings partly black, and the bill and legs red. It is a migratory species, which in the warm season extends into N. Europe, and in winter (as well as other seasons) is found in N. Afr. and Asia. It has no cry, but claps its bill together with a loud noise.

**Storks (Sir HENRY KNIGHT),** K. C. B., b. in Eng. Apr. 5, 1811, entered the army in 1828, and served on regimental duty until 1846, when employed on the staff in the Kafir war, 1846-47. In the Crimean war he commanded the Brit. military establishments on the Bosphorus, the Dardanelles, and at Smyrna 1854-55; in the war-office as sec. for military correspondence 1857-59, when promoted to be maj.-gen., and was lord high com. of the Ionian Islands until 1863; appointed gov. of Malta 1864; was summoned to Jamaica the next year to inquire into the Eyre outbreak on that island. In 1868 he became under-sec. of state for war, in 1870 surveyor-gen. of the ordnance, and in 1871 lieut.-gen. and M. P. from Ripon. D. Sept. 6, 1874.

**Storm Lake,** city, on R. R., cap. of Buena Vista co., Ia. Pop. 1870, 256; 1880, 1084.

**Storms, Hurricanes, Cyclones, and Tornadoes.** When currents of air moving in different directions encounter each other, they impart to the atmosphere a whirling and upward motion, as may often be seen when wind carries up the dust off the ground. Such a movement, on a grand scale, is a *storm*, which is usually accompanied by rain or snow when the contending winds are of different temperatures and moisture. Storms vary in their nature according to their immediate causes, some being due to struggling horizontal, some to ascending, currents of air, modified in their course by chains of mts. and inequalities of the surface; some, again, to descending currents or to mere local causes. The most remarkable for violence and the regularity of their course are the *hurricanes* of the W. I. and of Mauritius in the Indian Ocean, the *cyclones* of the Gulf of Bengal, and the *typhoons* of the S. Chinese Sea.

**Law of Storms.**—All the facts collected with great care and industry by Mr. Redfield of New York, Gov. Reid of Bermuda, Piddington of Calcutta, and Prof. Dove of Ger. prove that in these great storms the air has a strong rotary, or rather spiral, motion round a centre where calm prevails and the barometric pressure is least. All around the wind blows in various and opposite directions, while at the same time the body of the storm has a progressive motion, its course being marked by the track of its centre. In the N. hemisphere this rotary motion is from right to left, or contrary to the direction of the hands of a watch. In the S. hemisphere it is reversed. These storms usually begin within the tropics, but extend far into the temperate regions, where they gradually spend their force. In both regions they follow the course of the general winds peculiar to each zone, by which they are, as it were, borne along. The W. I. hurricanes usually originate in the E. Antilles (see Map in WINDS), and first move north-westerly toward the tropics. Beyond the limits of the trades (see diagram at the bottom of Map in WINDS) they suddenly turn around north-eastward, and, carried by the general motion of the atmosphere, sweep over the eastern coast of N. Amer., and after raging in the Atlantic, sometimes cross to W. Europe, where they finally expire. The Mauritius hurricanes start from the S. tropical ocean, move toward the S. W. to Mauritius and Réunion islands, and thence turn at right angles beyond the tropics in the temperate lats. The typhoons, also born in the tropical seas of India and China, move with the monsoons, and their course bends more strongly toward the N. E. when reaching the temperate regions. All these storms cover only a small area at their point of origin, but their violence is extreme. As they advance, their circle gradually enlarges while their fury diminishes. The W. I. hurricanes of 1839 had a diameter of 300 m. in the Antilles, 500 at the Bermudas, and 800 in the 50th degree of lat. They occur most frequently at the time of the breaking up of the seasons and



the change of the general winds—that is, about the equinoxes. Out of 365 hurricanes which have desolated the W. I. from 1493 to 1855, 245, or over  $\frac{2}{3}$ , took place from Aug. to Oct.

The position of the main regions of hurricanes above mentioned, on the S. E. side of the 3 great continents and near the tropics, is very remarkable, and proves that they are the result of the struggle between the general winds, intensified by the influence of the great bodies of land, varying with the season. (See **WHIRLWIND**.)

A knowledge of the law of storms enables the navigator to steer his vessel so as to avoid a direct encounter with

these tempests. He can ascertain what part of a circular storm he is coming into by observing how the wind begins to veer. In the N. hemisphere, within the tropics, if the wind is N. E., its body is moving to the N. W. (See figure). The commander must therefore sail to the S. W., and leave the storm behind him. Within the temperate regions, the body of the storm moving toward the N. E. he will steer W. or N. W., and thus get out of the path of the storm. In the S. hemisphere the opposite course must be taken.

**North-easters.**—Our great winter and north-easterly storms



are mostly but the left, or W. half, of such a revolving mass of air. Suppose the storm strikes a place first at the point A (fig.), the wind will be N. E. The storm passing over it along the line A B, the wind will successively blow from the N. N. E., N. N. W., and finally N. W., clear and cold; after which the storm is over. If the storm begins with a S. E. wind, as at point C, we are in the right-hand half, and while it is passing along the line C D the wind gradually veers to the S. S. W., W., and N. W.; which is always the end. It is thus easy to understand why it is that the wind, though coming from the N. E. blows at Wash. and Phila., as Franklin first remarked, before it is felt in New York and Boston.

The *norther*s are violent, cold, dry polar winds descending from the top of the atmosphere, and sweeping, mostly during the winter, over Tex. and La., and sometimes reaching Mex. and the Antilles. The *sirocco* of Italy, the *khamsin* of Egypt, the *harmattan* of Guinea, the *simoom* of Arabia, are hot winds from the zone of deserts of Afr. and W. Asia, blowing with great fury, more or less periodically at certain seasons. (See WINDS.)

*Tornadoes* and *water-spouts* repeat on a small scale, but with scarcely less violence, the phenomenon of cyclones. When opposite winds of different temperatures and moisture meet in the upper atmosphere, a vast amount of vapor is condensed into a thick black cloud, and a whirling motion is given to the air, which soon takes the shape of a vast funnel descending lower and lower into the quiet atmosphere beneath as the rapidity of its motion increases. This long revolving column of black cloud draws up in its vortex all the objects in the path of the tornado. On a narrow track, from a few yards to a quarter of a mile wide, trees are uprooted, houses unroofed or carried up into the air by this fearful power of suction. A tornado passing into the sea becomes a *water-spout*. The dark column, descending near the surface, raises the water, which joins in its whirling motion and binds together, as it were, the clouds and the sea. Like the cyclones, the tornadoes usually move with the general south-westerly winds.

**Storrs** (CHARLES BACKUS), brother of Dr. Richard Salter, Sen., b. at Longmeadow, Mass., May 15, 1794, ed. at Princeton and at Andover Sem. 1820; preached at Ravenna, O., from 1822 to Mar. 1828, when he became prof. of Chr. theol. in W. Reserve Coll., and was chosen pres. of that inst. 1831. D. Sept. 15, 1833.

**Storrs** (RICHARD SALTER), D. D., b. at Longmeadow, Mass., Feb. 6, 1787, passed a yr. at Yale Coll. 1802-03; taught in the Clinton Acad., E. Hampton, L. I., 1804-06, after which he entered the senior class at Williams Coll., graduating 1807; studied theol. with Rev. Aaron Woolworth at Bridgehampton, L. I.; was licensed by the Suffolk presbytery 1808; preached at Islip and Smithtown, L. I., 1808-09; spent a yr. at Andover Sem., graduating 1810; was ordained pastor of the First Congl. ch. at Braintree, Mass., July 11, 1811. Editor of the *Boston Recorder* (1817-25), and of the *Congregationalist* (1850-56); pub. a *Memoir of Rev. Samuel Green* and about 30 single sermons. D. Aug. 11, 1873.

**Storrs** (RICHARD SALTER), D. D., LL.D., son of preceding, b. at Braintree, Mass., Aug. 21, 1821, grad. at Amherst in 1839; studied law, and afterward theol. at Andover Sem., where he grad. in 1845, and after serving for a yr. as pastor of a Congl. ch. in Brookline, Mass., became in 1846 pastor of the Ch. of the Pilgrims, Brooklyn, N. Y.; was one of the eds. of *The Independent* 1848-61. Wrote *Report on the Revision of the Eng. Version of the Bible*, *The Graham Lectures on the Wisdom, Power, and Goodness of God, as manifested in the Constitution of the Human Soul*, etc.

**Storrs** (WILLIAM LUCIUS), LL.D., b. at Middletown, Conn., Mar. 25, 1795, grad. at Yale Coll. 1814; studied law at Whitestown, N. Y., where he was admitted the bar 1817; returned soon afterward to Middletown; was a member of the State assembly 1827-29, and its speaker 1834; M. C. 1829-33, and again 1839-40; was appointed associate judge of the State supreme court of errors June 1840, and chief-justice 1856, and was prof. of law in Yale 1846-47. D. June 25, 1861.—His elder brother, HENRY RANDOLPH, b. at Middletown in 1787, grad. at Yale 1804, practised law at Champion, Whites-town, and Utica, N. Y.; was for 5 yrs. first judge of Oneida co.; sat in Cong. 1819-21 and 1823-31; pub. *Congressional Speeches*; removed about 1832 to New York, where he took high rank in his profession. D. July 29, 1837.

**Story** (JOSEPH) LL.D., b. at Marblehead, Mass., Sept. 8, 1779, grad. at Harvard in 1798; studied law, and in 1801 commenced practice at Salem; was a member of the State legislature 1805-08, and the acknowledged leader on the Rep. side. In 1808 he was elected a representative in Cong.; he was in 1810 again chosen a member of the State legislature, of which he was elected speaker. In 1811 he was appointed associate justice of the supreme court of the U. S., and in 1820 was a member of the convention for the revision of the State const. In 1829 he was chosen Dane prof. of law in Harvard Univ. In 1804 he pub. an unsuccessful vol. of poems entitled *The Power of Solitude*, and in 1806 *Memorial of the Inhabitants of Salem*. He also pub. many addresses, literary discourses, and reviews, but his fame rests mainly upon his decisions, and especially upon his legal *Commentaries*. D. Sept. 10, 1845.

**Story** (WILLIAM WETMORE), son of Hon. Joseph Story, LL.D., b. in Salem, Mass., Feb. 19, 1819, studied law; was admitted to the bar, and pub. several legal books—*Report of Cases*, *Treatise on the Law of Contracts*, *The Law of Sale of Personal Property*, etc.; wrote *The Amer. Question*, *Roba di Roma*, *Proportions of the Human Figure*, etc., and has pub. 5 vols. of poems. As a sculptor he is known chiefly by his large allegorical statues, *Medea*, *Cleopatra*, *The Afr. Sibyl*, etc. Mr. S. has resided in Rome for about 30 yrs., and is better known as an artist on the other side of the Atlantic than at home. He was made Chevalier of the Legion of Honor at Paris Exposition 1878.

**Stosch, von** (ALBRECHT), b. Apr. 30, 1818, received his education in the Prus. corps of cadets; entered the 29th

Inf. in 1835 as a lieutenant; was one of the tutors of the crown prince of Prus., and accompanied him on his journey to the opening of the Suez Canal; from 1866 to 1870 he was director of the economy dept. of the ministry of war; during the war of 1870-71 he was supt.-gen. of the commissary dept. of the Ger. army in Fr.; in Dec. 1870 he was appointed chief of staff of the army of the Loire, and chief of staff of the army of occupation left in Fr. after the peace. On Jan. 1, 1872, he was placed in charge of the navy dept. July 26, 1870, he was made a Lieut.-gen., 1872 gen. of inf., and 1875 admiral.

**Stothard** (CHARLES ALFRED), son of the succeeding, b. in Lond. in 1786, early distinguished himself by his skill as an artist, being especially successful in the delineation of anc. costumes. His best known painting, *The Death of Richard II.*, was exhibited in 1810. D. May 27, 1821.—His widow, ANNE ELIZA, afterward the widow of the Rev. Edward Bray, was the author of several creditable novels written during her second marriage.

**Stothard** (THOMAS), R. A., b. in Lond. Aug. 17, 1755, was apprenticed to a designer of patterns for the silk-trade, but soon became an illustrator of books, and finally a painter. He was elected fellow of the Royal Acad. in 1794, and its librarian in 1812. D. Apr. 27, 1834.

**Stoughton**, Mass. See APPENDIX.

**Stoughton**, on R. R., Dane co., Wis. Pop. 1870, 985; 1880, 1353.

**Stoughton** (EDWIN W.), LL.D., b. at Springfield, Windsor co., Vt., May 1, 1818, came to New York in 1837; became in 1839 a contributor to *Hunt's Merchant's Magazine*, and was admitted to practice in the Federal courts and in the superior court of New York in 1840, and in the supreme court in 1841; commenced immediately practising in the city of New York. He was counsel and advocate on the Rep. side before the Electoral Commission, after which Hayes and Wheeler were declared elected. Appointed U. S. minister to Rus. 1877, and resigned in 1879. D. Jan. 7, 1882.

**Stoughton** (ISRAEL), b. in Eng., emigrated to Amer., and was one of the early settlers at Dorchester, Mass.; was member of the general court 1634-37; in 1637 commanded the Mass. troops sent against the Pequod Indians; was com. to administer the govt. of N. H. in 1641; assistant to the govt. of Mass. 1637-42, and again in 1644, when he returned to Eng. He held large landed estates in Mass., and gave 300 acres to Harvard Coll. D. at Lincoln, Eng., in 1645.

**Stoughton** (JOHN), D. D., b. in Eng. Nov. 18, 1807, is an independent minister, and author of *Lectures on Tractarian Theol.*, *Notices of Windsor in the Olden Time*, *Spiritual Heroes, or Sketches of the Puritans*, etc.

**Stoughton** (WILLIAM), son of Israel, b. Sept. 30, 1631, grad. at Harvard in 1650; studied theol.; went to Eng. and became a fellow of New Coll., Ox., but was ejected at the restoration of Charles II., and in 1662 returned to N. Eng. He was an assistant to the govt. from 1671 to the dissolution of the govt. in 1686, and was agent in Eng. for the colony 1676-79; was elected assistant and gov. in 1686, but declined to serve; was a justice of the court and a member of Andros's council 1686-89. In May 1692 he became lieut.-gov. of Mass., and in Dec. chief-justice of superior court, over which he presided in Salem witchcraft trials. D. July 7, 1701.

**Stoughton** (WILLIAM L.), b. in New York Mar. 30, 1827, studied law, and commenced practice at Sturges, Mich., in 1851; was prosecuting atty. 1856-60 and U. S. dist. atty. 1861; early in the c. war joined the army; became col. of the 11th Michigan Volunteers in 1862, distinguishing himself at the battle of Stone River; commanded a brigade at Chickamauga, Missionary Ridge, and Atlanta, where he lost a leg, and was brevetted a maj.-gen. of U. S. volunteers. He was elected atty.-gen. of Mich. 1866; Rep. in Congress in 1868, and re-elected in 1870.

**Stowe**. See APPENDIX.

**Stow** (BARON), D. D., b. at Croydon, N. H., June 16, 1801, grad. at Columbian Coll., D. C., in 1825; edited the *Columbian Star* 1825-27; became pastor of the Bap. ch. at Portsmouth, N. H., in 1827, of the Baldwin Place ch., Boston, in 1832, and of the Rome st. ch. in 1848. He was prominent in the missionary enterprises of the denomination, and pres. of the trustees of Newton Theological Sem. Wrote *Hist. of the Eng. Bap. Mission to India*, etc. D. Dec. 27, 1869.

**Stowe** (CALVIN ELLIS), D. D., b. at Natick, Mass., Apr. 6, 1802, grad. at Bowdoin Coll. in 1824, and in 1828 at Andover Theological Sem.; was assistant prof. of sacred lit. at Andover, and assistant ed. of the *Boston Recorder* 1828-30; prof. of langs. in Dartmouth Coll. 1830-33, of biblical lit. in Lane Sem. 1833-50, and of natural and revealed religion in Bowdoin Coll. 1850-52. In 1852 he became prof. of sacred lit. in Andover Sem., resigning the office in 1864. In 1832 he married Harriet Elizabeth Beecher. In 1836 he was sent by the State of O. to examine the public-school systems of Ger.; upon his return he pub. a report on *Elementary Education in Europe*. He translated from the Ger. Jahn's *Hist. of the Heb. Commonwealth*, commenced an *Introduction to the Criticism and Interpretation of the Bible*, and the *Origin and Hist. of the Books of the Bible*.

**Stowe** (HARRIET ELIZABETH BEECHER), daughter of Lyman Beecher and wife of the preceding, b. at Litchfield, Conn., June 14, 1812, taught for several yrs. at Hartford, and in 1832 was married to Prof. Stowe, then of Lane Sem., Cin., O. In 1849 she pub. *The Mayflower, or Sketches of the Descendants of the Pilgrims*, and in 1851 commenced the *National Era* of Wash. a serial story which was published separately in 1852 under the title *Uncle Tom's Cabin*. In 1843 she put forth a *Key to Uncle Tom's Cabin*. In 1853 she accompanied her husband and her brother to Europe, and upon her return pub. *Sunny Memories of Foreign Lands*. Her subsequent writings are *Nina Gordon*, *The Minister's Wooing*, *Agnes of Sorrento*, *My Wife and I*, etc.

**Stowell** (WILLIAM SCOTT), BARON, b. at Haworth, Durham, Oct. 17, 1745, the son of a merchant of Newcastle, grad. at Ox. in 1764; studied law, and was called to the bar in



**Strauss, strowss** (DAVID FRIEDRICH), b. in Ludwigsburg, Württemberg, Jan. 27, 1808. At a school in Blaubeuren and at the Univ. of Tübingen he pursued his classical and theological course; Baur was one of his teachers in both places. In philos. he was attracted by Schelling, Jacobi, and Jacob Böhm, following also the revelations in the sphere of animal magnetism. In the latter part of his course he was strongly influenced first by Schleiermacher, but chiefly by Hegel. Schleiermacher's lectures on the life of Jesus, which S. heard in Berlin in 1831, and Hegel's logic, were the preludes to the *Leben Jesu* of S., which, pub. in 1835, made an epoch in the hist. of Ger. theol. S. lays down in the preface the general principle that nothing which is supernatural can be historical. He resolves all the supernatural elements of the gospel story into myths; his hypothesis is known as the "mythical theory"—that is, the transforming of popular religious beliefs into facts supposed to have been realized in the life of Christ. The work had the merit of bringing together all the scattered objections to the life of Christ, and shaping them into a theory. In his concluding essay he applies the Hegelian logic to the life of Christ as historical, he yet admits that there are certain essential ideas at their basis. Historical Christianity is true, not as history, but as idea. The Hegelian philos. is to be substituted for Christianity. He lost his theological position at Tübingen, and became a teacher in Ludwigsburg and Stuttgart. He was called to be prof. of dogmatics and ch. hist. in Zurich in 1839, but was deprived of his chair by a popular insurrection, though retaining for life half his salary. In 1859 he pub. a vol. of *Charakteristiken und Kritiken*. In 1840-41 he attempted to do for theol. what he supposed he had accomplished for the life of Christ. Under the title *Die christliche Glaubenslehre*



in ihrer geschichtlichen Entwicklung, etc., he tried to resolve the whole of theol. into philos. He 1847 he pub. a pamphlet, *Der Romantiker auf dem Throne der Cäsaren*, an ingenious parallel between Julian the Apostate and King Frederick William IV. of Prus. In the revolutionary period of 1848 he was chosen to represent his native town in the diet of Württemberg, where he denounced democracy, and in his very latest work he takes special pains to disparage republican insts. His political views are contained in *Sechs Theologisch-politische Volksreden* (1848). In 1849 he pub. *Schubart's Leben in seinen Briefen*; in 1857 he produced a more important work, the *Life of Ulrich von Hutten*. In 1864 he returned to theol. in the attempt at writing another life of Christ, under the title *Das Leben Jesu für das deutsche Volk bearbeitet*. His object in the second work is, in general, to show what remains of Christ for the people after Ger. criticism has had its full course. And he still grants that "Christianity is a moral and spiritual power in the earth;" that "we cannot do without it, nor can it be lost;" that Jesus "stands foremost among those who have given a higher ideal to humanity." His last work, *The Old Faith and the New, a Confession*, appeared in Oct. 1872. It undertakes to answer four questions—viz. (1) "Are we still Christians?" (2) "Have we still a religion?" (3) "What is our conception of the universe?" (4) "What is our rule of life?" On the first of these questions the answer is, "We must acknowledge that we are no longer Christians." His reply to the second question is that we can only believe in an absolute dependence upon the universe; an absolute being cannot be conscious or personal. To the third question he says that the only idea of the universe we can frame is that of a development from a blind force or law, without any foreseen end. In answer to his fourth inquiry, "What is our rule of life?" he can only say that we must live for this world and for the human race—for the good we can find here, for science, and for art. D. Feb. 9, 1874. [From orig. art. in *J's Univ. Cyc.*, by PROF. H. B. SMITH, D. D., LL.D.]

**STRAUSS** (JOHANN), b. at Vienna Mar. 14, 1804, entered the orchestra of Lanner; began to compose dancing music, and became soon a favorite among the Viennese, whom he intoxicated with his melodies, his rhythms, and his instrumentation. In 1824 he formed an orchestra of his own, with which he made a concert-tour through Europe 1833-37, and d. at Vienna Sept. 24, 1849.—His three sons, JOHANN, JOSEPH, and EDWARD, have acquired celebrity as composers of dancing music.

**Strawberry** [*A.-S. streaw-berige*], a well-known plant of the genus *Fragaria* and of the family Rosaceae, found wild throughout most of the N. temperate zone, but more commonly in a cultivated state, is a stemless perennial herb, throwing out runners to form new plants, bearing on long stalks, with compound leaves made up of 3 obovate, wedge-shaped, deeply serrated leaflets. The calyx is 10-cleft, with 5 petals, many stamens, and simple pistils seated upon a convex receptacle, which at the ripening of the ovaries becomes the edible berry, incorrectly regarded as the fruit, the real fruit, in the botanical sense, being the small seed, like *achenia* or ripened ovaries scattered over the surface of the berry. The species are very numerous. The best-known are the Alpine (*F. vesca*) and the Virginian (*F. virginiana*), or common wild S. of the U. S., supposed to be indigenous to America. Among the delicious varieties largely grown for the markets of the Atlantic cities of the U. S. are "Hovey's Seedling," "Wilson's Albany," "Agri-culturist," and "Monarch of the West." They are planted in rows 2 ft. apart, require careful cutting and a highly fertilized soil, are often grown in hot-houses, and require in winter a covering of straw, whence the name.

**Straw** [*A.-S.*], **Manufacture of**. The braiding or plaiting of slender vegetable stalks, leaves, and filaments, so as to form tissues, is one of the primitive arts. In its simplest stages it is purely manual, requiring the use of no artificial implement. It is therefore suited to tribes in the earliest phases of social life, and it is accordingly found among the rudest tribes, as well as among those more advanced in civilization and art.

The manufacture of this sort which has the greatest economical importance is from the S. or stem of the cereals, especially wheat and rye, which is employed either in its natural form—i. e. whole—or split into slips according to the size of the S. and the particular tissue designed, a single S. sometimes being divided into as many as 15 slips. Wheat S. is preferred, but rye S. has longer stems and can be braided into more delicate and even tissues. It is, however, less durable, and does not wash so well as wheat. Tuscanry was from almost the sole seat of this industry, and the Leghorn hats, as they are called, are still preferred in most foreign markets. The first fine Tuscan hats sent to Eng. were simply such as were worn by the *contadine* or female peasants, and still are in common use. These are very broad-brimmed, plain hats, finely braided, but of flexible texture. They sold—and the best, called *fioretti*, still sell—at high prices, \$100, and even more, being sometimes paid for the labor on a single hat. S. is employed not only for the bodies or forms of hats, but for rosettes, borders, and other trimmings, as well as for baskets and other fanciful objects, in the manufacture of which the women of Fiesole exhibit much ingenuity and taste. In these fabrics silk or other fine thread or hair often forms a part of the tissue. The beauty of the S. tissue has led to many imitations, in the fabrication of which machinery is largely employed. Many species of palm leaf are used advantageously, and chip hats, called *navarinos*, in compliment to the great battle fought about the time of this invention, in which thin and narrow slips of birch, poplar, and other woods take the place of S., having been manufactured on a great scale.

The best S. is that of a variety of spring wheat—*grano da paglia*, as it is called in Tuscanry—thickly sown, preferably on sandy, hilly ground, in Feb. or Mar., according to season

and local climate, and harvested by *pulling*, like flax, as soon as the stalk begins to turn. The S. is left spread upon clean ground or grass for some days, for the sake of the action of the dew in bleaching it; it is then gathered into sheaves, from which the laborers draw out the stalks, breaking them at the joints and breaking off the heads. They are then sorted by a species of sieve composed generally of 16 tin plates pierced with holes of different diameters and briskly moved by a wheel. Three workmen can sort about 75 lbs. a day. The S. is now bleached by sulphur, and stored for working up at a convenient season. The peasantry braid it into narrow strips, which are flattened by pressure and sewed together, with an almost imperceptible seam, at the edges, and the hat, already nearly in its proper shape, is sent to the S.-factories in the towns, where breaks and other defects are remedied, the projecting points of the S. inside broken off, and discolored S. removed. It is now plunged for some time in a warm weak solution of acetate of lead, and then ironed with a hollow flat-iron containing charcoal to keep it hot. S. hats, however, are by no means always manufactured from braided strips, but often plaited directly with the stalks, in which case, as also often when formed of braids, the S. is whole or unsplit, and consequently produces a much stronger tissue.

GEORGE P. MARSH.

**Strays.** See ESTRAY.

**Streetor**, R. R. centre, La Salle co., Ill., 100 m. W. of Chicago. The head-quarters of the Vermillion coal-fields are located here. Pop. 1870, 1486; 1880, 5157.

**Street** (ALFRED BILLINGS), b. at Poughkeepsie, N. Y. Dec. 18, 1811, studied law with his father, and commenced practice at Monticello, N. Y., but removed to Albany in 1839, and was for many yrs. State librarian. He contributed largely, both in prose and verse, to periodicals, and wrote *The Burning of Schenectady*, and other *Poems, Drawings and Tintings, Fugitive Poems, Frontenac*, etc. D. June 2, 1881.

**Street** (AUGUSTUS RUSSELL), b. in New Haven, Conn., Nov. 5, 1792, grad. from Yale in 1812; studied law, but never practised his profession. He founded the Yale School of the Fine Arts. In Mar. 1864, erecting at his sole expense a very costly building. He also endowed the Street professorship of modern langs. and the Titus Street professorship in Yale Theological School. D. June 12, 1866.

**Street** (GEORGE EDMUND), b. at Woodford, Eng., in 1824, was ed. at the collegiate school, Camberwell, and afterward studied arch. under able instructors. In 1850 he was appointed arch. for the diocese of Ox., and subsequently for those of York, Ripon, and Winchester. His architectural structures are very numerous and important; among them are chs. in Garden st., Westminster; Sts. Philip and James, Ox.; All Saints, Clifton; St. Margaret, Liverpool; St. Mary, Paddington; the Crimean Memorial ch., Constantinople; and the new nave and the 2 W. steeples of Bristol cathedral. Among his ch. restorations are Eccleshall; Jesus Coll. chapel, Cambridge; Uffington, Berkshire; Stone, Kent; Wendover, Buckinghamshire; and the nave and choir of Christ ch. cathedral, Dublin. He was arch. of mansion of the earl of Crawford and Balcarra at Dun Echt, Scotland. Wrote *The Brick and Marble Arch. of N. It. in the Middle Ages* and *Some Account of Gothic Arch. in Sp.* D. Dec. 18, 1881.

**Strickland** (AGNES), b. at Reydon Hall, Suffolk, July 19, 1796, commenced her career of authorship at an early age, in most of her works being assisted by one or the other of her sisters. Her first work, in conjunction with her sister Susannah, was a vol. of *Patriotic Songs*, followed by *Worcester Field*, after which she appears to have published nothing for more than 20 yrs., her next work, also a poem, being *Demetrius, a Tale of Modern Gr.*, followed by *The Pilgrims of Walsingham*, an historical romance, and by many other vols. Her most important works, both prepared in conjunction with her sister Elizabeth, are *Lives of the Queens of Eng. and Lives of the Queens of Scot.* D. July 13, 1874.

**Strickland** (HUGH EDWIN), b. at Righton, Yorkshire, Mar. 2, 1811, grad. in 1832 at Oriel Coll., Ox.; devoted himself to geol. and ornithology; in 1835 made a tour in Asia Minor, and pub. papers on the *Geology of the Thracian Bosphorus*, the *Geol. of the Neighborhood of Smyrna*, the *Geol. of the Island of Zante*, etc. In 1850 he became a reader in geol. in the Univ. of Ox.; was one of the founders of the Ray Society, which he induced to undertake the publication of Agassiz's *Bibliographia Zoologica et Geologica*; assisted Sir Roderick I. Murchison in the preparation of his *Silurian System* and other works; wrote *The Dodo and its Kindred* and *Ornithological Synonymes*. D. Sept. 14, 1883.

**Strickland** (WILLIAM PETER), D. D., b. in Pittsburgh, Pa., Aug. 17, 1809, grad. at the Ohio Univ., entered the Meth. ministry in 1832; was for several yrs. stationed in Cin., and subsequently became agent for the Amer. Bible Society, and in 1856 removed to New York, where he engaged in literary work, mostly for the Meth. Book Concern; in 1862 was chaplain of a N. Y. regiment at Port Royal, S. C., and in 1866 became pastor of a Presb. ch. at Bridgehampton, L. I. Wrote *Hist. of the Amer. Bible Society, Hist. of Meth. Missions, Genius and Mission of Methodism*, etc.

**Stricture**, strik'tur [Lat. *strictura*; Gr. *στέγνωσις*], a constriction or compression of the tubiform organs of the body, as the cesophagus, the larynx, the windpipe, the intestines, the anus, the urethra, the lachrymal ducts, and others. The most frequent strictures are those of the urethra; they are generally produced by pathological changes in the coatings of the organ. Injuries of the perineum and the penis, with or without rupture of the urethra, may originate them, but their most general cause is inflammation of the mucous lining of the urethra, gonorrhoea. The immediate consequences of urethral S. are symptoms of impediment to free micturition. The urethra behind the S. is dilated by the pressure of the accumulated urine. The bladder is not thoroughly emptied, and undergoes inflammatory irritation by chemical decomposition of its contents. The urine becomes alkaline, with a putrid and



pungent smell of ammonia. The desire to urinate is very great and never ceases. In other cases, inflammation of the bladder extends to the kidneys, and there produces pyelitis and inflammation of the kidney proper. S. sometimes closes up the urethra entirely or become so narrow that the urine can only be passed out in single drops by the strongest and most painful efforts. Speedy relief by operation is necessary in such cases to save the life of the patient. The treatment of S. consists either in gradual dilatation or in external or internal urethrotomy. Gradual dilatation is effected by inserting bougies, or catheters, or sounds of increasing sizes. In cases where no instrument can be passed through the S., or where for other reasons dilatation cannot be resorted to, external urethrotomy is indicated. Internal urethrotomy is only applicable in cases where a sound can still be passed through the narrowed passage large enough to guide a small knife, which cuts and opens the S. from inside. Another method sometimes resorted to is the rupture of the S. by forcing through it a large conically shaped steel sound (forcible dilatation). [From orig. art. in *J. S. Univ. Cyc.*, by F. ZINSSER, M. D.]

**Strikes** [A.-S. *strican*]. The word *strike*, as denoting the refusal of a number of workmen in combination to work on the terms offered by employers, is not in Dr. Johnson's *Dictionary*, nor does it occur in Adam Smith's *Wealth of Nations*, and in the present century Eng. political economists found themselves in the presence of a perplexing phenomenon. Not that S. took place then for the first time in the hist. of Eng.; they were known 5 centuries earlier, after the great plague of 1349. These S. in the 14th century were encountered with a "statute of labor," ordaining that every man and woman, free or bond, within the age of threescore yrs., and not having landed property or other means of livelihood, should work for any employer requiring their labor at the old rate of wages. In our own age a succession of strikes in Eng. has been encountered with an alleged law of political economy, supposed to fix the price of labor beyond the control of either laborers or employers. Old restrictions have been repealed, trades-unions have been legalized, and the classes most opposed to S. have contented themselves with denouncing them as mischievous and ineffectual. On the last point the actual results have been conflicting. Many S. have been successful, but many have failed; in not a few cases it has been demonstrated that the state of trade, prices, and profits left no margin for compliance with the demands of the workmen, and in some it is sure that employers were gainers by the suspension of business.

It is urged against S. that profits in a particular business cannot continue above the average rate. The ignorance of the real conditions of trade, it is added, which is at the bottom of S., has repeatedly been proved by the fact that at the time of their occurrence it was actually an advantage to the capitalists to close their works. Sad evidence, too, is forthcoming in abundance of the misery which S. have occasioned to working people. On the other hand, it is contended that the equality of profits is a theoretical fiction; that the profits of employers in particular trades are often enormous, and huge fortunes are amassed in a few yrs.; and even if the ultimate notoriety of this fact should at length attract additional capital and competition, the public may then derive some benefit through a fall in prices, but the workmen may obtain none. The occasional failure of S., moreover, is no proof of their impolicy; even unsuccessful S. may act on the minds of employers so as to secure a rise or prevent a fall of wages on a future occasion; and to produce this effect they must actually take place from time to time, whether successful or otherwise. As for the temporary suffering they cause to the workmen, present sacrifices for future gain are in accordance with one of the fundamental principles of the political economy to which employers are so fond of appealing; but, in fact, a multitude of S. have been crowned with immediate success, and have compelled employers to concede terms which at first they peremptorily refused.

The conclusion to which these arguments really lead is, that no universal proposition can be laid down with respect to their justice or policy. The proposition which may with best reason be affirmed is, that the chief benefit to the working classes from past S. is that they have contributed to bring about measures which, beside other beneficial results, tend to prevent their occurrence in future. Co-operation, industrial partnership of capitalists and workmen in various forms, boards of conciliation and arbitration, wiser rules and policy on the part of trades-unions, all owe something to the lessons learned from S. [From orig. art. in *J. S. Univ. Cyc.*, by PROF. T. E. CLIFFE LESLIE, LL.B.]

**Stringham**, string'am (SILAS H.), U. S. N., b. Nov. 7, 1798, in New York, entered the navy as mdpn. June 19, 1810; became lieut. in 1814, commander in 1831, capt. in 1841, rear-admiral on the retired list in 1862, commandant of the Charlestown navy-yard 1864-66, and port-admiral of New York in 1867. Served in the last war with G. Brit., in the Algerine war, and in the war with Mex., and commanded the squadron during the c. war which reduced Fts. Hatteras and Clark, and enabled our vessels to get possession of the sounds of N. C. D. Feb. 7, 1876.

**Strombidae** [from *Strombus*—Gr. *στρομβος*, a "top"—one of the generic names], a family of gasteropod mollusks of the order Pectinibranchiata and sub-order Tænioglossa, containing the giant fountain-shell, so commonly used about gardens and houses, and kindred forms. The animal is entirely retractile within its shell; its mantle is but moderately developed, and not reflectible over the shell; the siphon is well defined, and more or less elongate; the gills are comb-like, and on the left side of the mantle; the head is produced into an elongated muzzle; the eyes are highly organized, and at the ends of long cylindrical pedicels; the tentacles are slender, and arise from the ocular pedicels; the teeth of the lingual ribbon are in 7 longitudinal rows, the middle broad and multidentate, the inner lateral row-

boid and denticulated, the 2 outer lateral of each side claw-like, and denticulated on their outer edges; the foot is compressed and narrow, rather dilated in front, tapering backward; the operculum is claw-shaped, and serrated on the outer edge. Species are generally diffused in all tropical seas, and between 70 and 80 are now known.

**Strong** (CALEB), b. at Northampton, Mass., Jan. 9, 1745, grad. at Harvard 1764; studied law, and commenced practice in 1772; took an active part in the cause of liberty; in 1775 was one of the committee of safety, in 1776-80 member of the legislature; in 1787 aided in the formation of the const. of the U. S.; U. S. Senator 1789-97; gov. of Mass. 1800-07 and 1812-16. D. Nov. 7, 1819.

**Strong** (GEORGE C.), b. at Stockbridge, Vt., in 1833, grad. at the U. S. Military Acad. in July 1857, when appointed brevet second lieutenant in the ordnance corps, second lieutenant 1859, first lieutenant 1861, captain 1863; was on the staff of Gen. McDowell as ordnance officer at the first battle of Bull Run; entered upon the organization of the New Orleans expedition, which he accompanied, and in Apr. 1862 commanded the expedition from Ship Island to Biloxi, Miss.; led the expedition to Pontelaticula, resulting in the breaking up of Jeff. Thompson's headquarters; in June 1863 assigned to command of the brigade which, in the operations about Charleston, effected the landing on Morris Island, July 10, 1863, Gen. S. leading the successful assaulting column, as also the intellectual assault on Ft. Wagner the following morning. His brigade led the second assault on that work July 18, at the head of which S. fell mortally wounded, after having gained the parapet. His commission as maj.-gen. was dated the day he died. D. July 30, 1863.

**Strong** (JAMES), S. T. D., LL.D., b. in New York, Aug. 14, 1822, grad. at Wesleyan Univ. in 1844; taught in Troy Conference Acad., Poughkeepsie, N. Y., 1844-66; in 1847 removed to Flushing, L. I.; projected and built the Flushing R. R.; superintended local improvements, and gave private lessons in Gr. and Heb. In 1856 he received the degree of S. T. D. from Wesleyan Univ.; in 1858-61 prof. of biblical lit. and acting pres. of Troy Univ., and in 1868 became prof. of exegetical theol. in Drew Theological Sem. at Madison, N. J.; member of Anglo-Amer. commission for revision of Eng. version of the Bible. In 1873 became chairman of archaeological council of Oriental Topographical Society; pub. *Harmony and Exposition of the Gospels*, in Eng., *Harmony of the Gospels*, in Gr., and brief manuals of the Gospels and of Gr. and Heb. gram. About 1853 he projected, in association with Rev. John McClintock, D. D., a *Cyc. of Biblical, Theological, and Ecclesiastical Lit.*, upon a scale hitherto unattempted in any lang.

**Strong** (JAMES WOODWARD), D. D., b. Sept. 29, 1833, at Brownington, Orleans co., Vt., grad. at Beloit Coll., Wis., in 1858, and at Union Theological Sem., New York, in 1862; was ordained Sept. 28, 1862, and commenced his ministry at Brodhead, Wis. In Jan. 1866 became pastor of Plymouth Congl. ch., Fairbault, Minn.; in 1870 first pres. of Carleton Coll. at Northfield, Minn.; subsequently also prof. of mental and moral philos.

**Strong** (NATHAN), D. D., b. at Coventry, Conn., Oct. 5, 1748, grad. at Yale 1769; was tutor there 1772-73; became pastor of the First Congl. ch. in Hartford 1774; served as army chaplain in the war of the Revolution, and subsequently held a high place among the clergymen of N. Eng.; was ed. of the *Evangelical Magazine* and founder of the missionary society of Conn.; contributed to the *Harford Selection of Hymns*; wrote *The Doctrine of Eternal Misery consistent with the Infinite Benevolence of God*. D. Dec. 25, 1816.

**Strong** (THEODORE), LL.D., b. at S. Hadley, Mass., July 25, 1790, grad. at Yale in 1812; was tutor in Hamilton Coll. 1812-16 and prof. of math. 1816-27, occupying the same position in Rutgers Coll. from 1827 to 1868; contributed to *Silliman's Journal*; solved by a direct method a problem in cubic equations which had long baffled the best math.; discovered a direct process of extracting the cube root of any integral number; pub. a *Treatise on Elementary and Higher Algebra*. D. Feb. 1, 1869.

**Strong** (THERON R.), b. at Litchfield, Conn., Nov. 7, 1822, settled as a lawyer at Palmyra, N. Y., 1826; was long a master and examiner in chancery; was M. C. 1839-41, and of the legislature 1842; was judge of the supreme court of N. Y. 1852-60; resided at Rochester from 1863 until 1867, when he removed to New York; established an active practice before the State and U. S. courts. D. May 15, 1873.

**Strong** (WILLIAM), LL.D., b. at Somers, Conn., May 6, 1808, grad. at Yale in 1828; was admitted to the bar in 1832, and commenced practice at Reading, Pa.; was M. C. 1849-54; in 1857 was elected a judge of the supreme court of Pa.; in 1863 resumed practice at the bar; was associate justice of supreme court of U. S. 1870-80.

**Strontium**, stron'-she-um, the metallic basis of strontia, one of the alkaline earths, first obtained from native carbonate of S. is of a pale yellow color, burns with a crimson flame, emitting sparks; decomposes water, liberating hydrogen gas; is hard, ductile, and malleable, and is obtained from the anhydrous chloride by electrolysis. Specific gravity, 2.54; atomic weight, 87.5. Its most important compound is the oxide, called strontia, a grayish-white, porous mass, which combines with water to form a white powder, the hydrate of S., deposited from the hot saturated solution in needle-shaped crystals. The principal salts are chloride, iodide, and bromide. The nitrate is much employed for the manufacture of the crimson lights in fireworks.

**Stroudsburg**, on R. R., cap. of Monroe co., Pa., has good water-power and some manufactures. Pop. 1870, 1793; 1880, 1860.

**Struensee** (JOHANN FRIEDRICH), b. at Halle, Prus. Sax., Aug. 5, 1737, studied med., and became body-phys. to the half-crazy king Christian VII. of Den. In this position he soon acquired an influence, and even a power, which no subject had ever had before in Den. In 1771 he was made minister of state, and a royal decree gave full authority to any



orders he might issue, whether they were signed by the king or not. But his power was very short-lived; it lasted hardly 1 yr. On Apr. 28, 1772, he was beheaded, and he would probably have been forgotten very soon if the enormous reformatory activity which he excited had not given the social development of the country an impulse which no reaction was able afterward to check.

**Struthionidæ** [from *Struthio*—Gr. *στροφιων*—the anc. name of the ostrich], a family of birds of the group (order or sub-order) Ratitæ, represented at present only by the ostrich of Afr. and Ar., the ostriches of S. Amer. belonging to the family Rheidae, and the cassowaries and emus to the family Casuaridæ. The feathers are destitute of after-shafts; the wings are imperfect, and furnished with long curving soft plumes; the tail is moderate, and consists of curved pendent feathers. The ostrich is the largest of the living birds. It feeds upon grass and other vegetation of the plains and deserts which it most affects, and has a well-known reputation for voracity and digestive powers. Individuals generally associate together in considerable flocks. Its ordinary gait is a stately walk, but it can run with great swiftness, and is then assisted by its wings. The nest is scratched in the sand, and is little more than a slight excavation of about 6 ft. in diameter. Generally, 2 females lay in the same nest about 20 eggs, while in a surrounding trench several more are deposited, believed to be for the use as food of the newly hatched young. The male especially sits on the eggs and cares for the young. The plumes of the ostrich are much esteemed as ornamental feathers.

**Strychnine**, or **Strychnia**. See *Nux Vomica*.  
**Strychnos** [Gr. *στροχυνος*, the deadly nightshade], a genus of trees and climbing woody vines of the order Loganiaceæ, found in the tropical parts of both continents. Most species, but it is said not all, are poisonous.

**Stuart**, on R. R., Guthrie co., Ia., has several locomotive and machine shops. Pop. 1880, 1994.

**Stuart** (ALEXANDER H. H.), b. at Staunton, Va., Apr. 2, 1807, studied at William and Mary Coll. and at the Univ. of Va., admitted to the bar in 1828; in 1836-38 member of Va. house of delegates, and M. C. 1841-43; in 1850 was appointed sec. of the interior by Pres. Fillmore; in 1857 was elected to the State senate of Va.; in 1866 delegate to national Union cong. at Phila.

**Stuart** (ARABELLA), b. at Chatsworth about 1575. Her father was Charles Stuart, earl of Lennox, brother of Henry, Lord Darnley, the husband of Mary Queen of Scots and father of James I. of Eng. Her great-grandmother was Margaret Tudor, daughter of Henry VII., who had married James IV. of Scot. Upon the death of Elizabeth in 1603, an unsuccessful plot was formed to place her instead of James upon the throne; in 1610 she was secretly married to William Seymour, who was descended from another daughter of Henry VII. Seymour was flung into the Tower, and his wife was placed in the custody of the bp. of Durham. She managed to escape, and made her way to the coast, where a Fr. vessel was waiting for her; but the vessel was captured by an Eng. ship, and she was committed to close confinement in the Tower, where she became insane, and d. Sept. 27, 1615.

**Stuart** (GEORGE HAT), b. at Rose Hall, co. Down, Ire., Apr. 2, 1816, was ed. at Bainbridge, Ire.; emigrated to Amer., taking up his residence in Phila., where he engaged in business, and is pres. of the Mechanics' National Bank. During the c. war he was pres. of the U. S. Chr. Commission, and subsequently of the Indian commission; is pres. of the Phila. branch of the Evangelical Alliance, a v.-p. of the Amer. Sunday-School Union, of the Amer. Bible Society, the Amer. Tract Society, etc.

**Stuart** (GILBERT CHARLES), b. at Narragansett, R. I., in 1756. His first instructor, a Scotch artist, took him to Edinburgh, but soon died, and the youth worked his way back to Newport. Thence he removed to Boston. The stir of the Revolution drove him to New York, and thence in 1778 to Lond. There, owing to the influence of West, he soon rose to eminence, and painted people of rank—George III., the prince of Wales, a duke, an earl, John Kemble, Joshua Reynolds. The duke of Rutland invited him to Dublin, and there he lived in splendor as the artist of the nobility. In Paris he met with similar fortune, having as a sitter the king, Louis XVI. A desire to revisit his native country and to paint the portrait of Washington brought him to Amer. in 1793. The first picture was destroyed as unsatisfactory; the second, the original sketch whereof is in the Boston Athenæum, is the accepted portrait. Beside Washington, S. painted John Adams, Jefferson, Madison, Monroe, John Jay, and John Quincy Adams, which was finished by Sully. From 1806 till his death S. resided and painted in Boston. D. July 1828.

**Stuart** (HENRY BENEDICT MARIA CLEMENT), b. in Rome in 1725, the son of the Pretender, James Francis Stuart, by whom he was created duke of York, and brother of Charles Edward, the Young Pretender; he was the last male descendant of the royal line of the Stuarts. He was preparing to join his brother in the rising of 1745 with a force of Fr. troops when that prince was overthrown at Culloden; subsequently took orders in the R. Cath. Ch., and in 1747 was raised to the cardinalship as Cardinal York. His brother, the Young Pretender, dying in 1788, he assumed the style of Henry IX., king of Eng. D. in 1807.

**Stuart** (ISAAC WILLIAM), son of Moses, b. at New Haven, Conn., in 1809, grad. at Yale 1828; became a teacher at the Hopkins Gram. School, Hartford; was for some yrs. prof. of Gr. and Lat. in the Coll. of S. C.; subsequently returned to Hartford; was several times a member of the Conn. senate. Wrote *Life of Nathan Hale, Hartford in the Olden Time, Life of Jonathan Trumbull*, etc. D. Oct. 2, 1861.

**Stuart** (JAMES), known as "Athenian Stuart," b. in Lond. in 1713; in 1752 accompanied the antiquarian Nicholas Revett to Athens; in 1755 returned to Lond., and in conjunction with Revett began the great work, *The Antiquities of Athens, Measured and Delineated*. D. Feb. 2, 1788.

**Stuart** (JAMES E. B.), b. in Patrick co., Va., in 1833, grad. at the U. S. Military Acad. July 1, 1854. During the Kansas political troubles of 1855-58 he served with his regiment, and in 1859 was a volunteer aide to Col. R. E. Lee during the John Brown insurrection at Harper's Ferry. He was in chief command of the cav. at the first battle of Bull Run. Promoted to be brig.-gen. in the Confed. army in Sept. 1861, and maj.-gen. early in 1862, he served thenceforth with the Army of N. Va. Gen. Lee, assuming command of this army (June 1862), and having reorganized it, determined upon a bold reconnaissance prior to resuming the offensive. Accordingly, on the morning of June 13, S. left Richmond, dispersed 2 squadrons of the 5th U. S. Cav., and was safely back in Richmond that night, having made the circuit of McClellan's army with the loss of but one man. During Pope's campaign in N. Va., S. surprised the headquarters train of the former near Catlett's Station, and made a descent on Manassas Junction. During the invasion of Md. by Gen. Lee in Sept. S. covered the Confed. rear; entered Pa. and occupied Chambersburg, and recrossed the Potomac below Harper's Ferry. In the battle of Fredericksburg his command formed the extreme right of the Confed. line. At Chancellorsville, after the fall of Stonewall Jackson, and A. P. Hill had been disabled, S. succeeded to the temporary command of Jackson's corps, which he led with ability in the severe fighting of Sunday, May 3. In anticipation of the proposed invasion of Pa., a large cav. force had been accumulated under command of S., against which Gen. Hooker despatched 2 divisions of cav. and 2 brigades of inf., which encountered S. advancing to cover the flank of the main movement. A determined engagement between the cav. on both sides ensued, resulting in a loss to each of 500 or 600. In the campaign of 1864 S. by a wide detour succeeded in interposing himself between the Confed. capital and Sheridan's advancing column. Concentrating all his forces at Yellow Tavern, near Richmond, he was here attacked by his able rival. During the struggle Gen. S. was mortally wounded. D. May 11, 1864, soon after reaching Richmond. [From orig. art. in *J. v. Univ. Cyc.*, by G. C. SIMMONS.]

**Stuart** (MOSES), b. at Wilton, Conn., Mar. 26, 1780, grad. at Yale in 1799; studied law, and was admitted to the bar in 1802, and for 2 yrs. was tutor in Yale; afterward studied theol., and in 1806 was ordained pastor of a Congl. ch. in New Haven. In 1809 he became prof. of sacred lit. in the theological sem. at Andover, and occupied the chair until 1848. Pub. *Elements of Interpretation*, from the Lat. of Ernesti; *The Sabellian and Athanasian Modes of Representing the Doctrine of the Trinity*, from the Ger. of Schleiermacher, etc. D. Jan. 4, 1852.

**Stucco** [It., a plastic, adhesive composition applied to walls both internally and externally in order to give them a smooth and even surface, either decorative or plain in color or form. The cementing medium of the composition for inside-work is common lime or calcined gypsum, or a combination of the two, generally mixed with a certain proportion of sand, depending on the special object to be secured. The word *stucco* technically applies to a mixture of lime-putty and white sand or powdered marble, and to a coating produced with this compound. The rudest example of the plasterer's art is the application of a single coat of mortar composed of lime-paste and common sand laid on the surface of a wall with the trowel, while the highest consists in imitating fine marbles and other beautiful building-stones by using pure calcined gypsum, mixed with gum, isinglass, and suitable coloring-matter, laid on in a variety of decorative forms in order to produce panels, pilasters, mouldings, cornices, etc.

**Stupor** [Lat. from *stupere*, "to be struck senseless"], is an abnormal state of more or less complete unconsciousness and interference with voluntary power, from which it is difficult or impossible to arouse the subject. Stupor may be caused by concussion of the brain from blows and falls; by compression of the brain from depressed fractures of the skull, foreign bodies, extravasated blood, accumulated fluids, or abnormal growths; by direct injuries, or irritation of the nervous system; by mechanical interference with the circulation to or from the brain; by imperfect aëration of the blood, and the introduction of poisonous substances into the circulation, such as opium, alcohol, chloral, the bromides, and other drugs in sufficiently large doses; also by the poisonous effects of waste matters formed within the system, and probably by special organic poisons of infectious diseases; finally, by interference with the cerebral nutrition from inflammatory conditions of the brain and its membranes. S. is therefore an important and in many cases an exceedingly grave symptom of brain disease. It must be remembered that we may meet with any of the transition stages from health to profound S. or *coma*, as S. is also termed. A person affected with S. is said to be *comatose*. The heavy breathing termed *stertorous*, somewhat deeper than ordinary snoring, is a frequent accompaniment of S. Restlessness and even violent convulsive movements may occur with S.

**Sturgeon**, *stur'jun* [Lat. *sturio*; Fr. *esturgeon*], the common Eng. name applied to the species of the family Acipenseridæ, super-order Chondroganoidæ, and order Chondrostel. All the species have the body elongated and slightly compressed and tapering backward; the skin is generally armed with minute osseous plates, as well as 5 rows of larger keeled bucklers, one dorsal, one pair lateral, and one pair on the sides of the abdomen; there is no well-defined lateral line; the head is produced into an incurved and projecting snout, which is provided below with 4 barbels in a transverse row; the opercular apparatus is imperfect, but the operculum proper well developed; the nostrils are double, and in front of the eyes; the mouth is inferior, transverse, protractile, with fleshy lips, and of small size; teeth entirely wanting in the adult; branchial apertures mostly limited to the sides, the branchial membrane being attached below to the isthmus; fins all composed of numer-

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ous fine and closely approximated rays. The skeleton is cartilaginous, and has numerous vertebrae. The stomach is not caecal; the pyloric appendages are numerous; the rectum has a spiral valve; the air-bladder is large and simple, and communicates with the oesophagus through its upper surface; the gills are 4 in number, and in addition are 2 accessory gills. Species are found in all the temperate portions of the N. hemisphere. All breed in the fresh water, but some are residents of the sea part of the year, while others are permanent denizens of the lakes and rivers. Their flesh is reddish-colored, and is by some highly esteemed. Their eggs are often made into caviare, their air-bladders can yield a kind of isinglass, and a not bad oil may be expressed from them.

THEODORE GILL.

**Sturgeon Bay, Wis.** See APPENDIX.

**Sturgis, R. R. Junc., St. Joseph co., Mich.** Pop. 1870, 1768: 1880, 2060.

**Sturt** (Sir CHARLES), b. in Eng. early in the present century. In 1828 he was the leader of an expedition to the unknown region of the interior of Australia, during which he discovered the Macquarie, Castlereagh, and Darling rivers, and soon after led another expedition which explored the course of the Murrumbidgee River, and in June 1830 discovered the great Murray River, which he followed to its mouth in Lake Alexandrina. In 1844 he penetrated to the great stony desert nearly in the centre of the continent, and on his return was made register-gen. and subsequently colonial sec. of S. Australia. In consequence of his exposure in these expeditions he became totally blind. D. June 16, 1869.

**Stuttering.** See STAMMERING.

**Stuttgart** (Ger. *stoot'gart*), capital of the kingdom of Württemberg, is in a charming valley among hills covered with forests and gardens. The Altstadt, occupying nearly the centre, contains several small and narrow streets, but the new parts of the city, surpassing the Altstadt 12 times in extent, have broad and beautiful streets and symmetrical squares. The most prominent point is the palace square, surrounded with magnificent buildings. Among these the new palace is the most remarkable. To the right of this edifice stands the old palace, built 1539-70, a gloomy castle with towers and pinnacles. In the left wing of the new palace is the royal theatre, and opposite the palace is the Königsbau, a beautiful structure with an Ionian colonnade. Near the palace square is the new depot. In the rear of the old palace is the Schiller Square, containing the statue of the poet, the immense building of the palace of the princes, and the parish ch., erected 1486-90. One of the most beautiful and most important streets is the Neckar-strasse, containing the museum of natural science, the national library, the museum of art, etc. Nearly parallel with the Neckar-strasse runs the Königs-strasse, dividing the city into 2 parts, and containing the royal stables, the royal central hall for commerce and industry, etc. Other remarkable buildings are the museum for Württembergian antiquities, the polytechnic school, the new market-hall; and among the chs., the Leonhard's ch., Johann's ch., a R. Cath. and a new Eng. ch., and the magnificent synagogue. The finest promenade is the palace garden, a park with lakes, fountains, statues, etc., stretching from the palace for a distance of about 2 m. The industry in woollen manufactures is important; a wholesale cloth-fair is annually held in Aug. The manufactures of piano-fortes, carriages, chocolate, sugar, and machinery are also considerable. The commerce of the city is extensive; the book and art trade are especially important. Pop. 117,303.

**Stuyvesant, st'v'e-sant (PETER)**, b. in Holland in 1602, served in the W. I.; was director of the colony of Curaçoa; lost a leg in an attack upon the Port. island of St. Martin; returned to Hol. in 1644, and in 1647 was made director-gen. of the New Netherlands; made peace with the Indians, and in 1650 arranged the boundary-line between the Dutch and the Eng. possessions in N. Amer. In 1651 the Dutch had built a fort on Del. River, which the Swedes claimed to be an encroachment upon their rights, and in 1654 the Swe. gov. rising took possession of the fort. In 1655 S. sailed for the Del. with 7 vessels conveying 600 or 700 men, recaptured the fort, and took possession of the entire colony of New Sweden. In 1653 a convention of 2 delegates from each settlement in the colony assembled and demanded that obsolete and obsolete laws should not be revived, and that no officer should be appointed except with the approbation of the people. S. replied that the magistrates derived their authority from God and the Dutch W. I. Co., and not from a few ignorant subjects, and ordered the convention to disperse under pain of condign punishment. In 1664 Charles II. of Eng. issued a charter to his brother, the duke of York, afterward James II., bestowing upon him all the country between the Hudson and the Del., including New Netherlands. In Aug. of that year Col. Nicolls, with an Eng. fleet, appeared in the bay and demanded the surrender of New Amsterdam. S. at first refused, but the municipal officers insisted that he should yield, and the town was surrendered Sept. 3, 1664, and its name changed to New York. S. went to Hol. the next yr. to render an account to his superiors of the loss of the colony, but returned soon after, and passed the remaining 18 yrs. of his life at his farm, called the *Bouwerij*, which has given its name to the present street called the Bowery. D. Aug. 1682.

**Sty** [*A.-S. stigend*] (*hordodolm*), a small boll which occurs on the edge of the eyelid. It should be treated with a warm-water dressing or light wet poultice.

**Stylites, St. Simeon.** See SIMEON STYLITES.

**Styracaceæ** [*i. e.* the storax family; from the typical genus, *Styrax*], a small order of trees and shrubs, mainly tropical or sub-tropical, but with several representatives in the U. S. Two species of *Halesia*, the snowdrop tree, grow wild from Va. to Fla. Our species of *Styrax* are handsome flowering shrubs, but unimportant. Other species yield fragrant gum-resins containing benzoic acid and some aromatic principles. Storax exudes from wounds of the trunk

of *Styrax officinale* of Syria, benzoin from *S. benzoin* of Java, etc.; both are used for incense in the Lat. and Gr. chs.; benzoin also in the preparation of paregoric, in the cosmetic called "virgin's milk," and formerly was an article of considerable repute in med. Benzoin in Eng. commerce is called gum-benzjamin. The leaves of *Symplocos tinctoria* (called sweet-leaf) are used in Carolina for dyeing yellow.

**Styrax.** See STYRACACEÆ.

**Stryx** [*Strōg*, "the hateful"], in the Gr. mythology, was a river of Hades which flowed 9 times around the lower world. At the entrance to Hades was the abode of the nymph or goddess Stryx, by whom the most solemn oaths of the gods were sworn.—STRYX was also the name of the highest waterfall in Gr., near Nonacris in Arcadia.

**Suakim.** See APPENDIX.

**Suber'ic Acid** [from *Lat. suber*, which designates both "cork" and the "cork tree;" Ger. *Korksaure*]. The name was originally due to the fact that this acid was first obtained by the action of nitric acid on cork. Fats generally, however, yield it by the same treatment, and it is by no means a characteristic product of cork. S. A. is a homologue of oxalic and succinic acids, and its general characters are those of that dibasic family of acids.

**Sublimation** [*Lat. sublimatio*]. This is a chemical process of separation and purification, applicable only occasionally in cases in which a volatile substance condenses or crystallizes from the condition of vapor directly to the solid condition, and not to the usual liquid form. In such cases this method of obtaining bodies in pure and crystallized form is highly convenient and valuable.

**Sublime Porte.** See PORTE.

**Submarine Blasting.** See HELL-GATE.

**Submarine Forests.** See FOSSIL BOTANY AND FOSSIL FORESTS.

**Submarine Navigation**, the art of navigating a submerged vessel. (See TORPEDO.)

**Subtraction** [*Lat. subtrahere*], the operation of finding from 2 given quantities a third which added to the second will give the first. The first is called the *minuend*, the second is the *subtrahend*, and the third is the *difference*. In arithmetical S. the subtrahend cannot exceed the minuend, but in algebra there is no such limitation. In all cases of algebraic S. the difference may be found by changing the sign of the subtrahend, and adding the result to the minuend. To distinguish this result from the arithmetical difference, already explained, it is called the *algebraic difference*.

**Succession Wars** were the natural result of the absolute monarchy, and became of a portentous frequency in the hist. of continental Europe in the 18th century. The Sp. S. W. (1700-18) was followed by the Polish (1733-38), the Aus. (1740-48), the Bavarian (1777-79); and the first and the third of these wars caused an immense loss of life and property, the devastation of some of the most prosperous regions of Europe, and unspeakable suffering and misery in thousands of families.

*The Spanish S. W.*—Charles II., king of Sp. (1685-1700), had no children and no collateral male heirs, but, according to Castilian law, females were competent of succession, and there existed 2 female lines of the royal house of Sp., represented by the 2 most powerful dynasties of Europe, the Bourbon in Fr. and the Hapsburg in Aus. Louis XIV., king of Fr., was a son of Anne of Aus., the eldest daughter of Philip III., and married Maria Theresa, the eldest daughter of Philip IV.; Leopold I., emp. of Ger., was a son of Maria Anne, the youngest daughter of Philip III., and married Margaret Theresa, the youngest daughter of Philip IV. Thus far the Fr. line had the preference, being the oldest, but both the Sp. princesses who went to Fr. had formally renounced their claims to the Sp. crown, while those who went to Aus. had not—a circumstance which much embarrassed Louis XIV. in his ambitious schemes, though without restraining him from pursuing his goal. To the other European powers the question was also of great interest. The Sp. monarchy comprised, beside Sp., Sic., Naples, Sardinia, Milan, the Sp. Netherlands, nearly corresponding to the present Belg., and vast possessions in Amer. A union between these dominions and either Fr. or Aus. would look very much like the beginning of a universal monarchy, and threaten the very existence of the other European powers. Both candidates were aware of this difficulty, and neither of them put forth his claims in his own name, but both in that of some collateral heir: Louis XIV. contended for his second grandson, Philip of Anjou; Leopold I. for his second son, Archduke Charles. For more than 10 yrs. the war was carried on in 4 different places—Catalonia, the valley of the Po, the Rhine countries, and the Sp. Netherlands. In Sp. the Fr. were generally successful. In Italy the war commenced in 1701, and the Aus. under Prince Eugene conquered Milan and Mantua. But in 1703 Prince Eugene was recalled, and Vendôme was placed at the head of the Fr. army. The result was that in a short time the Aus. lost all their conquests, and were able to hold only a few points on the Po. But the decisive battles were fought on the N. and N. E. frontiers of Fr. Finally a cong. was opened in Utrecht Jan. 29, 1712, and on Apr. 11, 1713, treaties of peace were signed between Fr., Eng., Hol., Prus., Savoy, and Port., by which it was stipulated that the 2 lines of the Bourbon house, the Fr. and the Sp., should renounce all claims of inheriting from each other, and the 2 crowns should never be held by the same person.

*The Polish S. W.*—After the death of Augustus II., king of Poland and elector of Sax., Feb. 1, 1733, one party of the Polish people wished to recall Stanislaus Leszczyński, who lived in exile in Fr., while another declared for the son of the late monarch, Augustus III. The former was supported by Fr., the latter by Rus. and Aus., and the contest was decided by a Rus. army which invaded Poland and expelled Stanislaus. By the Peace of Vienna (Oct. 3, 1735) Augustus III. was placed on the Polish throne, and Stanislaus received the duchy of Lorraine as a pension.



**The Austrian S. W.**—As the emp. Charles VI. had no male heirs, it was the sole purpose of all his diplomatic negotiations during the latter part of his reign to obtain the accession of all the powers concerned to the Pragmatic Sanction, by which it was stipulated that after his death all the Aus. possessions, comprising, beside Aus. proper, Bohemia, Hungary, N. It., and the so called Sp. Netherlands, should be transferred undivided to his eldest daughter, Maria Theresa, who was married to the grand duke Francis Stephan of Tuscany. The nearest claimant to the Aus. inheritance, the elector of Bavaria, Charles Albert, descending from Anne, a daughter of Ferdinand I., never gave his consent to the Pragmatic Sanction, and when Charles VI. died (Oct. 30, 1740) a general desire was manifested among the other European powers to break up the Aus. state and divide its dominions. Sp. demanded the It. terrs.; Augustus III., married to the eldest daughter of the emp. Joseph I., demanded Bohemia, etc.; and Fr. was more than willing to see its old enemy, the house of Hapsburg, humiliated. Availing himself of this feeling, Frederick II. of Prus. marched his army into Silesia in Dec. 1740, and began the first Silesian war, which became the signal of a general attack. A congress was opened at Aix-la-Chapelle in spring of 1748, and Oct. 18, 1748, the final treaty of peace was signed. Austria was forced to cede Parma, Piacenza, and Guastalla to a Sp. prince.

**The Bavarian S. W.** also called the *Potato War*, because it was carried out without any fighting, took place after the death of the elector Maximilian Joseph, Dec. 30, 1777. He left no male issue, and the Bavarian possessions now fell to a collateral line of the house of Wittelsbach, represented by Charles Theodore of the Palatinate. His claims were contested, however, by Sax., Mecklenburg, and Aus., and in order to secure at least some portion of the inheritance, Charles Theodore, who had no legitimate children, and chiefly wished to come into power in order to provide for his many illegitimate sons, made an agreement with Aus. by which he surrendered to her Lower Bavaria. Against this extension of the Aus. terr. in Ger., Frederick II. protested in a most energetic manner, thereby inaugurating that policy which in our days has made Prus. great, and by the Peace of Teschen (May 13, 1779) Aus. only retained a few insignificant dists.

CLEMENS PETERSEN.

**Succinic Acid** [Lat. *succinum*, "amber;" Ger. *Bernsteinsäure*], one of the dibasic series of homologues, of which oxalic acid is the first member. S. A. was known to the anc. as *volatile salt of amber*, from which it is obtainable by distillation. It is found ready formed in several plants, and even in animal bodies. It has been identified in the urine of dogs and rabbits. Many other organic transformations engender it. It is found in the watery part of the products of the distillation of amber, in solution, and crystallizes out by cooling. Warming with nitric acid will destroy the impurities, and pure S. A. can be got by recrystallization.

**Succory.** See CHICORY.

**Suchet**, su-shé' (LOUIS GABRIEL), duke of Albufera and marshal of the Empire, b. at Lyons Mar. 2, 1770. Entering the army in 1792, he served under Bonaparte, Brune, Masséna, Joubert, and Moreau in the campaigns in It. and Switz.; distinguished himself at Ulm, Jena, and Austerlitz. Under orders of Lannes he served at the siege of Saragossa, and was designated by him to Nap. on his departure for the command in Aragon. In this latter capacity he entered on the career which earned him his fame and the appreciation of Nap. A series of battles and sieges (of Lérida, Mequinenza, Tortosa, Tarragona) gained for him the baton of *maréchal d'empire*, and after the battle of Albufera and the siege and capture of Valencia he was created duc d'Albufera. The greatness of S. as a soldier was equalled by his wisdom as an administrator and ruler of conquered provs. See *Mémoires du Maréchal Suchet, sur ses Campagnes en Espagne*. D. Jan. 3, 1826.

J. G. BARNARD.

**Suck'er**, a name given to a number of very different kinds of fishes, and from no resemblance to each other, but simply because they "suck" in some way or other. 1. In the U. S. and Canada in the interior it is applied to members of the family Catostomidae, which have small mouths, into which they take their food by a kind of suction. 2. Along portions of the coast the term is applied to the species of Echenideidae, which are characterized by a flat ovate suctorial disk on the top of the head and front of the back. By means of this disk they suck and cling with great tenacity to other larger fishes, and are to some extent parasites. 3. In Eng. the name is given to representatives of the families Cyclopteridae, Liparidae, and Gobiesocidae. These have the ventral fins peculiarly modified and adapted for adhering to rocks and other bodies.

**Suck'ling** (Sir JOHN), b. at Whitton, Middlesex, in 1609, was ed. at Trinity Coll., Cambridge, and inherited a great fortune from his father. In 1631-32 he offered his services as a volunteer to Gustavus Adolphus, king of Swe., who was waging war against the emp. of Ger. Returning to Eng. he was attached to the court of Charles I. In 1640 he was elected to the Long Parl., but was obliged to flee to Fr. in consequence of his complicity in a plot to rescue the earl of Strafford from the Tower. Wrote 4 plays, a number of songs, some letters, and *An Account of Religion by Reason*. D. about 1642.

**Sucre**, Bolivia. See CHUQUISACA.

**Sucre**, soo'kra, de (ANTONIO JOSÉ), b. in Cumana, Venezuela, in 1793, was made brig.-gen. in 1819, and in May 1822 won the victory of Pichincha, which compelled the Spaniards to evacuate Quito; in 1823 he led a force from Colombia to Peru. In 1824 he won the victory of Ayacucho, which secured the independence of Peru, and finally of Bolivia, of which he was made pres. in 1826. An insurrection broke out in 1827. In June 1830 he was assassinated near Pasto, in Ecuador.

**Sudan.** See SOUDAN.

**Sue** (MARIE JOSEPH EUGÈNE), b. at Paris Dec. 10, 1804, studied med.; having inherited a considerable fortune, he

devoted himself to lit. His first novels are evidently inspired by Cooper. He then turned from the more or less historical to the strictly social novel—*Les Mystères de Paris*, *Le Juif Errant*, *Les Sept Peches capitaux*, *Les Mystères du Peuple*. Elected to the Constituent Assembly in 1850, he took his seat among the farthest-going radicals. After the coup d'état he left France and settled at Annecy in Savoy, where he d. Aug. 3, 1857.

**Suet** [Lat. *sebum*]. The solid fat of the sheep and of beef, and chiefly that from the kidneys and loins, is called *suet*. Mutton suet is the firmest and hardest of the animal fats. Chemically, there is no distinction between suet and tallow. *Suet Butter*, or *Oleomargarine*, is a substitute for butter. (See BUTTER.)

**Suetonius Tranquillus** (CAIUS), probably b. about the beginning of the reign of Vespasian, and ed. for the position of a teacher in gram. and rhetoric, enjoyed the friendship of the younger Pliny, who introduced him to the emps. Trajan and Hadrian. The latter employed him for some time as his *magister epistolarum*, but dismissed him, jealous of his too great intimacy with the empress Sabina. The date of his death is unknown. His prin. work is *Deo. decim Caesarum Vita*. It contains biographies of the first 12 Rom. emps., from C. Julius Caesar to Domitian.

**Suevi**, originally a collective name, comprising several individual Germanic tribes which formed a kind of union. The S. of Caesar lived between the Rhine and the Weser. To the union belonged the Semnones, the Catti, and other tribes. The S. of Tacitus lived farther to the E. from the Danube to the Baltic, and comprised, among other tribes, the Marcomanni and the Quadi. In the 4th century the name was applied to a single tribe, one branch of which settled in the regions along the Neckar, afterward called Swabia, while another branch broke into Gaul, and in 409 crossed the Pyrenees and penetrated into Sp.

**Suez**, soo'ez, town of Egypt, on R. and Suez Canal, at the head of the Gulf of Suez, an inlet of the Red Sea. The surrounding country is a complete desert. Nevertheless, since the opening of the railway from Cairo to S., and especially since the construction of the Suez Canal, the city has grown rapidly. Pop. 11,327.

**Suez Canal**, connecting the Mediterranean with the Red Sea, and thus greatly abridging the voyage between Europe and India and China. In 1847 the project of a canal here was seriously entertained by the European powers, and again in 1853. In the next yr. M. Ferdinand de Lesseps, a Fr. diplomatist, obtained a concession from the pasha for this purpose, and succeeded in organizing a company for carrying on the work. The entire length of the canal is about 100 m., of which 29 m. are actual excavation, the remainder being through shallow lakes which in some places had sufficient depth of water, but usually were to be deepened. The usual width of the excavation is 325 ft. at the top and 72 ft. at the bottom, with a depth of water of 26 ft. The work was fairly commenced in 1858, and the canal was officially opened Nov. 17, 1869. The Red Sea terminus of the canal is at Suez, on the Gulf of Suez; the Mediterranean terminus is at Port Said, an artificial harbor, where a considerable town has sprung up.

**Suez, Gulf of**, the W. and larger of the branches into which the Red Sea divides itself, lying between Egypt and the peninsula of Sinai. Its extreme length is about 180 m., with an average breadth of 20 m. The generally received scene of the passage of the Red Sea by the Israelites is near the present head of the gulf.

**Suez, Isthmus of**, a neck of land connecting the continents of Asia and Afr., and separating the Mediterranean from the Red Sea. Its extreme breadth from the Gulf of Suez to that of Pelusium is about 72 m. in a straight line, but following the course of the canal the distance is 100 m. The surface is low and sandy, having an average elevation of not more than 6 or 8 ft. above the sea, but in places reaching to 50 or 60 ft. The isthmus is almost a desert.

**Suffocation.** See ASPHYXIA.

**Suf'folk**, R. R. June, cap. of Nansemond co., Va., 22 m. from Norfolk. Pop. 1870, 930; 1880, 1963.

**Suffolk**, EARLS and DUKES OF. These titles have been borne in Eng. hist. by persons of several different families. MICHAEL DE LA POLE, EARL, b. about 1390, was the son of a wealthy merchant of Kingston-upon-Hull; in 1399 was made admiral in the N. seas; in 1383 became lord chancellor; in 1385 was created first earl of Suffolk. In 1386 he was impeached by the Commons for alleged abuses committed as lord chancellor; in 1388 was attainted of treason, and his estates were confiscated. He made his escape to Fr., where he d. Sept. 5, 1388.—MICHAEL DE LA POLE, EARL, son of the preceding, b. in 1368, obtained a reversal of his father's attainder in 1398, and in 1403 regained the estates and earldom; accompanied Henry V. to Fr., and was killed at the storming of Harfleur, Sept. 14, 1415.—WILLIAM DE LA POLE, EARL, MARQUIS, and DUKE, son of the preceding, b. in 1396, commanded in the siege of Orleans; in 1444 negotiated the marriage of Henry VI. and Margaret of Anjou. In 1447 he was suspected of complicity in the murder of Humphrey, duke of Gloucester, and became unpopular on account of having surrendered Anjou and Maine to Fr. In 1450 he was impeached by the Commons, committed to the Tower, and without trial sentenced to 5 yrs.' imprisonment, but having been set at liberty upon his own oath of innocence, he embarked for Fr.; was pursued by a vessel belonging to the constable of the Tower, overtaken, and beheaded at sea in May 1450.—JOHN DE LA POLE, DUKE, son of the preceding, married a sister of Edward IV.; was one of the 3 dukes who aided in placing the crown upon the head of Richard III.—EDMUND DE LA POLE, EARL, second son of the preceding, in 1491 succeeded to the ducal title which he waived in consideration of the restoration by Henry VII. of a part of his estates, and accepted the rank of earl in 1497; entered into political intrigues; retired to Fr. in 1502, but in 1507 fell into the hands of Henry VII., who caused him to be be-



*Properties.*—Cane-S. crystallizes readily when pure. The individual crystals are colorless and transparent; masses of small crystals, loaf-S., appear white, owing to the numerous reflections and refractions of the light by the crystals. When broken or rubbed together in the dark, the S. emits a phosphorescent light. The specific gravity of cane-S. is 1.606. Heat  $230^{\circ}$  F. cane-S. melts to a clear liquid, which solidifies on cooling to a transparent mass. "Barley-S.," which in time becomes opaque and crystalline. At a higher temperature it gives off water, and probably becomes glucosane. At  $410^{\circ}$  more water is given off, and caramel remains. Cane-S. is very soluble in water, and has a pure



sweet taste. It is insoluble in ether and in cold absolute alcohol. The aqueous solution of cane-S. rotates the plane of polarized light to the right. This property of cane-S. is the basis of optical saccharimetry. Cane-S. is not directly fermentable, but when its dilute solutions are mixed with yeast in considerable quantity, and exposed to a warm atmosphere, the S. is converted into glucose by the soluble ferment of the yeast, and the glucose undergoes vinous fermentation. Diastase and pectase (fruit-ferment) change cane-S. to glucose. Pure solutions of cane-S. in water, when very concentrated, remain unaltered for yrs.; when dilute, they suffer decomposition. Saccharine solutions are also liable to undergo viscous fermentation. Strong solutions of S. are used for preserving fruits, etc. Dilute acids convert cane-S. into glucose—slowly in the cold, rapidly when heated. Acid salts act in the same manner. Long-continued boiling with even very dilute acids results in the formation of brown ulmine, ulmic acid, etc. If the air has access, formic acid is also produced. Strong sulphuric acid destroys cane-S. rapidly, evolving sulphur dioxide, and forming a black carbonaceous mass. Concentrated hydrochloric acid decomposes cane-S. rapidly. The crystallization of cane-S. is much hindered by the presence of certain salts, especially sodic chloride, and to a less degree potassic chloride. Magnesian sulphate promotes the crystallization of 10 times, magnesian chloride of 17 times, calcic chloride of  $7\frac{1}{2}$  times, its weight of cane-S. The addition of sulphuric acid often promotes the crystallization by converting injurious carbonates, etc. into harmless sulphates.

(16) *Parasaccharose*, a modification of cane-S., produced when a solution of cane-S. containing ammoniac phosphate is allowed to stand, exposed to the air, for several months during the summer. It can be crystallized, is very soluble in water, nearly insoluble in 90 per cent. alcohol, and has a dextro-rotatory power of  $+108^\circ$ .

(17) *Melitose*, a S. found in the manna of *Eucalyptus* species in Tasmania. It crystallizes in slightly sweet needles, soluble in 9 parts of cold water and in boiling water. Its dextro-rotatory power is  $+102^\circ$ . It is changed by hot dilute sulphuric acid into a fermentable S. In contact with yeast it undergoes the same change.

(18) *Melzitose* is a S. which occurs in Briançon manna from the larch (*Larix Europæa*). It crystallizes from the alcoholic extract in small, hard, shining, efflorescent crystals. Its dextro-rotatory power is  $+94.1^\circ$ . It is readily soluble in water, nearly insoluble in cold, slightly soluble in boiling alcohol. In contact with yeast it passes slowly, or sometimes not at all, into vinous fermentation.

(19) *Trehalose and Mycose*.—Trehalose is a S. contained in *Trehala manna* from Per., which consists of the hollow cocoons of a coleopterous insect. The S. is extracted by boiling alcohol. Mycose is a S. found in the ergot of rye. These S. crystallize in shining rhombic crystals, are very sweet, soluble in water and in boiling alcohol. The dextro-rotatory power of trehalose is  $+199$ , of mycose  $+192.5^\circ$ . In contact with yeast they pass slowly and imperfectly into vinous fermentation.

(20) *Lactose, lactine, or milk-sugar*, an important constituent of the milk of all Mammalia, amounting to  $\frac{1}{4}$  or more of the solid constituents. Cow's milk contains from 4 to 5 per cent., human milk more. It is prepared from milk by coagulating the caseine with sulphuric acid or rennet, separating the curd, which includes both the caseine and the butter, filtering, and concentrating the whey to the crystallizing-point by evaporation. Sticks are introduced for the crystals to collect upon. By solution, filtration over animal charcoal, and recrystallization, or by repeated precipitation by alcohol, it is obtained pure. It is soluble in 5 or 6 parts of cold,  $2\frac{1}{2}$  of boiling water, but does not form a syrup. It is slightly soluble in alcohol. Its dextro-rotatory power is  $+60.28^\circ$ . The rotatory power of the solution diminishes on standing or on heating. When yeast is added to a solution of milk-S., it gradually passes into a state of vinous fermentation. When cheese or gluten is added, lactic fermentation occurs, with the formation of lactic acid, always, however, with the formation of some alcohol. In the presence of chalk or oxide of zinc this fermentation continues till all the S. is converted into lactic acid. The ordinary souring of milk is due to the transformation of the milk-S. into lactic acid, the curd being precipitated by the free acid produced. Fermented milk is called *koumiss*; when distilled, it yields a kind of spirits called *arraca* or *arrack*. Milk-S. forms compounds with potassa, soda, lime, and baryta, but not with sodic chloride.

(21) *Synanthrose*, a variety of S. which is found in company with inuline in the roots of the dahlia, Jerusalem artichoke, etc. It is deliquescent, readily soluble in water and in dilute alcohol, is optically inactive. When in contact with yeast it does not ferment directly, but is converted into dextrose and levulose, which subsequently ferment.

II. SUGAR FROM THE SUGAR-CANE.—The sugar-cane is not known in a wild state. It is probably a native of S. E. Asia. It belongs to the family of Gramineæ or grasses. It has a solid stem, from 1 to  $1\frac{1}{2}$  inch in thickness, and from 8 to 20 ft. in height. The stem is jointed about every 3 to 6 inches, and sends forth leaves, which fall off with the ripening of the plant. They are 3 or 4 ft. long, and 1 to 2 inches in breadth. In the 11th or 12th month of their growth the canes send up at their top a sprout 7 or 8 ft. high, nearly half an inch in diameter, smooth and without joints, called the arrow, which bears an ample panicle about 2 ft. long, divided into numerous ramifications, carrying soft, silky flowers. When ripe, the stem contains a dirty-white pith or open cellular tissue, which is filled with the very pure saccharine juice. The cane flourishes best where the mean temperature is from  $75^\circ$  to  $77^\circ$  F., but it thrives and can be economically cultivated where the mean temperature is as low as  $66^\circ$ . While, therefore, it is most productive within the tropics at low elevations, it is extensively cultivated in the warm temperate zones, and even on high table-lands.

*Extracting the Juice*.—The canes are cut with a large knife. The leaves and tops are then chopped off and left in the field, while the ripe cane is carried to the factory for the extraction of the juice. This is effected by pressure. The pressure is usually applied by mills; hydraulic presses have been tried, but have not proved advantageous. The pressed cane or residue after the removal of the juice is known as "bagasse," "megass," "cane-trash," or "straw." It is dried and used under the boilers, often constituting the only fuel employed on the plantation. No system of pressure serves to extract all the juice from the cane, as the moist bagasse always retains a considerable percentage of it. The juice is opaque, frothy, and of a yellowish-green color. The green matter may be filtered out, leaving a clear yellow fluid.

*Diffusion*.—The loss of S. which occurs when mills are used has led to experiments with diffusion. The juice of the cane is contained in cells, the walls of which permit the passage of the juice by liquid diffusion. If these cells are surrounded by water, S. passes into the water until a uniformity of saccharine contents is established, the percentage of the S. passing out from the cell depending upon the ratio of water to juice. If a gallon of water is used for every gallon of juice present, then  $\frac{1}{4}$ , or 50 per cent. of the S. would be extracted. By submitting the cells to a second bath of water,  $\frac{1}{2}$  of the S. left would be extracted. Thus, the first treatment would leave  $\frac{1}{4}$  of the S. in the cells, the second  $\frac{1}{8}$ , the third  $\frac{1}{16}$ , fourth  $\frac{1}{32}$ , fifth  $\frac{1}{64}$ , sixth  $\frac{1}{128}$ , etc. To make the process economical, the water used on the first lot of cells must be applied to a second lot, and thus strengthened in S.; then to a third, and so on. So, while the cane is passed through successive baths until it is practically exhausted, the baths are applied to successive lots of cane until they become finally nearly as rich in S. as the juice. The advantage of diffusion is not limited to the extraction of nearly all the S. in the cane, but results in the production of a purer juice, as the cells are not fractured and the albuminoid and other nitrogenous bodies are not extracted, not passing readily through the cell-walls.

*Clarification or Defecation of the Juice*.—Owing to the presence of albumen and other nitrogenous bodies, cane-juice, when left to itself, rapidly undergoes fermentation. S. is inverted and destroyed, and free acids are developed. Twenty minutes are in some cases sufficient to initiate this change. To prevent this, as well as to free this juice from suspended impurities, clarification is resorted to.

*Evaporation* is conducted in various ways: (1) in open kettles over direct fire; (2) in open (free-fire) kettles to  $20^\circ$  or  $30^\circ$  Baumé, and then to crystallization in open kettles heated by steam; (3) exclusively in open kettles heated by steam; (4) by the aid of evaporators, which involves blowing heated air through the juice or passing the juice over heated surfaces; (5) in open (free-fire) kettles to  $20^\circ$  or  $30^\circ$  B., and then to crystallization in a vacuum-pan; (6) in open steam-heated kettles to  $20^\circ$  or  $30^\circ$  B., then to crystallization in a vacuum-pan; (7) in vacuum-pans altogether.

The composition of raw sugar is very complex. Many of the minor constituents have not been identified. The following are the most important: (1) cane-S.; (2) glucose, consisting of dextrose and levulose; (3) mannite; (4) gum; (5) coloring-matter; (6) albuminoids; (7) lactic, acetic, propionic, butyric, and other organic acids, free or in combination; (8) ammoniacal salts, with the organic and inorganic acids; (9) phosphates, sulphates, carbonates, and organic salts of potassa, soda, lime, and magnesia; (10) silica; (11) sand, dirt, fragments of cane, etc.

The following list presents the most important qualities of raw sugar: (1) *Ordinary muscovado*, boiled in open kettles and purged in hogsheads. (2) *Centrifugal muscovado*, boiled in open kettles to syrup, and in vacuum-pans to grain, or entirely in vacuum-pans, etc., with or without the use of bone-black filters. (3) *Potted sugars*, boiled in open kettles, crystallized in earthen moulds, drained, but not clayed. (4) *Clayed sugars*, potted S. clayed. The cones are divided into from 3 to 5 qualities—(a) white (*florets*), (b) second white, (c) first yellow, (d) second yellow, (e) brown (*cocorchers*). (5) *Melada*, muscovado not freed from the molasses by draining. (6) *Concete*, same as melada, but boiled harder—4. e. drier. (7) *Molasses sugar*, made from the molasses, generally boiled in vacuum-pans and purged in the centrifugal. (8) *Cistern bottoms*, the S. deposited in the molasses-tanks. There are several varieties of molasses, corresponding to several of the raw S. The most important are—(1) *muscovado*, which is the richest in crystallizable S.; (2) *clayed molasses*, the next richest; *centrifugal molasses*, the poorest, yields no appreciable quantity of S. when boiled again.

Raw S. generally contains a living insect in large numbers, the *Acarus sacchari*, or sugar-mite, which belongs to the same genus as the *Acarus scabiei*, or itch insect, and strongly resembles it in appearance. The animal is very small, hardly perceptible to the naked eye, and the only objection to it is its possible connection with the "grocer's itch."

The composition of molasses is similar to that of raw S., as far as the nature of the constituents is concerned, but the proportions of these present are quite different; the percentage of cane-S. is low, while the percentages of water, glucose, gum, coloring-matter, and salts are high.

III. SUGAR FROM THE BEET.—The sugar-beet is, like the common mangold-wurzel, derived from the *Beta cicla* and *Beta vulgaris*, which grow wild near the sea-shores of S. W. Europe. Cultivation has developed many improved varieties, some of which contain 13, and even 14, per cent. of S. (1) *The Silesian beet*, a pear-shaped root, white in the body and light green on the top, is not so rich in sugar as some other varieties, but is much more extensively cultivated in Fr. and Ger., for the reason that it yields a larger weight of roots to the acre, is of vigorous growth, and produces the largest amount of S. per acre.

(2) *The French or Belgian Vilmorin sugar-beet* has small leaves and a slender spiral root, close in structure, and white in flesh.



(3) *The Quedlinburg sugar-beet* is a slender rose-colored root, rich in S., and maturing 14 days before any of the other varieties.

(4) *The Siberian beet*, called also "the white-ribbed beet," a coarse pear-shaped root, leaves abundant, light green, ribs almost white; weight per acre larger than with Silesian, but the percentage of S. smaller.

(5) *Imperial beet*, slender, pear-shaped, very white, rich in S.; does not yield as well as the Silesian.

*The manufacture of sugar from the beet* consists of the following operations: (1) washing and cleansing the beets; (2) extracting the juice; (3) defecation by lime and heat; (4) carbonatation, removal of the lime with carbonic acid gas; (5) filtration, to remove suspended impurities; (6) filtration through bone-black; (7) evaporation to a thin syrup; (8) second filtration over bone-black; (9) evaporation to crystallization; (10) separation of the S. from the molasses. The first molasses is evaporated again, to furnish a second crop of S., and a third and fourth crop are subsequently obtained. The final molasses is too offensive in taste and smell to serve as food, and is diluted and subjected to fermentation and distillation for the production of alcohol, the residue from the distillation being evaporated to dryness and calcined for the production of potash.

IV. SUGAR FROM THE MAPLE.—The sugar-maple (*Acer saccharinum*) grows abundantly in N. New Eng., N. Y., Mich., Wis., and Canada. Two varieties are selected for the manufacture of S., the rock-maple and the black sugar-maple. As soon as the frost begins to leave the ground the sap begins to ascend, and as the first sap is richest in S. and freest from other substances, the farmer hastens to tap the trees as soon as the snow melts around the stems. This is toward the end of Feb., in Mar., or early in Apr., according to the season. Trees 20 or 30 yrs. old give the best yield.

V. SUGAR FROM THE PALM.—Most palm trees yield a sweet juice when the top shoot or spadix is cut or bruised. Enormous quantities of S. are made from this juice in the E. In Bengal the *Phoenix sylvestris*, either growing wild or cultivated in large plantations, furnishes the largest supply of S. The trees are tapped, a bamboo spout is inserted, and a pail suspended to receive the sap, which must be frequently collected, and boiled at once to prevent its undergoing fermentation. It is boiled down to a solid, and sold as a dark, deliquescent mass under the name of *goor*. A purer product, called *kham*, is obtained by pressing the molasses out of the blocks of *goor*. By applying wet grass to the kham contained in baskets, a kind of *claying* occurs, by which the S. is rendered tolerably white and pure. The S. is generally sold, however, in the crude form under the name of *jaggery*. S. is also made from the wild date-palm (*Phoenix dactylifera*) and other species of *Phoenix*. In the Philippine and Molucca Islands much S. is made from the gommerto palm (*Sagueria saccharifer*), in the S. Sea Islands from cocoanut palm, and in Ceylon from kintul tree (*Caryota urens*), palmyra tree (*Borassus flabelliformis*), and *Cocos nucifera*.

VI. SUGAR FROM THE CHINESE SUGAR-CANE.—The Chi. sugar-cane is a name given to shaloo or sugar-grass, a species of *durra* millet. The sorghum species are coarse grasses, with thickly crowded panicles. The seed is round, and somewhat larger than mustard-seed. They are natives of the E. I., and are extensively cultivated in Asia and Afr., particularly *Sorghum vulgare*, common *durra*, which is the prin. cereal of Afr. *S. saccharatum* is cultivated in warm portions of Asia and Afr. Its seeds are pleasanter to the taste than those of common *durra*. The *durra* does not make good meal, but is used as a substitute for rice. The sweet pith of the culm is eaten, and is valuable as a source of S. Both the leaves and stems of the *durra* are valuable as food for cattle and horses. Some yrs. ago a Fr. missionary saw the sorghum used in the interior of China for the manufacture of S. The Fr. consul gen. procured seed, and sent them to Fr. in 1851. Since that time the plant has been extensively used for the production of alcohol.

VII. SUGAR FROM OTHER PLANTS.—*Sugar and Starch from Sweet Potatoes*.—The juice of the N. C. sweet potato contains—sugar, 10.50; starch, 6.00; gum, etc., 0.33; salts, 1.17; water, 82.00; total, 100. The common pumpkin is said to yield a saccharine juice of 10° to 11° Baumé. *Sugar from melons* has attracted some attention in Cal. *Sugar from maize* (Indian corn) was made prior to the Sp. invasion, and has been made successfully by many farmers in the U. S. for domestic consumption.

VIII. SUGAR REFINING.—The raw S. from the plantation is not sufficiently pure for use. It contains sand, clay, albuminous matters, coloring matters, etc., and is not agreeable to the eye or to the taste. Raw beet-S. is free from sand and clay, but contains, even when quite white and almost chemically pure, a peculiar substance which gives it a most offensive taste and smell. To remove these impurities refining processes are resorted to.

IX. SACCHARIMETRY, or the determination of the composition of impure S., has acquired great importance in connection with the manufacture of beet-S. and S. refining. It involves not only the determination of the cane-S., but also of the glucose, salts, water, etc.

*The determination of cane-sugar* is effected by a variety of methods: (a) If the solution contains no other substance, it may be determined by observing the density and consulting the tables which have been carefully prepared, showing the relation between density and percentage. (b) If other bodies are present, which is usually the case, the cane-S. may be determined by the aid of polarized light; by dissolving out the impurities with alcohol; by determining by a standard acid the amount of lime dissolved by the solution; by converting it into glucose and determining its reducing power on an alkaline solution of cupric oxide; by fermenting the solution and measuring the carbonic acid gas set free. The optical method was devised by Biot, and depends upon the fact that a solution of cane-sugar rotates the plane of polarized light. He constructed a simple sac-

charimeter by which he could place a glass tube containing a solution of the S. to be tested in the path of a beam of polarized light, and measure the amount of rotation which it suffered. By comparing the result with observations on solutions of known strength, he ascertained the percentage. C. F. CHANDLER.

**Sugar-berry.** See HACKBERRY.

**Sugar-Cane.** See SUGAR.

**Sugar Grove,** on R. R., Warren co., Pa., 37 m. S. of Dunkirk, N. Y. Frin. business, farming and dairying. Pop. tp. 1870, 1729; 1880, 1861, including 492 in v.

**Sugar-Molasses.** See SUGAR.

**Sugar, Mountain-Ash.** See SORBITE.

**Sugar of Lead.** See LEAD.

**Sugar of Milk.** See MILK.

**Suicide** [Lat. *svi*, "one's self," and *cadere*, to "kill"] is the deliberate intentional act of self-destruction by a person of sound mind and having attained to years of discretion. At the common law, S. was a felony, and one who aided and was present at its consummation was guilty as a prin. of murder. The deceased was punished by the forfeiture of all his goods and chattels real, and by denying to his body a Christian burial. The criminal law of the U. S. does not inflict any forfeiture or penalty upon one who takes his own life, but a person who aided and abetted the act would be guilty of murder in some one of its degrees, or of manslaughter. In N. Y. attempt to commit suicide is a penal offence. JOHN NORTON POMEROY.

**Su'idas** [Σουΐδας], a Greek lexicographer of whose life nothing is known. His book contains explanations and notices of Gr. words and names, illustrated by extracts from older Gr. writers; as many of the words from which it quotes passages are lost, it has great historical interest.

**Suliman Mountains**, forming the boundary between India and Iran, range from N. to S., and reach their greatest height, 11,300 ft., in Takht-i-Suliman. They connect S. with the Kurlekhi Mts. of Kelat, and N. with the Safed Koh. The descent toward India is steep, but gentle toward the Afghan plateaus. Climate and products are Indian; confers occur on the N. slope. The inhabs. are Afghans.

**Sull'na**, the name of one of the delta-branches of the river Danube. The Danube divides at about 50 m. from the coast into the Kilja and Toulthca branches. The latter and more S. branch again divides into the St. George and Sulina arms, the latter running eastward nearly.

**Su'notes** [from *Sull*, one of their former v. in the Caspoeian Mts.], a Greco-Albanian people whose ancestors in the 17th century fled from Tur. oppression to the almost inaccessible mts. of the Epirus. In consequence of their hostility to the Tur. govt., All Pasha made several attempts to exterminate them. They took a prominent part under Marco Bozzaris in the war of Gr. Independence.

**Sulla** (a word of doubtful etymology), the surname of a patrician family in anc. Rome belonging to the Cornelia gens. The family was poor, and the only member of it who attained historical importance was LUCIUS CORNELIUS SULLA FELIX, b. 138, d. 78 B. C. In 107 B. C. he became questor, and distinguished himself so much in the wars against the Cimbric and Teutones that he became the acknowledged leader of the aristocratic party. In 88 B. C. he was elected consul and appointed commander in the war against Mithridates. Marius, the head of the democratic party, rebelled and tried to have the appointment cancelled, but after successfully finishing the war S. was declared dictator, 83 B. C., and by confiscations, massacres, etc. he utterly reduced the Marian party. Having thus restored the dictatorship and retired.

**Sull'ivan**, city and R. R. junc., cap. of Moultrie co., Ill. Pop. 1870, 742; 1880, 1305.

**Sullivan**, on R. R., cap. of Sullivan co., Ind., 26 m. S. of Terre Haute. Rich deposits of coal exist here. Pop. 1870, 1396; 1880, 2161.

**Sullivan (JAMES)**, LL.D., b. at Berwick, Me., Apr. 22, 1744, studied law; practised at Biddeford, and in 1770 was appointed king's atty. for York co. As the Revolution approached, he espoused the patriot cause; was a member of the provincial cong. of Mass., and was one of a commission of 3 who were in 1775 sent on a secret mission to Ticonderoga. In 1776 he was appointed a judge of the superior court, in 1779-80 a member of the State constitutional convention, and a delegate to Cong. in 1784-85. He removed to Boston, for which he was repeatedly chosen representative in the legislature; was a member of the executive council and judge of probate in 1787; atty.-gen. of the State 1790-1807; elected gov. in 1807, and again in 1808. He was the projector of the Middlesex Canal, a member of the Amer. Acad. of Arts and Sciences, and for many yrs. pres. of the Mass. Historical Society. Wrote *Observations on the Govt. of the U. S.*, *Hist. of Me.*, *Review of the Causes of the Fr. Revolution*. D. Dec. 10, 1808.

**Sullivan (JOHN)**, LL.D., brother of James, b. at Berwick, Me., Feb. 17, 1740, studied law and practised successfully; was a member of the first gen. cong., and Dec. 1774 captured a fort near Portsmouth, N. H.; appointed brig.-gen.; during the siege of Boston commanded on the left under Gen. Lee; in the spring of 1776 was sent to Canada with reinforcements for the invading N. army in Canada; succeeded to the command, and conducted the retreat from the prov.; in the was sent to join the army under Gen. Washington; in the battle of L. I. commanded the division of Gen. Greene; was taken prisoner, but soon afterward exchanged and returned to duty; succeeded to the command of the division of Gen. Lee, which he led at Trenton and Princeton; planned the expedition against Staten Island, which under his leadership nearly achieved success in the descent of Aug. 22, 1777. At the battle of Brandywine he commanded the right wing, and defeated the Brit. left at Germantown; laid siege to Newport, R. I., Aug. 1778, but was compelled to withdraw his forces from the island, after defeating the enemy at Butts' Hill Aug. 29. In the summer of 1779 he led an expedition



against the Indians of the Six Nations, and Aug. 29 at New-town (now Elmira) defeated a body of Indians and Tories; in 1780 was again a member of Cong.; was atty.-gen. 1782-86 and pres. of N. H. 1786-89; in 1788 his exertions secured the adoption of the const. In Oct. 1789 he was appointed U. S. dist. judge of N. H. D. Jan. 23, 1795.

**Sullivan** (JOHN LANGDON), M. D., son of James, b. at Saco, Me., Apr. 9, 1777, grad. at Harvard in 1797; in 1804 was appointed engineer of the Middlesex Canal, connecting Boston harbor with Merrimack River; invented a steam towboat, for which he received a patent in 1814; in 1824 he was appointed associate civil engineer of the U. S. board of internal improvements. Subsequently he studied med.; began practice in New Haven in 1837; removed to New York in 1847; adopted the homoeopathic system, and made valuable discoveries in his profession. D. Feb. 9, 1865.

**Sullivan** (WILLIAM), LL.D., son of James, b. at Saco, Me., Nov. 30, 1774, grad. at Harvard in 1792; was admitted to the bar in 1795; member of the Mass. legislature. Beside several addresses, he pub. *Political Class-Book*, *Moral Class-Book*, *Historical Class-Book*, etc. D. Sept. 3, 1839.

**Sullivan's Island**, a long, narrow island in Charleston co., S. C., 6 m. from Charleston, and on the N. side of the entrance to Charleston harbor. It is the site of Ft. Moultrie, and is becoming a fashionable resort for sea-bathing. The island is connected with Charleston by steam-ferryboats, and is 6 m. long.

**Sulivant** (WILLIAM STARLING), LL.D., b. near Columbus, O., Jan. 15, 1803, grad. at Yale in 1823; took charge of the extensive landed estates left by his father, and devoted himself with great zeal to bot., making the mosses a special study. He pub. *Catalogue of Plants Native or Naturalized in the Vicinity of Columbus, O.*, *Mosses brought Home by Wilkes's Exploring Expedition*, *Mosses and Hepaticae, collected mostly in Japan*, and *Icones Muscorum*. The genus *Sulivantia* was founded by Torrey and Gray upon a rare plant of the saxifrage family discovered by him. D. Apr. 30, 1873.

**Sully** (ALFRED), b. in Phila. in 1821, grad. at W. Pt. in 1841; served in the Fla. and Mex. wars; commanded a brigade during the Peninsular campaign, and was present at the battles of Fair Oaks, Malvern Hill, Antietam, Fredericksburg, and Chancellorsville; in 1863-66 commanded a brigade in Dakota. He pub. *Manual for the Non-Commissioned Officers of Inf. and Riflemen of the U. S. A.* D. Apr. 27, 1879.

**Sully** (MAXIMILIEN DE BÉTHUNE), BARON OF ROSNY, DUKE OF, b. at Rosny, dept. of Seine-et-Oise, Dec. 13, 1560, of a Prot. family; was from his 11th yr. ed. with Henry of Navarre; accompanied him through his shifting fortunes at the court and in the camp, and became his minister of finance and chief adviser in all public and private affairs when he ascended the throne under the name of Henry IV. He was an excellent financier. He also distinguished himself as an engineer. After the assassination of Henry IV. he resigned and retired into private life. D. Dec. 22, 1641.

**Sully** (THOMAS), b. in Horncastle, Lincolnshire, Eng., June 1783, came to Amer. with his parents, who were actors, in 1792; lived first in Charleston, next in Richmond, next in New York, and finally in Phila.; painted Jefferson, La Fayette, *Washington Crossing the Delaware*, Fanny Kemble, Charles Kemble, Mrs. Wood, Cooke the tragedian, and other actors of celebrity. His best pieces are in Eng. D. Nov. 5, 1872.

**Sulphates.** See SULPHURIC ACID AND SULPHATES.

**Sulphides**, also called **Sulphurets**, compounds of sulphur with metals, and other elements more basic or less electro-negative than itself. This class of compounds is probably quite as large in number as the oxides.

**Sulphites.** See SULPHUROUS ACID AND SULPHITES.

**Sulphocarbonates**, compounds belonging to the class of sulphur-salts, formed by sulphocarbonic acid with some metallic sulphides. Some of the sulphocarbonates—namely, those of calcium and barium—have assumed considerable importance of a commercial kind from having been brought forward as remedies for the *Phylloxera*.

**Sulphocarbonic Acid**, also called **Bisulphide of Carbon** and **Bisulphide of Carbon**, is a transparent, colorless liquid, very volatile, like ether, which is formed by the action of sulphur-vapor on carbon at a high red-heat. Boils at about 116°-117° F.; inflames at an extremely low temperature, much lower than sulphur; has a very offensive odor as found in commerce, but not at all so when carefully purified.

**Sulphocyanic Acid**, also called **Hydrosulphocyanic Acid** and **Sulphocyanhydric Acid** [Ger. *Schwefelcyanwasser*; Berzelius called it *Rhodanwasserstoffsaure*], occurs in saliva, and in some sulphuretted essential oils of plants, such as *mustard* and *sadiah*. It may be prepared from *sulphocyanate of mercury*, which is first made by precipitating a mercurous salt with sulphocyanate (sulphocyanide) of potassium. This acid and its compounds are highly interesting to science.

**Sulphovinic Acid**, also called **Sulphethylic Acid** and **Ethylsulphuric Acid**, a compound which is formed by the action of sulphuric acid upon alcohol or ether. It is obtained from sulphovates, which are produced by saturating with baryta a mixture of equal parts of alcohol and oil of vitriol that has been heated to 212° F. for 24 hours, and crystallizing. The crystals are then decomposed by an exact equivalent of sulphuric acid, the liquid filtered from the baric sulphate, and concentrated *in vacuo* over oil of vitriol.

**Sulphur** [Lat.: Fr. *soufre*; It. *zolfo*; Ger. *Schwefel*], also called **Brimstone**, one of the most important of the elements of matter, very abundantly and almost universally distributed throughout the earth and the sea. It is an important essential element of the blood, muscles, skin, hair, and other parts of animals, and exists also in some essential components of plants, though not in the *woody* substance thereof. It is evolved also from volcanoes, both as vapor of S. and as sulphuretted hydrogen and sulphurous dioxide gases. Most commercial S. is merely the native mineral

purified by fusion or further by distillation and sublimation. Much S. is likely to be furnished to commerce from the W. coasts of the U. S. In Lake co., Cal. (with *cinnabar*), Humboldt co., Nev., and numerous other places near these coasts, large deposits are reported, some of which are already worked. The refined S. (*brimstone*) of commerce, and the pulverulent material known as *flowers of sulphur*, are products of distillation and sublimation. S. is one of those elements most liable to assume allotropic states when isolated. These are characterized by differences of crystalline form or by amorphous character, different relations to solvents, and different densities. Native S. often occurs in very beautiful and brilliant transparent yellow crystals, which are orthorhombic in form, with 2 imperfect cleavages. Among these the densities at 0° C.—2.048 and 2.068—indicate 2 distinct modifications. The density of the common opaque brimstone, crystallized from fusion, is lower, and there are several variations. Its crystallization is monoclinic.

**Sulphur, Acids of.** See SULPHURIC ACID AND SULPHATES.

**Sulphuretted Hydrogen**, called also **Hydrosulphuric Acid** and **Sulphohydric Acid** [Fr. *acide sulfhydrique*; Ger. *Schwefelwasserstoff*, or *Hydrothionsaure*], a gas which seems to be a parallel compound to water, and might therefore be expected to perform similar or parallel functions. S. H. is emitted naturally by mineral springs and from volcanoes, and, in combination with ammonia, is evolved in the putrefaction of animal and vegetable matters. The smell of rotten eggs and that of a privy are due chiefly to the compound it forms with ammonia or *sulphide of ammonium*. Artificially, this gas is prepared by the action of a dilute mineral acid on certain metallic sulphides, of which *ferrous sulphide* of commerce is the one generally employed, though the native *sulphide of antimony* may also be used. When pure, S. H. is a colorless gas, of an intense odor, which somewhat recalls that of bitter almonds, which produces immediate vertigo in the case of some persons, and acts as a deadly poison upon some animals, even in very small proportion. Many persons will, however, inhale it in diluted form without much apparent effect for some time.

**Sulphuric Acid and Sulphates.** Sulphuric acid is called also *oil of vitriol*, from its having been originally obtained by distillation from *vitriol*, or sulphate of iron (Fr. *acide sulfurique*; Ger. *Schwefelsaure* or *Vitriolsaure*). The manufacture by burning sulphur, as now practised, was introduced in Eng. by Dr. Roebuck about 1720. The general method is to burn sulphur, either as brimstone or in the form of metallic sulphides, as pyrites, in a draught of air, which is passed into very large chambers built of metallic lead, where the sulphurous oxide gas formed by the combustion is mixed with steam, and a quantity of nitrous fumes evolved from a mixture of saltpetre or nitrate of soda with S. A. The product precipitates with condensing steam upon the walls and floors of the leaden chambers as diluted S. A., which is then concentrated to oil of vitriol—first, in pans of lead, and when it has become strong enough to attack these, the boiling down is completed in large stills made of *platinum*. S. A., or oil of vitriol, when fully concentrated, has a density at 0° C. of 1.846. It is an oily, colorless, inodorous liquid, which boils at 630° F. and freezes at -31°. It absorbs water rapidly from the air, being one of the most useful agents in the laboratory for drying air and for absorbing moisture from other substances. When mixed with water, great heat is developed, with a great condensation of the molecules of the water.

*Nordhausen, or Fuming Sulphuric Acid.*—This is the acid obtained by distilling ferric sulphate. It is considered by some chemists as containing sulphuric trioxide, but this seems hardly in accordance with the fact that it crystallizes as a whole in transparent crystals at zero. When gently heated, however, it breaks up into sulphuric oxide, which distils over and condenses as a solid body, and ordinary oil of vitriol, which remains behind in the retort. Its name of *fuming acid* comes from the fact of its forming white fumes in the air.

*Uses of Sulphuric Acid.*—Among those materials and products of science and art that constitute the main pillars of modern civilization S. A. occupies incontestably a first rank. This will appear on a mere enumeration of some of the principal products necessary to human life, health, comfort, luxury, or necessity which are dependent, directly or indirectly, upon S. A. as an essential agent in their production: *soda* from common salt, and, through this, *glass*, *soap*, *sodium*, *aluminum*, *magnesium*; *nitric* and *hydrochloric acids*, upon which depend the arts of *refining gold and silver* for money and jewelry, with the *electro-plater's* and *photographer's* arts; *artificial mineral waters*; and *the vegetable acids and alkaloids*; *alum*; *ammonia*; *ultramarine*; *the aniline colors*; *bleaching-powder*; *chrome compounds*; *chloroform* and *ether*; *phosphorus* and *matches*; *artificial fertilizers*; and so on almost without end.

**Sulphur, Medical Uses of.** Taken internally, S. produces little effect beyond that of a mild and somewhat slow laxative. Externally, applied in the form of ointment, it is a powerful parasiticide, principally employed to kill the little insect that produces the itch disease. *Potassium sulphide* is a sharp irritant, and in large dose internally a corrosive poison.

**Sulphurous Acids and Sulphites.** Sulphurous dioxide gas, passed into water, forms sulphurous acid. It is a strong reducing agent; deoxidizes iodic, arsenic, chromic, and permanganic acids and chloride of gold, precipitating metallic gold from the latter.

**Sulphites.**—Of these the sulphites of calcium and of sodium only are of much practical interest, they being prepared commercially to some extent for bleaching purposes and for the prevention of fermentation of wines, syrups, and other organic liquids.

**Sulphurous Oxide, or Dioxide**, also called **Sulphurous Anhydride** [Fr. *acide sulfureux*; Ger. *Schwef-*



*lige Sæure*], the gaseous substance formed by the combustion of sulphur in the air. Even in pure oxygen the same compound is formed. It is emitted by volcanoes. It may be obtained artificially, in a pure state, by heating oil of vitriol with some metals, copper and mercury being among these. Sulphate of the metal and water are at the same time formed. It is also obtainable pure by heating together sulphur and sulphuric trioxide, in one limb of a sealed U-tube. It then appears as a liquid, condensed by the pressure, in the other limb. S. O. gas is colorless, with the well-known suffocating odor.

**Sulphur Springs.** See WATER.

**Sulphur Springs,** on R. R., cap. of Hopkins co., Tex. Here are several sulphur springs. Pop. 1870, 921; 1880, 1854.

**Sulpicians,** a R. Catholic congregation of missionary priests founded in Paris in 1642 by Abbé J. J. Olier. They were confirmed in 1645. They have quite a number of European and a few Amer. houses. Their chief work is the training of young men for the priesthood.

**Sulpicius Severus,** b. in Aquitania about 363 A. D. He was descended from a noble family, and in his youth had a career of distinction at the bar and in public life open before him. The loss of his wife led him to abandon this career about 392 A. D. He entered the Ch.; became a presbyter and a devoted admirer of St. Martin of Tours, whose life he wrote. The date of his death is not known, but it was some years after 400. His chief writings are *Historia Sacra*, or *Chronica*, from the Creation to A. D. 400; *Vita S. Martini Episcopi et Confessoris*; *Tres Epistolæ*, relating to his patron St. Martin; *Dialogi duo*, etc.

**Sulu Islands.** See SOOLOO ISLANDS.

**Sumach,** or **Sumac,** *shu'mak* [Ar. *summak*], the common name for plants of the genus *Rhus*. In the U. S. there are about 12 species, all shrubs or small trees; the most common is the well-known smooth S. (*Rhus glabra*), which is often found covering large tracts of barren ground; and the stag-horn S. (*R. typhina*), which sometimes reaches the height of 30 ft., and is readily distinguished by the soft down at the extremity of the branches. The S. of commerce formerly consisted of the leaves of the *R. coriaria* of S. Europe, used in tanning, dyeing, and calico-printing; but it has been proved that our native S. are quite as valuable, and the collection and preparation of the leaves has become an important industry in some parts of the S.

**Sumatra,** soo-mah'tra (when Australia is not reckoned), the third largest island of the earth, extends from N. W. to S. E., between lat. 5° 45' N. and 5° 55' S., and lon. 90° 40' and 105° 5' W., divided by the equator into 2 equal parts. Its area has been computed at 169,538 sq. m. Through its whole length it is traversed by a mt.-range, Boukit Barisan, which reaches its greatest height, 9535 ft., in Ophir. The prin. rocks are granite, syenite, gneiss, mica-slate, and red sandstone. Six volcanoes are known, situated near the equator. The S. E. part has many streams, navigable even for large vessels far into the interior. The several river-systems are connected with each other by arms and canals, and on the banks, in the midst of a luxuriant vegetation, stand the towns and v. The climate is different in the different parts of the island, but generally it is healthy, with the exception of the low coast-regions to the W. The dry season lasts N. of the equator from Oct. to May, and S., from the end of Apr. to the end of Oct. The natural productions of S. are more varied and more abundant than those of any other island in the archipelago. Of metals, gold, iron, copper, and tin occur; brown coal occurs, but anthracite is not found. The development of the vegetable kingdom is grand. Rice forms the prin. food, then sago, beans, and roots. The most palatable among the fruits are the mangosteen, durian, rambutan, rambel, pisang, pineapple, etc. Of the species of trees, the *Sideroxylon* yields the best wood for ship-building, it being so hard that it blunts the sharpest arrow; teak is not found. The most important plants entering into commerce are cotton, black pepper, camphour, benzoin, gutta-percha, various dyestuffs, and camphor. The Dutch have introduced coffee, tobacco, and cacao. Of mammals there are 80 species, among which are the elephant, rhinoceros, tapir, tiger, panther, and bear; among the ruminants, the *Cervus equinus* is noticeable; among the many species of apes are the orang-outang and two other anthropoids, the siamang and the wau-wau; the buffalo occurs both in a wild state and domesticated; the horse is small, but vigorous, adapted to a mt.-country. The pop. belongs to the Malayan race. Of the native pop., the Malays proper form the majority. Next to them the Battaks are the most important division. The Orang Koabos live in the forests; in physical respects they do not differ from the other inhabs. of the island, but they are uncivilized, though harmless; they are agriculturists. The Malays are all Moslems; they have a comprehensive lit., devote themselves less to agriculture than to commerce, navigation, and occasionally to piracy, and are well versed in several kinds of trade. With respect to their character they are said to be unreliable, treacherous, and addicted to sensual enjoyments. The Battaks are fetich-worshippers and addicted to cannibalism. Pop. 2,000,000.

**Sumbul,** a drug imported from India and Rus., is the root of some unknown plant, probably umbelliferous. It is used as a substitute for musk.

**Summer,** the warm season of the yr., astronomically including the period between the vernal and autumnal equinoxes, from about June 21 to Sept. 23, but popularly, in N. hemisphere, the months of June, July and Aug.; in S. hemisphere the summer months are Dec., Jan., and Feb.

**Summer Duck.** See WOOD DUCK.

**Summerfield** (JOHN), b. at Preston, Eng., Jan. 31, 1798, was ed. at a Moravian sem.; went to Dublin, where he joined the Wesleyan society; came to Amer. in 1821, and at once attracted great crowds by his rare eloquence, first in New York, and subsequently in Phila., Baltimore, and Wash. His health failing, he went to Europe in 1822, re-

turning in 1824 to New York, where he d. June 13, 1825. He was the founder of the Amer. Tract Society.

**Summers** (THOMAS OSMOND), D. D., LL.D., b. near Corfe Castle, Isle of Purbeck, Dorsetshire, Eng., Oct. 11, 1812, came to the U. S.; was "admitted on trial" into the afterward ordained deacon and elder; was a missionary in Tex. 1840-Dec. 1843; was one of the 9 preachers who constituted the Tex. conference at its organization, Dec. 1840, and sec. 4 sessions; transferred to Ala. conference, stationed at Tuscaloosa in 1844, sent to Livingston station in 1845, and to Mobile in 1846; at the General Conference, May 1846, was sent to Charleston, S. C., as assistant ed. of the *S. Chr. Advocate*, with Dr. Wightman; was sec. of the Louisville convention in 1845, at which the M. E. Ch. S. was organized, and has been sec. of all the General Conferences; was chairman of the committee that compiled the hymn-book; was general book-editor of the Ch. from its organization; started the *Sunday-School Visitor*; edited the *Quarterly Review of the M. E. Ch. S.*; wrote *Commentaries on the Gospels, the Acts, and the Ritual of the M. E. Ch. S.*; a *Treatise on Baptism, one on Holiness, The Sunday-School Teacher, Refutation of the Theological Works of Paine*, etc. During the war he returned (Feb. 1862) to Ala., and performed pastoral work in Tuscaloosa 1862-65, and in Greensboro (a part of 1866); was general ed., and ed. of the *Sunday-School Visitor*; also ed. of *Chr. Advocate*, prof. of systematic theol. in Vanderbilt Univ. and dean of theological faculty. He was one of the associate eds. of *J.'s Univ. Cyc.* D. May 6, 1882.

**Summers's** (or **Somers's**) **Islands.** See BERMUDAS.

**Summit, N. J.** See APPENDIX.

**Sumner** (CHARLES), b. in Boston Jan. 6, 1811. The Sumners had long been prominent in Mass. The family was noted for physical as well as intellectual vigor—tall, strong, and stalwart. The Senator's father was, however, a spare man, about the average height. He delivered and pub. addresses and poems, was a wide student, with fine literary taste. Charles was ed. at the Boston Public Lat. School; entered Harvard 1826, and was grad. there 1830. After his graduation he gave a yr. to science, belles-lettres, hist., and art. In 1831 he joined the Harvard Law School, and entered on the study of law with enthusiasm. His leisure was devoted to contributing to the *American Jurist*, of which he became chief ed. Admitted to the bar in 1834; pub. 3 vols. of *Story's Decisions*, and often supplied his place as lecturer at the law school, where he was himself lecturer from 1835 to 1837 and in 1843. In 1836 he edited Dunlap's *Admiralty Treatise*. In 1837 he went to Europe and was received with most flattering attention, returning in 1840. In 1845 he was chosen by the city of Boston to pronounce the Fourth of July oration, and took for his subject the *True Grandeur of Nations*. This was bitterly criticised at home, but pronounced by Cobden "the most noble contribution made by any modern writer to the cause of peace."

S. had planned a lawyer's life, and his highest ambition was to reach the bench. But when (1845) it was proposed to admit Texas to the Union he turned to politics, speaking and working against such admission, and protesting against the war with Mex. which followed. When the Whigs nominated Gen. Taylor, a slaveholder, for the Presidency, he quitted the Whig party, joined (June 1848) the Free-Soil party, which he assisted to form, supported its nominee, Van Buren, for Pres., was chairman of its State central committee, and took an active part in the canvass. In Oct. 1846 he had refused to be a candidate for Cong., but in Oct. 1848 he consented to stand as the candidate of the Free-Soil party. Although he was defeated, this step gave such serious offence to the circle in which he moved that his fees for legal services thenceforth dwindled to almost nothing. Yet as he had been in society, and with such promise at the bar, his decided anti-slavery position created a resolution to crush him socially and professionally. But from this moment he was recognized as the leader of the young men of the Commonwealth. No matter that in after yrs. the legislature censured the press abused, and politicians criticised him. He always had, to the day of his death, the hearty, entire, steadfast, and loving confidence of the young men of Mass. In 1849 he maintained before the supreme court of Mass. the unconstitutionality of separate schools for whites and blacks. The decision was against him. In this argument he introduced to English speech the phrase "equality before the law." In 1851 he was elected Senator of the U. S., the first civil office, and the only one, he ever held. He took his seat Dec. 1, 1851. At that time an anti-slavery speaker was not considered "respectable" by the Senate. His remarks were not so much heresies as blasphemies. From this moment his life becomes in a large sense the hist. of the anti-slavery cause in Cong. In Aug. 1852 he began his Congressional assault on slavery by a masterly argument for the repeal of the Fugitive Slave law, entitled *Freedom National—Slavery Sectional*. In May 1856 he made one of his ablest speeches, *The Crime against Kansas*, advocating the admission of that State to protect it from slavery. His comments on the conduct of several Senators who had taken part in the debate led to a scene which Sir G. C. Lewis characterized as "the beginning of civil war." On May 22, 1856, Preston S. Brooks, one of the Reps. from S. C., approached Mr. S. while seated at his desk in the Senate chamber engaged in writing, and struck him repeatedly over the head with a heavy gutta-percha cane, causing him to fall unconscious.

Elected and re-elected to the Senatorship, and passing the last 23 yrs. of his life in the Senate, his attention was by no means given exclusively to slavery. He took a leading part in all great debates. His speech in Jan. 1862, advocating the surrender of Mason and Slidell, taken from the Brit. mail-steamer Trent, is a masterly exhibition of maritime law, and did much to reconcile the country to that distasteful course. His speech on the Alabama claims, in 1869, bitterly offensive to all his Eng. friends and severely criticised



by John Bright, was undoubtedly a fair representation of Amer. opinion, and was the basis of final settlement. His addresses on the constitutional law respecting rebel States, on reconstruction, the war powers of the govt., international relations, internal improvements, etc., exhaust the subjects of which they treat. His sketches of Story, Allston, Granville Sharpe, Lincoln, and La Fayette show rare powers of portraiture. His articles on *White Slavery in the Barbary States*, *Prophetic Voices concerning America*, and other literary efforts, show good taste, ingenious research, and exact scholarship. He was among the very first to insist that we should seize the opportunity the rebellion gave not only to fortify the Union, but to abolish slavery, and that abolition was inevitable. He early and constantly urged Lincoln to emancipate by proclamation; so of the enlistment of black troops and the recognition of negro citizenship by an amendment of the const. He maintained that under our const. Cong. could give the negro the right to vote; hence he gave no support to the Fifteenth amendment, considering it unnecessary. During the session of 1870 he exerted himself vigorously to defeat Grant's San Domingo policy, criticised the administration and the Pres. severely on that and other grounds, and protested earnestly against the re-nomination of Grant. In May 1872 he had moved in the Senate that the names of victories in our c. war should not be inscribed on our regimental flags. He again visited Europe Sept.-Nov. 1872. During the session of 1872-73, and the following one, he gave most of his time to his Civil Rights bill, which puts the negro on the exact level of the white in respect to inns, juries, schools, chs., public conveyances, and all civil privileges. D. Mar. 11, 1874. [From orig. art. in *J.'s Univ. Cyc.*, by Hon. WENDELL PHILLIPS, LL.D.]

**Sumner** (CHARLES PINCKNEY). See SUMNER (CHARLES).

**Sumner** (EDWIN VOSE), b. in Boston, Mass., in Jan. 1796, where ed.; served during the Mex. war, leading the charge at Cerro Gordo, where severely wounded, and at Molino del Rey commanded the cav.; was gov. of N. M. 1851-53; in 1857 made a successful expedition against the Cheyennes; in Mar. 1861 appointed brig.-gen. in the army, commanded the 1st corps of the Army of the Potomac throughout the Va. Peninsular campaign of 1862, being twice wounded; appointed maj.-gen. of volunteers July 11, 1862, and commanded the 2d corps; also commanded at Fredericksburg Dec. 13, 1862; at his own request was relieved Jan. 25, 1863. D. Mar. 21, 1863.

**Sumner** (GEORGE), brother of Charles, b. in Boston Feb. 5, 1817, studied at Heidelberg and Berlin; travelled extensively, studying public and international law, and was often consulted by foreign govts. upon points of political economy. To him and Dr. S. G. Howe is especially due the establishment in this country of schools for idiots. He was an accomplished scholar, contributed largely to European and Amer. reviews, lectured extensively in the U. S. on philanthropic topics, and pub. several valuable addresses and pamphlets. D. Oct. 6, 1863.

**Sumner** (INCREASE), LL.D., b. at Roxbury, Mass., Nov. 27, 1746, was admitted to the bar in 1770, and commenced practice in his native town; was rep. in the legislature 1776-80, State senator 1780-82, associate judge of supreme court 1782-97, gov. of Mass. 1797-99, and in 1789 member of convention for adoption of U. S. const. D. June 7, 1799.

**Sumner** (JOHN BRD), D. D., b. at Kenilworth, Warwickshire, in 1780, was ed. at Eton and at Cambridge; entered holy orders; became rector of Mapledurham, canon of Durham in 1820, bp. of Chester in 1825, and abp. of Canterbury and primate of all Eng. in 1848. Wrote *Essays tending to show that the Prophecies now accomplishing are an Evidence of the truth of the Chr. Religion, Treatise on the Records of Creation*, etc. D. Sept. 6, 1862.

**Sumner** (WILLIAM GRAHAM), b. at Paterson, N. J., Oct. 30, 1840, prepared for coll. at the Hartford (Conn.) gram. school; grad. at Yale 1863; studied philos. at the Univ. of Göttingen 1864-66, and at Ox. Eng.; was tutor in Yale 1866-69; took orders in the P. E. Ch. Dec. 29, 1867; was for a time assistant minister of Calvary ch., New York; appointed prof. of political and social science at Yale 1872. Wrote a *Hist. of Amer. Currency*.

**Sumptuary Laws** are laws to restrict the expenses of citizens within defined limits. They have respect to certain articles of consumption and to the general style of living. Such laws involve always an abridgment of individual liberty and the assumption that a govt., in the exercise of its paternal authority over its subjects, can judge better than themselves what will best subserve their welfare in the use of what they have. Under an aristocratic organization of society such enactments have been made in part for the purpose of maintaining class distinctions. This legislation has, however, almost entirely failed of its object. Actual experience, and a better understanding of the true functions of govt., have led to the abandonment, in modern times, of all S. L. properly so called. A. L. CHAPIN.

**Sumter** (SUMTER C.-H. P. O.), R. R. junc., cap. of Sumter co., S. C., 145 m. from Wilmington, N. C. About 10,000 bales of cotton are shipped annually from here. Pop. 1870, 1880, 2011.

**Sumter** (THOMAS), b. in Va. in 1734, removed in early life to S. C.; participated in the Cherokee war, and was a prominent actor in the events which preceded the Revolution; served in the interior of the State until the fall of Charleston; went to N. C. and raised a large force, with which he defeated (July 12, 1780) a force of Brit. and Tories; made an unsuccessful attack on the post at Rocky Mount Aug. 1, but Aug. 6 he defeated and routed the Prince of Wales regiment at Hanging Rock, and dispersed a large body of Tories; captured a valuable convoy Aug. 16, but was in turn defeated and routed by Tarleton on the 18th at Fishing Creek; gained a victory at Broad River Nov. 12, and on the 20th defeated Tarleton at Blackstocks, and was severely wounded; was member of the convention which adopted the Federal const.; was M. C. 1789-93 and 1797-1802. U. S.

Senator 1801-10, and U. S. minister to Brazil 1809-11. D. June 1, 1832.

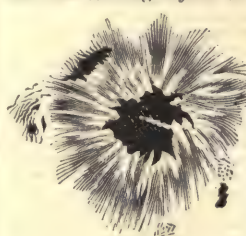
**Sumter, Fort.** See FORT SUMTER.

**Sun** [A.-S. *sunna*]. The sun is the centre of the solar system, controls by its attraction the motions of the planets, and by its heat is the prime mover and maintainer of all activity upon their surfaces. Hence it has always been to astrons. a subject of earnest and careful study, never more so than at present, and to mankind in general an object of admiration, and sometimes, as with the Peruvians and anc. Pers., of worship. The prin. numerical facts relating to it are the following:

Mean equatorial horizontal parallax.....	8.66" ± 0.05"
Mean distance from the earth, miles.....	92,260,000 ± 500,000
Difference between greatest and least distance miles.....	3,100,000
Mean apparent diameter.....	32' 36"
Diameter in miles.....	860,000
Diameter (earth's taken as unity).....	108.7
Mass " " ".....	330,000
Density " " ".....	1/4
Specific gravity.....	1.42
Force of gravity at sun's surface (earth's as 1).....	27.1
Inclination of sun's equator to the ecliptic.....	7° 13'
Longitude of node of sun's equator.....	73° 57'
Mean time of rotation on its axis.....	25.3847
Radiation of heat per second, sufficient to melt 287,200,000 cubic miles of ice.	

Nearly all the above given data depend upon the first as a foundation, and since the parallax, as at present known, is itself subject to a probable error of at least 1/200 of its whole amount, a corresponding uncertainty affects all the rest. The distance of the sun, 92,000,000 m., is so great that a R. R. train travelling without stops at the rate of 40 m. an hour would require 263 yrs. to accomplish it. Sound, moving with the same velocity as on the earth, would be 14 yrs. on the way.

When examined by the telescope, the surface of the sun presents a peculiar curdled or mottled appearance, much like that of coarse-grained drawing-paper. Near the edge the disk is noticeably darker than at the centre, and is marked here and there with long, irregular streaks of light, called faculae, which closely resemble the flecks of foam floating on the surface of an eddy below a cascade. But the most striking objects are the spots, of which there are usually several visible at once.



The figure gives a good idea of their general appearance. They consist of a nearly black central portion, called the nucleus or umbra, of irregular form, and around it a fringe less deeply dark, called the penumbra. In magnitude they vary greatly, from minute black pores to blotches which are even visible to the naked eye and have a diameter of nearly 100,000 m. They generally go in groups, and are distributed in 2 zones

upon the solar surface, on each side of the equator and parallel to it, being seldom found very near the equator itself, and almost never as distant from it as 40° of solar lat. Their forms and dimensions are no more permanent than those of our clouds, but are continually changing, old spots closing up and disappearing, while new ones break out to take their place. By watching them we are able to ascertain the period of the sun's rotation and the position of its equator as given in the table of numerical data. But it is a most important fact that they show the surface of the sun to move, not like that of a solid globe, but in such a way that while near the equator the time of rotation slightly exceeds 25 days, at a solar lat. of 44° it is 28 days. Their number is periodically variable, the periodicity being somewhat irregular, but the time not differing much from 11 yrs. The number of different spot-groups observed during a yr. sometimes rises as high as 350, or nearly one new one every day, and sometimes falls as low as 24. It is found that, during the yr. of maximum, the magnetic disturbances on the earth are also at a maximum, and vice versa.

As to the constitution of the sun, and the cause and nature of the spots, opinion is divided. The small specific gravity of the whole mass, however, is greatly in favor of the present prevailing doctrine that the sun is mainly gaseous, but covered by a sort of luminous shell of cloud formed by the precipitation of the vapors which are cooled by external radiation; this cloudlike layer is called the *photosphere*. The photosphere is overlaid by an atmosphere containing in its lower regions nearly all the materials which enter into the composition of the sun, while higher up the lighter gases alone prevail, the distribution not following, however, the laws of gases in equilibrium, but being largely dependent on dynamical actions.

During an eclipse certain beautiful and singular appearances present themselves. Hanging on the edge of the moon there are usually several rose-colored "prominences" or "protuberances," to use the names by which they were first described in 1842. After their nature had been long debated, the spectroscopic was applied to them in 1868, and at once showed them to be great clouds or flames (mainly composed of hydrogen, though also containing other elements) which seem to float above the sun in some upper atmosphere like our terrestrial clouds. Lockyer showed them to be mere extensions of a stratum of incandescent hydrogen which overlies the photosphere and atmosphere of metallic vapors. To this rose-colored stratum, whose existence, however, had been recognized before by Arago, Grant, and others, he gave the name of "chromosphere." The corona with which the sun is surrounded during a total eclipse is in appearance much like the "glory" with which the old painters encircled the heads of saints. Close to the



sun is a ring of pearl-colored dazzling light, which rapidly decreases in brightness, as the distance from the sun increases, and assumes a distinctly radiated structure. Its rays, with here and there distinct dark gaps between them, extend to a distance equalling the radius of the sun, and sometimes its diameter, and are terminated by an irregular outline somewhat star-like in form, having from 4 to 6 points, but not symmetrically placed. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. C. A. YOUNG, LL.D.]

**Sun-Birds**, the Promeropidae, a family of small brilliantly colored, slender-billed birds, found in the Old World, and chiefly in hot countries. They represent the humming-birds of the New World, and some of them approach quite near the humming-birds in appearance and habits.

**Sunbury**, R. R. centre, cap. of Northumberland co., Pa., 53 m. N. of Harrisburg. Pop. 1870, 3131; 1880, 4077.

**Suncook**, R. R. junc., Merrimack co., N. H., at confluence of Suncook and Merrimack rivers. Pop. 1880, 1966.

**Sunda Islands** is the common name of that chain of large islands belonging to the Malay Archipelago which separates the Java Sea from the Indian Ocean.

**Sunday** [Sax. *Sunnan dæg*; Lat. *Dies solis*; in Sans. and other langs. of India the name of the first day of the week has the same signification], the secular name of the first day of the week, which is held among Chrs. as a Sabbath or rest-day and in remembrance of Christ's resurrection. As soon as the Chr. religion came to be recognized by the state, laws were enacted for the observance of the S. Constantine (321) prohibited all business except agricultural labor, and all legal proceedings except the manumission of slaves. Theodosius II. (425) forbade games and theatrical exhibitions on S. The laws of Theodorice the Great, several kings of Fr., and especially Charlemagne (813), prohibited servile work and secular business. In Eng. S. laws were of very early origin. The common law distinguished S. from other days by allowing no judicial acts on that day, according to the maxim, *Dies dominicus non est juridicus*. The most important of the Eng. statutes is 29 Chas. II. c. 7, which prohibits all worldly labor or business (works of necessity and charity only excepted), the sale of goods, travelling for purposes of trade, and the serving or executing of any process or warrant, except in case of treason, felony, or breach of peace. The dressing of meat in families, and its sale in inns and eating-shops, and the crying of milk before 9 and after 4, are allowed. This statute, somewhat modified by subsequent laws, is the present S. law of Eng., and lies at the basis of the S. laws of this country.

The early Amer. colonists brought with them the observance of S., both as a religious and as a civil inst., and both the religious and secular observance of the day was enforced by laws similar to the Eng. statutes, though modified by the popular feelings and modes of life. The early laws of Mass., Conn., Ga., S. C., and Va. compelled attendance at ch. After the establishment of the Federal govt. as the separation between Ch. and State came to be carried out, the earlier S. laws were modified in conformity with this principle, and the legislatures and courts have been careful to distinguish between S. observance as a religious and as a civil inst., and to enforce only the latter. The Federal const. provides that S. shall not be reckoned in the 10 days within which the Pres. may return any bill; the Federal courts and the offices of the depts. are closed; the service of the P. O. is restricted; no session of Cong. is held, and provision is made by act of Cong. for the observance of S. in the army and navy. Beyond this, S. legislation does not come within the sphere of the Federal govt. The statutes of the States differ somewhat in details and strictness. S. is everywhere held as a *dies non*. Public affairs are suspended; the legislatures do not sit; courts are not held, except that in some cities police courts are open for an hour or two; legal processes are not served. In most of the States common labor and traffic are prohibited; contracts made or for service on S. are invalid; public amusements are restricted or forbidden. [From orig. art. in *J.'s Univ. Cyc.*, by REV. W. W. ATTERBURY.]

**Sunday-Schools**. The S.-S. of the present day has several distinctive features: (1) It is held on the first day of the week, a day on which there is a general suspension of secular labor, on which public schools everywhere are closed. (2) It is a school for positively religious instruction. (3) It is thoroughly a Bible school. The Holy Scriptures furnish the basis and almost exclusively the text-book of instruction. (4) It is for children and youth universally. Its advantages are freely offered to all. (5) The pupils are usually grouped together in small classes, comprising those of equal attainments, and each class is brought into very close relations with its teacher. (6) Instruction is given by unpaid lay teachers. (7) The instruction is supplementary to that given by the family, the state, and the ministry. While many pupils may be found whom the public schools do not reach or who are under no Chr. influences at home, the great mass of S.-S. children attend the common school throughout the week and belong to nominally Chr. families. (8) The S.-S. is to a very large extent independent of ecclesiastical control. It is a voluntary organization very informally constituted, having no pecuniary interests to create trouble, and managed very much as the superintendent and teachers prefer.

**History**.—To Robert Raikes of Gloucester, Eng., is to be ascribed the distinction of having originated a movement in the interests of philanthropy some results of which are now seen in the modern S.-S. system. His plans, first made public in the *Gloucester Journal* (1783), of which he was editor, were afterward unfolded more at length and discussed in various numbers of the *Gentleman's Magazine*. Having had his attention called in 1781 or 1782 to the ignorance and poverty of certain children in the suburbs of his native city, he started among them, on his own responsibility, what in modern phrase would be called a missionary

enterprise, hiring some women to teach them to read and to recite the Ch. catechism. The movements in G. Brit. attracted attention on this side of the Atlantic, and led to the organization, in Jan. 1791, of the Phila. Society for the Support and Institution of First-Day or S.-S. [From orig. art. in *J.'s Univ. Cyc.*, by REV. E. W. GILMAN, D. D.]

**Sunderland**, town of Eng., co. of Durham, on the Wear, near its mouth on the N. Sea. It has extensive docks and ship-building yards along its harbor, large manufactures of glass, earthenware, rope, sailcloth, anchors, and other ironware, and is, next to Newcastle, the greatest coal-shipping port in the world. Pop. 134,980.

**Sunderland** (LA ROY), b. in Exeter, R. I., in 1804, entered the ministry of the Meth. Ch. in 1823; became prominent in the temperance and anti-slavery movements and in other reforms of the day; was connected, as ed. or contributor, with various journals and periodicals, and pub. many works, among which are *A Question on Temperance*, *Testimony of God against Slavery*, *Book of Psychology*, etc.

**Sunderland** (SPENCER, EARLS OF). HENRY SPENCER, the first earl, b. in 1690, joined Charles I. at the beginning of the c. war; fought at Edgehill; was created earl of Sunderland in June 1643, and was killed at the battle of Newbury, Sept. 20, 1643.—ROBERT SPENCER, his son, the second earl, b. in Paris about 1641, was sent on embassies to Madrid and Paris in 1761, and became a privy councillor in 1674 and sec. of state in 1678; at first opposed and then supported the bill for the exclusion of the duke of York, afterward James II.; was detected in a secret intrigue with the prince of Orange; was dismissed in 1688, and took refuge in Hol.; was specially excepted in the act of indemnity granted by the prince of Orange upon his accession as William III.; gained the favor of William, and in 1695 was made lord chamberlain and privy councillor, but retired from public life in 1697. D. Sept. 28, 1702.—CHARLES SPENCER, his son, the third earl, b. in 1674, professed liberal principles; married in 1699 a daughter of the duke of Marlborough, thereby strengthening his alliance with the dominant Whig party; in 1706 took part in negotiations for the union between Eng. and Scot.; in 1707 was appointed sec. of state; was made lord lieut. of Ire. in 1714, in 1715 lord privy seal, in 1717 sec. of state again and pres. of the council, and in 1718 first lord of the treas.; was apparently deeply involved in the "South Sea Bubble"; was acquitted, but driven from office in 1730. D. Apr. 19, 1732.

**Sundew**. See INSECTIVOROUS PLANTS.

**Sun-Dial**. See DIAL.

**Sun-Fish**, a name given for various, but never very obvious, reasons to different aquatic animals. (1) In the U. S. and Canada it is most frequently applied to species of fresh-water fishes belonging to the family Centrarchidae, and chiefly to the genera *Pomoxis* and *Lepomis*. (2) On the sea-coast, to some extent, but more especially in Eng., it is given to species of Orthogoriscidae. (3) In some parts of Eng. the name is also applied to the basking shark. (4) It is also frequently applied by sailors to the species of aculeophors or jelly-fishes floating on the surface of the ocean.

**Sun-flower**, the *Helianthus annuus*, a coarse and tall annual plant of the order Compositae. It is often seen in gardens, and is well known for its large and showy compound flowers. It is a native of N. Amer., and was planted by the Indians, but its original home is uncertain. In Europe the plant is raised for its seeds, which afford a good drying oil, nearly equal to that of linseed. The planting of S. is reputed to be a preventive of miasmatic fevers.

**Sungaria**. See SOONGARIA.

**Sunna Hemp**, the fibre of *Crotalaria juncea*, a leguminous herb of Bengal, extensively cultivated in India both for its fibre and as a forage-plant for cows. It is inferior to true hemp, but better than jute, and is used for cables and canvas. It is exported extensively.

**Sunnas**. See SUNNITES.

**Sunnites**, the prin. of the 2 great divisions of Mohammedans, so called from their maintenance of the authority of the *Sunna*, a compilation of the sayings and teachings of Mohammed, his companions and immediate successors. They are therefore the orthodox believers, and comprise the Moslems of Ar., N. Afr., the Tur. empire generally, and most of those of Toorkistan.

**Sun-stroke**, *Insolatio*, or *Coup de Soleil*, prostration of the animal vitality from long exposure to the direct heat of the sun. S. has been regarded as a state of paralysis of the vaso-motor or ganglionic nervous system. In its first form or stage, that of congestion and excitement, the surface of the body is intensely red and hot—a condition often disconnected with any actual sunburn, but due to general capillary relaxation and congestion consequent upon the impairment of the nerve-centres which control the elastic arterial walls. For the same reason, the various large glands and organs of the body—liver, spleen, kidneys, lungs—are engorged with blood, swollen, and very tender to touch. The brain is congested, stimulated to excessive and incoherent mental action. The temperature of the body may be 112° F. or more; the pulse full, hard, bounding; the heart's action tumultuous; the breathing is hurried, labored, and noisy; the conjunctiva reddened, pupil contracted; there may be headache, delirium, convulsions. In graver cases, either at the outset or later as a second stage, one of depression or shock following that of excitement, the various vital functions may be alarmingly depressed. The patient becomes unconscious; the pulse feeble, compressible, and irregular; breathing slow, irregular, stertorous; the surface may be cool and pale; convulsive action is absent, and the muscular system completely relaxed. Death may occur suddenly by syncope or paralysis of the heart, by pulmonary congestion, by exhaustion, or by convulsion. Physical fatigue, exhaustion, over-clothing, bad ventilation, deficient drinking-water, alcoholic excess, are predisposing causes of S. Disturbance of the natural moisture, evaporation and radiation from the skin, is re-



garded the immediate cause of the overheating of the blood; hence, a murky, damp heat is attended with more cases of S. than when the atmosphere, though hot, is dry and clear. The treatment of S. consists in promptly withdrawing caloric from the overheated body, or, when shock and coma are present, by diffusible stimulants and revulsive agents, maintaining strength and relieving cerebral congestion. The cold douche to the head, neck, and chest, evaporating lotions or ice-bag to the head and spine, the wet sheet swathing the entire body, and cold immersion are agencies to be employed with judgment to the overheated body with the best results. Bromides may be employed, but arterial sedatives, as digitalis or veratrum, are dangerous. Reverse, in coma and the sinking stage or form, sinapisms, blankets, and heat may be applied to the surface, rich liquid food, ammonia, and alcohol administered by mouth or rectum, blisters applied over the nape of the neck.

E. DARWIN HUDSON, JR.

**Sun-Worship** is an essential part of the religious system of the Parsees. The anc. Peruvians, who worshipped every aspect of nature, paid the chief honors to the sun. The old Egyptians, the Grs., the Its., and the Celtic and Teutonic races, the E. Indians, and some Afr. pagans, were, as some heathen races still are, sun-worshippers.

**Superior, Wis.** See APPENDIX.

**Superior Lake**, the largest fresh-water lake in the world, and the largest of all lakes except the Caspian Sea, which is salt. It is roughly triangular in outline, and is bounded N. W. by Minn. and Ont., N. E. by Ont., and S. by Wis. and Mich. Its area is over 31,400 sq. m.; its mean depth is about 1000 ft.; the greatest length, 355 m.; breadth, 160 m. Whitefish, sturgeon, and several noble species of lake-trout abound in its waters, which are singularly clear and cold. The lake is subject to severe storms. The islands are not very numerous. Isle Royale, the largest, also Grand Island and the Twelve Apostles, belong to the U. S.; and Pic, Michipicoten, St. Ignace, Montreal, Leach, the Slate Islands, Sandy Islands, Caribou, Silver, and many smaller islands are Canadian. The lake never freezes over in winter, but is un navigable at that season on account of the shore ice.

**Supernatural.** See MIRACLES.

**Supper, 'The Lord's.** See EUCHARIST.

**Suppuration.** See ABSCESS, PYÆMIA, and WOUNDS.

**Surat**, town of Brit. India, presidency of Bombay, on the Taptée, is 6 m. in circumference, and surrounded with walls surmounted by towers. The place is most important in a military point of view. Pop. 113,117.

**Surety.** See GUARANTY.

**Surf-Bird**, a turn-stone, a small wading bird of the Amer. Pacific coasts, about 10 inches long, named from its habit of allowing the surf occasionally to dash over it as it seeks its prey on the rocky shores. Its flight is short and irregular.

**Surf-Duck**, a sea-coast duck of Amer., one of the group called scoters in G. Brit. and coots in the U. S. It is quite black, except a little patch of white on the head and another on the nape. Its flesh is not eatable.

**Surgery.** Our first definite traditions regarding S. come from the Grs. The Asiatics and Egyptians, however, were their preceptors. Agenor, a Phœnician king, practised S. with distinction, devising the scarf or sling now almost indispensable in many injuries of the upper extremity. Chiron, the Thessalian centaur, is more generally accredited the father of S. in the fabulous ages of Gr. hist. His reputation is eclipsed by that of Æsculapius. Jason, Theseus, and Hercules practised S., and Epione, the wife of Æsculapius, as well as Medea, proved that women not only shared with men the perils of war, but aided in repairing its ravages. A Thracian king, Orpheus, cured a woman bitten by a snake, whence arose the fable that he had rescued her from hell. The Grs. made many demigods partly because of their achievements in the healing art. Two sons of Æsculapius, Podalirius and Machaon, are not inconspicuous among the heroes of the *Iliad*. For 6 centuries after the Trojan war we have little information of any advances in S. It was not until the age of Pythagoras that the way was paved toward raising its dignity. The school that he founded at Crotona inspired the schools of Cnidos and Cos, and a century later there appeared in the latter that splendid genius, Hippocrates (460-357). It was with him a maxim that when med. failed recourse should be had to the knife or to fire, and he used courageously the cautery and knife. He commended operations like tapping the chest for empyema, nephrotomy for calculus lodged in the kidney, and trepanning the skull for headache. He was familiar with cataplasms and venesection and cupping; with operations on rana, nasal polyp, and ganglia; with the treatment of piles and fistulae by ligature; with tapping in dropsies, etc. He gave rules for the treatment of dislocations and fractures, and anticipated a multitude of the practices that have been vaunted by the moderns. Of the more immediate successors of Hippocrates, Diocles of Carystus was one of the most prominent in S., and Praxagoras of Cos is reported to have been a very bold surgeon, laying open the abdomen for the removal of intestinal obstructions. The Egyptian school took its rise b. c. 300. Herophilus of Chalcedon and Erasistratus were its most conspicuous leaders. That the former dissected human bodies is asserted by Galen. He discriminated nerves of motion from those of sensation; described the occipital depression "torcular Herophilii" as the point at which the sinuses of the dura mater converge; distinguished the cerebrum from the cerebellum; dissected the tunics of the eye and originated the term *retina*, etc.; Erasistratus is reported to have been a bold surgeon, not hesitating to excise portions of the liver and of the spleen. He decried drugs, and insisted on the utility of diet, bathing, regimen, gymnastic exercises, and other hygienic resources as therapeutic measures. Xenophon of Cos, Mantius, Philoxenus, and Andreas were great inventors in S., and Ammonius, surnamed *Lithotomus*, in-

vented an instrument for crushing vesical concretions too large to be extracted through the ordinary incision.

Until the reign of Augustus there appeared in Rome no surgical practitioner or writer of note until Aulus Cornelius Celsus. His *De Re Medica* is preserved, in which he advises the amputation of limbs affected by gangrene, pronouncing the operation very dangerous, but giving excellent precepts for the performance of the operation. The method of lithotomy he describes is still regarded as of value, especially in children. He gives rules for the removal of cataract by depression, for forming an artificial pupil, for the reduction of several varieties of hernia, etc. Galen was a surgeon at Pergamus (A. D. 165), and afterward at Rome. His commentaries on various surgical subjects are of value, and he made a step toward the knowledge of the circulation of the blood. After Galen, in the 3d century came Antyllus, who recommended extraction for hard cataract, and suggested arteriotomy in place of venesection in some cases. We owe to this period an encyclopedic performance by Orbasius (326-403 A. D.), whose observations on operations on the urinary organs and on fractures and excisions are of value. The next surgical writer commonly thought worthy of mention, after a lapse of nearly 2 centuries, is Aëtius (550 A. D.). Paulus Ægineta, prof. at Alexandria about 640 A. D., wrote a compendium of the healing art, of which the sixth book is esteemed the best body of surgical knowledge prior to the revival of letters. He was pre-eminent as an accoucheur.

In the 7th century learning was gradually communicated to the Arabians, and for the next 5 centuries we must look for anything noteworthy in S. in this direction. Rhazes (852-923 A. D.), who practised at Bagdad, was the first to describe spina bifida. He cauterized the bites of rabid animals. He gave a better account of hernia than his predecessors. Hally Abbas was a voluminous writer at the end of the 10th century. Avicenna (980-1037 A. D.), ed. in Bagdad, acquired an extraordinary distinction, but the most important among the Ar. celebrities is Albucasis (1110 A. D.). His *Chirurgia* contains the most complete knowledge of S. that then existed. Avenzoar (1183 A. D.), a Jew, practised at Seville in Andalusia. He describes abscess of the mediastinum, and a case of suppuration of the kidney with discharge of 14 pints of pus. He treats judiciously of fracture involving the hip-joint, and of wounds of the blood-vessels. His pupil, Averroës (1198 A. D.), a native of Cordova, achieved a great reputation. The contempt with which the Saracenic school has been regarded in Christendom seems not altogether undeserved. It may be said, however, that by the systematic division of the medical art into physis, S., and pharmacy they made a certain progress. For several centuries the only attempts worthy of notice are in connection with the schools established at Salerno and Monte Casino, and it was not until the 13th century that they were eclipsed by the rising reputation of the schools of Bologna and Paris. Worthy of note are Rogerius of Parma (circa 1206), and his disciple, Roland Capelluti, who composed a voluminous commentary on the work of his preceptor. In a case of hernia of the lung he excised the protruding part, and the patient survived. Hugo of Lucca (d. 1252) is regarded as the founder of the Bolognese school; Brunus of Longobucco taught at Padua (1262); Theodorico of Cervia is accredited with having substituted soft and simple bandages and splints in fractures for the cruel appliances in vogue in his day. William of Salicet (b. at Piacenza in 1210) practised in armies, and at Cremona, Pavia, and Verona, and finally went to Bologna and lectured on S.; and there (June 8, 1275) completed his work on S. He is the first It. surgeon who treats at any length of the surgical affections of women. Gilbertus Anglicanus (1290) appears to be the first Eng. writer on S. In 1271 Pitard founded the Coll. of St. Côme at Paris, and his observations on wounds of the head and on poisoned wounds are still remembered.

The 13th century is conspicuous as the era in which most of the great European univs. were founded. Lanfrancus, a Milanese and a pupil of William of Salicet, is generally regarded as the creator of S. in Fr. At this time flourished Master Jehan Ypermann (1295-1350), lately styled the Father of Flemish S. During the 14th century surgical science was dead in It. Bartolomeo de Varignana dissected human bodies in 1290. Mondini de Lucei also publicly dissected at Bologna the cadavers of 2 women. Early in the 14th century John of Gaddesden practised S. with success at Ox.; John of Ardenm flourished about 1350 in Newark and Lond. Guy of Chauliac practised in Avignon in the middle of the 14th century with renown, and his numerous works on S. are still consulted. In them we find the first mention of the Caesarian operation. In the latter part of the 14th century the school of Montpellier rapidly declined. Both It. and Fr. were desolated by contending factions. Nicolo Faloucci (d. 1412) or Nicholas of Florence compiled voluminously on S. In 1493 Peter of Argelata professed S. at Bologna, while Leonardo Bertapaglia (1420) is said to have practised human dissections at Padua. Arculanus (1427) taught with credit at Verona and Ferrara, and Antonio Benivieni, a Florentine nobleman (1460), is probably the first writer treating systematically of morbid anat. Heinrich von Pflsprundt wrote his *Buch der Blindt-Ertzney*, containing an early observation on shot wounds, and Hieronymus Brunswig (b. 1490) pub. a treatise on the *Handverueckung der Wundtartzney*. In 1490 Colot, a Fr. surgeon in favor with Louis XI., performed lithotomy successfully on a condemned criminal. With the revival of letters and of the natural sciences in the 16th century a new era dawned on S. Investigation of anat. in the true spirit was undertaken by Vesalius (1513-64). Fallopius (1532-62) and Eustachius (1520-79) worthily succeeded him. Fabricius of Acquapendente (1537-1619), a pupil of Fallopius, was the teacher of William Harvey (1578-1675), the discoverer of the circulation of the blood. Gasparo Aselli (1581-1626) followed with the discovery of the lymphatic vessels. Preceded by John de Vigo (1520) and by the Swiss surgeons Hans von Gersdorf (1520)



and Felix Würtz (1576), appears Ambrose Paré, the founder of the modern Fr. school, and reckoned the ablest of early army surgeons. He was the restorer of the art of securing arteries by ligature after amputation—an advance which alone sufficed to secure for him immortality. His mere presence in a besieged town was enough to reanimate the garrison.

In the 17th century the impulse given to the sciences by the diffusion of learning led to further improvements. Fabricius Hildanus of Berne (1560-1634) was styled the father of Ger. S.; Richard Wiseman surgeon to Charles II., the father of Eng. S. Hol., restored to liberty in this century, furnished several good surgeons who promoted their art.

In the 18th century we find great advances in S., and the Fr. surgeons, J. L. Petit, P. J. Desault, Dominic Anel of Toulouse, in the front rank. The institution of the Royal Acad. of S. at Paris (1731) had great influence on the advancement of S. throughout the world. Its *Mémoires*, composed of contributions from the most eminent men, constituted a rich mine of information. In Eng. S. attained great eminence in this century, and the brilliant and illustrious John Hunter (1728-93) is justly ranked with the greatest minds that have graced the profession. It is about the middle of the 18th century that attention is first attracted to Amer. In 1763 lectures on anat. and S. were delivered in Phila. by Dr. Shippen, and in 1791 the med. school of that city was completely established under Benjamin Rush. At the threshold of this century Fr. surgeons were still in the foreground. In Ger. the advance of S., if not as brilliant, was relatively as decided. At the commencement of the century the Vienna school in ophthalmology was pre-eminent. In G. Brit. a succession of surgeons of the first merit rivalled their Fr. contemporaries, and in the U. S. great advances have been made in practical S.

As the middle of the century is approached the boundaries of nationality seem to vanish from the domain of S. With marvellously increased facilities for intercommunication, all advances in the art are speedily known throughout the civilized world. One result of the emulative ardor with which S. has been latterly cultivated is the prevalent tendency to pursue special branches of the art. The discoveries and improvements in S. in the 19th century are not inferior to those of any preceding age. [From orig. art. in *J.'s Univ. Cyc.*, by GEORGE A. OTIS, M. D.]

**Su'ricate** [Fr. *suricate*], sometimes called **Zenick** [*Suricata capensis*], a carnivorous viverrid mammal of S. Afr., about 12 inches long, with a tail of something more than half that length, and closely resembling the ichneumon; of a grayish-brown color, tinged with yellow, and faint darker bands across the back. Its habits are nocturnal, dwelling in burrows.

**Surinam, or Dutch Guiana.** See GUIANA.

**Surrey** (HENRY HOWARD), EARL OF B. in 1516, was the eldest son of Thomas Howard, duke of Norfolk; passed his youth at the court of Henry VIII.; in 1544 he commanded the Eng. forces in Fr.; was made field-marshal, and gov. of Boulogne; in Jan. 1546 he suffered a reverse; committed to the Tower, was released, but again arrested upon charge of treason for having quartered the royal arms upon his escutcheon; was condemned, and beheaded upon Tower Hill Jan. 19, 1547. His works consist of sonnets, amatory poems, elegies, paraphrases of the Bible, and translations of the second and fourth books of the *Æneid*.

**Survey'ing** [Lat. *super*, "over," and *videre*, to "look"], a branch of applied math. whose object is to determine the relative positions of points on or near the surface of the earth. It may be divided into 2 great branches—*plane S.* and *geodesic S.* In plane S. the curvature of the earth is not taken into account, the general surface being regarded as a plane; in geodesic S., the curved form of the earth's surface is considered. The former is employed when only a small portion of the earth's surface is to be examined; the latter when a large extent of terr. is involved.

**Plane Surveying.**—A plane survey may be undertaken for any one of a great number of objects. We have, accordingly, a great number of branches of the subject, of which *land S.*, *topographical S.*, *hydrographical S.*, *railroad S.*, and *mining S.* are the most important.

**Geodesic Surveying.**—A geodesic survey may be made for the purpose of determining the length of an arc of the earth's meridian, or for the more general object of ascertaining the grand outlines of an extended tract of country. To the former we may refer the survey commenced by Fr. in the latter part of the last century for determining the length of a meridional arc through Paris reaching from the equator to the pole. This survey resulted in finding a value for this arc in terms of the *toise*, and the value found, divided by 10,000,000, was made the basis of the Fr. system of measures and weights—a system known as the "metric system," and now adopted by many nations. To the latter we may refer the trigonometric surveys that have been carried on by almost all civilized nations of the earth for ascertaining the geographical features of their respective territories. As examples we may mention the trigonometric survey of G. Brit., known as the *Ordnance Survey*, the great survey of India, and the survey of our own country now in progress, and known as the *Coast Survey*. W. G. PZEC.

**Surviv'orship.** When two or more persons are jointly interested in certain legal relations, and one of them dies, the others are termed "survivors;" and not only the mere act of being thus left, but more especially the sum of legal rights and duties belonging to them by virtue of being thus left alive, is termed "survivorship." The peculiar and essential feature of S. consists in the fact that, so far as the joint relation extends, the legal rights and obligations of the deceased pass to his survivors, and not to his heirs or administrators; or, to speak more accurately, these rights and duties remain in the survivors, having been entirely extinguished in respect to the deceased. The doctrine of S. exists in the following legal relations: (1) joint owners of

land, (2) trustees, (3) joint debtors, (4) joint creditors, and (5) partners.

**Su'sa** [the *Shushan* of the Scripts, the Gr. *za Susa*, "the city of lilies"], an anc. city of Per., the cap. of the prov. of Susiana, and one of the residences of the Per. monarchs. The city was at the time of Alexander the Great one of the largest and most magnificent cities of the world, celebrated for its delicious climate, containing a gorgeous palace and temple, and used as the treasury of the realm.

**Susan'nah, History of,** a short apocryphal book, regarded by the R. Cath. Ch. as the 13th chapter of Daniel. It relates the story, the temptation, and virtue of Susannah, a beautiful Jewish matron, the punishment assigned her by her enemies, her final rescue from death, and the overthrow, by the judgment of young Daniel, of the wicked men who designed her ruin.

**Suspen'sion Bridge,** R. R. centre, Niagara co., N. Y., on Niagara River, 1½ m. below the Falls, so named from the great railway suspension bridge 800 ft. long, 24 ft. wide, with the railroad 15 ft. above the carriage-way. Begun in 1852, the first locomotive crossed in Mar. 1855. It is used by N. Y. Central and Erie R. Rs. The U. S. gov't. has a stone edifice, for custom-house and P. O. Pop. 1870, 2376; 1880, 2476.

**Susquehanna River,** R. R. junc., Susquehanna co., Pa., on Susquehanna River, Pop. 1870, 2729; 1880, 3467.

**Susquehanna River** is formed by the Union of its E. and W. branches at Northumberland, Pa. The E. branch, the larger, rises in Otsego Lake, Otsego co., N. Y., at an elevation of 1300 ft. The W. branch rises in Cambria co., Pa. It has a course through a region abounding in timber and coal, but less celebrated for its fertility and beauty than the valley of the E. branch, a portion of which, called the Wyoming Valley, is world-renowned for historic events and mineral wealth. The main S. flows first in a S. and then in a S. E. course through a wide, fertile, and picturesque country of Devonian slates and limestones. It reaches the head of Chesapeake Bay at Port Deposit, Md. It is nowhere navigable to any extent, save in the spring. The length of the main stream is 150 m., of the W. branch 200 m., of the E. (or N.) branch 250 m.

**Sus'sex** (EARLS AND DUKES OF). This title has been borne by persons of different families: THOMAS RATCLIFFE, earl of S., b. in 1526, was sent in 1553 as Eng. ambassador to the emp. Charles V. to negotiate the marriage between Queen Mary and Philip of Sp., son of the emp.; made knight of the Garter and lord deputy of Ire., and in 1569 pres. of the North; put down the insurrection against Elizabeth headed by the dukes of Northumberland and Westmoreland; was made lord chamberlain. D. without issue July 9, 1583.—AUGUSTUS FREDERICK, duke of S., sixth son of George III., b. at Buckingham Palace Jan. 27, 1773, went to It., and there contracted a marriage with Lady Augusta Murray, daughter of the earl of Dunmore; the court of prerogatives pronounced this marriage to be null and void, but the prince and the lady lived together as man and wife until her death in 1830. The marriage of Prince Augustus Frederick was highly offensive to his father, and he was always in disgrace at court, and it was not till 1801, when he was 28 yrs. old, that he was created duke of S. He took no part in public affairs, but collected an extensive library, and was fond of presiding at public dinners. D. Apr. 21, 1843.

**Suth'erland** (DUKES OF). GEORGE GRANVILLE LEVESON-GOWER, the first duke, b. Jan. 9, 1758, was the son of the marquiss of Stafford. His uncle, the duke of Bridgewater, dying in 1803, he inherited his immense property, which, with the estates which he already held, made him the most wealthy nobleman of Eng. D. July 19, 1833. The Bridgewater estates were entailed upon his second son, Francis, while the remainder of the property devolved upon the eldest son, GEORGE GRANVILLE SUTHERLAND-LEVESON-GOWER, the second duke (b. in 1786, d. Feb. 28, 1861), who is chiefly noted as the husband of Harriet Elizabeth Georgiana, daughter of the earl of Carlisle, famous for her patronage of anti-slavery and other philanthropical movements (b. May 21, 1800, d. Oct. 27, 1898). The present and third duke is GEORGE GRANVILLE WILLIAM SUTHERLAND-LEVESON-GOWER, b. Dec. 19, 1828. He is one of the wealthiest of Brit. peers.

**Sut'lej**, the easternmost of the "five rivers" of the Punjab, rises in Thibet, at an elevation of 20,000 ft. above the sea, breaks through the Himalaya as a furious torrent at an elevation of 8494 ft., flows in a S. W. direction, and joins the Indus as a calm, majestic stream.

**Sut'ra** [Sans. a "thread"], in Sans. lit., the technical name of the numerous series of religious aphorisms and rules which constitute an important part of Hindoo lit., including all the ritual, grammatical, metrical, and philosophical works.

**Suttee** [Sans. *Sati*, "a virtuous wife"], a term incorrectly applied by Eng. writers to denote the practice formerly common in India of a widow burning herself on a funeral pile along with the body of her husband. Between 1815 and 1826 there were above 7000 cases of S. in Bengal alone. A prohibitory law was enacted in 1829.

**Sut'ter** (JOHN AUGUSTUS), b. at Kandern, Baden, Feb. 15, 1803, grad. as a Swiss military officer at Berne, and in 1834 emigrated to Amer.; established himself as a trader at Santa Fé, N. M.; in 1838 sailed for the S. I., thence back to Alaska; was stranded in the Bay of San Francisco July 1839. He made his way into the interior, received a Mex. grant of land, and in 1841 built New Helvetia, on the site of the present Sacramento. The Mex. gov't. made him gov. of the N. dist. of Cal., and when the Amers. came into possession of the region he was appointed alcalde and Indian agent. He was in Feb. 1848 engaged in enlarging the race agent. He was in Feb. 1848 engaged in enlarging the excavation of his saw-mill, when gold was discovered in the vicinity. This discovery soon proved his financial ruin. In 1873 he left Cal. and took up his residence at Lititz, Lancaster co., Pa. D. June 19, 1880.

**Sut'ton**, on R. R., Clay co., Neb., 60 m. W. of Lincoln. Pop. 1880, 1630.



**Su'warow, or Su'voroff** (ALEXEI VASILIEVITCH), COUNT RIMNISKI, PRINCE ITALSKI, b. in Finland Nov. 24, 1729, entered early the Rus. army, and was made a col. after the battle of Kunersdorf, Aug. 12, 1759, and a gen. in 1783, after the campaign against the Tartars on the Kuban. As commander-in-chief in the Tur. war of 1787 he defeated the Turks at Kinburn Oct. 1, 1787, at Fokshany Aug. 1, 1789, on the banks of the Rymnik Sept. 22, 1789, and took Ismail with great slaughter Dec. 22, 1790. In 1794 he commanded in Poland, and took Pragwitz Sept. 24, 1794, after which Catharine II. made him field-marshal. But his most brilliant exploit was his it. campaign in 1799. He defeated the Fr. at Trebia July 17-19, 1799, and at Novi Aug. 15, 1799, and then crossed the Alps to join the Aus. under Korsakoff and Hotz. But both the Aus. gens. had been defeated, and S. was compelled to retreat. D. May 17, 1800.

**Swa'bia, or Suabia** [Ger. *Schwaben*], was formerly the name of a terr. of S. W. Ger., corresponding to the present Württemberg and Baden, and bounded S. and W. by the Rhine, which separated it from Switz. and Fr., and N. and E. by the Palatinate, Franconia, and Bavaria. Its original name was *Alemannia*.

**Swain** (DAVID LOWRY), LL.D., b. near Asheville, N. C., Jan. 4, 1801, grad. at the Univ. of N. C.; was admitted to the bar in 1823, elected to the State legislature 1824, appointed judge of the supreme court 1831; was gov. of the State 1832-35, and from 1835 to his death pres. of the Univ. of N. C. He pub. *Hist. of the Brit. Invasion of N. C.* in 1776. D. Aug. 28, 1868.

**Swainson** (WILLIAM), b. in Liverpool Oct. 8, 1789, devoted himself especially to the study of nat. hist. In 1841 he emigrated to New Zealand, where he pub. several works on the nat. hist. and social and political condition of that colony and Tasmania. Among his works, many of which have become standard and have passed through several editions, are *Zoological Illustrations*, *Exotic Conchology*, 11 vols. on zoology, etc., in *Lardner's Cabinet Cyc.*; *Birds of W. Afr. Fly-Catchers*, *New Zealand*, etc. He also made a govt. survey and report of the forests and trees of Tasmania. He appears to have been living as late as 1876.

**Swallow** [A.-S. *swaſele*], the Eng. name given to birds belonging to the family Hirundinidæ, and which are distinguished by their wide deep gape, allusion to which is evidently conveyed in the name. They all have the form familiar in the common S. of the U. S.; the neck is rather short; the head full; the bill short, but comparatively broad and depressed, triangular, the sides rapidly converging, and the whole slightly decurved toward the tip; the gape is very deep, and continued backward nearly as far as or quite under the eyes; there are no distinct rictal bristles; nostrils sub-lateral; the wings are long and pointed, and have only 9 primaries, of which the second is generally longest, but the first is nearly or quite equal to it; the tail is forked or emarginated, and normally consists of 12 feathers; the legs are weak and small, the tarsi being not longer than the middle toe; the tarsi have each 2 lateral undivided plates, meeting behind in a sharp ridge; the toes are not versatile, long and slender, 3 anterior and 1 posterior, and with the normal number of joints; the claws curved and acute, but slender. The species are quite numerous, and representatives are found in almost every land and every zone save the extreme polar regions. The species are among the most active and graceful of birds, and their circling and sweeping flight is well known to observers. They feed almost exclusively on insects, which they take on the wing. Their mode of nesting is various.

**Swampscott, Mass.** See APPENDIX.

**Swan** [A.-S.], a name applied to those swimming birds of the family Anatidæ which have a bill nearly equally broad throughout and as long as the head; the cere soft and extending to the eye; the front toes with a large web; the hind toe without a lobe; the tail short and rounded; the second and third wing-quills the longest. They are the largest species of the family, and among the largest of birds. Swans live to a great age. They are mostly beautifully white, and their down is prized for trimming ladies' garments, but an Australian species is black.

**Swan** (JAMES), b. in Fifeshire, Scot., in 1754, came to Amer. at an early age; was clerk in a mercantile establishment in Boston; pub. a *Dissertation to G. Brit. and the Colonies from the Slave-Trade to Afr.*; was one of the "Boston tea party;" aide-de-camp to Warren at Bunker Hill, where he was wounded; became member of the legislature in 1778, and afterward adjutant-gen. of the State. He went to Paris in 1787, deeply involved in debt; wrote *Causes qui sont opposées au Progrès du Commerce entre la France et les États-Unis de l'Amérique*. He acquired a large fortune, returned to Amer. in 1795, and became famous for his munificence. In 1798 he returned to Europe, and was engaged in important commercial and financial enterprises until 1815, when, upon the suit of a German with whom he had transactions, he was arrested and thrown into the prison of Ste. Pélagie in Paris. He pub. *On the Fisheries, Fisheries of Mass.*, etc. D. Mar. 18, 1821.

**Swan** (WILLIAM DRAPER), b. at Dorchester, Mass., Nov. 17, 1809, was for many yrs. prin. of the Mayhew Gram. School, Boston; afterward became a publisher, and in 1862 was elected to the State senate; prepared a series of popular books for schools, and wrote *The Critic Criticised*, and *Worcester Undivided*. D. Nov. 2, 1864.

**Swann** (THOMAS), b. at Alexandria, Va., was ed. at Columbian Coll. and the Univ. of Va.; studied law at Wash., and was appointed sec. to the Neapolitan commission; settled at Baltimore in 1834; became a director of the Baltimore and O. R. R. in 1836, and its pres. 1847-53, and was also pres. of the N. W. Va. R. R.; in 1856, and again in 1858, was elected mayor of Baltimore. In 1864 he was elected gov. of Md., and in 1866 U. S. Senator. In 1868 he was chosen a Rep. in Cong., and in 1875 was chairman of the committee on foreign affairs. D. July 24, 1883.

**Swansea**, swon'see, town of Eng., co. of Glamorgan, S. Wales, at the mouth of the Tawe, where a good harbor has been built. The town is the centre of the Eng. copper production. Copper ore is brought hither not only from G. Brit. and Ire., but also from Cuba and Australia, and 185,000 tons of copper are annually produced. Very important too are its breweries, tanneries, and manufactures of iron, pottery, and porcelain, and of patent fuel, a mixture of culm and tar in the shape of bricks. Pop. 63,739.

**Swanton, Vt.** See APPENDIX.

**Swatow, or Chow-Chow**, town of Chi. prov. of Quang-Tong, on the Chi. Sea, has a good harbor, open to foreign commerce. Sugar, rice, paper, and tobacco are exported; opium, cotton and woollen goods, and metallic wares are imported.

**Swayne** (NOAH HAYNES), LL.D., b. in Culpeper co., Va., Dec. 27, 1804, studied law, was admitted to the bar in 1824, and commenced practice at Coshocton, O.; in 1829 was elected to the State legislature; was U. S. dist. atty. 1830-39; was again elected to the legislature in 1836, and was prominent in organizing asylums for the deaf and dumb, the blind, and the insane; in 1861 was appointed a justice of the U. S. supreme court; resigned 1881.

**Sweaborg, swä'ah-borg, or Sveaborg**, a fortress of Rus., on the N. coast of the Gulf of Finland, occupying 7 small islands which outlie the town and harbor of Helsingfors, and are connected by boat-bridges. The place was bombarded by the allied fleets in 1855.

**Sweating Sickness**, one of the several prevalent and fatal epidemics occurring during the 15th, 16th, and early part of the 17th centuries. It was also known as "pestilential sweat" and as the "English ephemera," as the Eng. people both at home and abroad were chiefly attacked. By Hecker, Guy, and others the several epidemics of this disease are ascribed to preceding periods of atmospheric and telluric insalubrity, the influence of gathered armies, and to the absence of house and street drainage in the larger cities and towns. Hecker has termed it "a rheumatic fever in the most exquisite form that has ever yet been seen in the world." It has also been regarded a form of influenza or catarrhal fever. Guy considers it undoubtedly of malarial nature, an ague with short febrile and sweating stages, often malignant and fatal in the first or congestive period, and in convalescence leaving, as in all malarial periodic disorders, a temporary lassitude and frequent recurrences. The treatment most successful in these epidemics was absolute rest for 24 hours, and blanketing, warm air, and warm drinks to hasten profuse sweating. E. D. HUDSON, JR.

**Sweden** (KINGDOM OF) occupies the larger part of the Scandinavian peninsula, extending between lat. 55° 20' 18" and 69° 3' 21" N., and comprising an area of 170,979 sq. m. Agriculture forms the prin. occupation, and employs about ¾ of the whole pop.; there are 233,650 land-owners. Rye thrives everywhere, wheat only in the S. parts; barley is the most common cereal. Oats, peas, and beans can be raised only as high as lat. 64° N., but potatoes everywhere. The annual production of grain is larger than the country needs, and valued at \$20,000,000. The cattle-breeding is still capable of great development. There are many cattle, but not improved. The horned cattle and the horses are small but vigorous; the sheep yield only coarse wool. The number of reindeer is estimated at 100,000. The forests form a considerable part of the national wealth, and their management is of the highest importance. Wood is not only used as fuel, but most houses are built entirely of this material, and it forms a valuable export. About 20 per cent. of the forests belongs to the state or public property. They consist chiefly of fir and spruce, mixed with birch, alder, and ash; S. of the Dal-Elf the oak appears, and in the southernmost provs. the beech. Mining and smelting are of great importance. S. is rich in ores, especially in iron ores. They occur chiefly within a belt extending from E. to W. from Uppland and the S. parts of Gesbrikland, through Westmanland, Nerike, and the S. parts of Dalarna, to the E. part of Wernmland. S. possesses coal only in the prov. of Skåne. The forests in the neighborhood of the mines are nearly exhausted. Large quantities of iron and steel are exported, especially to Eng. Next to iron, copper is the most important. Only small quantities of gold are produced; silver, lead, and zinc are found. Salt, manganese, sulphur, graphite, and feldspar occur, though only in small quantities. Peat is abundant. The fisheries yield a considerable profit, especially those of herring on the Baltic coast and of salmon in the rivers. The chemico-technical industry, though still very young, is highly developed in several directions. Thus, the Swe. matches, for instance, are celebrated all over the world. Manufactures of acids and salts are established at Stockholm, Göteborg, and Fahlun; of manures at Stockholm and Göteborg; of fats and soaps, mineral and wood oils, of dyestuffs, etc., at several places. Sugar-refining is an important branch of industry; of whiskey about 38,000,000 litres are annually produced; about 100 tobacco manufactories are in operation. The manufactories of woollens at Norrköping, Stockholm, Halmstad, Malmö, Landskrona, and other places consume annually 1,750,000 kilograms of foreign wool, without satisfying the demands of the country. The cotton industry has been very fluctuating since the Amer. war. The linen manufactures are chiefly dependent on home industry, though there are large weaving-factories at Almedal and Göteborg. The silk industry stands at the same point of development as centuries ago, and is unimportant. The leather industry is small. The centre of the manufacture of metallic wares is the town of Eskilstuna in Södermanland. The standard of gold and silver is regulated by the govt. The industry in wood is considerable, though chiefly home industry. The potteries and the stone and glass factories produce fine articles. The building material is mostly granite; the porphyry articles from Elfdal in Dalarna are celebrated; the glass manufactories at Kosta and Limmared are important;



earthenware is made at Rörstrand, Gustafsberg, and Höganas. The hardware manufactures are small, but the paper manufacture has recently increased, and several fine inventions have been made in the manufacture of paper from wood. The prin. articles of exportation are the products of agriculture, the forests, the mines, and the fisheries. The prin. articles of importation are colonial goods, spinning materials, textile fabrics, hides, leather, guano, coal, salt, and railway materials. Nearly all the foreign commerce is carried on by sea, and for the greater part by foreign vessels. By the convention of Dec. 18, 1872, between S., Nor., and Den., the *krona* (crown), a gold coin equal in worth to the old *riksdaler*, was made the basis of the coinage. On Dec. 31, 1880, the pop. numbered 4,565,668. The average annual emigration between 1860 and 1870 amounted to 12,245; the emigration fell to 7791 in 1874, but rose again to 49,920 in 1882. With the exception of 16,412 Finns and 6600 Lapps, the rest of the population belongs to the Scandinavian branch of the Teutonic family. The most important towns are Stockholm (168,775), Göteborg (76,401), Malmö (38,054), Norrköping (26,735), Gefle (18,758), Carlskrona (18,300), Jönköping (16,147), Upsala (15,675), and Lund (14,304). Politically, the country is divided into 25 *län*, but the geographical division of the country into 3 parts is also still in use—Sweden, the central part; Götaland, the S. part; and Norrland, the N. Lapland, the northernmost part of the country, belongs to Norrland. Norrland and Lapland comprise more than  $\frac{1}{2}$  of S., but it has only 330,000 inhab. The established Ch. is the Lutheran. The ecclesiastical division comprises 12 episcopal sees. The govt. is a constitutional monarchy. An act of July 31 and Aug. 6, 1814, regulates the relations to Nor. All govt. business is laid before the king in the state council, and there despatched. The state council consists of 10 members, among which are the chiefs of the 7 depts. of justice, foreign affairs, war, navy, interior, finances, and worship and education. The popular representation, called the *riksdag*, consists of 2 houses. The consent of both houses is necessary to issue a law, to fix the budget, to levy taxes and duties, etc. In questions relation to the ecclesiastical const. the consent of the ch. assembly (*kyrkoförsamling*), convened every 5 yrs., is necessary. Every third yr. the chiefs of the nobility assemble in a cong. of nobles to discuss their own affairs, but the nobility has no prerogatives. The interior self-government, which is very old, received its present form by the law of Mar. 21, 1862. Each of the 50 towns, and in the country each parish—of which there are about 2900—forms a community. The *läns* form communities of a higher order, in which self-government is carried on by assemblies of deputies. The Swe. law is not based on the Rom. law, but developed independently, according to the wants of the people. The budget of 1883-84 shows total receipts to be £4,389,777, and total expenses the same. At the end of 1883 the public debt amounted to £12,719,525. The army consists of 5 classes of soldiers: (1) *värffade*, volunteers who are engaged for 6 yrs.; (2) *indelta*, troops in cantonment, who receive a certain payment in money or naturalia, possess house and ground, and annually serve for several weeks; they are bound to serve as long as capable; (3) *befäring* or *landvärn*, troops levied by conscription, among which every Swede is bound to serve from his 20th to his 25th yr.; (4) the militia of Götaland, which is not bound to serve outside of the island; (5) the volunteer *tränings*, established in 1861. In 1881 the army numbered 41,280 men of the line, 135,337 in the reserve, and 26,166 in the militia; in all, 202,783 men. In 1881 the navy consisted of 1 ship of the line, of 800 horse-power, 66 guns, and 735 men; 1 frigate, of 1400 horse-power, 16 guns, and 316 men; 4 corvettes, of 5680 horse-power, 21 guns, and 565 men; 4 monitors, of 1570 horse-power, 8 guns, and 330 men; 10 small monitors, of 1191 horse-power, 10 guns, and 411 men; 21 gunboats, 1 transport vessel, 2 avisoes; beside 10 sailing vessels, with 105 guns and 1547 men, and 87 rowing vessels, with 113 guns. Within recent years a network of railways, very important for the trade and industry both of Sweden and Norway, has been constructed in the country, partly at the cost of the state. At the end of 1882 the total length of railways in Sweden was 3940 miles, of which 1395 belonged to the state. All the telegraphs in Sweden, with the exception of those belonging to private railway companies, belong to the state. The total length of all the telegraph lines at the end of 1882 was 5233 miles, and the total length of telegraph wires 12,720 miles. The number of telegraphic despatches sent in 1882 was 1,175,882. Popular education is obligatory and good. In 1882 there were 9639 elementary schools with 11,387 teachers and 659,815 pupils, being quite 94 per cent of all the children between 6 and 15 years of age, also 9 seminaries for the education of teachers; 77 higher schools, 21 academies, and 2 universities, one of them situated in Upsala and the other in Lund.

**History.**—The introduction of Christianity and the consolidation of a national empire were accomplished during the reign of Eric IX. (d. 1160). The contest between the 2 royal families—that of Sverker and that of Eric—which began in 1061, continued, however, up to 1250. During these controversies there arose a number of powerful families which, in connection with the higher clergy, suppressed the people and opposed the royal power. The most powerful of these families was that of the Folkunger, from which issued a new dynasty (1296-1365). By the battle of Enköping (1365) Albert of Mecklenburg obtained the crown, but was defeated at Falköping (1389) by the Danes, and Margrethe, daughter of the Dan. king Waldemar, and widow of the Norwegian king Haco, now became queen of S. Her grand-nephew, Eric of Pomerania, was chosen heir-apparent at Kalmar (July 20, 1397), and at the same time a union was concluded between S., Nor., and Den., and lasted up to the 16th century. But Christian II. of Den. made himself hateful by his cruelty (the Stockholm massacre, Nov. 8, 1520), and by the valor of the peasants of Dalarne, Gustavus Wasa succeeded

in expelling him, and ascended the throne in 1523. He broke the power of the R. Cath. clergy, but under his successors, Eric XIV. and John III. (1560-92), they recovered their influence, and the country was agitated by religious disturbances. Sigismund (1592-1600), a R. Cath., was overthrown by his uncle, Charles IX. (1600-11), a zealous Prot.; and his son, Gustavus Adolphus (1611-32), became a celebrated king and gen., the champion of Protestantism, and the dangerous enemy of Aus. during the Thirty Years' war. Nevertheless, under his reign the nobility were powerful and the people were poor. The power of the nobility still more increased under the govt. of Queen Christina and the Chancellor Oxenstiern. S. obtained by the Peace of Brömsebro (1645) the island of Gotland and other important terrs. from Den., and by the Westphalian peace (in 1648) Pomerania, Rügen, Wismar, Bremen, and Verden. Her political influence was considerable. Charles X. Gustavus (1654-60) involved the country in wars with Den., Poland, and Rus., but gained by the Peace of Roeskilde (1658) Skåne and the whole S. part of the present S. from Den. Charles XI. (1660-97) regulated the relations of S. to Poland, Brandenburg, and Aus. by the Peace of Oliva (May 6, 1660), to Den. by the Peace of Copenhagen (June 23, 1660), and to Rus. in 1661, and left the country in a good state to his son, Charles XII. S. had at that time reached the culminating point of its power. But Charles XII. ruined it for a whole century by his senseless wars. By consenting to the establishment of a constitutional govt., Ulrica Eleonora, the sister of Charles XII., and married to Friedrich of Hesse, was chosen regent. On Feb. 21, 1719, she made oath on the const., according to which a state council of 24 persons was to take part with the king in the govt. Meanwhile the war went on, but unfortunately. Two parties arose in the state councils—the *Hats* and the *Caps*—and from 1720 to 1772 their rivalries greatly disturbed the country. The Hats were the friends of the king; the Caps contended for freedom and progress. In 1741 the Hats prevailed with the king, and the war with Rus. was renewed, but it was unlucky, and by the Peace of Åbo (in 1743) S. lost a part of Finland. On Mar. 25, 1751, Adolphus Friedrich of the house of Holstein-Gottorp ascended the throne, but the state council had at this time assumed the whole power of governing. The king was almost without influence. In the Seven Years' war S. joined Fr., but with small effect. Gustavus III., who ascended the throne in 1771, broke the power of the nobility, but was assassinated Mar. 29, 1792, and succeeded by his son, Gustavus IV. Adolphus. Under his govt. S. interfered in a most awkward manner in the affairs of Europe; finally, the army rebelled and deposed the king Mar. 29, 1809. The duke of Södermanland succeeded, and reigned from June 6, 1809, as Charles XIII., but as he had no children the French marshal Bernadotte was chosen crown prince, and he soon became the real ruler of the country. He refused to join Nap. in his war against Eng., concluded an alliance with Rus., and led the S. army in 1813 and 1814, in reward for which he obtained Nor. from Den. by the Peace of Kiel (Jan. 14, 1814). Bernadotte ascended the throne as Charles XIV. John, Feb. 5, 1818. His measures for the material development of the country were successful, but in other respects his govt. was destitute of any definite character—a perpetual yielding to the nobility. He d. Mar. 8, 1844, and was succeeded by his son, Oscar I. During the reign of his son, Charles XV., who succeeded him July 8, 1859, the constitutional reform was accomplished, June 22, 1866. D. Sept. 18, 1872; succeeded by his brother, Oscar II. [From orig. art. in *S.'s Univ. Cyc.*, by AUGUST NIEMANN.]

**Sweden, Language and Literature of.** See SWEDISH LANGUAGE AND LITERATURE.

**Swedenborg** (EMANUEL, b. in Stockholm, Swe., Jan. 29, 1688. His father, Jesper Swedenborg, was bp. of Skara in W. Gothland, and was charged with the care of the Swe. chs. in Eng. and in the N. Amer. colonies. His family was ennobled in 1719, and took the name of Swedenborg. After leaving the Univ. of Upsala he travelled through Europe; visited It., Fr., Ger., Hol., and Eng., publishing most of his books in those countries; applied himself to math. and mechanics, to the natural sciences, and to physiology. In 1716 he was made assessor of the board of mines by Charles XII. He assisted the king at the siege of Fredericksshall in 1718 by transporting some vessels over 14 m. of land by machines of his own invention. At Leipzig, in 1722, he pub. *Miscellaneous Observations* on various scientific questions. In 1734 he pub., at the expense of the duke of Brunswick, his *Philosophical and Mineralogical Works*, of which the first vol. is his *Principia, or the First Principles of Natural Things, being new Attempts toward a Philosophical Explanation of the Elementary World*. This very remarkable work is a complete cosmogony. He held that matter is resolvable in the last analysis, but not into definite atoms or molecules occupying space, but into points of dynamic force; sets forth distinctly the nebular hypothesis; asserts that nature is everywhere the same, in great as well as in little, mere size making no difference; each maintained a peculiar doctrine of vortices, looking on each molecule, which is derived from the primal point, and each sun and earth formed of molecules, as all having the gyrating force of the primal point, which he defines as nature. He held total motion, and as the origin of all things in nature. He held also that heat, light, and electricity were but modifications of one element, one ether, and that magnetism is in all matter, latent or active, and is one of the means and forces by which matter exists. In 1734 he pub. *Principia, or the First Principles of Natural Things, being new Attempts toward a Philosophical Explanation of the Elementary World*, small work on *The Infinite, and the Prime Cause of Creation, and the Mechanism of the Operation of the Animal Kingdom*; in 1744 *The Economy of the Animal Kingdom and The Worship and Love of God*. In 1745, he tells us, he "was called to a new and holy office by the Lord himself, who manifested himself to him in person, and opened his sight to a view of the spiritual world, and granted him the privilege of conversing with spirits and angels." In 1747 he resigned his office of assessor.



From 1749 to 1756 he pub. the *Arcana Cælestia*; in 1758, among other works, *On the New Jerusalem and its Heavenly Doctrines*; in 1763, *The Doctrine of the New Jerusalem*, etc.; in 1769, *A Brief Exposition of the Doctrine of the New Church and The Intercourse between the Soul and the Body*. In 1771 he pub. his last work, *The True Chr. Religion, containing the Universal Theology of the New Church*. D. Mar. 20, 1772.

In his system religion and philos. are one. His scientific and philosophical works, pub. before what his disciples call his illumination, are characterized by exact statement and sustained and coherent argument. The same qualities are to be found in his theological writings so far as they relate to principles or doctrines. His rules of life exhibit the man. They were: "I. Often to read and meditate on the word of God; II. To submit everything to the will of Divine Providence; III. To observe in everything a propriety of demeanor, and to keep the conscience clear; IV. To discharge with fidelity the functions of my employment and the duties of my office, and to render myself in all things useful to society." He held that we live while in this world because we have a spiritual body, which fills and animates our material body; that this spiritual body is formed of spiritual substance, and at death leaves the material body and rises into a world of spiritual substance; that spiritual substance stands to the spiritual organs of sense and the mind therein as material substance stands to the material senses, and is related to and affects them in a similar way; that this material substance, while the spiritual body is within it, is an instrument by which the spiritual senses perceive material things, and a barrier between them and spiritual things; and that when it pleases Providence this barrier ceases, wholly or partially, to obstruct the perception by the spiritual senses of spiritual things. Then the spiritual senses are "open." It may be added that S. exhibited in many instances a knowledge of facts which, as it seemed, implied an opening of his spiritual senses. In 1759 S. was in Gottenburg, and on the 19th of July dined at the house of William Castel with a large party. About 6 o'clock he appeared much disturbed, and stated that a dangerous fire had broken out in Stockholm at the Sudermalm, and was spreading rapidly. He then described the progress of the fire, and at 8 o'clock declared that it was extinguished. This was reported to the gov., who sent for S. and received from him a description of the fire. On the 21st a messenger arrived from Stockholm (which is 300 m. from Gottenburg), announcing the fire and describing it precisely as S. had done. Many other circumstances similar to this might be mentioned. But S. never regarded them as of importance in any way, holding that the doctrines of the New Church could be received only in freedom, and by those whose reason they satisfy. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. THEOPHILUS PARSONS, LL.D.]

**Swedenborgians.** See NEW JERUSALEM CHURCH and SWEDENBORG.

**Swedish Language and Literature.** The Swe. lang. is a modern development of that Teutonic lang. which in anc. times was spoken uniformly throughout the whole of Scandinavia, Den., Nor., and Swe. under the name of *Norrana* or *Dönsk Tung*, and which, in the 9th century, was brought to Iceland by the Nor. colonization of that island, where it still lives in its original form under the name of the Icelandic lang. It is impossible to tell exactly at what time this primitive lang. began to separate into the different branches, Dan. and Swe. The Runic inscriptions, in which Swe. is very rich, and which are found from the S. frontier of Den. to the N. part of Swe., show that the separation had not taken place in the 11th century. Nevertheless, in the 16th century, at the time of the Ref., S. had become an independent lang., as different from its mother-tongue, the Icelandic, as from its sister-tongue, the Dan.; and from that time it went on developing on its own principle, but influenced first by the Ger., and then by the Fr. lang., until in the 18th century it became finally settled in its present form, a little earlier than the Dan. Of the Scandinavian langs., the Swe. is, without qualification, the most beautiful. But the style in which it is written is inferior. Only on 2 fields, the humorous song and the historical narrative, has the Swe. style attained any high degree of excellence, and succeeded in establishing this degree of excellence as the general standard. On other fields exaggeration and vagueness are not uncommon.

A series of detached literary monuments from the 14th and 15th centuries, a more collected effort in the 16th, brought about by the Ref., and a rather fantastical attempt in the 17th, inspired by Queen Christina, form the introduction to the hist. of the Swe. lit., which begins in the 18th with Olaf Dallin. This first period, which extends into the next century, to 1800, went through 3 different phases of rising (Dallin), culminating (Gustavus III.), and falling into decay (the Academy), but it may be generally characterized as the reign of Fr. taste. Great activity was shown both in science and in lit. proper. It was the time of Linnæus (1707-78) and Swedenborg (1688-1772). Christopher Polhammer (1661-1751) constructed the Trälhætta Canal and the dock at Carlserona. Johan Ihre (1707-80) wrote his Swe. diet, and a gram. of the Lat. lang., which was extensively used also outside of Swe. Olaf Rudbeck the younger (1670-1740) was a good ornithologist, and C. V. Scheele (1742-86) a great chemist. But it was from the poet Olaf Dalin (1708-63) that the period received its true character. Of his poetical works, *Den Svenska Friheten*, an allegorical epic, and *Brynhilda*, a tragedy, are cold and trivial to our taste, but in their own time they were models, and looked like inspirations; and his satires and minor poems are often witty and ingenious, always lively and elegant. During the reign of Gustavus III. (1771-92) the period reached its culmination. Gustavus was a highly gifted man, eloquent, ambitious, and with a lively sense for poetry and art. Like his uncle, Frederick II., he was deeply imbued with Fr. ideas and Fr. taste, but he was more successful in making his court the seat of the Muses

and Graces, for he was less narrow. I. H. Kellgren (1751-95), C. G. Leopold (1756-1829), and J. G. Oxenstiern (1750-1818), the 3 greatest celebrities of the period, and intimate friends of the king, were not imported from Fr., like Voltaire and Maupertuis; nor were they mere imitators. The Fr. period in Swe. was always thoroughly patriotic; the subjects were taken from Swe. life and hist.

A transition from the classical to the romantic ideal, from the Fr. to the Ger. influence, was formed critically by C. A. Ehrensward (1745-1800) and C. H. Holjer (1767-1812), and poetically by F. M. Franzén (1772-1847) and J. O. Wallin (1779-1839). Great scientists arose—in chem., Johan Jakob Berzelius; in bot., Elias Fries and K. A. Agardh; in hist., Fryxell and Geijer; in med., Retzius; in philos., Boström; in theol., Reuterdaahl and Thomaner. In lit. proper the new time announced itself under 2 forms, the romantic and the national, of which the former was most conspicuous in the contest with the old, while the latter became the true representative of Swe. taste and Swe. civilization. The romantic school, called the "Phosphorists," from *Fosforus*, the name of its journal, was headed by P. D. A. Atterbom (1790-1855) and L. Hammarsköld (1785-1837). The national school, called the Gothic, and represented by the journal *Juanna*, was headed by Tegnér and Geijer. RUNEBERG was a later representative. CLEMENS PETERSEN.

**Sweet Bay.** See BAY.

**Sweetbrier.** See EGLANTINE and ROSE.

**Sweet Flag.** See ACORUS CALAMUS.

**Sweet Gale.** See GALE.

**Sweet Gum.** See GUM TREE.

**Sweet Potato.** the *Batatas edulis*, a convolvulaceous twining plant, a native of S. Asia, whose rich sweet tuberous roots are employed as food. The S. P. is extensively cultivated as an article of food in the U. S.

**Sweet Sop.** the soft, sweet, and aromatic fruit of *Anona squamosa*, a small shrub, a native of tropical Amer., now common in most hot countries. It is extensively used as an article of food.

**Swett (SAMUEL),** b. at Newburyport, Mass., June 9, 1782, grad. at Harvard in 1800; studied law, and entered upon practice, but subsequently became a merchant; was a representative in the Mass. legislature, and during the war of 1812 served on the N. frontier, on the staff of Gen. Izard, with the rank of major. He pub. *Abstract of Baron de Rogiat's Considerations on the Art of War, Hist. of the Battle of Bunker Hill*, etc. D. Oct. 28, 1866.

**Sweyn,** swān, or **Sven,** king of Den. and father of Canute the Great; invaded Eng., conducted several successful campaigns, and proclaimed himself king, but d. (1014) before he had firmly established his power, leaving Canute as his successor.—Another SWEYN, a powerful A.-S. noble, ravaged Wales in 1046; abducted an abbess; fled to Bruges, thereby forfeiting his estates; served in the Eng. fleet against the count of Flanders; was restored to his estates; murdered his kinsman, Bjorn, and in expiation went on a pilgrimage to Jerusalem. D. about 1050.

**Swift,** the name given to certain swift animals. (1) It is most familiar in connection with birds of the family Cypselidae, evidently bestowed on account of their swiftness of flight, and has been extended as a popular scientific term to all the members of the family. These have the same general form as the swallows. (2) In some parts of the U. S., especially of the S. States, S. is also the name given to certain lizards of the family Iguanidae, and particularly to the *Sceloporus undulatus*, a species which runs rapidly.

**Swift (JONATHAN),** D. D., b. in Dublin Nov. 30, 1667. His father died 7 months before the birth of S. His uncle Godwin made some provision for the family, and when Jonathan was 15 had him entered at Trinity Coll., Dublin, where in 1685 he received his degree of B. A. He remained at coll. until 1688, his uncle Godwin having in the mean time died insolvent, his maintenance and education being now assumed by his uncle William. Subsequently S. joined his mother in Eng., where she was living on the bounty of relatives, one of them the wife of Sir William Temple. Sir William received him into his household at Moor Park in Surrey, making use of his services as an amanuensis, and apparently giving him the means of entering himself at Ox. for a short time, where he obtained his degree as M. A. in 1692. It was at Moor Park that the intimacy grew up between Swift and Esther Johnson, known best as the "Stella" of S.'s life. S., who was more than twice her age, took a sort of charge of her education, and as she grew up she became devotedly attached to him. Temple d. in 1699, and S. took possession of Laracor vicarage in 1700, and Stella, accompanied by an elderly female friend, came over to Ire., took lodgings in a neighboring v., but made her residence at the rectory whenever S. went to Lond., which he did every yr. In 1701, on his first visit to Lond., S. made his earliest essay as a political writer in a pamphlet purporting to be a *Discourse on the Contests between the Nobles and the Commons of Athens and Rome*, but which was really a defence of the Whig leaders. In 1708 he went over to the Tories, who now came into power. He now pub. his *Tale of a Tub*, and the author of that witty but indecent burlesque being unfit to wear the lawn sleeves he became a dean of St. Patrick's, and in 1713 went back to Ire. Some 4 yrs. previously he had become acquainted with Hester Van derburgh, whom he celebrates as "Vanessa." She was less than 20, he more than 40 yrs. old; she fell violently in love with him, and urged him to marry her. She finally learned of his relations with her rival, and in 1723 wrote to her demanding to know in what position she stood to S. Stella sent this letter to him; he rode straight to the residence of Vanessa, flung the letter before her without saying a word, and left her. Her heart was broken, and she d. within a short time. There was a scarcity of small coin in Ire., and a patent was granted to one William Wood for coining brass farthings and half-pence to the amount of £108,000. The people were indignant; the Irish Parl. vainly remonstrated,



until one day a letter appeared in a Dublin newspaper bitterly denouncing this debased coinage, and signed "M. B. Draper," followed in quick succession by several others. The *Draper Letters* struck the right chord and gave form to the popular feeling. When at length it was found that S. was the author, he became the popular idol. The *Travels of Lemuel Gulliver* were pub. anonymously in 1726; by 1740 his memory had almost entirely failed, and he became subject to bursts of passion which resulted in furious lunacy, which lasted for 2 yrs., when he sank into a state of complete idiocy, continuing 3 yrs., until his death, Oct. 19, 1745.

**Swift** (JOSEPH GARDNER), LL.D., b. in Nantucket, Mass., Dec. 31, 1783; in 1800 was appointed a cadet at the U. S. Military Acad.; its first graduate, Oct. 12, 1802; promoted second lieu. in the corps of engineers, rising to be chief engineer, with rank of col., July 31, 1812; mainly engaged in the construction of fortifications on the Atlantic coast. In the war of 1812 he first served in the Carolinas on the staff of Maj.-Gen. Pinckney; in 1813, as chief engineer of the army, was engaged in Gen. Wilkinson's campaign on the St. Lawrence, participating in the battle of Chrysler's Field, and subsequently (1813-14) superintended the defence of New York, including Brooklyn and the heights of Harlem; after the war assumed the direct supervision of the Military Acad. Upon his resignation (1818) he was appointed surveyor of the port of New York, which position he held until 1827. In 1829 Pres. Jackson appointed him to superintend the harbor improvements on our great lakes, on which duty he continued until 1845, meanwhile (1830-31) constructing the R. R. from New Orleans to Lake Pontchartrain; was chief engineer of the New York and Harlem R. R. 1833; on peace mission to the Brit. provs. 1841. D. July 23, 1865.

**Swift** (ZEPHANIAH), LL.D., b. at Wareham, Mass., in Feb. 1759, grad. at Yale in 1778; studied law, and practised at Windham, Conn.; was M. C. 1793-96, and in 1800 sec. to Mr. Ellsworth, minister to Fr.; was appointed judge of the supreme court of Conn. in 1801, and was chief-justice 1806-19; was several times elected to the State legislature, a delegate to the Hartford Convention, and a member of the committee to revise the laws of the State; wrote *Domestic Slavery, System of the Laws of Conn., Digest of the Law of Evidence*, etc. D. Sept. 27, 1823.

**Swinburne** (ALGERNON CHARLES), b. near Lond. Apr. 5, 1837, received his education partly at Eton, partly in Fr.; in 1857 entered Balliol Coll., Ox.; made a visit to It. He has pub. *Rosamond and The Queen Mother*, 2 dramas; *Atalanta in Calydon*; *Chastelard, a Tragedy*; *Poems and Ballads*; in conjunction with W. M. Rossetti, *Notes on the Royal Acad. Exhibition, Ode on the Proclamation of the Fr. Republic*, *Bothwell, a Tragedy*, etc.

**Swine**. See BABIRUSSA, HOG, and BOSCH-VARK.

**Swin-ton** (WILLIAM), A.-M., b. in Edinburgh Apr. 23, 1833, came to the U. S. in 1843; studied at Amherst Coll.; in 1853 taught in a female sem. at Goldsborough, N. C., and subsequently in a private school in New York; during a considerable part of the c. war was the correspondent of the *New York Times*; in 1866 received the degree of A. M. from Amherst Coll., and was subsequently appointed prof. of belles-lettres in the Univ. of Cal. Wrote *Rambles among Words, The Times's Review of McClellan, Campaigns of the Army of the Potomac*, etc.

**Swiss Guards**. Bodies of mercenary Swiss troops have since the 15th century been employed in many European countries as body-guards and for duty about courts. The Parisian *Gardes Suisses* were organized in 1616; in 1789 they were roughly handled by a mob, and Aug. 10, 1792, almost every man was killed in the defence of the Tuileries. Louis XVIII. reorganized the S. G. in 1815. In the revolution of 1830 they were defeated and dispersed. At the Vatican the pope's body-guard is composed of Swiss mercenaries.

**Switzerland, Confederation of** [Ger. *Schweiz*; Fr. *Suisse*; It. *Swizzera*]. This state occupies, in the heart of Europe, the culminating region of the continent, from which the land slopes in every direction toward the surrounding seas. From Fr., on the W., it is separated by the Jura Mts.; on the N. the Rhine and Lake Constance mark its boundary toward Ger.; on the E. the valley of the Rhine and the ranges of the Rhaetian Alps border it along the Aus. dominions; on the S. the main chain of the Central Alps forms a barrier toward It. Its terr. is comprised between 45° 48' and 47° 48' N. lat. and 5° 38' and 10° 30' E. lon. Its extreme length from E. to W. is 208 m.; its greatest width, from Tessin on the S. to Schaffhausen on the N., 138 m. Its surface is 15,902 sq. m.

**Physical Structure**.—There are 3 physical regions—the narrow belt of the Jura, the broad belt of the Alps, and the plain or hilly plateau between the two.

A. THE ALPINE REGION is the most characteristic and the most extensive, covering little less than  $\frac{2}{3}$  of the area. It is a broad and high mountainous zone, scooped out into innumerable sharp ridges and valleys, mostly deep and narrow, comprising the greater part of the Central Alps, with the loftiest peaks and largest snow and ice fields of the whole Alpine system. Its limit toward the central plain is approximately marked by a line drawn from Lausanne, on Lake Geneva, to Arbon, on the shores of Lake Constance; on the S. it runs along the snowy peaks of the central chain, except in Ticino; its width, on the Swiss terr., is over 60 m. It forms 2 main chains, running toward the E. N. E., separated by a long furrow, in which flow, in opposite directions, the Rhone and the Rhine. These 2 chains nearly unite their bases in the group of the Gothard, which forms a high swell from which the waters flow in every direction.

The Southern or Main Chain, which divides the It. waters from the N., is composed of 4 groups: (1) The chain of the Mont Blanc, which, at the close of the Franco-It. war, was given to Fr. It stretches from S. W. to N. E. between the valley of Chamouni and Val d'Entrèves; its highest peak, Mt. Blanc proper, 15,781 ft., is also the culminating point of

the continent of Europe. The Mer de Glace, the Glacier des Bossons, and the vast Glacier de la Brenva, all descending from the central pinnacle, the first two in Vale of Chamouni, the other on the It. slope, toward the Allée Blanche, need only to be alluded to here. (2) The group of the Pennine Alps, running nearly due E. from the col of the Great St. Bernard to the Col du Simplon, between the valleys of the Rhone and Val d'Aosta. Its culminating points are the Grand Combin, 14,170 ft., on the W.; the Mont Cervin, or Matterhorn, 14,712 ft., in the centre; the Monte Rosa, 15,217 ft., on the E. This is the most massive of the Alpine groups. It sends out long and heavy spurs, such as the chain of the Mischabelhörner, rising in the Dom to 14,948 ft.; and near by the range of the Dent Blanche, 14,321, with the Weisshorn, 14,803 ft. The Fletschhorn, 13,182 ft. in height, along the Simplon road, marks the limit of the Pennine Alps. (3) The group of the Gothard, along the upper waters of the Rhone and Rhine, extends between the Simplon and Lukmanier passes, and includes the Alps of Ticino. The high peaks seldom exceed 10,000 ft. The watershed is transferred more to the N., between the 2 small longitudinal valleys of Urseren, 4738 ft., and Airolo, 3868. (4) The group of the Grisons, or Rhaetic Alps, from the Lukmanier pass to the E. boundary of S. It begins with high snow-peaks near the sources of the Rhine, among which the Rheinwaldhorn rises to 11,148 ft.; but the salient feature is given by 2 snowy chains inclosing the valley of the Upper Inn, or Engadine, placed farther S. The N. or Albulan range separates the waters of the Rhine from those of the Inn and Danube; on the S. side the Alps of the Bernina, 13,294 ft., at the headwaters of the Inn and the Adna, divide the basin of the Danube from that of the Po.

The Northern Chain follows closely the valleys of the Rhone and Rhine, and terminates where these 2 streams cut transversely the Alpine chains. Its short slopes turned toward them, and its long slopes toward the N. plain. Deep transverse valleys divide it into 3 groups. (1) The Bernese Alps are the largest of these groups. Beginning with the Dent de Morcles, 9639 ft., near the Rhone, they increase in elevation toward the E., through the Diablerets, 10,666 ft., and the Wildhorn, 10,722 ft., to the mt.-knot of the Bernese Oberland, whose highest peaks, the Finster-Aarhorn, 14,026 ft., the Aletschhorn, 13,803, and the Jungfrau, 13,672, are but a trifle lower than Mt. Blanc and Monte Rosa. Here lie the snow-fields which feed the glacier of the Aar, that of Aletsch, those of Grindelwald. (2) In the middle group, the Alps of Uri rise in the Schneestock to 11,230 ft., in those of Unterwald the Titlis reaches 10,627 ft., while Pilatus, 7003 ft., and the Rigi, 5877, are placed on the border of the plain. (3) In the group of the Clarides the chain of the Tödi, 11,887 ft., is the controlling feature, and more to the N., the Glärnisch, 9539 ft., reaches the snow-limit. To the N. E., between the lakes of Wallenstadt and Constance and the valley of the Rhine, an isolated group, with the chain of the Churfirsten, 7565 ft., and the Sents, 8215, fills the greater portion of the cantons of St. Gall and Appenzel.

A striking feature of the Alps is the great depth of their indentations. The bottom of the valleys is from 10,000 to 11,000 ft. below the neighboring peaks. Deep notches, or cols, cut down to one half the height of these snowy chains, and afford a comparatively easy passage from one side to the other. A carriage-road crosses the main chain by the Simplon, 6595 ft., leading from the Rhone valley to Lago Maggiore and Milan. The St. Gothard road, 6556 ft., between the Reuss and Ticino, is the only one crossing both chains in the central knot from Lake Lucerne to Lago Maggiore. In W. Grisons is the San Bernardino road, 6768 ft., from the Hinter Rhein valley through Val Misocco to Lago Maggiore, and more to the E. is the Splügen, 6946 ft., from the same valley to Lago di Como. E. Grisons has the Julier Pass, 7508 ft., and the Albulan, 7589 ft., from the Rhine to the Upper Engadine; the Maloggia, 5942 ft., leading from the head of the Inn valley to the Splügen road and Lago di Como; and the Bernina Pass, 7644, from the Engadine to the Valtellina, or valley of the Adna. In addition to these 10 passes, fine military roads have lately been built, connecting the Rhone and Rhine through the Furca Pass, 7992 ft., the valley of Urseren and the pass of Oberalp, 6732 ft. A proposed R. R. through the Simplon having failed, another more central, forming the most direct communication between Ger. and It., has been constructed through the St. Gothard. (See ST. GOTHARD, TUNNEL.) Beside these great highways there are a number of bridle-paths, among which may be named the Great St. Bernard, 8110 ft., across the Pennine Alps, from Martigny to Aosta; the Lukmanier, 6292 ft. E. of St. Gothard, from the sources of the Rhine to the Ticino; the Sanetsch, 7389 ft., from the upper Sarine; over the Bernese Alps to the Valais; the picturesque Gemmi, 7556 ft., from Lake Thun; and the Grimsel, 7103 ft., from the Aar to the sources of the Rhone. The predominance of transverse valleys over those which run parallel with the Alpine ranges is a marked feature of the Swiss Alps. To these valleys, which, cutting through all secondary chains, open the shortest way to the heart of the snowy regions, the Alps owe most of the beauties which attract so many visitors. Rich as the Alps are in beautiful and rare minerals, they are poor in useful ones, and mining has never been anywhere extensively carried on.

B. THE JURASSIC BELT—the second physical region—in which comprises only a portion of that mt.-system, is, in structure and outline, a complete contrast to the Alpine region. Long, uniform, parallel chains, without the marked indentations and projecting peaks so characteristic of the Alps, intercept open, trough-like valleys, with gentle acclivities. The general system deviates slightly to the N. from the direction of the Alps, but the single chains tend to keep in parallelism with them. The highest point, Le Crêt de la Neige, which is in the Fr. Jura, opposite Geneva, has an elevation of 5653 ft.; La Dôle, the first on Swiss terr., 5505 ft.; the Chasseron, in the canton of Neuchâtel, 5286



ft.: the Hasenmatt, in Soleure, 4751 ft.: the Lägeren in Zurich, 2828 ft. The interior valleys communicate among themselves and with the plain by deep gorges, called *cluses*, furnishing an escape for the waters. Some are of large size, as the Val de Ruz, Val de Travers, in Neuchâtel, 2500 ft. high, and Val Delémont, in the Bernese Jura, 1500 ft. Their moderate elevation permits of agriculture, while the higher and colder valleys, like those of La Chaux de Fonds and Locle, over 3000 ft., only admit of grazing. All the Jura mts. are made up of Mesozoic limestones, whose geological name, Jurassic formation, is taken from them.

C. THE PLAIN of S. is the third physical region. It is in reality a hilly plateau of an average elevation of 1400 ft., with a few alluvial plains. It has a gentle inclination from the Alps to the Jura, and another, still less marked, from the S. W. to the N. E. along the base of the Jura. On both extremities, however, the lakes of Geneva, 1230 ft., and Constance, 1306 ft., mark 2 depressions below the general level, which receive the waters of the Rhone and the Rhine. The basin of the Lake of Geneva is separated from the general plain by the gentle heights of the Jorat, 2500 ft.; that of Lake Constance by the hilly region of Thurgovia.

The river system of S. shows a remarkable symmetry in its arrangement. From the central swell of St. Gothard the Rhine and the Rhone flow in opposite directions between the 2 main chains. At about the same distance from their source each quits the valley to cross the N. chain at right angles—the Rhine to enter Lake Constance; the Rhone, the Lake of Geneva. Leaving Lake Constance, the Rhine runs to the W., forming just below Schaffhausen the Rheinfalt. Further it gathers in its course most of the waters of S., and turning suddenly to the N. at Bâle, carries them to the N. Sea and the Atlantic. Issuing from Lake Geneva, the Rhone, after receiving its main tributary, the Arve, from Mt. Blanc, crosses the chain of the Jura at the Perte du Rhône, where it disappears for a short distance in a deep fissure, and descends by rapid strides to the Mediterranean. From the same Gothard region flow 4 other rivers—the Aar and Reuss to the N., the Ticino and Tosa to the S. On the N. slope the Aar drains the Bernese Oberland, the Reuss the Alps of the 4 primitive cantons; on the S., the Tosa and the Ticino drain the Gothard Alps. The Aar fills the Lake of Brienz, 1857 ft. in altitude, and the Lake of Thun, 1850 ft., the Reuss, the quadruple lake of Lucerne, 1434 ft., the Ticino and Tosa, the long and deep trough of Lago Maggiore, 646 ft. The 2 extreme divisions of the N. chain have also each their river. The Linth gathers the waters of the Clarides and of Lake Wallenstein, 1364 ft., and forms the Lake of Zurich, 1342 ft., from which it issues at Zurich under the name of Limmat. The Sarine leads the waters of the Bernese Alps through Freiburg into the Aar. The Emme, the Suhre, the Glatt, and the Thur, all of third rank, rise in the border Alps. All these streams follow the general slope of the plain toward the Jura; but the most important is the Aar. Reaching the base of the Jura near the Lake of Bienné, it turns at right angles and receives all the waters of the central plain, including those of the lakes of Neuchâtel, 1427 ft., Morat and Bienné, 1424 ft., and, uniting with the Reuss and Limmat, carries them by a single channel to the Rhine through the last spurs of the Jura. The second great hydrographical centre is found in the Alps of Grisons, in the Upper Engadine, where the waters of the Rhetian Alps flow through the Inn and the Danube into the Black Sea; through the affluents of the Hinter Rhein to the Atlantic; through the Maira, Lago di Como, 699 ft., and the Po, to the Adriatic.

Climate.—Under the general influences which make Europe the warmest of the temperate continents, the climate of S. is milder than that of any mt.-country in the same lat., while the quantity of rain is rather above the average. This is shown by the following table, which gives the average temperature of the yr. and the warmest and coldest months, together with the average amount of rain in inches, at the following cities of the plain:

Places.	Latitude.	Altitude.	Temperature.			Amount of rain in inches.
			January.	July.	Year.	
Geneva.....	46.12	1250	31.5	65.4	48.5	32
Neuchâtel ..	47.0	1430	32.3	66.5	49.0	33
Berne.....	46.51	1770	26.9	62.6	46.0	46
Zurich.....	47.23	1350	29.2	65.7	48.	33
Bâle.....	47.34	900	33.0	66.4	49.1	25

The extremes of temperature seldom exceed 90° or fall below 10°. The spring is early and pleasant; the first flowers appear in Mar., and May is the month of roses. The summer has frequent rains; Sept. is clear and mild, but in Oct. the weather begins to be raw; Nov. and Dec., however, are often quiet and warm in the heights, while the plain, and especially the lake region, is covered with a thick layer of fog. The prevailing winds are, as in all Europe, the alternate normal equatorial and polar currents—the first, from the S. W., warm and rainy; the other, called the *Bise*, from the N. E., cold and dry. A peculiar wind called the *Föhn*, felt especially in the E. part of S., and more frequently during the winter, is noted for its great heat and dryness, flowing from the S. across the Alps, and descending with great fury along the N. valleys. Under its influence the snows of the mts. melt with such rapidity as to cause the most destructive inundations.

The various zones of vegetation which can be distinguished, from the lowest valleys to the limit of permanent snow, are—(1) The lower region, comprising all the central plain and its lower hills, and extending from 700 to 2000 ft. above sea-level. It is the zone of deciduous trees, the chestnut, walnut, oak, and beech, and of the vine. Here the cultivation embraces all the European grains, including even maize to a certain extent. All the fruits of temperate lats. grow

abundantly, and acquire in the Jura a rare degree of excellence. (2) The second region is that of the lower mts., from 2000 to 4000 ft. In the lower half the harder deciduous trees, such as the beech, ash, and maple, are still abundant, and the cereals and hardy fruits, apples, pears, and plums, are cultivated. In the upper half, comprising the higher valleys of the Jura and the lower Alps, spruce forests, extensive pastures, and a scanty cultivation of oats and barley are characteristic. (3) The sub-Alpine region, or zone of conifers, extends from 4000 to 5500 ft. on the N., and from 4000 to 6000 ft. on the S. It comprises the middle Alps, and its upper limit is also that of the growth of trees. Here agriculture ceases, but the rich grassy pastures of the Alps begin. (4) The Alpine region, from the limit of trees, 6000 ft., to limit of permanent snow, 9000 ft., begins with a zone of shrubs, reaching to 7000 ft., among which the lovely Alpine roses (*Rhododendron ferrugineum* and *hirsutum*), the creeping azaleas, junipers, willows, and alders are the most conspicuous. The chamolins, the steinbok, or rock-sheep, now nearly extinct, the lammergeyer, or large eagle, the formidable enemy of the lamb, the sleepy marmot, are the representative animals of the Alpine region. (5) The region of perpetual snow in the Alps is broader and more extensive than in any other mt.-system of Europe. Its lower limit is found in the Bernese Alps at 8800 ft. of altitude; in the Grisons, at 9200 to 9400 ft.; on the S. slope it rises to 9000 and 9800 ft. From the lower limit of these vast snow-fields long streams of ice, which are but a mode of melting of the snow, the glaciers, pass through the several zones of vegetation just described, and reach in the glaciers of Grindelwald within 3000 ft. of the level of the sea. A. GUYOT.

**Switzerland, History of.** The most anc. records of the inhabs. of S. are found in the pre-historic implements and traces of anc. lake-dwellings in most lakes of that country. The constructions of the lake-dwellers seem to indicate that their builders were of Asiatic origin. The Helveti are the first inhabs. whose name has been transmitted to us by history. They had to suffer from both the Roms. and the Germanic tribes of the N., and their mts. and valleys had to witness many a battle. They always fought with great valor, and even once compelled the Roms. themselves to pass under the yoke. But they were finally overpowered by the legions of the Roms. and their military tactics. After this they received the name of "confederates" from the Roms., and their duty was to form a bulwark on behalf of Rome against the Gers. Their country became a Rom. prov. The E. was occupied by the Rhetii, the S. by the Pennini, the centre by the Helveti proper, and their next neighbors W. were the Sequani, belonging to the Gauls. The time came, however, when the Roms. had to make room for other invaders, the Ostrogoths, the Alemans, the Burgundians, and the Franks, who occupied S. up to 579. The last of the Burgundian kings parted with his sovereignty in favor of the emp. Conrad I. in the yr. 1016. At the beginning of the 12th century the emp. granted to the dukes of Zähringen, as vassals, the greater part of W. S. At the death of the last Zähringen (1218) S. was again put under the paramount authority of the emp. who conferred several parts thereof on other vassals, whom the Swiss were not always ready to acknowledge as their lords. The leagues of these nobles induced the Swiss communities to form like associations: the 3 forest cantons, Uri, Schwytz, and Unterwalden, formed such a league in 1291.

The House of Hapsburg, which had been instituted by the duke of Zähringen protector of the "Lands," attempted to increase their domains; the Lands opposed, and were successful, but did not conquer their liberty without many a battle. The league of the Swiss of 1291 was renewed in 1313, after the famous battle of Morgarten, gained over the Aus. In the W. part of that country the house of Savoy had an authority almost as considerable as that of Hapsburg in the centre and the E. In 1336 the Swiss again routed the Aus. at Sempach. The period from 1412 to 1431 witnessed the annihilation of the Aus. power and the undermining of the house of Savoy. In the 15th century the Swiss had to fight several battles with the Armagnacs, under Louis XI., at St. Jacob, near Bâle, and the veteran troops of Charles the Bold of Burgundy, at Grandson and Morat.

Another period of the hist. of S. extends to 1643. It witnessed, first, the extinction of the last vestige of the house of Savoy and the establishment of the principles of the Ref. This was a period of intestine wars with the aristocratic element. The latter were generally reduced to silence during these wars. Throughout the same period religious wars took place between the R. Caths. and the Reformers—wars in which the former were sustained by Fr. The Thirty Years' war nearly put an end to the Swiss confederation, but the Treaty of Westphalia (1648) declared S. independent of the Ger. empire.

Up to the time of the death of Louis XIV. the greatest disorder existed in S., and this disturbed condition of things continued until the outbreak of the Fr. revolution, the principles of which gained ground easily in S. The Swiss were to be seen in opposing armies. The canton of Berne fought valiantly to the last against the new ideas and the foreign republican armies, but was overpowered. Thus, S. fell into the hands of foreigners, sustaining within it an anti-national party. This lasted 4 yrs. To the republican form of govt. succeeded a league based upon federal principles; but the mediator of that "mediation act" (Feb. 13, 1803) was a despotic ruler. The mediation came to an end at the fall of the Fr. empire. Then S. threw herself into the arms of the Holy Alliance. The European reaction against France took place, and S. had to participate in it. By the Cong. of Vienna (1815) her independence was again acknowledged and guaranteed. The spirit of self-preservation and sense of dignity developed themselves in S. Constitutions were framed, one after the other. The last const. voted by the people bears the date of May 29, 1874. If S. has been for a very long time suffering from want of a sufficiently central







MAP OF  
**SWITZERLAND**  
 Drawn, and Engraved on Copper-Plate  
 EXPRESSLY  
 FOR  
**JOHNSON'S UNIVERSAL CYCLOPEDIA**

Scale of Miles  
 5 10 20 30













power, the tendency of our age is to increase centralization to the detriment of the sovereignty of the cantons. Here is the danger for that country. [From orig. art. in *J.'s Univ. Cyc.*, by GEORGE A. MATILE, LL.D.]

**Switzerland, Statistics of.** Switzerland consists of 22 cantons of very unequal size, united under the const. of May 29, 1874.

CANTONS.	AREA.	POPULATION.
Graubünden (Grisons).....	2,774	94,991
Bern.....	2,660	532,164
Valais (Valais).....	2,626	100,216
Vaud (Vaud).....	1,245	238,730
Ticino (Tessin).....	1,095	190,727
St. Gallen.....	780	210,401
Zürich.....	665	317,576
Luzern.....	640	134,506
Fribourg.....	549	115,400
Aargau.....	549	128,645
Uri.....	415	29,594
Schwyz.....	351	51,235
Neuchâtel (Neuenburg).....	312	103,732
Glarus.....	267	34,213
Thurgau.....	382	96,552
Unterwalden.....	295	27,348
Solothurn.....	303	80,424
Basel.....	177	124,372
Appenzell.....	162	66,790
Schaffhausen.....	116	38,948
Genève (Genf).....	109	101,595
Zug.....	72	22,994
Total.....	15,992	2,846,102

During 1880 the movement of the pop. comprised 19,447 marriages (1879), 87,395 births, 65,690 deaths. The emigration in 1880 amounted to 7255. In 1880, 2,635,067 of the pop. were natives, 211,035 were foreigners. German was spoken by 2,030,782; French, 608,017; Italian, 161,923; Romansh, 38,705. According to the revised const. the legislative power of the govt. of the federal republic is vested in the federal assembly, consisting of the national council and the council of states. The national council is formed of delegates elected by the people at large, one for each 20,000 souls. Every voter, not a clergyman, is eligible. The council of states consists of 44 members, each canton sending 2. Beside its legislative power, the federal assembly has the right to make treaties and alliances with foreign powers, declare war and conclude peace, take measures for neutrality or intervention, sanction the const. of the cantons, etc.; but all federal laws and all general measures in which the whole confederacy is concerned, and which are not of a pressing nature, are subject to a popular vote on the demand of 30,000 voters or 8 cantons. The executive power belongs to the federal council, whose 7 members are chosen by the federal assembly for 3 yrs. from among the whole mass of Swiss citizens eligible to the national council. More than one member, however, cannot be chosen from the same canton, and no member can hold any other office either in the confederacy or in any single canton, nor can he carry on any business. The pres. of the federal council, who is also the pres. of the confederacy, is chosen by and among the members of the council for 1 yr., and he cannot be re-elected until after the intervention of 1 yr. The federal court consists of 9 members and 9 substitutes chosen by the federal assembly for 6 yrs. Under its jurisdiction belong all cases between the confederacy and the cantons, between canton and canton, between the confederacy or the cantons on the one side and a corporation or private individual on the other, etc. The cantons have each its own const., and form 25 republics, with 25 different consts. Bâle, Unterwalden, and Appenzell being each divided into two. These consts. range from purely democratic to perfectly representative systems, but each const. must be sanctioned by the federal assembly before it can come into force. Ecclesiastical authorities are, in the Reformed Ch., the synods, assemblies of the whole clergy; and at their side stands in each canton, as the highest administrative authority, an ecclesiastical council—in Geneva a consistorium.

On the occupations of the inhabs. the mountainous character of the country exercises great influence. 31 per cent. of the soil is unproductive, 69 productive; 19 is covered with forest, from 35 to 38 is meadow and pasture. Only the cantons of Bâle (country), Lucerne, Schaffhausen, Solothurn, Thurgau, and Zug produce more grain than they use; those of Aargau, Bern, Freiburg, Vaud, and Valais produce just enough for home demand; but the other cantons must import grain. The production of fodder is very considerable. The cultivation of vines, fruit trees and garden-plants is flourishing. The cattle-breeding is celebrated. An important source of wealth is the exportation of wood. The products of the chase are of small importance, but fishing is carried on with great success. Mining yields no great profit; the country is poor in metals. About 600,000 cwts. of salt are annually raised, and much building-stone is quarried. Mineral springs are numerous. The manufacturing industry is very considerable, especially of cotton, silk, straw goods, leather, paper, woodenware, machinery, watches, jewelry, etc. Watches are made especially at Geneva and Neuchâtel. The manufacture of embroidery flourishes, especially in St. Gall and Appenzell; that of silk ribbon in Bâle, Aargau, Bern, and Thurgau. The commerce is also important. The principal articles of export are cotton and silk goods, watches and cheese; those of importation, raw cotton and silk, iron, grain, and colonial products. There exist no official records of the commercial transactions. [From orig. art. in *J.'s Univ. Cyc.*, by AUGUST NIEMANN.]

**Sword,** sôrd, a curved or straight weapon, usually with one or two cutting edges and a sharp point, but also made (scimitar, etc.) without a sharp point or (rapier) without a

cutting edge. S. of pre-historic and even much later times were often of bronze, but for many ages steel has been the material exclusively employed. Damascus, Toledo, Pistoja, Bilbao, and Milan are among the cities of the Old World which have been famous for the excellence of their S.

**Sword-fish,** a common name for fishes of the family Xiphiidae, remarkable for having the upper jaw prolonged forward in the shape of a bony sword. The common S.-F. (*Xiphias gladius*) ranges from our Atlantic coast eastward to the Mediterranean. It is often from 10 to 16 ft. long, has very fine scales, no ventral fins, a long broken dorsal fin, and a large and deeply forked caudal.

**Sya'grius,** the last Rom. ruler in Gaul, was a son of Egidius. A battle between him and Clodwig, the chief of the Franks, was fought at Soissons in 486. S. was defeated, and fled to the Visigothic king, Alaric II., who surrendered him to Clodwig, by whose command he was put to death.

**Sybaris,** city of Magna Græcia, in Lucania, was founded by Achæans and Troezenians about 720 B. C., 8 m. from the Tarentine Gulf, between the rivers Crathis and Sybaris, the modern Crati and Cosile. It rose rapidly to a great prosperity, and was notorious for the luxury and effeminacy of its pop. In a war against Crotona the city was destroyed.

**Sycamine** [Gr. *συκάμινος*], an anc. name for the mulberry, both black and white, also for the true sycamore.

**Sycamore** [Gr. *συκόμορος*, from *σύν*, a "fig," and *μορον*, a "mulberry"; Heb. *shik'mah*], a tree and its fruit, the *Ficus sycamorus*, a species of fig. It is a wide-spreading, shady tree, much planted in Egypt and the Levant for its shade. In some parts of the U. S. the buttonwood or plane tree is improperly called sycamore, and in Eng. that name is applied to a kind of maple (*Acer pseudoplatanus*).

**Sycamore,** city, on R. R., cap. of Kalb co., Ill. Prin. business, farming and dairying. Pop. 1870, 1967; 1880, 3028.

**Sydenham,** sid'en-am (CHARLES EDWARD POULETT THOMSON), BARON, b. at Waverley Abbey, Surrey, Eng., Sept. 13, 1799, became clerk, and subsequently partner, in the St. Petersburg house; became intimate with Bentham and his circle of political economists, whom he represented in Parl. from 1826; v.-p. of the board of trade and treas. of the navy Nov. 1830; pres. of the board of trade June 1834; obtained a seat in the cabinet 1835; appointed gov.-gen. of Canada Aug. 1839; created Baron Sydenham Aug. 1840, and after a brief administration, in which he effected the union of Upper and Lower Canada, he d. Sept. 19, 1841.

**Sydenham** (THOMAS), b. at Winford Eagle, Dorsetshire, in 1624, ed. at Ox.; studied med. at the coll. of Montpellier, Fr.; took his degree of M. D. at the coll. of Cambridge, and established himself about 1660 as a phys. in Lond.; abandoned the mere routine system of practice, basing his own upon the theory that there is in nature a recuperative power which it is the province of the phys. to aid, not to oppose; was especially acute in observing and describing the symptoms of diseases, and carefully studied the relations between epidemics and the conditions of the atmosphere. Among the services which he rendered to med. practice was the treatment of intermittent fever by cinchona and the administration of cooling remedies in smallpox. D. Dec. 29, 1689.

**Sydney,** cap. of the Eng. colony of New S. Wales, Australia, is on the S. shore of Port Jackson. On a hill to the left, seen from the harbor, is the palace of the gov., built in Gothic style, and a little below, on a steep promontory, is situated Ft. Macquarie. The city is somewhat straggling and irregular in form, and occupies a site of various elevation. The most remarkable buildings are the univ., the museum of nat. hist., the market-hall, the P. O., and a number of schools and chs. Twenty-three suburbs or tps. surround the city; they are all incorporated boroughs. Business is most lively along the Darling harbor, occupied by the numerous coasting vessels, while the large, sea-going vessels anchor at Sydney Cove, beside Ft. Macquarie. The city is lighted by gas, and provided with water from the Lachlan and Botany swamps; it has many public promenades and charitable insts. For parliamentary purposes the city is divided into 2 electorates, each of which returns 4 members to Parl. The gen. govt. of the city is in the hands of a municipal council consisting of 16 aldermen. S. is the entrepot for the products of the colony, and carries on itself an important manufacturing industry in iron, machinery, linen, cloth, soap, and tobacco. Its commerce is very great. New S. Wales was originally intended for a convict colony, and on Jan. 28, 1788, 1000 convicts and soldiers were first settled here; now it is a rich and important colony, and its cap. has developed with extraordinary rapidity. Deportation ceased entirely in 1850. Pop. 1881, 220,487.

**Sydney** (ALGERNON and PHILIP), See ADEN.

**Syente,** See GRANITE.

**Sykes** (GEORGE), b. at Dover, Del., Oct. 9, 1822, grad. at the U. S. Military Acad. in 1842; in the war with Mex. served with credit from Vera Cruz to the Mex. cap.; from 1848 to 1861 was almost constantly with his regiment on the frontier; in the early part of 1861 was serving with his company in Texas; in July commanded the battalion of regular troops in the battle of Bull Run; commanded the regular inf. in the defenses of Wash. during the winter of 1861-62, and in the Va. Peninsular campaign of 1862 the division of regulars (Porter's corps) which so stubbornly maintained its position on the right at the battle of Gaines's Mill; continued in command of this division at the second battle of Bull Run, Antietam, Fredericksburg, and Chancellorsville; succeeded to that of the 5th corps, which a week later was engaged at Gettysburg. D. Feb. 9, 1880.

**Sykes** (OLIVE LOGAN), daughter of Cornelius A. Logan, b. in New York in 1841, made her début on the stage in Phila. 1854; went to Eng. 1857; pub. 2 novelettes (1860); re-appeared on the stage at Wallack's, New York, in 1864, in *Evelyn*, a play written by herself; had considerable success on the stage, but retired in 1868, since which time she has devoted herself principally to lecturing on woman's rights and on other social topics. From 1857 to 1866 she was the



wife of Edmund A. Delille, and afterward the wife of Wirt Sykes, U. S. consul at Cardiff, Wales.

See SYLLA.

**Syllabus** [Lat.: literally, an index of words or heads of a book, a table of contents; also a collection or résumé] is a document issued by Pope Pius IX. Dec. 8, 1864, which condemns 80 current doctrines of the age as heresies. Its full title is: *A Syllabus, containing the Principal Errors of our Times, which are noted in the Consistorial Allocations, in the Encyclicals, and in other Apostolical Letters of our Most Holy Lord, Pope Pius IX.* The document is divided into 10 sections. The first condemns pantheism, naturalism, and absolute rationalism; the second, moderate rationalism; the third, indifferentism and latitudinarianism; the fourth, socialism, communism, secret societies, Bible societies, and other "pests of this description;" the fifth, errors concerning the Ch. and her rights; the sixth, errors concerning civil society; the seventh, errors of natural and Chr. ethics; the eighth, errors concerning Chr. marriage; the ninth, errors concerning the temporal power of the pope; the tenth, errors of modern liberalism. Among the errors condemned are the principles of civil and religious liberty, and the separation of Ch. and State. The S. indirectly asserts the infallibility of the pope, the exclusive right of Romanism to recognition by the civil govt., the unlawfulness of all non-Catholic religions, the complete independence of the papal hierarchy, the power of the Rom. Ch. to coerce and enforce, and its supreme control over public education, science, and lit. It reasserts all the extravagant claims of the mediaeval papacy, and is a declaration of war against modern ideas of civilization and progress. It has provoked the new conflict between the papal and the civil power in Prus., Aus., Fr., and Brazil. PHILIP SCHAFF.

**Sylvest'or**, the name of 2 popes and an antipope. What is told of SYLVESTER I. (314-335) is only fable.—SYLVESTER II., whose true name was GERBERT, was b. in Auvergne; acquired a great reputation for learning, and was appointed by Otto II. teacher to his son Otto III.; became director of the school of Rheims. He was elected abp. of that diocese in 991, but had to give up his see to Arnulf; abp. of Ravenna in 998, and in the following yr. pope.

**Syme** (JAMES), M. D., b. in Edinburgh in 1799, grad. in surgery 1821; originated many improvements, including the resection of diseased joints in place of amputation, the process known as "Syme's operation" for amputation of the foot at the ankle-joint, and the removal of large tumors of the lower jaw by excision of the entire bone. Wrote *The Excision of Diseased Joints and Principles of Surgery*. D. June 26, 1870.

**Symmachus**, b. at Sinagla, Sard., about 440, was consecrated pope Nov. 22, 498, but Laurentius was on the same day made antipope. S. was supported by Theodoric, king of It., and Laurentius by the Byzantine emp. The contest lasted about 7 yrs., but was finally decided in favor of S. In 502 a synod of Rome decreed that no layman should interfere in the affairs of the see of St. Peter without the severest penalties, and in 503 another synod of Rome declared that the occupant of the see of St. Peter could be judged by none but God; buried July 19, 514, and was declared a saint.

**Symmachus** (QUINTUS AURELIUS), b. about 350 A. D., and ed. in Gaul, but acquired great fame as an orator, and held some of the highest civil offices in Rome in the latter part of the 4th century. Of his works, the *Epistolarum Libri X.* have come down to us. He was one of the last champions of paganism, a noble and pure character. D. about 420 A. D.

**Symmes**, simz (JOHN CLEVES), b. on L. I., N. Y., July 21, 1742, was a member of the Continental Cong. 1785-86; judge and chief-justice of the supreme court of N. J.; was appointed judge of the N. W. Terr. 1788, and was founder of the settlements in the Miami Valley. D. Feb. 26, 1814.

**Symmetry** (Gr. *συμμετρία*), a mathematical term implying regularity in the arrangement of the parts of a mathematical figure. Two points are said to be symmetrically disposed with respect to a straight line when they are on opposite sides of the line and equally distant from it—that is, when they are so situated that a line joining them is bisected by the given line. A curve is symmetrical with respect to a line when its points, taken in pairs, are symmetrically disposed with respect to that line—that is, for each point on one side of the line there is a corresponding point on the other side, equally distant from it. In this case the given line is called an *axis of symmetry*.

**Sympathetic Inks.** See INK.

**Symplesometer** [from the Gr. *συμπιέζω*, "compress," and *μετρον*, "measure"], an instrument for indicating the amount and variations of atmospheric pressure, consists of a vertical glass tube, terminated above by an oblong bulb, and bent upward at its lower extremity, where it expands into a cistern open at the top. The bulb and upper part of the tube contain hydrogen gas, the cistern and lower part of the tube colored oil of almond.

**Synagogue**, sin'a-gog, the place of worship of the Jews [from Gr. *συναγωγή*, class, Gr. "collection," "gathering," LXX. "assembly," "meeting;" N. T. and ecclesiastical writers, "house of assembly"]. It was undoubtedly during the Captivity, when the people, afar from temple and native land, assembled privately on their sabbaths and feast-days for reading the Law and devotion, that the system had its origin; but not until after the Gr. conquests, and the consequent dispersion of the Jews throughout W. Asia and Europe, was it fully developed as one of the characteristic features of Judaism. In Pal. the development was more gradual, but at the time of Christ S. are found in every town and v. throughout the country, and he makes use of them for much of his teaching. Since the destruction of the temple the S. have exercised an immense influence on the Jewish religious and national character; to such an extent have they cultivated the idea of local worship that the temple is almost eliminated from their religion. As the founders of the early Ch. were brought up under S.

influence, the intimate connection of the forms of worship, officers, and order of the Chr. Ch. with the S. is natural.

**The Great Synagogue.**—A body of 120 men, who, according to Jewish tradition, were constituted by Nehemiah, after the return from the Exile, for the reorganization of religious worship and civil order. To them is attributed the formation of the canon of the Prophets, etc. Many regard, without sufficient ground, the whole account as an invention of the later Rabbinical schools. Most probably Ezra and Nehemiah gathered around them a council for aid and advice in re-establishing the Jewish Ch. and State, and this body perpetuated itself until it developed into the Sanhedrim.

**Syncope.** See FAINTING.

**Syndicate.** This word first came into general use in connection with the funding of our national debt by a combination of native and foreign bankers. Originally, it meant a council of judges, but the associated action of great capitalists having a specific object in view required a new word, or a new meaning to an old one; hence "syndicate."

**Synergism** [Gr. *συν*, "with," and *εργον*, "work"] denotes those views of the work of regeneration according to which the human volition is not absolutely passive, and the divine grace not the only activity. In the latter part of the 16th century vehement controversies arose between the synergists and the orthodox. The question was finally settled by the *Formula Concordiae* in favor of the orthodox.

**Synesius**, si-nee/she-us, b. about 375 in Cyrene, the civil metropolis of the Libyan Pentapolis, studied philos. in Alexandria; was sent at the head of a provincial embassy to the emp. Arcadius at Constantinople in 397; visited Athens in 402; spent most of his time in rural retirement near the frontier of Cyrenaica, occupied with the study of philos. and literary pursuits. In 410 he was elected bp. of Ptolemais. He accepted the election with great reluctance. Many of the Chr. doctrines he could not reconcile with the ideas of the Neo-Platonic philos. which formed his innermost conviction; he felt averse to the large secular business connected with the episcopate; he was married, and he was absolutely unwilling to renounce wedlock. D. about 430. Of his works are extant several essays and orations, a number of hymns, and letters of great and varied interest.

**Synod of Dort.** See DORT, SYNOD OF.

**Synovitis.** Acute S., acute inflammation, may attack any joint as the result of violent injury, exposure to cold, rheumatic taint, or less often from vitiated blood in the course of fevers and other diseases. The symptoms are local swelling, extreme tenderness upon touch or pressure, pain when moved, and often persistent agonizing pain caused by the distension of the sensitive inflamed cavity by a hypersecretion of fluid. Chronic S. is often a product of tubercular or scrofulous hereditary taint.

**Syntax.** See GRAMMAR.

**Synthesis** is directly opposed to ANALYSIS (which see). S. advances step by step through known propositions, from the data to the *quaesita* in the case of a problem, or from the hypothesis to the predicate in the case of a theorem. Analysis is the chief though not the sole instrument of *discovery*, while S. adapts itself naturally to *instruction*. The methods of conducting analysis and S. are the same in kind, the only difference being that, in the hands of the investigator at least, the several steps of the former are experiments suggested by experience, for which no rule can be assigned, whereas in the latter these steps are suggested by previous knowledge, gained, in fact, very frequently from a preliminary analysis.

**Syphilis**, si-fil'is [etymology uncertain], the *lues venerea* of old authors, and vulgarly known in English as "pox." S. is a specific venereal disease, contracted chiefly in impure sexual congress, rarely by other and accidental inoculation, and also capable of transmission in a chronic form from parent to offspring. S. is first manifested by an initial sore at the point of inoculation on the genitals. This initial sore is known as a chancre, and constitutes primary S. It appears, on an average, 2 weeks after the cohabitation by which the contagion was transmitted. The initial sore, or ulcer, or chancre may heal with or without cauterization. But in from 25 to 50 days later the constitutional infection is further demonstrated by the appearance of a cutaneous eruption on the various parts of the body, the face, and in the hair. This eruption may appear even as late as 6 months. It may be a simple roseola, or scattered roseate spots, or a papular eruption. About this time a concurrent eruption appears in the mouth and throat, mucous patches on the tongue and walls of the mouth, inflammation, ulceration, and exudation in the soft palate. Iritis is liable to occur at the height of the eruptive period, which is designated the period of secondary S. If untreated, S. is likely to progress, and affect not merely the superficial structures—skin and mucous membrane—but also the special organs and deep tissues. Periostitis, or inflammation of the fibrous sheath of bones, is next in order; soreness of the shins, swollen glands in the neck and groin, scabs in the scalp, falling of the hair, gummy tumors beneath the skin, finally breaking as small abscesses, inflammation and loss of the nails of the fingers and toes, nodes on the skin, osteitis, with persistent rheumatoid pains in the limbs at night, ulcerative destruction of the palate and nasal bones, are all liable to occur progressively in from 6 months to 3 yrs. when the disease is not checked by specific treatment or it has been implanted in a constitution shattered by dissipation. Extensive changes in the brain, liver, glands, bones, etc. gradually take place, and the disease being fastened upon the system, "tertiary S.," ineradicable, is said to exist. The sexes contaminate each other with S. only when a fresh initial sore is present. But either parent may transmit S. to the child.

Constitutional S., whether acquired by inheritance or existing as tertiary S., constitutes a serious vice of the blood, and endangers phthisis and steady failure of bodily powers. A syphilitic sore or chancre should at once be healed either by cauterization or by the milder applications for ordinary



sores. The treatment of secondary S. is at first by mercurials, until the eruptions, sore throat, and other manifestations begin to yield; then by a "mixed treatment" of mercury and iodide of potassium. In good constitutions the disease may vanish from sight in a few weeks, but is liable to crop out at intervals and leave vague sequelæ like neuralgia and catarrhs, unless the remedies be used steadily or intermittently for 2 or more yrs. The complete eradication of the taint is questioned by some authorities. [From orig. art. in *J. s. Univ. Cyc.*, by Prof. F. N. Otis, M. D.]

**Syra** [anc. *Syros*], island of Gr., in the Egean Sea, with an area of 55 sq. m., with 35,000 inhabs. It is high and mountainous, the highest peak rising about 4000 ft. above the level of the sea. It produces wheat, wine, figs, fruits, etc., but not in sufficient quantity to supply the demands of the inhabs.

**Syra**, or **Hermopolis**, cap. of the island of Syra, is well built and has a safe, spacious, and convenient harbor. Its trade and ship-building are very important. It owns about  $\frac{1}{2}$  of the whole Gr. merchant fleet. Pop. 21,245.

**Syracuse**, sir'a-kuz [It. *Siracusa*], city of Sic., chief town of the prov. of the same name, on the E. coast of the island. The modern town occupies the rocky islet Ortygia, which serves as an irresistible breakwater to protect the large harbor on the W. The small harbor, Porto Marmoreo, lies N. of Ortygia. The present town is fortified by walls and a citadel of the Byzantine period, as well as by works of the time of Charles V. and of Charles III. of Naples, so that it is one of the strongest places in the kingdom of It. There is, however, little commerce here, and the industry is even less, so that the general aspect of the town is depressing in the extreme. Its chief interest consists in the still existing monuments of its former greatness. Ortygia was colonized by the Corinthians 753 a. c. Possessing every advantage of position and climate, the young colony grew with great rapidity. When the Romans obtained possession of the rest of Sic., S., together with some important places in its neighborhood, was left to Hieron II. (375 a. c.). Under this king the city rose to its highest point of magnificence. But in the course of the second Punic war, Hieronymus, the successor of Hieron, broke off the alliance with Rome and joined the Carthaginians. After a long and desperate resistance S. fell into the hands of the Romans under Marcellus (212 a. c.), by whom it was sacked. The town at the time of its capture consisted of 4 distinct quarters—or 5, if Epipolæ be included. The most important remains of anc. S. are found on the main island, though some objects of interest are still to be seen in the modern town. A large number of fine columns from the old temple of Minerva have been made use of in the arch. of the modern ch. of the Duomo. Among the ruins of the temple of Diana (Vico di San Paolo) the remains of a very remarkable Gr. temple have lately been uncovered. The museum, near the Duomo, contains anc. inscriptions, papyri, vases, statues more or less mutilated, etc., but its great treasure is the marble Venus, considered by many as second only to the celebrated Venus of Milo. Only a few among the many objects of antiquarian interest can be enumerated here: the gigantic walls of Dionysius (405-368 a. c.), which unite at Ft. Euryalus; the vast Latonia, or quarries, which served both for prisons and as places for sepulture; the famous Ear of Dionysius; the Ara of Hieron (650 ft. long, 75 ft. broad), on which 450 oxen were sacrificed yearly; the amphitheatre, the theatre, the nymphaeum, the aqueducts, the Street of Tombs, the temples of Bacchus and of Proserpine, etc. Of the anc. ch. of Santa Lucia, patroness of S., the W. portal only remains. The same is true of S. Giovanni, in the crypt of which St. Paul is believed to have preached. The catacombs below and near this ch. are very much like some recently discovered Phœnician tombs. The fountain of Cyane (Pisma) is reached by crossing the great harbor and ascending the Anapus. The great temple of the Olympian Jove (6th century b. c.) stood on a hill above the right bank of the Anapus. The sea-coast caves on the E. side of Achradina are scarcely inferior in beauty of color to the Blue Grotto at Capri. Pop. 23,507.

**Syracuse**, Neb. See APPENDIX.

**Syracuse**, city and important R. R. centre, capital of Onondaga co. N. Y., on the Erie Canal, 150 m. W. of Albany. It was settled about 1796, passing under different names until 1824, when it was called Syracuse. It was incorporated as a v. in 1825, and as a city in 1847. It is noted especially for its extensive salt-works. The manufacturing establishments of S. are numerous, and the wholesale trade of the city is very large, aggregating many millions of dollars annually. S. has 10 banks, 2 savings banks, and several private bankers. Each of these insts. has recently erected a large and elegant banking edifice in the central part of the city. The public and charitable insts. include the N. Y. State asylum for idiots, the Home association for elderly females, the Onondaga co. orphan asylum, the asylum of St. Vincent de Paul, the House of the Good Shepherd, and St. Joseph's Hospital. The Onondaga co. penitentiary is a large establishment, and furnishes accommodations for criminals of surrounding cos. A large State armory is also located here. The educational advantages of S. are excellent. The public-school system is complete in all its appointments, and in the most prosperous condition. The plan for popular education embraces a high school and about 20 graded schools, all under the charge of a board of education elected by the people. The Syracuse Univ. is located here, and comprises a coll. of liberal arts, a coll. of med., and a coll. of fine arts, all well supplied with competent profs. There are 3 public libraries. Pop. 1870, 43,051; 1880, 51,792.

**Syria**, sir'e-a [Tur. *Suriyan*; Ar. *Esh-Sham*], at present forming, together with Pal., a division of Asiatic Tur., extends between lat. 31° and 37° 30' N. along the Mediterranean from the Gulf of Iskanderoon to the Isthmus of Suez, and is bounded N. by Asia Minor, from which it is separated by the Taurus Mts.; E. by Mesopotamia, from which it is separated by the Euphrates and the Syrian desert; S. by

Ar. Its area is estimated at 60,000 sq. m., but its E. and S. frontier, along the Syrian and Ar. deserts, is indefinite. Of its pop. no official statistics exist, but it is estimated at from 1 to 2 millions. The configuration of the country is quite remarkable. Connected to the N. with the Taurus Mts., but losing themselves to the S. in the plateaus of the Ar. desert, 2 systems of mt.-ranges run parallel through the middle of the country, inclosing a valley of varying breadth and depth. The W. system consists of the Lebanon, which rises in Jebel Timarum to a height of 10,533 ft., and ends abruptly on the banks of the Litany; the Samaria hills and the highlands of Judæa, which connect with the sinaitic group. Toward the Mediterranean these mts. fall rapidly and in terraces, often sending spurs far into the sea, but generally leaving at their feet a belt of low, level, or undulating coast-land, from 10 to 15 m. broad. The ranges of the E. system are generally lower, though the Anti-Lebanon in Mt. Hermon reaches a height of about 10,000 ft.; less sharply defined and more broken up in separate groups, the mts. of Moab, of Seir, etc. To the E. they roll off gradually into the plateaus of the Syrian desert. The depression between these 2 systems of mt.-ranges comprises the beautiful and fertile valley of Coele-Syria (*El-Bekaa*), between Lebanon and Anti-Lebanon, from 10 to 30 m. broad, and elevated 2300 ft. above the level of the sea. To the S., at the point where the Litany breaks through the W. wall to the Mediterranean, the valley of Coele-Syria connects by a narrow, rapidly descending gorge, 15 m. long, with the valley of the Jordan (*El-Ghur*), which at the Lake of Merom (*El-Huleh*) is on a level with the Mediterranean, but at the Lake of Tiberias 650 ft., and at the Dead Sea about 1300 ft. below it. Here, as well as in several other places, the country bears a strongly marked volcanic aspect, and earthquakes are frequent, and sometimes very destructive; Safed was fearfully devastated in 1837, Antioch in 1872, etc. The prin. rivers are the Jordan, the Aasy, and the Litany.

Wherever the supply of water is sufficient, the soil, generally of a sandy and light character, proves to be very productive; all the choicest plants of the tropical and temperate zones grow luxuriantly. Nevertheless, in extensive dists. and at certain seasons the country has a barren and desolate aspect. The climate, although different according to location, is dry and hot. Summer rains are rare, and in the coast-region and El-Ghur the summer heat is very oppressive; at Aleppo the thermometer often rises above 100°. The true cause, however, of the desolation of the country is not its difficult climate, but the circumstance that through centuries of bad fortune it has become almost depopulated and its few inhabs. degenerate. The pop. is a very much mixed race. Shemitic blood, however, is the prevailing element; the Osmanlic Turks, of the Turanian race, are the rulers. Arab is the lang. commonly spoken and written. The old Syriac or Aramaic has nearly died out. In the cities on the coast Gr. is everywhere understood. The religion of the country comprises a great number of Mohammedan, Chr., and Jewish sects, some of a very peculiar character, such as the Maronites, Druses, Nusairieh, and Assassins.

CLEMENS PETERSEN.

**Syriac**, a dialect of Aramaean or Low Shemitic, known to us only through a Chr. lit. so often called *Christian Aramaean*, also incorrectly called *West Aramaean*, as distinguished from Chaldeæ, East Aramaean. It first comes to our notice in the 2d century A. D. It was spoken in various dialects throughout Syria, but the form in which it is preserved to us in lit. is probably the cultivated dialect of Edessa. From the 3d to the 8th century it was the common lang. of W. Asia, but after the Mohammedan conquest (636) it began rapidly to decay. During the 10th and 11th centuries S. was given up in the cities, and by the end of the 13th it had disappeared from the v. and country; since then it has been practically a dead lang., used only as the "ecclesiastical language" in the S. chs., and spoken in a very corrupt idiom in some few mt.-dists. of the Lebanon and on Lake Urumeah.

**LITERATURE**.—S. lit. reflects the situation of the country, which was continually subject to foreign dominion and devastated by hostile inroads; it has no freedom of range or originality in character. It is very largely made up of translations, and is almost exclusively religious.

**FIRST PERIOD**.—Up to the Mohammedan conquest, A. D. 636. S. a spoken lang., and the Syrian univs. of Edessa and Nisibis centres of learning for the Entire Orient.

**Bible Versions**.—A. The Peshito (i. e. "The Simple") edition, the oldest S. lit. that has come down to us. It exerted an immense influence in moulding the lang., as well as all the subsequent lit., and has remained the accepted version among all parties of the Syrian Ch. (a) *Version of New Testament*.—Earliest and most important translation of N. T., invaluable for its critical study; made at Edessa in the 2d century. (b) *Version of Old Testament*.—Valuable translation, made directly from Heb. It is by Chr. editors, and probably contemporaneous with the version of the N. T.

B. *Philoxenian Version*, a critical version of the N. T. prepared under direction of Xenagoras or Philoxenus, bp. of Mabug (488-518), mainly preserved to us through the revision of Thomas of Harkel (hence called "Harklensian Revision"), made in Alexandria A. D. 616. Its design was to render literally the Gr. original, which is slavishly followed.

C. *Hexaplar Version of O. T.* (formerly called *Figurata*), made 617 A. D. by Paul, bp. of Tella, from Origen's text of LXX., extremely valuable for textual criticism of LXX.

D. *Syro-Palestine*, a lectionary of inferior importance, in a corrupt dialect of Pal., and probably belonging to the 6th or 7th century.

**SECOND PERIOD** (636-1313 A. D.).—Period of decay of S. James of Edessa (d. 708), learned scholar, celebrated grammarian, and linguist; Barsalibäus (d. 1166); Barhebraeus; Gregory Abul Farasch (1226-86); best known are his civil and ecclesiastical histories—(a) *Chronicon Syriacum*, (b) *Chronicon Ecclesiasticum*; Ebed Jesus (d. 1318).



**THIRD PERIOD (1318).**—Arabic the spoken lang.; S. cultivated only as a learned and ecclesiastical lang., chiefly in the Maronite coll. in Rome. Amira (1644), grammarian; the Assemanis.

**SYRIAC MSS.**—The chief collections of Syriac MSS. are in the Brit. Museum, the Vatican, the Bibliothèque Nationale in Paris, and the Bodleian in Ox. The oldest MSS. are of the 5th century. [*From orig. art. in J.'s Univ. Cyc.*, by PROF. T. C. MURRAY.]

**Syrin'ga** [Gr. *σύνρυξις*, a "tube"], a genus of Old-World shrubs of the order Oleaceæ, to which the lilacs belong. Popularly, the beautiful *Philadelphus coronarius*, of the order Saxifragaceæ, is called syringa. It is a native of Japan.

**Syr'tis Major and Syr'tis Minor**, the anc. names of the 2 opposite angles (E. and W.) of the great re-entrant in the S. coast of the Mediterranean, of which the margins are the coasts of Tunis and Tripoli. They are now called the Gulf of Sidra and the Gulf of Gabes.

**Szabadka** [Ger. *Maria-Theresiopol*], town of S. Hungary, co. of Bacó, on Lake Palicz, has manufactures of linens and leather, important cultivation of tobacco and breeding of cattle, and a brisk trade in horses, cattle, sheep, wool, and hides. It contains several handsome buildings, such as the ch. of St. Theresa, the beautiful Gr. ch., the town-house, the new barracks, etc. Pop. 61,357.

**Szegedin**, seg'e-din, town of Hungary, at the influx of the Maros in the Theiss, is fortified and has several fine buildings, though in general it is ill built and most of its streets are unpaved. It manufactures soda, tobacco, cloth, and soap, and has an active trade in corn, wine, salt, and timber. Its two annual fairs are, next to those of Pesth and Debreczin, the best frequented in Hungary. On its wharves are built the best river-boats in Hungary. Pop. 73,075.

## T.

**T**, a consonant, classed as a lingual mute. It is subject to numerous interchanges with other consonants. T, as an abbreviation stands for Titus, ten, treble.

**Tabas'co**, state of the Mex. confederation, bordering N. on the Gulf of Mexico, and bounded E. by Yucatan, comprises an area of 11,861 sq. m. The surface is a flat plain sloping toward the sea. The climate is very hot, but the soil is exceedingly fertile. The surface is to a great extent covered with primeval forests. Sugar, coffee, tobacco, vanilla, and cacao are cultivated. Pop. 104,747.

**Tabasheer** [Per. *lāshīr*, "clay"], a natural glass obtained from the hollow stems of certain bamboos. It appears to be the product of an exudation of the silicious sap of the plant into its internal cavity. It is very light, brittle, porous, and has hygroscopic properties.

**Tabernacle** [Lat. *tabernaculum*], **The**, a large and costly tent erected by the Israelites near the close of their encampment at the foot of Mt. Sinai, and subsequently carried with them in their wanderings in the wilderness and into the Holy Land; it was continued in Pal. until replaced under Solomon by the temple. In structure it consisted, essentially, in ground-plan, of 2 adjoining rooms, with an outer court surrounding both. The inner room, which was an exact cube, contained the ark of the covenant with its contents; over this were the figures of 2 cherubim, and between them the Shekinah. The only access to this room was from the outer room, of the same width and height, but just twice the length. Between them hung a veil, which was passed only by the high priest, and by him only on one day of the yr., the great day of atonement. In the outer room was the golden censer, the golden altar on which incense was burned every morning and evening, the table of shewbread, on which were 12 loaves of bread, replaced each week, and the golden candlestick, the lamps of which were trimmed every morning and lighted every evening. Into this the high priest and the priests entered daily in the course of their regular ministrations, but no others. In the court the principal object was the large brazen altar, on which all burnt-offerings and the appointed parts of other sacrifices were burned. Between this and the sanctuary itself was placed the brazen laver for the frequent ablutions of the priests. This court was entered not only by the priests and Levites, but by all Israelites who came to offer sacrifices. The court was inclosed on all sides by pillars of brass resting in sockets of brass; and on these were hung, by hooks of silver, curtains, one for each side, of "fine twined linen." The sanctuary itself, within the court, was a tent covered with a series of curtains; but under these curtains was a structure with sides and rear of acacia boards. Each board had at the bottom 2 silver temons fitting into silver sockets placed on the ground, and at the top on the outer side a ring of gold through which ran bars of acacia to hold all together. This was divided by a curtain so as to form the holy place and the holy of holies. The covering rose in the form of a triangle to an apex over the centre. The T. in all its structure was arranged for convenient packing, transportation, and setting up, but nevertheless, in size, in beauty of workmanship, and in costliness of material, was a magnificent structure for the wilderness. [*From orig. art. in J.'s Univ. Cyc.*, by PROF. FREDERIC GARDINER, D. D.]

**Tabernacles, The Feast of**, one of the three great festivals at which all the males of Israel were required to present themselves at the sanctuary. It began on the 15th Tisri (the last part of Sept. or first part of Oct.), and continued 7 days, with a supplementary eighth day. The feast was pre-eminently a thanksgiving festival after the close of the agricultural labors of the yr., and was far more joyously kept than any of the other feasts. According to the ordinances of the Law, it was distinguished by 2 peculiar observances. The first of these characteristics resulted from the command to the Israelites to dwell in booths during the 7 days of the feast. This dwelling in booths connected the harvest festival with the national and religious life of Israel,

and was expressly made in the Law a remembrancer of their deliverance from Egypt. The other legal peculiarity of the feast was in the sacrifices. There was offered on each day a kid for a sin-offering, with 2 rams and 14 lambs for a burnt-offering; but beside this there was a further burnt-offering of bullocks, 13 on the first day, 12 on the second, and so on diminishing by one on each successive day, until only 7 were offered on the seventh day. On the eighth day the sacrifices were a goat for a sin-offering, 1 bullock, 1 ram, and 7 lambs for a burnt-offering.

**Ta'bes Dorsa'lis**, known as **Progressive Locomotor Ataxia**, a degenerative condition of the posterior gray column of the spinal cord. The term "progressive locomotor ataxia" is descriptive of the chief features of the disease. Ataxia (Gr. *α*, privative, and *τάξις*, "arrangement" or "order") designates the peculiar loss of control in this disease over groups of muscles which in health are co-ordinated or employed in unison. This deranged, inharmonious action of muscles is limited chiefly to the lower extremities, and manifested when attempting to walk; hence the term "locomotor," while the affix "progressive" indicates the steady and hopeless progress of the malady. In advanced stages the patient has not sufficient control to stand with the eyes shut, and, on attempting to walk, the limbs move irregularly and wildly, the feet coming down abruptly with a flapping sound, the patient catching at support or falling. Intense pains, of electric rapidity and lancing severity, shoot from the feet to the thighs, trunk, and often to the head. The soles of the feet often are anæsthetic, and seem to the patient puff, as if walking on down or velvet. There may be anæsthesia of other parts. This disease of the spinal cord is in some cases induced by intemperance; in others by licentious excess and specific disease; in others it would seem the reflex result of disease of the bowel and the urinary tract, as in stricture of the rectum, hæmorrhoids, urethral stricture, etc. Habitual exposure to inclement weather and the rheumatic and gouty vicissitudes of the blood may induce it. When due to specific blood-states, as rheumatism, gout, and syphilis, there is hope of cure or arrest of the disease by specific treatment. But more often the cause is obscure and of slow, insidious approach; it is surely "progressive," and treatment is limited to general tonic and hygienic measures, and assuaging pain by anodynes. E. DARWIN HUDSON, JR.

**Table-Land, or Plateau**. See EARTH.  
**Table Mountain**, in Pickens co., S. C., 20 m. N. W. of Greenville, rises 4300 ft. above tide, and there is on one side a long line of cliffs 1000 ft. in perpendicular height. The vicinity is becoming a place of summer resort.

**Taboo**, or **Tabu**, a Polynesian interdiction which makes persons, places, or things sacred, so that certain persons cannot touch or come near them without becoming defiled and outlawed.

**Tabor College**, Fremont co., Ia., was incorporated under the name of Tabor Literary Institute in 1854, and reincorporated under the name of Tabor College in July 1866. In the admission of students no distinction is made on account of sex or race. An acad. was opened in 1857, and a coll. department in 1866. T. C. includes, beside the coll. dept., a ladies' dept., a teachers' dept., and a preparatory acad. In all depts. the number of students during the yr. has varied from 156 to 210, about 1/3 the average attendance being in the college course.

**Ta'borites** [named from *Tabor*, one of their strongholds], a sect of the Hussites organized in 1420 under Ziska. They opposed the Calixtines or Utraquists, no less than the Romanists, and waged long defensive wars. They finally (about 1457) took the name of Bohemian Brethren.

**Tabor, Mount** [Heb. "height"], an insulated mt. of N. Pal. in Galilee, 6 m. S. E. of Nazareth, rises 1033 ft. above the plain and 2018 ft. above the sea. It is often mentioned in the O. T.

**Ta'brez**, town of Per., cap. of the prov. of Azerbaijan, is surrounded with a brick wall 3 1/2 m. in circuit, but is ill built, with crooked, narrow, and dirty streets, and no remarkable public edifices. A large trade is carried on, partly in the manufactures of the city itself, silk, arms, shawls, tobacco, and leather, partly as a transient trade between Rus. and Tur. and Per. and India. Pop. about 50,000.

**Tacamahac**. (1) The resin of *Fagra octandra*, a tree of Curaçoa and Venezuela; (2) that of the buds of balsam poplar, which grows in the U. S. (*Populus balsamifera*); (3) that of *Calophyllum Calaba*, C. *inophyllum*, and C. *Tacamahaca*, Old-World tropical trees, producing E. I. T.; (4) the Mex. Copal (which see). These articles are sometimes used in med.; all but the second are employed in varnishes, incense, etc.

**Taché** (ALEXANDRE), brother of Sir Etienne P., b. at Kamouraska, Lower Canada, in 1822, grad. at the coll. of St. Hyacinthe; became a member of the order of the Immaculate Conception; was ordained priest 1843; went as a missionary to the Red River country, and thence among the Indians of the valley of the Saskatchewan; became coadjutor bp. of St. Boniface, Manitoba, 1851, bp. 1853, and abb. 1871; exerted himself as a peacemaker during the Riel insurrection of 1869-70, and established a coll. and theological sem. at St. Boniface, opposite Fort Garry. Wrote *Vingt Années de Missions dans le Nord-ouest de l'Amérique, Esquisse sur le Nord-ouest de l'Amérique*, etc.

**Tachygloss'ida** [from *Tachyglossus*—Greek, *ταχύς*, "quick," and *γλῶσσα*, "tongue"], a family of mammals of the order Monotremata, confined to Australia and its adjuncts. *Echidna*, a name often used, was preoccupied in zoology. The jaws are produced into a long and tubular rostrum; at the end of this is the small mouth; teeth are entirely wanting, but on the palate are robust horny spines, pointing backward; the tongue is subcylindrical, and very long, flexible, and protractile, and armed with numerous horny warts; the surface of the body and head above and on the sides is armed with long, stout, tapering, and pointed



spines, intermingled with coarse hair, and below is clothed chiefly with simple coarse hair; the limbs are short and robust, each provided with five toes; those of the anterior feet with graduated long, compressed curved claws; those of the hinder feet with abruptly unequal claws—viz. the inner with a broad rounded nail, the second with a very long, and the others with regularly graduated, moderately compressed curved claws (the males are provided with horny spurs to the hind feet, which are wanting in the females); the tail is rudimentary. The family is now represented by one genus (*Tachyglossus*), found in Australia and New Guinea, and *Zaglossus*, a form lately discovered in New Guinea. They chiefly feed on ants and other small insects, but sometimes take in grass. They are capable of sustaining life for a long time without food, and are supposed to remain dormant during the dry hot months of summer, as they are at least chiefly seen during winter.

THEODORE GILL.

**Tachygraphy.** See STENOGRAPHY.

**Tac'itus** (C. CORNELIUS). The place and date of his birth are not known, but he married a daughter of C. Julius Agricola in 78 A. D.; was praetor in 88, consul suffectus in 97, and probably survived Trajan, who died in 117. As an author he was much appreciated by his own times and the next century. *Agricola* is a biography of his father-in-law, an artistic masterpiece. *De Moribus et Populis Germaniae* is an essay which probably had originally a moral purpose as much as an historical. Of his *Historiae*, written before the *Annales*, only the first 4½ books are extant, giving the hist. of the years 69-70 A. D. The *Annales* begin at the death of Augustus and end at death of Nero, 14-68 A. D.

**Tacitus** (M. CLAUDIUS). Rom. emp. Sept. 25, 275-Apr. 9, 276, b. at Interamna, the present Terni, in Umbria, about 200. It was his idea to reinstate the senate in its former authority, and to check the steadily increasing licentiousness and confusion in all public affairs, but he d. 300 days after his election.

**Tackmahack, or Tacamahac.** See POPLAR and TACAMAHAC.

**Tacoma** (W. T.). See APPENDIX.

**Tadama** (LAURENZ ALMA). See APPENDIX.

**Tad'pole**, (1) a name given primarily to the larval or young stage of the frogs, which is distinguished by the large head, compressed tapering tail, and want of legs; (2) to the corresponding stage in other amphibians; (3) furthermore employed for the larvæ of many ascidians, having a superficial resemblance to the tadpoles of frogs.

**Tael**, tal, a Chinese measure of weight equivalent to 1½ ounces avoirdupois.

**Tania.** See TAPEWORM.

**Taniol'idea** [Gr. τανιολίς, "like a ribbon"], a family of sterelintoid intestinal worms, of which the type is the TAPEWORM (which see).

**Tafel** (JOHANN FRIEDRICH LEONHARD), Ph. D., b. at Sulzbach, Würtemberg, Ger., Feb. 6, 1800, grad. at the Univ. of Tübingen 1820; was prof. of langs. for many yrs. in gymnasia at Stuttgart, Ulm, and Schorndorf; introduced the Hamiltonian interlinear method of teaching langs. In 1853 he came to the U. S.; was for 3 yrs. prof. in Urbana Univ., O., and ultimately settled at St. Louis, Mo. With his son, Ludwig H., he pub. *A New and Complete Eng.-Ger. and Ger.-Eng. Pocket Dict.*—His son, RUDOLPH LEONHARD, Ph. D., prof. of langs. at Washington Univ., St. Louis, b. at Ulm, Ger., Nov. 24, 1831, came to the U. S. in 1847; was joint author (with his father) of *Lat. Pronunciation and the Lat. Alphabet*; pub. *Emanuel Swedenborg as a Philos. and Man of Science, and Investigation into the Laws of Eng. Pronunciation and Orthography*.

**Taft** (ALPHONSO), LL.D., b. at Townshend, Vt., Nov. 5, 1810, grad. at Yale 1833, afterward tutor; admitted to the bar 1838, and moved to Cin., O., same yr.; judge of superior court of Cin. 1866-72; resigned, and resumed practice of law; U. S. sec. of war Mar. 8 to May 22, 1876; U. S. atty.-gen. 1876-77; became envoy extraordinary and minister plenipotentiary of U. S. to Aus. Apr. 26, 1882.

**Tagus**, one of the prin. rivers of Sp., rises in the Sierra Albaracin, in lat. 40° 38' N., lon. 1° 35' W., flows mostly in a W. and S. W. direction through Sp. and Port., and falls into the Atlantic at Lisbon, after a course of about 540 m. It is navigable 115 m.

**Tahiti, or Otahel'te**, the prin. of the Society Islands, is in the Pacific Ocean, in lat. 17° 29' S., lon. 149° 29' W. It is high, its highest point rising 8500 ft., but traversed by beautiful and fertile valleys. Pop. about 13,800.

**Tahoe, Lake.** See APPENDIX.

**Tail'or**, a name applied in the U. S. to different species of fishes. (1) At and in the neighborhood of Phila., Baltimore, and Wash., as well as along other parts of the coast, it is given to the *Pomatomus saltatrix*, known at New York and designated in most angling works as bluefish. (2) About Wash. and at some other places the name is employed either alone or qualifying herring for the *Pomolobus medocensis*, a species of the herring family.

**Tailor-Bird**, the Eng. name of the *Orthotomus longicauda*. It is a small bird, about 5 inches long, with a slender subtriangular and slightly decurved bill, short and rounded wing, and very long cuneiform tail composed of narrow feathers; the color is an olive-green above and white beneath on the body, and bright red on the top of the head. Its name is due to the manner in which it uses in the nest, and sews, as it were, the leaves which it uses in the composition of it. The bird is insectivorous, like the other members of the family. It is an inhab. of India, as well as Ceylon and Burmah.

**Taine** (HIPPOLYTE ADOLPHE), b. at Vouziers, in the Ardennes, Fr., Apr. 21, 1828, was ed. at the Collège Bourbon and the normal school of Paris, and became prof. of aesthetics in the school of fine art in 1864. His earliest writings attracted much attention by their originality and their polemical tendency. His *De l'Intelligence* has a similar char-

acter. Free of polemics are his *L'Idéal dans l'Art*, *Philosophie de l'Art dans le Pays Bas*, *Philosophie de l'Art en Grèce*, etc. His prin. works are *Histoire de la Littérature anglaise* and *Les Origines de la France contemporaine*.

**Tait** (ARCHIBALD CAMPBELL), D. D., LL.D., b. at Edinburgh, Scot., Dec. 22, 1811, ed. at the high school and acad. at Edinburgh, at the Univ. of Glasgow, and at Balliol Coll., Ox.; took orders in the Ch. of Eng.; head-master of Rugby School 1842-50; accepted the deanery of Carlisle 1850; bp. of Lond. 1856; abb. of Canterbury 1868 till his death, Dec. 3, 1882. Wrote *The Dangers and Safeguards of Modern Theol.* and *The Word of God and the Ground of Faith*, etc.

**Tal'bot**, a breed of snow-white hounds now nearly extinct. The T. had very long ears, a very broad muzzle, and seems to have been kept for show rather than for use, but was sometimes used in the chase.

**Talbot** (JOHN), rector of Fretherne, Gloucestershire, Eng., 1701; chaplain on the ship Centurion, which brought to Amer., in June 1702, the first missionaries of the Society for the Propagation of the Gospel in Foreign Parts; was himself appointed a missionary of this society Sept. 18, 1702; founder and first rector of St. Mary's ch., Burlington, N. J., Mar. 25, 1703; for 30 yrs. a leader of the Ch. of Eng. in the N. colonies of Amer.; consecrated bp. in 1722 by non-jurors in Eng. D. Nov. 29, 1737.

**Talbot** (MATTHEW), b. in Eng. about the middle of the 18th century, became a wealthy carrier at Leeds, and spent his leisure in distributing the verses of the Eng. Bible, according to their sense, publishing (in 1800) as a result *An Analysis of the Holy Bible, containing the whole of the Old and New Testaments, collected and arranged systematically in 30 Books, which are subdivided into 285 Chapters and 4144 Sections*.

**Talbot** (SILAS), b. in R. I. about 1750, was present at the siege of Boston; in 1776 accompanied the army to New York, where he conducted operations against the Brit. shipping; was severely wounded in 1777 at the defence of Ft. Mifflin, and in 1778 aided Gen. Sullivan by transporting the Amer. forces from the main land to R. I.; he captured the Brit. floating battery, the Pigot; in 1780 was made prisoner and sent to Eng., but was exchanged in Dec. 1781; was a member of the N. Y. legislature, and M. C. 1793; when the navy was reorganized in 1794, he superintended the construction of the frigate Constitution, which was his flagship during a cruise in the W. I. in 1799. D. June 30, 1813.

**Talbot** (WILLIAM HENRY FOX), LL.D., b. at Chippenham, Wiltshire, Eng., Feb. 11, 1800, grad. at Trinity Coll. 1821; sat for Chippenham as a Liberal in the first reformed Parl. 1832-34; pursued for some yrs. from 1833 a series of experiments which resulted in Sept. 1840 in the discovery of the essential principle of the art of photography; he of late yrs. devoted himself to antiquarian pursuits, and was one of the few scholars who have successfully deciphered the Assyrian cuneiform inscriptions. Many of his versions from the Assyrian are found in the *Transactions* of the Royal Asiatic Society, of the Society of Biblical Archaeology, etc. Wrote *Hermes, or Classical and Antiquarian Researches, The Antiquity of the Book of Genesis illustrated by some New Arguments*, etc. D. Sept. 21, 1877.

**Talbotype.** See TALBOT, W. H. F., and PHOTOGRAPHY.

**Talc**, talk [Gr. *τάλκ*], from the same root, possibly, as our Eng. word *tallow*, which in Ger. and Swe. is *Talg*; in Dut. *talk*, and in Dan. *talq*, and having reference to the greasy, tallow-like feel of the mineral], a highly important mineral species, a silicate of magnesia, usually somewhat hydrated, which sometimes makes up the mass of great geological formations. T., when crystallized, is right rhombic. It belongs to the softest of minerals, ranking with graphite in this respect, and is used as the lowest member of the scale of hardness. Its most usual color is a light green, due usually to ferrous oxide associated with the magnesian base; but this color and this constituent are not essential, and it is found perfectly white, sometimes with a silvery lustre. The massive varieties are called soapstone.

**Tal'cott** (ANDREW), b. in Conn. about 1798, grad. at the U. S. Military Acad. July 24, 1818, accompanied Gen. Atkinson, as engineer, on the expedition to locate military posts on the upper Missouri and Yellowstone rivers; engaged in the construction of the defences of Hampton Roads, Va., Ft. Delaware, etc., until 1835; as astron. for determining the boundary-line between O. and Mich., and was in charge of the improvement of the Hudson River 1834-36; division engineer on the Erie R. R.; supt. of the improvement of the delta of the Miss. River 1837-39; member of commission for exploration and survey of the N. E. boundary of the U. S. 1840-43; of joint army and navy board to visit the Portsmouth and Pensacola navy-yards and prepare plans for dry-docks and other important works 1844-45; from 1848 to 1855 was chief engineer of the Richmond and Danville R. R.; of the O. and Miss. R. R. 1856-57, in which yr. he went to Mex. as chief engineer of the proposed railroad from Vera Cruz, via the City of Mexico, to the Pacific Ocean.

**Tal'ent** [Gr. *τάλαντον*], an anc. Gr. weight containing 60 mina, about 82 lbs. avoirdupois. A T. in money was originally a T.'s weight of silver or of gold, but the T. finally became a money of account.

**Taliaferro**, tol'-i-ver (BENJAMIN), b. in Va. about 1751; during the war of the Revolution served with marked distinction in Morgan's rifle corps in the actions at Saratoga and Monmouth, and at the siege of Savannah. In 1780 he was volunteer aide to Gen. Lincoln at Charleston, S. C., where he was taken prisoner. He removed to Ga. in 1781; was M. C. 1799-1802, a delegate to the Ga. constitutional convention of 1798, and subsequently pres. of the state senate and a judge of State superior court. D. Sept. 3, 1821.

**Tal'ipat Palm**, the *Corypha umbraculifera* and *C. Tal'iera*, noble E. I. trees. The first mentioned affords great leaves, which are used for covering houses, making umbrellas, and for making a substitute for writing-paper extensively used in the E., as well as for many other purposes.



The pith affords a kind of sago. The tree grows in Malabar and Ceylon.

**Talladega**, on R. R. city, cap. of Talladega co., Ala., 110 m. N. E. of Montgomery, contains Talladega Coll., a fine graded school for freedmen, and a synodical inst. Pop. 1870, 1933; 1880, 1233.

**Tallahassee**, city and R. R. junc., cap. of Leon co. and of State of Fla., beautifully situated on high ground, and regularly laid out with wide, well-shaded streets and squares, has a State capitol building, a c-h., the W. Fla. Sem., a State inst., with separate male and female depts. Pop. 1870, 2023; 1880, 2494.

**Talleyrand-Perigord**, tah-la-ron'-pa-re-gor', de (CHARLES MAURICE), DUKE, prince of Benevento, b. at Paris Feb. 13, 1754, d. there May 17, 1838. Entered the service of the Ch. against his will, and was made bp. of Autun in 1788. When the revolution broke out he joined the *tiers état*, proposed the confiscation of the property of the Ch. Oct. 10, 1789, the suppression of the religious orders Feb. 13, 1790, and consecrated the colors of the national guard July 14, 1790. From 1797 to 1807 he was minister of foreign affairs, and the easy terms which Fr. obtained after the fall of Nap. were due to his sagacity and energy during the cong. of Vienna. During the reigns of Louis XVIII. and Charles X. he took very little part in public life. In Sept. 1830 Louis Philippe sent him as ambassador to Lond., and he completely succeeded in establishing a cordial and intimate relation between the courts of St. James and the Tuilleries, and concluded the quadruple alliance between Eng., Fr., Sp., and Port. Apr. 23, 1834. See his *Mémoires*.

**Tallien**, tah-le-an' (JEAN LAMBERT), b. at Paris in 1769, became noted in 1792 as the ed. of a Jacobin journal, *L'Ami du Citoyen*; sided with Marat; advocated the condemnation and immediate execution of Louis XVI., and attacked the Girondins with senseless fury. In 1793 he was sent to Bordeaux to exterminate the moderate party, but here he became acquainted with Madame de Fontenay, and this acquaintance suddenly changed him from an extreme radical to a decided moderate. He rallied the partisans of Danton and Hebert, and by his energy and coolness at the decisive moment the overthrow of Robespierre and the Terrorists was accomplished July 27, 1794. He now became one of the most conspicuous figures in the republic, and married Madame de Fontenay. Treated as a traitor by the republicans, also considered a traitor by the monarchists, he was driven out of the council of Five Hundred under the Directory, and very glad to accompany Bonaparte on his campaign to Egypt as savant. Gen. Menon, however, sent him back to Fr. in 1800. He was captured by some Eng. cruisers and brought to Lond. d. at Paris Nov. 16, 1820.

**Tallis** (THOMAS), b. about 1529, was perhaps organist to Henry VIII., and certainly gentleman of the chapel to Edward VI., Mary, and Elizabeth, and organist to the last, and has been styled "the father of Eng. cathedral music." In conjunction with his pupil, William Byrd, he put forth *Discursus Cantiones Sacre*, etc. (1575), which are masterpieces. D. Nov. 23, 1585.

**Tallmadge** (BENJAMIN), b. at Setauket, L. I., Feb. 25, 1754, grad. at Yale 1773; taught a high school at Wethersfield, Conn.; entered the Continental army at the outbreak of the war of the Revolution; became col. of a Conn. regiment; performed a brilliant exploit in crossing the Sound, surprising and capturing 500 Tories at Lloyd's Neck, L. I., Sept. 5, 1779, without the loss of a man of his own force; planned and executed the capture of Ft. George at Oyster Bay and the destruction of Brit. forces on L. I. May 1780; was intrusted with the custody of Major André, and superintended his execution; became after the war a successful merchant, and was M. C. 1801-17. D. Mar. 7, 1835.

**Tallmadge** (FREDERICK AUGUSTUS), son of Col. Benjamin, b. at Litchfield, Conn., Aug. 29, 1792, grad. at Yale 1811; studied law; was admitted to the bar; commenced practice in New York 1814; member and pres. of the State senate, judge of the supreme court of errors, recorder of New York, M. C. 1846-48, supt. of the metropolitan police 1857, and clerk of the court of appeals 1862-65. He became best known for his energy while recorder in suppressing the "Astor-Place riot" of May 1849. D. Sept. 17, 1869.

**Tallmadge** (JAMES), LL.D., b. at Stamford, N. Y., Jan. 28, 1778, grad. at Brown Univ. 1798, was for some time private sec. to Gov. George Clinton; held a military command in New York during the war of 1812-15; was M. C. 1817-19; introduced an amendment to the bill admitting Mo. excluding slavery from the region W. of the Miss.; took a prominent part in the N. Y. constitutional conventions of 1821 and 1846; sat in the assembly 1824; was lieutenant-gov. 1826-27; was instrumental in introducing into Rus. several Amer. mechanical inventions, especially cotton-machinery; was one of the founders of the Univ. of New York; was for 19 yrs. pres. of the Amer. Inst., and was a leading exponent of the Whig doctrine of protection to Amer. industry. D. Sept. 29, 1853.

**Tallmadge** (NATHANIEL P.), b. at Chatham, N. Y., Feb. 8, 1795, grad. at Union Coll. 1815; studied law; was admitted to the bar 1818; chosen to the N. Y. assembly 1828; State senator 1830-33, U. S. Senator 1833-44, and gov. of Wis. Terr. 1844-55. D. Nov. 2, 1864.

**Tallow**. This term includes the hard fat of animals, more properly called *suet*, and also those fats of a less degree of hardness; e. g. lard and grease, as distinguished from oils. The fats obtained from the "rendering" of animal fats, of all kinds are technically known as "tallow," and are chiefly used by the tallow-chandler for the production of soap and candles. The animal fats are hard in proportion as they contain more stearine and palmitine and less of oleine.

**Tallow, Mineral**. See MINERAL TALLOW.

**Tallow-Tree** (1) of the S. U. S. and of Chi., see *STILINGIA*; (2) the *Pentadesma butyracea* of W. Afr., a guttiferous tree whose fruit yields a kind of yellowish tallow;

(3) a name of the piny dammar tree of India, *Vateria indica*, a huge dipterocarpaceous tree, whose seeds on boiling yield an excellent white tallow.

**Tally**, a stick on which are notches and other marks indicative of an account, pledge, or other commercial transaction. In the Brit. exchequer T. consisting of bits of peeled wooden rods were used until 1783. The T. was split in such a way as to divide certain of the notches cut on it. One half the T. was given to the payer and one half retained by the exchequer.

**Talma**, tal'ma; Fr. tahl-mah' (FRANÇOIS JOSEPH), b. at Paris Jan. 15, 1763, was irresistibly drawn to the stage. He produced the first great impression by his performance of the title-rôle in Marie-Joseph Chenier's tragedy *Charles IX.*, Nov. 4, 1789, from which date he rapidly rose in the estimation of the public until in the first decade of the 19th century he stood acknowledged by the whole world as the greatest tragedian of his time. In his art he continued unrivalled and improving till his death, Oct. 19, 1826.

**Talmage** (REV. THOMAS DE WITT), D. D., b. in Boundbrook, Somerset co., N. J., Jan. 7, 1832. He entered New York Univ. in 1849, graduating in 1853, and grad. from New Brunswick Theological Sem. in 1856, and the same yr. was called to the Reformed ch., Belleville, N. J. In 1859 he became pastor of the Reformed ch. in Syracuse, N. Y. In 1862 he was called to the Second Reformed ch. of Phila. In 1869 he accepted the call of the Central Presb. ch. of Brooklyn. In 1870 a new ch. was built of wood and iron, which was destroyed by fire Dec. 22, 1872. On Feb. 22, 1874, a massive structure of brick and stone was dedicated. The new tabernacle has sittings for 4600, and is the largest Prot. ch. building in Amer. In 1872 Mr. T. organized in the old ch. building a Tabernacle Lay Coll. for training young men who desire to enter the ministry. In Sept. 1873 he became ed. of an undenominational religious journal, *The Christian at Work*. Wrote *The Almond Tree*, *Crumbs Swept Up*, *Abominations of Modern Society*, etc.

**Talmud**, a work whose authority was long esteemed second only to that of the Bible, and according to whose precepts the Jewish people have continued to order their religious life down almost to the present day. It is composed of 2 distinct works, which were compiled at different epochs—namely, the Mishna and the Gemara.

A. *Mishna*.—The name Mishna signifies "doctrine." It was used to designate, first, each individual ordinance; secondly, a group of interconnected ordinances; lastly, the entire system of ordinances.

(a) *The Structure and Arrangement of the Mishna*.—It consists of 6 divisions (*Sedarim*, literally, "orders"): (1) *Seraim*, seeds and products of the field; (2) *Moed*, festival celebration; (3) *Nashim*, laws relating to women; (4) *Nesikin*, legal provision; (5) *Kodoshim*, sacred things; (6) *Toharoth*, the distinctions of clean and unclean. Each division is subdivided into *Mesachtoth* ("tracts"). Each tract is again subdivided into *Perakim* "chapters", and each chapter into paragraphs.

(b) *The Origin, Enlargement, and Close of the Mishna*.—During the whole epoch of the first Temple the Mosaic religion was almost entirely neglected. After the return of the Jews from captivity in Babylon, Esra the Sofer ("scribe") was actually the first to recall it to life. But he was compelled by the altered circumstances of the time to enlarge, complete, and in many respects remodel it. A thousand problems urgently demanded solution, and Esra solved them. His word became law. His successors, called after him Soferim ("scribes"), otherwise known as the "Men of the Great Assembly," continued his work in the spirit of the master. That which they taught came to be looked upon as the rule of life. When they retired from the scene, the Sanhedrin of Jerusalem took their place. From its decisions there was no appeal. Thus, in the course of several centuries a vast stock of laws and usages had accumulated, which the Tora did not directly authorize, but which had been transmitted orally from generation to generation, till at last the accumulated mass became too unwieldy for the unassisted memory. Acad. arose for the cultivation and propagation of this stock of tradition, and simultaneously efforts began to be made to found the traditional enactments upon a biblical basis and support. Hillel the Elder, also called the Babylonian (b. c. 32), patriarch in Pal., and head of a numerous and learned school, arranged the mass of traditional laws in 6 Mishnic divisions; and this general arrangement was accepted by all his successors. R. Akiba, the celebrated martyr to his religion and patriotism, first took up the task which Hillel had begun. He was the greatest of the Talmudists of his own and of succeeding times. He instituted a more correct division and a more skilful disposition of the material which had thus far accumulated, and in this way laid the foundation of the Mishna as it now exists. Among his disciples, R. Meir holds the highest rank. Then arose R. Jehuda, also called simply "Rabbi." Since the yr. 120 A. D. he had been clothed with the patriarchal dignity. He made it the business of his life to establish a code of undisputed authority among his people. With this end in view he undertook to bring to a close the work which his predecessors had begun, but which still remained unfinished. He examined anew the whole vast accumulation of ordinances which centuries had contributed to heap up, and sifted and arranged them. He abridged in one place and amplified in another. In short, his indomitable energy and rare independence of spirit enabled him to master the whole difficult subject. He was the last, the most devoted, the true author of the Mishnic compilation.

(c) *Language of the Mishna*.—The language of the Mishna, though essentially Heb., differs from the more anc. Heb. of the Bible in important particulars. This difference is due partly to the natural development which the lang. had undergone, and partly to its fusion with the Aramaic dialects, especially with the Syriac and Samaritan.

(d) *The Composition of the Mishna*.—The Mishna was not



east in a single mould. It consists of anc. and more recent elements. In every direction the work exhibits manifest and manifold incongruities. Let us briefly indicate a few of the most important. *Repetition*.—(1) Certain ordinances are twice and three times repeated in various connections, and form parts of various distinct series. (2) Occasion offering, the whole of a series is repeated, or a part only. (3) Either all or some few of the ordinances thus repeated are abridged or developed and enlarged, while again, at other times, the repetition takes place without any modification at all. (4) One and the same ordinance is sometimes supported by totally different arguments in the different places in which it occurs. (5) Certain ordinances are omitted in those tracts to which they properly belong, and are introduced in others where their connection is purely formal.

(e) *Reduction of the Mishna to Writing*.—It was an undisputed principle with the men of the T. that the traditional law elaborated in their acad., ought not to be committed to writing. There was to be one holy "Scripture" only. It is a fact that, nevertheless, the Mishna and the Gemara were actually written down. Later writers seek to reconcile the two facts by explaining that upon the authority of a certain passage in the Bible it was deemed better to transgress a single precept than to suffer the whole body of traditional precepts and laws to fall into neglect and be forgotten. Concerning the exact time at which the Mishna was written down, diversity of opinion has prevailed among the most eminent Jewish scholars during the last 9 centuries. Rabbi arranged the Mishna in his own mind without the help of pen, delivered it, the same in form and contents as it stands to-day, in his acad., and thus transmitted it by word of mouth to his disciples. They again delivered it to succeeding generations, and it was thus preserved with verbal accuracy down to the time when the acad. sank in importance, and the authorities of the day found it necessary to fix the existing stock of traditions in writing. Such is the opinion of the "spirits that deny." Opposed to these we find a series of scholars, no less eminent, who affirm that Rabbi himself wrote out the Mishna in full.

(f) *Authenticity of the Mishna*.—The Mishna is to-day before us in 3 recensions—one embodied in the Babylonian T., another in the T. of Pal., the third being the complete collection of the Mishna, pub. separately, without the commentaries of the Gemara. All 3 differ, not only in points of style and verbal expression, but often even in the subject-matter. Frankel has shown that even during the lifetime of Rabbi, and soon after his death, the great authorities in Pal. did not scruple to subject his work to revision, making such additions and alterations that in the very next generation no less than 3 different redactions of the Mishna existed in Pal. Under these circumstances it does not appear strange that criticism of the text of the Mishna should have begun at a time when textual criticism in any other field was utterly unknown.

(g) *Commentaries on the Mishna*.—Maimonides (12th century) heads the list with his commentary, written in Arabic. He was followed by R. Tanchum of Jerusalem, who wrote a lexicon of the Mishna, also in Arabic. Since then an uninterrupted series of Heb. commentaries, written by prominent rabbis, either upon the whole or some select few of the Mishnaic tracts, have continued to appear down to the present day.

B. *The Gemara*.—The term *Gemara* is of Aramaic origin, and its signification is the same as that of Talmud—"teaching." In common parlance it denotes the whole body of controversies and teachings which arose in the acad. after the close of the Mishna, and which, being collected in writing, now form the second and major part of the work of the T. There are 2 different *Gemaras*—the one elaborated in the acad. of Babylon, the other having Pal. for its birthplace.

(a) *The Gemara in its Relation to the Mishna*.—The relation of the *Gemara* to the *Mishna* is that of a commentary to the text. The *Gemara* uniformly attaches its discussions to the words of the *Mishna*, explains terms and things wherever necessary, seeks to elucidate difficulties and to fortify the *Mishnaic* ordinances by adducing proofs for the same. It endeavors to harmonize discrepant statements, and to refer anonymous decisions to their proper authors. But the *Gemara* is more than a mere commentary. It has sedulously gathered, without any reference to their connection with the *Mishna*, whatever utterances had for centuries dropped from the lips of the great masters, whatever tradition had preserved concerning their life and actions, whatever bears directly, or even distantly, upon the great subjects of religion and ethics. Thus, it contains *legal enactments*, *homiletical exegesis of Script.*, *gnomes*, *moral maxims*, *popular proverbs*, *parables*, *tales*, *manners and customs*, both of the Jews and other nations. Beside these, there are also *medical*, *mathematical*, *astronomical*, *scientific* data, etc. The T. itself assigns its various component elements to 2 distinct classes, which are distinguished both in name and in substance. To the one class belong all laws and regulations that bear upon the practice of religion. This class is called *Halacha*, meaning originally "custom," then "law." Everything else is embraced under the term *Hagada*, or mere individual utterances in which no general and binding authority resides.

(b) *Ancient Elements in the Gemara*.—Shortly before and after the close of the *Mishna* a number of prominent authorities undertook to prepare various collections of ordinances and disputations. They interspersed the sterner *Halacha* with more or less *Hagada*. They differed in the methods employed. A few of these compilations, though considerably expanded by later writers and greatly corrupted in the course of time, are still preserved. They are—the *Tosefta*, composed after the manner of the *Mishna*, the *Mechilta*, *Sifra*, and *Siphri*, all 3 arranged in the form of a running commentary on the Bible. There were other collections of the kind which have long since disappeared.

(c) *Scope of the Two Gemaras*.—The *Gemara* of Babylon

does not cover more than 37 of the *Mishnaic* tracts. The *Gemara* of Pal., as we possess it, extends over 39 tracts.

(d) *The Language of the Two Gemaras*.—The anc. Aramaic branched off in the course of time into E. Aramaic or Chaldaic, and W. Aramaic or Syriac. The Babylonian Jews spoke a mixed dialect of Heb.-Chaldaic, and in this mixed dialect the Babylonian *Gemara* is written. The Palestinian *Gemara* is written in the Syriac, with but a very slight sprinkling of Heb.

(e) *The Teachers of the Two Gemaras*.—From the end of the 2d century to the middle of the 4th century an unbroken bond of friendly reciprocity had connected the high schools of Pal. and Babylon. Young students from Babylon, eager for knowledge, and with them many a ripe scholar, sought the Palestinian acad., to return to their homes after yrs. of absence and after enriching themselves with fresh learned material. Occasionally, though less often, it would happen that Palestinian scholars emigrated to Babylon and enriched the minds of their brethren with the new stores of erudition which they brought with them. This explains how it happens that names and teachings of Palestinian authorities are met with in very considerable number in the *Gemara* of Babylon; while, conversely, though not to the same extent, the opinions of Babylonian masters found a place in the *Gemara* of Pal.

(f) *The Compilers of the Gemaras, and the Date of their Compilation*.—The compilation of the Babylonian *Gemara* took place toward the close of the 5th century of our era; its ed. was R. Ashi (d. 427), who presided over the acad. of Sura. But R. Ashi was not the only one engaged in the work; tradition mentions R. Abina as co-editor; and to say that the *Gemara* was closed by R. Ashi, or by any one else, is too broad a statement to be literally true. The work was never formally closed; it was simply interrupted by the adverse circumstances of the times, then taken up again and carried forward by some until their energies flagged and the work remained unfinished. The Palestinian *Gemara* displays far greater uniformity in lang., style, and methods than the Babylonian, and this leads us to expect less difficulty in determining the questions of its authorship and the date of its completion; but this is decidedly not the case. Both questions are involved in dense obscurity, and the light of scholarship has hitherto struggled in vain to pierce it. The same uncertainty prevails with regard to the date of its composition.

(g) *The Condition of the Text of the Gemaras*.—The disfigurement of the text of the Babylonian *Gemara* as it stands is great beyond all expectation—greater than in the case of any other work which has been handed down to us from ancient times. In numerous instances well-meaning but incompetent men have foisted the marginal notes of some anonymous writer upon the text; others, no doubt from mere inadvertence, have omitted whole sentences, which, fortunately for us, have been in part discovered in the writings of the older commentators; others, again, making light of their task, have confused names and things in such fashion that the T. now abounds in contradictions and other difficulties which have cost its learned expositors much toil and trouble. Nor has the number of those self-conceited, would-be critics been small who, for their pleasure, made uncalculated changes in the text to suit their pleasure. For nearly 900 yrs. the ablest commentators labored to restore the text to at least approximate correctness, without any permanent success; later copyists and printers caused ever-new confusion. Since the invention of printing there have been pub. 45 complete editions, of which certainly no 2 editions are quite alike. The complete editions are for the most part in 12 folio vols. If the Babylonian *Gemara* has been unfortunate, the Palestinian has fared still worse. The corruption of its text is visible on every page. It has been less accessible to censorial interference, and has suffered less from mistakes of copyists; for during a long period it remained unknown, even in the foremost of the high schools, and then, even after it had become known, was barely noticed, much less critically studied, by scholars. The great source of injury in its case seems to have been, first, the Syriac idiom in which it is written, and which few of its readers or transcribers were capable of understanding; secondly, the want of proper attention. Errors and arbitrary alterations, when once they had been introduced, remained fixed.

(h) *The Literature of the Talmud*.—For full 13 centuries, with rare exceptions of local and temporary character, Jewish thought moved within a sphere whose centre is the T. What Script. says of Israel in Egypt is true of the intellectual activity of the Jews in later times: the more it was oppressed by its enemies, the more fruitful did it become. An immense lit. has grown out of the T. A bare list of those works which have at various times been pub. would alone fill a bulky volume.

(i) *Science*.—The religion of Judaism has in the course of time become a religion of life in the most comprehensive sense of the word; it accompanies its adherent from the cradle to the grave in all his doings, prescribes observances for every possible situation in health and disease, for every class of society, for occurrences of every kind, and in this manner its ceremonial forms surround not only man, his inner emotions and his outer development, but also the whole actual world around him. The T., therefore, had not rarely, in its *Halachic* part, to touch and treat of questions of general science, and hence it affords us an insight into the state of a number of scientific pursuits of the men of that time. The *Hagada* offers further scientific material in abundance, with which the *Halacha* are amply represented. The following branches of knowledge are amply represented in the T.: (1) *Mathematics*, (2) *medicine*, (3) *botany*, (4) *zoology*, (5) *astronomy*, (6) *technology*, (7) *law*, (8) *history*, (9) *geography*, (10) *pedagogy*. [From orig. art. in J.'s *Univ. Cyc.*, by REV. SAMUEL ADLER, Ph. D.]



**Ta'ma City**, R. R. centre, Tama co., Ia., near the centre of the State. Pop. 1870, 1161; 1880, 1289.

**Taman'dua**, a corruption of the name applied among Brazilian aborigines to a species of ant-eater, distinguished by its arboreal habits, long and prehensile tail, and the development of 5 teeth in the upper and 4 in the lower jaw on each side; the hair is short; the color of the head, shoulders, fore limbs, hind limbs outside, and tail along the middle is white; a stripe from each side of the neck over the shoulder and remaining part black.

**Tama'qua**, R. R. centre, Schuylkill co., Pa., in the midst of a mining dist., and with considerable manufactures. Pop. 1870, 5960; 1880, 5730.

**Tamarack**. See HACKMATAACK and LARCH.

**Tamarin**, a name sometimes applied to species of the monkey family, *Mididae*.

**Tamarind** [*Ar. tamar*, a "palm," and *Hindī*, "Indian," hence "Indian palm or date"], a beautiful leguminous tree, *Tamarindus indica*, from S. Asia and Afr., now naturalized in most warm regions. The pods are filled with a pleasant sour pulp, which is preserved with sugar, and is used for making a drink for fever-patients, etc. The wood is very hard and handsome.

**Tamarisk** [Lat. *tamariscus*, *tamarix*, diminutive of *Ar. tamar*, "palm"], a name applied to trees and shrubs of the order Tamaricaceæ. They have tonic properties, and some yield nut-galls: *Tamarix orientalis* affords a sort of manna.

**Tamaulipas**, tah-mōw-lee'pahs, state of the Mex. confederation, bounded N. by Tex. and E. by the Gulf of Mexico. Area, 30,225 sq. m. Pop. 140,137, mostly mestizos. The coast-land is low. Farther inland the ground rises and becomes by degrees mountainous. All cereals, fruits, and vegetables of the tropic and temperate zones are grown, immense herds of cattle are fed on the extensive pastures, and many horses, mules, sheep, and goats are reared. The mineral wealth of the country is considerable. Much salt is manufactured along the coast. Cap. Victoria.

**Tamerlane**. See TIMUR.

**Tamil**, its Language and Literature. Tamil is one of the most highly cultivated, ancient, logical, exact, and generally interesting langs. of India. It is the queen of Dravidian tongues, much in the same way as Sans. is the king of the Aryan dialects. It is a cultivated Dravidian dialect. In its phraseology it is rich and copious. When a scholar is heard to speak it, it has a robust and sonorous power that is unmistakable. There are 2 kinds of T.—the Shen-T. and the Kodun-T.—which vary greatly. Throughout all of the vast plain of the Carnatic, T. in some form or other is spoken. From a little N. of Madras to where triple lines of white breakers flash over the nets of Tinnevely and Travancore fishermen who ply their trade round about Cape Comorin, T. is the common vernacular. It is spoken by 14,500,000 Hindoos. Malabar was the name given 3 centuries ago to T. by the Port. In anc. times Tamilians were divided into 3 great subdivisions—namely, the Chôlas, the Chêras, and the Pândyas. The Pândya kings ruled over a part of the Malabar coast during the time of Pliny; and Strabo mentions the name of the Indian king who sent an embassy to the Rom. emp. Augustus as "*Pandion*."

T. may be described as an aboriginal Indian lang. It was spoken in S. India before the flood of Aryan Invasion came into India from the N. W. When Sans. thus entered Hindostan, T. may have been driven farther S.; indeed, it is almost reasonable to suppose that many tracts of Central or even N. Indian hill-country were primitively occupied by tribes who spoke modifications of the T. lang. It seems perfectly certain that T. was spoken in India 1000 yrs. n. c. Classical T. differs almost as widely from ordinary colloquial T. as Lat. does from It. The vocabulary of the most anc., most polished, and most poetical forms of the T. lang. is most exhaustive, precise, and extensive. Centuries must have elapsed before the methods elaborated could have become crystallized and authoritative in the lit. of the lang.

T. lit. is of large extent, but all the more anc. portion of it is composed in intricate and elaborate verse. Every treatise, whether relating to ethics or gram., med. or theol., astron. or any science or art, was by the unalterable law of custom written in metre. It is only of late yrs. that a T. prose lit. has been springing up and flourishing. We have no specimen at present extant of the earliest T. classics. The earliest work, probably, which we still possess is the old gram. called the *Tol Kâppiyam*—i. e., "the ancient poem." But as for the precise date of the rise of Tamilian lit. nothing is known with absolute certainty. The works of the greatest writers might have been composed a century or two earlier than computed, or a century or two later. Take, for instance, the greatest work in the T. lang. It is entitled the *Kural* of Tiruvalluvar. It is a magnificent ethical poem of 1390 distichs. Each distich is a poetical aphorism of rare beauty. Yet the precise date of the production of this noble work is still involved in mist. All that can be said with any degree of certainty is that it was composed in every probability before the 10th century A. D. How many centuries before it is impossible to determine with absolute certainty. Tiruvalluvar, the author of the *Kural*, was a pariah.

Auveiyar, or Auvel ("the venerable matron") was a T. poetess, who was reputedly Tiruvalluvar's sister. She is the Sappho of S. India, and many of her writings possess the highest poetic beauty. Two of the greatest works, as also the oldest, are the *Nâladī* and the *Chintāmanī*. The former is an ethical poem, and is remarkable for great sweetness of rhythm. It is composed in stanzas of 4 lines each throughout. The *Chintāmanī* ("the jewel which gratifies every wish") is by far the greatest epic poem in the T. lang. It contains some 15,000 lines. Another great poem is the *Ramāyana*, in T. The version is by Kamban, one of the most fluent and ornate of T. classical writers. The T. *Ramāyana* is not a slavish translation of Valmiki's great Sans. epic, but it is rather an adaptation. Two other

famous T. poets of Kamban's time are Pugalēndi and Ottakuttan. For some 2 centuries after the death of Kamban there appear to have arisen no great T. authors, till suddenly there sprang up a literary revival. A new poet, Athivirarama Pândya, now flourished, and this elegant writer produced the *Neididam*, the *Kâikandam*, and *Vettri Verkel*—the latter a small poem which has attained enormous popularity. About this time, too, Villiputturār translated the Sans. *Mahabharata* into T. verse. At this period, too, was probably composed the greatest of the Vedantic poems in T., the *Gnāna Vâisikhtham*. Not much later than this time were written those elegant poems, full of smiles, and metaphors, and pleasant moral aphorisms, which are now taught in every T. vernacular school in the Madras presidency. About and after this time the Sittar school of T. poets flourished—men who openly taught anti-Brahminical doctrines. Among others, Tirumūla and Konkana occupy a prominent position in this school. But the foremost place must be ascribed to Pattira Gīriyar and Sivavākkīar. Pattira Gīriyar's chief poem is entitled *Lamentations*. Sivavākkīar is a bolder poet, more original, more uncompromising—an iconoclast at heart, a hater of shams, and one who deigns only to worship the unseen "Audar-Kōn," the "Shepherd of the World," to whom the sun and stars are but as sheep, which he guides whithersoever he willeth.

Since the beginning of the 18th century several writers of the highest eminence have flourished in T.-land. Tayumānavar of Trichinopoly and Beschi of Madura have left an imprint of their genius on the lit. of T. which will not be erased as long as that lit. exists. The new revised edition of the T. Bible has literary excellence not common in translations from a European lang. into an Oriental one. [From *orig. art. in J. v. Univ. Cyc.*, by R. C. CALDWELL.]

**Tam'many Society**, an Inst. originally organized for charitable purposes in New York May 12, 1789, deriving its name from a Delaware chieftain who had recently died at the age of above 100 yrs., and who for his reputed virtues was in the latter yrs. of the Revolution facetiously chosen patron saint of the new republic. Secret societies under the auspices of St. Tammany were organized in Phila. and other cities; but the Inst. soon fell into oblivion except in New York, where it soon became the prin. instrument of the managers of the Dem. party in New York. The society was much discredited by the participation in its honors of William M. Tweed and his accomplices in fraud, but it was reformed after the Tweed prosecutions.

**Tampa**, Fla. See APPENDIX.

**Tam'pa Bay**, on the W. coast of Fla., is chiefly in Hillsboro' co. Its upper portion is divided into 2 parts, Old Tampa Bay and Hillsboro' Bay. It is 35 m. long and from 6 to 15 m. wide. A line of keys fences its entrance from storms, making it a safe, spacious, accessible, and excellent harbor. The bay contains many small islands, and abounds in fish and turtle.

**Tan'cred**, one of the most celebrated heroes of the first crusade, b. in Sic. in 1078, a son of Odo and Emma, the sister of Robert Guiscard; in 1096 raised an army in Apulia and Calabria, joined his cousin, Bohemund of Taranto, and distinguished himself greatly at the conquest of Jerusalem, July 19, 1099, and in the battle of Askalon, Aug. 12. He was made prince of Tiberias, and most of his time was taken up in petty warfare, partly with Baldwin and the other Chr. princes, partly with the Saracens. D. Dec. 6, 1112.

**Taney**, taw'ne (ROGER BROOKE), LL.D., b. in Calvert co., Md., Mar. 17, 1777, grad. at Dickinson Coll. in 1795; studied law, and was admitted to the bar in 1799; in 1816 was elected to the State senate. Originally belonging to the Federal party, he became in 1824 a supporter of Gen. Jackson, by whom in 1831 he was appointed U. S. atty.-gen., and in 1833 was nominated as sec. of the treas.; but the senate, by a vote of 28 to 18, refused to confirm the nomination. Chief-Justice Marshall having died in 1835, the Pres. appointed Mr. T. as his successor. In the administration of this office his most noted act was his decision in the Dred Scott case in 1857. Chief-Justice T. again came somewhat prominently into notice in May 1861. A Mr. John Merryman had been arrested in Baltimore by order of a Federal gen. for alleged treason; the chief-justice issued a writ of *habeas corpus* to bring the prisoner before him; the officer in charge of Merryman refused to obey, on the ground that he had been empowered by Pres. Lincoln to suspend the execution of the writ of *habeas corpus*; whereupon the chief-justice wrote out a formal opinion that the Pres. had no constitutional authority to suspend the writ, and that this could be done only by the legislative authority. D. Oct. 12, 1864.

**Tanganyika**, a lake of Central Afr., S. of Lakes Albert and Victoria, between lat. 3° and 9° S. and lon. 29° and 32° E., extends for about 400 m. from N. E. to S. W. It has an elevation of 2711 ft. above the sea, deep and clear water, and a very irregular form, its width varying from 10 to 60 m. Its shores are generally rich in beautiful scenery. The surrounding country is in many places densely peopled. The most important town is Ujiji, on the E. shore.

**Tan'gent**. A line is T. to a curve when it touches it at a single point, called the *point of contact*. The T. to a curve at a point may be regarded as the limit of a secant through that point; for, suppose a secant to be drawn through the point of contact and any other point of the curve; then let the second point be moved along the curve toward the first; the secant will continually approach the T., and when the second point falls on the first, the secant will become a T.; if the motion of the second point is continued, the line will become a secant on the other side. Hence we infer that only one T. can be drawn to a curve at a given point.

**Tan'ghin**, an ordeal poison formerly in vogue in Madagascar. It is the exceedingly poisonous seed of *Tanghinia venenifera*. A small portion of the powdered seed was administered to the suspected person, whose only hope was in the emetic action which the drug sometimes exerts.

**Tan'gle and Sea-Tangle**, names for several sea-



weeds, but especially for *Laminaria digitata*. The young shoots are sometimes used as food and forage, and the plants are employed in the production of iodine.

**Tan'häuser**, the hero of a Ger. legend of the early Middle Ages; spent some yrs. in wild dissipation at Venusberg, but was finally smitten by conscience, and went to the pope to get remission of his sins. The pope answered that his sins could as little be forgiven as the wand which the pope held in his hand could become green again, and T. walked back to Venusberg. But a few days after, the pope's wand suddenly began to sprout.

**Tanjore**, town of Brit. India, cap. of a dist. of the same name in the presidency of Madras, on a branch of the Cavery. It is a large city, well built and strongly fortified, carrying on a lively trade and extensive manufactures of silks, muslins, and calicoes, and containing many fine buildings and magnificent monuments. Its great pagoda is one of the finest specimens of Hindoo arch., and its colossal bull statue of black granite is the greatest and most finished work of Hindoo sculpture. Pop. 54,745.

**Tank-Worm**. See GUINEA-WORM.

**Tan'ner** (THOMAS), D. D., b. at Market Lavington, Wiltshire, in 1674, was ed. at Ox., and was made fellow of All Souls in 1696; entered holy orders; became successively rector of Thorp, prebend of Ely, archdeacon of Norfolk, canon of Christ Ch., and in 1732 bp. of St. Asaph. Wrote *Bibliotheca Britannico-Hibernica*. D. in 1735.

**Tannhäuser**. See TANHÄUSER.

**Tannic Acids**, or **Tannins** [Ger. *Gerbsäuren*; Fr. *acides tanniques*]. These are astringent principles which are very widely disseminated in the vegetable kingdom. The most important sources of these compounds are the barks of varieties of the oak and pine, sumach, gall and valonia nuts, kino, divi-divi, and catechu; the bark and berries of many forest and fruit trees, such as the elm, the willow, the horse-chestnut, the plum, the pear. Numerous shrubs and roots, such as the whortleberry, the tormentilla, and the bistort, contain notable proportions of some modification of T. A. Less important in this respect are coffee, tea, nettles, etc. All of the forms of T. A. were formerly supposed to be identical with the tannin contained in the gallnut, the differences in chemical composition presented by them being accounted for by the presence of accidental impurities; but at present there is no doubt of the existence of several distinct acids, which possess, however, many properties in common. The most important and best investigated form of tannin is *gallotannic acid*. Other modifications are *caffeotannic*, *catechutannic*, *morintannic*, *quercitannic*, and *quinotannic acids*, which, although very similar in many properties, possess different compositions.

**Tanning and Tawing**. See LEATHER.

**Tan'nin** (Fr.), **Medicinal Uses of**. T. is a powerful astringent, peculiarly characterized by its freedom from the irritant properties of the mineral astringents. Taken internally, it is also devoid of any poisonous action. Its uses in med. are solely as an astringent to catarrhal mucous membranes, and occasionally as a styptic to control bleeding from small vessels.

**Tann, von der** (LUDWIG), BARON, b. at Darmstadt-June 18, 1815, was aide-de-camp to the crown-prince Max of Bavaria when, in 1848, in the Schleswig-Holstein war, he organized a corps of volunteers; became chief of staff to Prince Eduard of Sax. in 1849, and chief of staff to Gen. Willisen in 1850. In the war with Prus. in 1866 he was chief of staff of the Bavarian army. In 1869 he was made a gen. of inf., and commanded first Bavarian corps in Fr. Here he distinguished himself in battles of Wörth, Beaumont, and Sedan, and in battle of the Loire.

**Tan'rec**, the Fr. name given to certain insectivorous mammals of the genus *Centeles*. In external appearance and size the species considerably resemble the hedgehogs (*Erinaceus*), but are very different anatomically. Their head-quarters are the island of Madagascar.

**Tan'sy** [Fr. *tansie*] (*Tanacetum vulgare*) is a perennial plant bearing doubly pinnatifid leaves and yellow flowers, blossoming from July to Sept. It possesses a very strong, not unpleasant, odor, and an acrid and aromatic taste. The leaves contain, beside the usual proportions of chlorophyll, lignine, stearine, resin, tannin, etc., a peculiar volatile oil and an acid termed *tanacetic acid*. The seeds and leaves of T. are employed, to a slight extent, as medicinal agents.

**Tanta**, cap. of the Goorbeeys provs., in the Delta, Egypt, 54 m. N. of Cairo, on the Cairo and Alexandria R. R. T. is the centre of religious fanaticism in Lower Egypt. Its situation, in about the middle of the Delta, renders it easily accessible to those who go there on the triennial religious pilgrimages to celebrate the birthplace of a great Moslem saint, the Seyyid Ahmad El-Bedawee. The greatest of these festivals, which is near the end of the Chr. yr., attracts more pilgrims than any other in Egypt. These festivals are characterized by debauchery, crime, and riot. There is yearly a mammoth gathering in this unique city, known among the Franks as the "Tanta Fair." Pop. 60,000. Scene of massacres in 1882.

**Tan'talus**, in Gr. mythology, a wealthy king of Argos, Corinth, Phrygia, or Paphlagonia, who committed some great crime against the gods. As a punishment, T. was placed in a lake in the lower world whose waters receded from his lips whenever he tried to drink, surrounded by rich fruits which withdrew whenever he attempted to eat of them, and with a heavy rock suspended over his head and always threatening to fall and crush him.

**Ta'pa**, a kind of paper-cloth made by the S. Sea Islanders from the bark of small branches of the paper mulberry (*Broussonetia papyrifera*). The natives take the moistened slips of the bark, beat them together, and dry them.

**Tapajos**, ta'pah-zhoce, river in Brazil, rises in the S. of the prov. of Matto Grosso under the name of Jarnenna, assumes the name of Tapajos after its entrance into the prov. of Para, and joins the Amazon, after a northward

course of about 1100 m. It is navigable to within a few m. from its source.

**Tap'etry** (Gr. *τάπης*, a "carpet;" Fr. *tapiserie*), an ornamental carpet-work for decorating walls and furniture, brought into general use in W. Europe by the Saracens of Sp. The oldest known specimen is the Bayeux T., commemorating the Norman conquest of Eng. In the 14th and 15th centuries the fabrication of T. by the loom became an important industry in Flanders, and was introduced into Eng. early in the 16th century. The most important manufactory at the present time is that of the Gobelin in Fr.

**Tape-worm**, *Tenia* [Gr. *ταΐα*, "tape;" Fr. *taenia*]. There are three varieties of T.: 1. *Tenia solium*; 2. *Tenia medio-canellata*; 3. *Botriocephalus latus* or *Tenia lata*. The first grows to great length, 100 or 150 ft., and, as its name implies, is usually alone or single. Its segments are longer than they are broad, the neck long, often an inch, and the head has a nose-like prominence, 2 rows of siliculous hooks, a dozen or more in each row, and back of them 4 "suckers." The second has neither snout nor hooks on the head, only the suckers; the neck is shorter and the links are thicker, shorter, and broader. The third variety has on the head only 2 lateral slits or suckers, a short neck, and very broad links. The T. is usually detected by the patient finding links in the passages from the bowels. The symptoms caused by its presence are not dissimilar to those of gastric and intestinal indigestion. Colicky pains, sense of motion in the bowels, capricious and impaired appetite, defective health and strength, and lack of flesh are its chief indications. The remedies for T. are the fluid extract of male fern, powdered kousso, decoction of pomegranate-bark, or powdered pumpkin-seeds, all of which are efficacious. Other remedies, as carbolic acid, turpentine, opium, calomel, are given in small repeated doses, often with good results. (See VERMIFUGES.) E. D. HUDSON.

**Tapio'ca**, the starch of the *Janipha* (or *Jatropha manihot* (cassava-plant), from which it is prepared by pressing the washed and dried roots under water, when it is obtained in a mealy form, which is converted into a granular condition by drying over hot plates. T. is largely consumed as an article of food.

**Tapir'idae** [from *Tapirus*—a Latinized form of a Brazilian aboriginal name—the typical genus], a family of mammals of the order Ungulata and sub-order Perissodactyla, related to the rhinoceroses and horses. The tapirs more resemble the hogs than their nearer relations, but they are peculiar in that the hind quarters project notably backward, and the snout is produced into a rudimentary flexible proboscis; the nostrils are at the end of the proboscis; the ears are erect and moderately developed; the neck abbreviated; the tail very short; the anterior feet have each 4 toes, the posterior 3. The lower canines in each jaw. There are 6 incisors and 2 small canines in each jaw; the upper jaw has 7 and the lower 6 molars on each side. The skull has a nasal aperture very large, and encroaching far behind into the frontals and on each side of the nasal bones, leaving apparent sideways the septum between the nares, and separated from the orbits only by the thin frontal bones. All the species are denizens of deep forests, but near where water abounds, to which they love to resort.

**Tap'pan** (ARTHUR), b. at Northampton, Mass., May 22, 1786, son of Benjamin (1748-1831), a Revolutionary patriot and merchant; received a good common-school education; established himself in New York as an importer of Brit. dry goods 1814; was one of the chief founders of the Amer. Tract Society, and a liberal benefactor of the Amer. Bible Society; endowed Lane Sem. at Cin., a professorship at Auburn Theological Sem., erected Tappan Hall at Oberlin; joined his brother Lewis in founding the New York *Journal of Commerce* (1828); furnished the money for establishing the *Emancipator* newspaper at New York 1833; formed at his own rooms the nucleus of the New York Anti-Slavery Society, which was publicly organized under his presidency Oct. 2; was first pres. of Amer. Anti-Slavery Society, formed at Phila. Dec. 4, 1833. D. July 23, 1865.

**Tappan** (BENJAMIN), brother of Arthur, b. at Northampton, Mass., May 25, 1773, learned the arts of copper-plate engraving and printing and portrait-painting; subsequently studied law; settled in O. 1779; was chosen to the legislature 1803; was aide-de-camp to Gen. Wadsworth in the war of 1812-15; was for 7 yrs. pres. judge of the fifth O. circuit; was appointed U. S. dist. judge by Pres. Jackson 1833; U. S. Senator 1839-45; an active Dem. politician; joined Free-Soil movement of 1848. D. Apr. 12, 1857.

**Tappan** (HENRY PHILIP), D. D., b. at Rhinebeck, N. Y., Apr. 23, 1805, grad. at Union Coll. in 1825; studied thiol. at Princeton; became in 1828 pastor of a Congl. ch. in Pittsfield, Mass.; in 1832 became prof. of moral philos. in the Univ. of the City of New York; resigned in 1838, and opened a private school, and in 1852 was elected chancellor of the Univ. of Mich.; resigned in 1863, and after that resided chiefly in Europe. He wrote *Review of Edwards's Inquiry into the Freedom of the Will*, *The Doctrine of the Will applied to Moral Agency and Responsibility*, etc. D. Nov. 15, 1881.

**Tappan** (LEWIS), brother of Arthur and Benjamin, b. at Northampton, Mass., May 23, 1788, engaged in commercial business and cotton manufacture at Boston; removed to New York 1827; aided his brother in founding the *Journal of Commerce* 1828, and was sole owner of that paper 1828-31; had his house sacked by a mob in consequence of his anti-slavery sentiments July 1834; was prominent for many yrs. in anti-slavery, religious, and philanthropic associations, especially in the Amer. Missionary Association, of which he became pres. D. June 21, 1873.

**Tappan** (WILLIAM BINGHAM), b. at Beverly, Mass., Oct. 29, 1794, acquired a sound education; became general agent of the Amer. Sunday-School Union, and was licensed as a preacher in 1840. Pub. *New England and other Poems, Poetry of the Heart*, etc. D. June 18, 1849.



**Tappan Sea, or Tappan Bay** [Dut. *Tappaan Zee*], is an expansion of Hudson River. Its lower end is 24 m. N. of New York. It is 12 m. long, and its greatest breadth is 4 m.

**Tar, Coal, or Pitch.** The term *pitch* is applied to a variety of solid resinous substances of dark color and brilliant lustre: (1) mineral pitch, called asphaltum and bitumen, abundant at the Dead Sea, Barbadoes, Trinidad, Mex., Cuba, Ritchie co., W. Va., Albert mine, N. S., Peru, Cal., etc.; (2) Burgundy pitch, the melted resin of *Abietis resina* or *Thui*; (3) wood-tar pitch, prepared by boiling down (distilling off the naphthas) wood-tar; (4) coal-tar pitch, prepared in the same way from coal-tar.

**Tara.** See TARO.

**Tarantism**, an epidemic dancing mania, formerly prevalent in Apulia, and especially at Taranto, whence its name. It was popularly believed to be caused by the bite of the tarantula.

**Taranto** [Gr. *Tápas*; Lat. *Tarentum*], town of It., prov. of Lecce, at N. extremity of the large gulf of same name which forms the hollow below the heel of the *Boot*. The town is built on an island connected with the mainland by 2 stone bridges, and on both sides a deep bay sweeps inland, thus forming a double basin. Two low islands (anc. *Cherades*), San Pietro and San Paolo, lie as a protection across the harbor. There is little to interest the visitor beyond the exceptionally beautiful views of sea and land to be had at many points, and the abundance and richness of the almost tropical vegetation. The honey, the oil, and the fruits of the neighborhood have as great a reputation as ever, and the waters abound in excellent fish of many varieties. The remains of the anc. town, the largest of all the cities of Magna Græcia (founded 707 b. c.), are very insignificant. In mediæval hist., T. is especially remembered as the fief of Bohemond the Norman crusader. Pop. 33,942.

**Tarantula** [from Taranto], a name applied to several different kinds of animals. (1) Primarily, it was given to a spider of S. It. Its bite was supposed to cause the disease called tarantism. (2) In warm, temperate, and tropical countries it is extended by the Eng.-speaking races to sundry large spiders. (3) Some lizards are also popularly styled tarantulas.

**Tarboro'**, on R. R., cap. of Edgecombe co., N. C., 60 m. S. E. of Raleigh, has male and female acads. Pop. 1870, 1340; 1880, 1600.

**Tarbox** (INCREASE N.). See APPENDIX.

**Tare**, a name of various leguminous plants, especially applied to some of the species of *Vicia*, particularly *V. sativa*. Its rather scanty herbage is very nutritious. It is probable that the plant called tare in the Eng. N. T. is either daniel or chess.

**Tarentum.** See TARANTO.

**Targums** [Chaldee for "interpretation"], the name of certain paraphrases of the Heb. Scripts., written in the popular or Aramaic tongue, and giving the rabbinical and traditional interpretation of the text. They are of very anc. and obscure origin.

**Tariff**, a table or list of duties, drawbacks, and bounties charged or allowed on the importation or exportation of goods from one country, state, or city to another. The name is derived from the Moorish town of Tarifa, N. of the Strait of Gibraltar, where duties were collected upon the objects of Afr. commerce. In the U. S. the term is exclusively applied to a law of Cong. fixing the amount of the duties on imports.

**Tarleton** (Sir BANASTREE), b. in Liverpool Aug. 21, 1754, commenced the study of law, but at the beginning of the Revolution purchased a cornetcy in the dragoon guards; served under Howe and Clinton in the campaigns of 1777-78; rose to the rank of lieutenant-col. and to the command of the Brit. Legion, with which he served under Clinton and Cornwallis in the South; took part in the battles of Camden and Guilford C.-H., and at the battle of the Cowpens, Jan. 17, 1781, was defeated by Col. Morgan. He served with Cornwallis during the remainder of the war, being among those surrendered at Yorktown. Returning to Eng. he was promoted to the rank of col., and in 1790 was returned to Parl. for Liverpool; in 1798 married the daughter of the duke of Ancaster. He was promoted to be maj.-gen. 1794, lieutenant-gen. 1801, gen. 1812, having previously been appointed gov. of Berwick and Holy Island, and was created a baronet and a G. C. B. in 1818; pub. *Hist. of the Campaign of 1780-81 in the S. Prov. of N. Amer.* D. Jan. 23, 1833.

**Taro** [the native name], the root of *Colocasia macrorhiza*, of which many varieties are grown in the Pacific Islands. The tops are used as a potherb, and the starchy root is an important article of food in Polynesia.

**Tarpeian Rock**, at Rome, was the S. portion of the Capitoline Hill. Here Tarpeia was buried, a vestal virgin who during the reign of Romulus betrayed the Capitoline citadel to the attacking Sabines. In later times it was customary to hurl from the T. R. persons condemned for treason or the exercise of dangerous political powers.

**Tarquinius**, the name of a Rom. family which, according to legend, played a very important part in the earliest hist. of the city of Rome, and 2 of whose members became kings. (1) LUCIUS TARQUINIUS PRISCUS was elected king after the death of Ancus Marcius, in 616 b. c. His reign was very glorious. He waged successful wars against the Sabines, Latins, and Etruscans. He built the Cloaca Maxima, laid out the Circus Maximus and the Forum, and commenced the Capitoline temple and the stone wall around the city. He instituted the Rom. games, added 100 new members to the senate, etc. But the sons of Ancus Marcius assassinated him in 578 b. c.—(2) His son, LUCIUS TARQUINIUS SUPERBUS, assassinated Servius Tullius in 534 b. c., and seized the crown. T. was, as his surname, *Superbus*, the "Proud," indicates, a very high-handed master; at the same time that he slighted the higher classes he sorely oppressed the lower by heavy taxes and forced labor; the rape of Lucretia became the occasion of a general out-

break. T. was deposed and the monarchical govt. abolished in Rome. D. 495 b. c.

**Tarragon** [Sp. *taragona*], an aromatic perennial herb of the family Compositæ, a native of N. Asia, but acclimated in European gardens. T. vinegar is an article of commerce.

**Tarrytown**, Westchester co., N. Y., on R. R. and the Tappan Sea (Hudson River), 26 m. N. of New York. It is celebrated as containing the former home (Sunnyside) and the burial-place of Washington Irving. Sleepy Hollow is included within its precincts, and there are many elegant mansions along its heights. Pop. 1880, 3025.

**Tarshish** is often mentioned in the O. T. as a large and important commercial emporium, but it is doubtful where it was located.

**Tarsia, or Intarsiatu'ra**, a kind of mosaic made of pieces of wood of different colors, so disposed as to form regular patterns or more artistic designs, and then strongly glued together. These designs are sometimes inlaid in tablets of walnut or other wood.

**Tarsus**, town of Asiatic Tur., on the Cydnus, 12 m. from its mouth in the Mediterranean, was for several centuries before and after Christ an important city of Asia Minor, the cap. of the Rom. prov. of Cilicia, and celebrated both as a seat of learning and as a centre of commerce. The apostle Paul was born here, and Julian the Apostate was buried here. In the confusion of the Middle Ages the city greatly declined. It has still some importance, however, as the place from which are exported the rich harvests of cotton, wheat, and fruits which the fertile dists. in the neighborhood produce. Its pop. may vary between 4000 and 80,000.

**Tar'tar** [Gr. *τάρταρος*, "nether world"], a term applied to all salts of tartaric acid, but more especially to the acid tartrate of potassium or hydric-potassic tartrate. Crude T. or argol is obtained as a deposit in the interior of the casks in which fermenting wines are stored in the form of a hard crystalline crust. The best varieties of crude T. contain from 77 to 85 per cent. of acid tartrate of potassium, the chief impurities being tartrate of calcium and coloring or mucilaginous matters. From these latter it is purified by dissolving in hot water, and precipitating the flocculent matter by means of finely powdered clay and charcoal; the solution is then concentrated and crystallized. The purified commercial article usually contains from 85 to 98 per cent. of the acid tartrate.

**Tartar, Cream of.** See CREAM OF TARTAR.

**Tartar Emetic, Tartarized Antimony, Stibiated Tartar, or Potassio-antimonious Tartrate.** This well-known salt is made by boiling acid potassium tartrate (cream of tartar) with antimony trioxide in water. It forms in transparent crystals, which become white and opaque by exposure to the air, but in the shops it is generally kept in the form of powder. It dissolves in 20 parts of cold water, and in between 2 and 3 of boiling, but all aqueous solutions spontaneously decompose on keeping. It is insoluble in alcohol, but soluble in proof spirit or wine. If pure, a solution of T. E. yields no precipitate with barium chloride, nor, when diluted, with argentic nitrate, nor does it turn blue with potassio ferrocyanide.

T. E. has rather a nauseous, harsh metallic taste, and upon the animal system is both a local irritant and a powerful constitutional poison. Applied to the skin, as in ointment, it causes burning pain, redness, and finally the eruption of a crop of painful pustules. Taken internally, small doses, as a small fraction of a grain, tend to reduce the force and frequency of the pulse and promote perspiration. Somewhat larger quantities cause nausea and vomiting, with relaxation of the bowels and of the muscular system, reduced action of the heart, and a general feeling of depression and weakness. Still larger doses cause an intensification of the above symptoms, with burning pain in the stomach, the induction of a choleric state, characterized by violent and prolonged nausea, vomiting, and serious purging, colic, cramps, great enfeeblement of the heart and general strength, and finally collapse and death. After death decided inflammation of the stomach and bowels is generally found.

**Tartaric Acid** [Fr. *acide tartrique*; Ger. *Weinsäure*; the acid of tartar; Sax. *teart*; Dut. *taart*; Sp. *tarta*]. At present 6 acids isomeric with the tartaric are known, which have the same composition and possess nearly the same chemical properties, but differ much in their crystalline structure and in their behavior toward polarized light.

**Ordinary tartaric acid** (dextrotartaric or dextroracemic acid) is quite widely disseminated in the free state in various plants and berries; its chief source, however, being the grape, in which it occurs as the hydric-potassic tartrate (cream of tartar). It is prepared by dissolving crude tartar in boiling water, and slowly adding pulverized chalk as long as the mixture effervesces. This acid can also be artificially produced by the oxidation of milk-sugar, glucose, starch, gum, etc. with nitric acid.

The isomeric *levotartaric acid* is obtained upon neutralizing equal parts of racemic acid, one with soda, the other with ammonia, mixing the fluids, and allowing the double salt to crystallize. Levotartaric acid is also produced by the complete fermentation of racemic acid, by which the dextro-acid present is decomposed, and by the fractional crystallization of cinchonidine racemate. When equal amounts of the dextro- and levo-tartaric acids are mixed and evaporated, racemic acid is produced; in the same manner racemates are obtained from mixtures of dextro- and levo-tartrates.

RACEMIC ACID has already been described under that head. It has lately been obtained upon heating the dextro-acid with water for some time in sealed glass tubes.

T. A. is extensively used in dyeing and in the preparation of effervescent drinks and baking-powders. Some of the tartrates, such as tartar emetic, Rochelle salt, and the



potassio-ferric tartrate (*tartarus chalybeatus*), possess valuable medicinal properties.

**Tartars**, or, more properly, **Tatars**, is not a strictly defined ethnological name, but used in a somewhat vague sense. The word *Tar-tar* is of Chi. origin, and was first applied to those Mongolian tribes who descended from the Altai plateaus into the Chi. lowlands, robbing and plundering. When adopted by the Europeans, the word was applied to all those races which Genghis Khan had brought under his sway and led into Europe. At present the name is used partly in a wider sense, comprising all the various tribes and races inhabiting the plateaus of Central and N. Asia, and not belonging to the Aryan family; partly, in a more restricted sense, comprising the Kirgheez, the Oozbeks, and some other tribes inhabiting Toorkistan and the adjacent regions.

**Tartarus** is used synonymously with *Hades* by the later Gr. and Lat. writers, but with Homer it means a separate place, as far below Hades as the heavens are above earth, into which Zeus had thrown the worst offenders against his authority. Later poets sometimes make a distinction between T. and the Elysian Fields as 2 divisions of Hades, the former occupied by the criminals, the latter simply by the dead. As a personification, T. is represented as the son of Æther and Gea (air and earth), and by his mother he was father to the Gigantes, Typhoeus and Echidna.

**Tartary**, one of those geographical names which change meaning according to time and place. In the Middle Ages the name denoted the whole central part of E. Europe and Asia from the Dnieper to the Sea of Japan. Later, the name of European T. was confined to the terr. now called Crimea, while that of Asiatic T. first signified the whole empire of Genghis Khan and his successors, then Toorkistan alone, and now only that part of Toorkistan which does not belong either to Rus. or to China.

**Tartrates**. See TARTARIC ACID.

**Tascherau**, TASH'RO (ELZÉAR ALEXANDRE), D. D., b. at Que., Canada, in 1818, studied divinity in the sem. of that city; ordained a R. Cath. priest 1842; prof. of mental philos., director of studies, and superior of the sem.; became prof. of canon law in Laval Univ. 1856; administrator of diocese 1870, and abb. of Quebec Mar. 19, 1871.

**Tashkend**, cap. of the Rus. dominions in Toorkistan, and the most populous city in Central Asia, in a gently sloping, well-watered, fertile plain, covered with numerous fruit trees, at the foot of the Alatan and Chatkal mts. T. is one of the oldest cities of Central Asia, from old times the seat of an important agriculture and a brisk trade. Here the roads from Kashgar meet with those which lead S. from Samarcand, N. from Orenburg and Siberia, into Central Asia. The prin. articles of exportation and importation are cotton fabrics, metal ware, and silk. Pop. 76,072.

**Tasman** (ABEL JANSSEN), b. at Hoorn, prov. of N. Hol., probably in 1600, was sent by the gov.-gen. of the Dutch E. I. Co., Van Diemen, to circumnavigate the Australian continent; discovered, Nov. 24, 1642, the island which he called Van Diemen's Land, but which now is called Tasmania; Dec. 13, the S. Island of New Zealand; Jan. 6, the Friendly Islands; Feb. 6, the Fiji Islands. Jan. 29, 1644, he set out on a new voyage along the coasts of New Guinea and New Holland, but never returned.

**Tasmania**, an island belonging to G. Brit., situated to the S. E. of Australia, between lat. 40° 44' and 43° 38' S., was called Van Diemen's Land up to 1854; comprises an area of 26,215 sq. m., and has the form of an irregular quadrangle, with steep, rocky coasts indented with numerous bays, which afford good harbors. Three mt.-ranges (highest peak 5200 ft.) traverse the island in the direction from N. W. to S. E., but the general character of the surface is that of a plateau diversified by hills and valleys, tolerably well watered, and covered almost entirely with forests. The climate does not allow the cultivation of tropical plants, but is favorable to all the plants and fruits of Central Europe; agriculture and cattle-breeding are carried on with success. The mts. are rich in iron and copper ore, coal, marble, alum, and crystals. Characteristic among the native animals are the emu, an ostrich-like bird, and the kangaroo, but they have of late been so ruthlessly hunted that they have now become nearly extinct. The original inhab. were Papuans, but the last Papuan d. in 1869. Pop. 1881, 115,705. The immigration is considerable. Agriculture and cattle-breeding are the prin. occupations. The commerce, chiefly carried on by the cities of Hobart Town and Launceston, is very brisk. The prin. articles of export are bark, brain and polard, butter and cheese, flour, fruit, gold, grain, hides, skins and leather, hops, horses, sheep, oatmeal, oil, timber, vegetables, wool. The internal traffic is very limited. It has a R. R. 120 m. long connecting Hobart Town and Launceston, also a branch from Mersey River to Deloraine. A submarine cable connects Low Head at the mouth of the Tamar with Queensland. In administrative respects T. is directly under the Brit. colonial sec., has a gov. and commander-in-chief, an executive council, legislative council, and a house of assembly to which each electoral dist. sends a deputy. Hobart Town is the seat of gov.

**History**.—T. was discovered in 1642 by the Dut. explorer Tasman, and called Van Diemen's Land, after the Dut. gov. of the E. I. In 1803 it was colonized by 3 soldiers and 10 male and 6 female convicts, and these settled near the point where now Hobart Town stands. A few months later 2 Eng. vessels arrived, and the settlement was increased by a number of convicts. In 1825 T. was separated from New S. Wales and established as an independent colony, and from that time it has progressed steadily, though very slowly. [From *orig. art. in C.'s Univ. Cyc.*, by AUGUST NIEMANN.]

**Tasoso** (BERNARDO), b. at Bergamo Nov. 11, 1493, of a noble family, received an excellent education; accompanied the prince of Salerno as sec. to Tunis and Flanders; married in 1539 Porzia de' Rossi, and settled at Sorrento, where

he wrote his great epic in 100 cantos, *L'Amadigi*. In 1547 he left Sorrento, having lost his wife and being persecuted by the Sp. Inquisition. He entered the service first of the duke of Urbino, afterward of the duke of Mantua, and d. as gov. of Astiglia in 1569.

**Tasso** (TORQUATO), b. at Sorrento Mar. 11, 1544, a son of the preceding, entered the Univ. of Padua in 1557 to study law. He felt himself more attracted, however, to lit. and poetry. In 1562 he pub. a romantic epic, *Rinaldo*, in 12 cantos, and the applause with which it was received determined him to give up jurisprudence altogether and devote himself entirely to poetry. He repaired to Bologna, where he studied philos., especially Plato, and commenced work on his great epic, *Gerusalemme Liberata*. In 1570, at which time he had finished the first 8 songs of his epic, he received a kind of court appointment and a pension from Alfonso II., settled at Ferrara, and in 1575 *Gerusalemme Liberata* was completed. He afterward became insane. D. Apr. 25, 1586.

**Tatars**. See TARTARS.

**Tate** (NAHUM), b. in Dublin in 1682, was ed. at Trinity Coll.; went to Lond., devoted himself to lit., and in 1692 fitly succeeded Shadwell as poet-laureate; fell into pecuniary straits, and died in the precincts of the Mint, where debtors were privileged from arrest. He assisted Dryden in the composition of *Abalom and Achitophel*; perpetrated an alteration of Shakespeare's *King Lear*; is chiefly known as a psalmist, the versions of the Psalms executed by him and Nicholas Brady being still retained in the Eng. Book of Common Prayer. D. Aug. 12, 1715.

**Tatlian**, b. about 180 A. D. in Syria or Assyria; studied philos. and rhetoric; went to Rome about 162; enjoyed the friendship of Justin Martyr; was converted by him to Christianity, and wrote one of the earliest apologies for Christianity against the Pagan philosophers, *Oratio ad Græcos*; returned to the East and adopted heterodox ideas. He forbade marriage, animal food, wine, etc.; in the celebration of the Eucharist the sect used water, whence they were often called Hydroparastatai.

**Tat'nall** (JOSHUA), b. at Bonaventure, near Savannah, Ga., in 1762; at 18 joined the army of Gen. Wayne at Ebenezer, Ga.; took an active part in the military affairs of the State, and was several times elected to the legislature; was U. S. Senator from Ga. 1796-99, and gov. of the State 1801-02. D. June 6, 1803.

**Tatnall** (JOSHUA, JR.), son of Josiah, b. at Bonaventure, Ga., Nov. 1796, entered the navy; was made commander in 1838; in the Mex. war participated in the attacks on Tampico, Panuco, and Vera Cruz; in 1850 was promoted capt., and in 1856 was sent as flag-officer of the E. I. squadron; in 1859 aided the Brit. in the capture of the Peiho forts, near Canton, China; in 1860 brought the Japanese ambassadors to the U. S.; was stationed at Sackett's Harbor, N. Y., in 1861, when Ga. seceded; entered the Confed. service; was subsequently commander of the Iron-clad Virginia; was elected harbor-master at Savannah. D. June 15, 1871.

**Tat'tam** (HENRY), D. D., LL.D., F. R. S., b. in Ire. Dec. 28, 1788, ed. at Trinity Coll., Dublin, and at the univ. of Göttingen and Leyden, where he received his doctorate respectively in laws, theol., and philos.; took orders in the Ch. of Eng.; was rector of St. Cuthbert's, Bedford, 1818-45, also rector of Great Woolstone, Bucks, during a portion of that time; became archdeacon of Bedford 1845, and rector of Stamford Rivers, Essex, 1849, and was afterward a chaplain in ordinary to the queen. D. at Stamford Rivers Jan. 8, 1868. Dr. T. discovered at the convent of Nitria in the N. W. desert of Egypt, and secured for the Brit. Museum, a splendid collection of Anc. Syriac MSS. Wrote *A Compendious Gram. of the Egyptian Lang.*, etc., *The Anc. Coptic Version of the Book of Job the Just*, etc.

**Tat'tier**, a name applied to numerous birds of the snipe family. The T. are of several genera and many species. Some of them are very fine game-birds.

**Taulism** and **Tauists**. See LAOU-TSZE.

**Tauler** (JOHANNES), b. at Strasburg in 1290, entered the order of the Dominicans in 1308, and studied theol. at the Univ. of Paris; felt himself drawn toward the mystical and speculative writers on religion and philos.; the moral bearing of the religious ideas forms the essence of all his writings. With the exception of a few excursions to Cologne, Bâle, etc., he lived and worked in Strasburg to his death, June 16, 1361, enjoying the reputation of being the greatest preacher of his time, and setting a rare example of Chr. courage, self-denial, and persistency during times of papal ban, of plague, and other hardships. Wrote *Following the Lowly Life of Christ*, etc.

**Taunton**, city, R. R. centre, port of entry, and cap. of Bristol co., Mass., incorporated as a town in 1699, as a city in 1864, is situated in the valley of Taunton River, and is distant 33 m. S. from Boston, in the centre of a prosperous agricultural and manufacturing community. Prin. manufactures, locomotives, cotton machinery, nails and tacks, steam-engines, and brick. The Bristol Co. Agricultural Society possesses a fine estate in the centre of the city, which is annually the scene of a most successful agricultural and mechanical exhibition. The charitable insts. are a home of aged ladies and a city mission with commodious chapel. Pop. 1870, 18,629; 1880, 21,213.

**Taurine** [Lat. *taurus*, "bull"], a neutral organic compound, occurs in the bile of the ox and other animals, in which it is formed by the action of acids and alkalis upon taurochloric acid; it is also contained in certain mollusks. Upon treating ox-bile with hydrochloric acid, filtering the liquid, and evaporating the filtrate, it is obtained in crystals mixed with sodium chloride, from which it is separated by crystallization.

**Taurus** [Lat. "bull"], a constellation, one of the 12 signs of the Zodiac, occupying the region corresponding to the sign Gemini, and chronologically to the month Apr. 30-May 21. It includes the Pleiades and Hyades, and is rich in telescopic stars.



**Taurus**, the name of a range of mts. in Asia Minor, stretching in an E. to W. direction from the Euphrates to the Gulf of Adalia. By the Alma-Dagh it communicates with the Lebanon Mts. in Syria, and by one branch of the Anti-Taurus with the Caucasian Mts. It rises in terraces from the Mediterranean to a height of 10,000 ft. and incloses between itself and Anti-Taurus an elevated plain, arid, and dotted with salt lakes.

**Tautog**, a corruption of the aboriginal name (*Tautoga onitis* or *nigra*), a well-known fish of the E. Amer. coast, of considerable economical importance. It belongs to the family Labridae and sub-family Labrinae, and is an oblong fish, with small smooth scales; the opercular bones scaleless, and the cheeks with few, distant, and imbedded scales; the teeth on the jaws conical and in 2 rows, and none behind developed as canines; the dorsal spines numerous, and only 3 anal spines; the color in the adult is sometimes an almost uniform black, but generally more or less blotched, and in the young banded and otherwise decorated. It makes its appearance in large numbers and in shallow waters on the N. Eng. and N. Y. coasts between the months of Apr. and Nov., and is most abundant in May and Oct.

**Tawing and Tanning.** See LEATHER.

**Taxation** [Lat. *taxatio*, from *taxare*, to "rate," to "value," to "estimate"], the means employed to gather from a people the contributions needed for the purposes of its govt. Every individual of the state has an interest with regard to his own well-being in the maintenance of govt., and it is wise and right that he contribute a portion of his wealth to its support. It is a fundamental principle of free govt. that taxes shall be imposed by representatives of the people alone, through proportional and reasonable assessments on all estates, and shall be collected through uniform and responsible agencies, acting under defined powers and direct accountability. Adam Smith laid down the 4 following maxims with regard to taxes in general: "(1) The subjects of every state ought to contribute toward the support of the govt. as nearly as possible in proportion to their respective abilities. (2) The tax which each individual is bound to pay ought to be certain, and not arbitrary. (3) Every tax ought to be levied at the time or in the manner in which it is most likely to be convenient for the contributor to pay it. (4) Every tax ought to be so contrived as both to take out, and to keep out, of the pockets of the people as little as possible over and above what it brings into the public treasury of the state."

The terms *direct* and *indirect* are used to distinguish 2 prominent methods of taxation. According to J. S. Mill, "a direct tax is one which is demanded from the very persons who it is intended or desired should pay it. Indirect taxes are those which are demanded from one person in the expectation and intention that he shall indemnify himself at the expense of another." A poll-tax, a tax on land, and, strictly speaking, an income-tax, are examples of direct taxes. Duties laid on imports and excises on articles of home manufacture are examples of indirect T., the importer or manufacturer who pays the tax adding the amount of the tax to the price of the goods, to be ultimately paid by the consumers. Direct T., with fair assessments and honest returns of property, may be most fully conformed to the equitable principles embodied in the maxims just stated. Indirect taxes, on the other hand, are more cheerfully submitted to, and more easily collected, because laid on the goods at the port of entry or at the manufactory, and no one thinks of the tax he pays when he buys the goods.

In the U. S. there are 2 general systems of T.: (1) That instituted by the national govt.; (2) that instituted by the State govts., including all local taxes imposed under authority of the State by counties, cities, towns, and school dists. The const. authorizes the Federal govt. to impose taxes in every form, subject only to the qualification that direct taxes must be apportioned to the several States according to their respective pops., and that all duties, imposts, and excises shall be uniform throughout the U. S. It expressly forbids any State to lay any imposts or duties on imports or exports except for executing its inspection laws. In consequence of these constitutional provisions, the taxes laid by the national govt. have been hitherto, with only slight exceptions, indirect, while the State govts. rely almost exclusively on direct taxes. Duties are imposed by act of Cong. establishing a tariff—i. e. a list of articles to be taxed—and the tax is collected by govt. officers at the ports of entry as the goods come into the country, before they pass into the hands of the importer or consignee. The duties are either *specific*—i. e. so much per lb., yard, etc.—or *ad valorem*—i. e. a percentage charged on the value of the goods as invoiced. Excises are imposed by act of Cong. on certain articles specified, and are collected by the sale of stamps to be affixed by the manufacturer or by an officer of govt. before the goods are thrown upon the market.

Under State authority all taxes are direct, laid upon persons by poll-taxes and upon property by assessment. The poll-tax is ordinarily a small amount levied upon every male inhab. who has reached his majority. It recognizes the protection which the govt. extends to the persons as well as to the property of its citizens. Many of the States lay no poll-tax. The method of imposing taxes on property is essentially the same in all the States. The State authority, by statute, requires the election or appointment annually of assessors in every town and city, who make a valuation of all property which the law subjects to taxation. Real estate and such articles as are open to their inspection are estimated by the assessors. Personal property is returned in prepared lists by the owners, who may be required to make oath to the truthfulness and completeness of their returns. The usage of different States varies, but commonly real estate is set down at from 25 to 50 per cent. less than its market-value. Since assessors in different places may adopt different standards of valuation, the original assessments are, in most of the States, referred to boards

of equalization appointed for each county, and their judgment is subsequently reviewed by a general board for the State. Upon the basis of the valuation of property so determined, the taxes to be raised for the purposes of the State are apportioned to each county, city, or town. By general statute or by special city charters each county, city, town, and school dist. is authorized to levy taxes for local purposes. These also are apportioned on the basis of the State valuation, except in case of certain improvements in cities, such as opening, paving, and lighting streets, which are charged upon the adjoining property in proportion to the benefit conferred. Generally, all of these taxes for the State, the county, the city, the town, and the school dist. are collected in each town or city ward by one collector at one time, he being furnished with a tax-list covering all. If other means fail, he is authorized to levy upon goods to secure the tax, and according to forms prescribed by law, lands may be sold for delinquent taxes, the title thus given being made complete and valid after a certain period allowed the original owner for redemption. (See TAX SALES.)

The following are the chief exemptions made in legislation for taxes: (1) Public property of both the State and the nation, including public lands, custom-houses, court-houses, public-school buildings, parks, etc.; (2) the property of incorporated insts. of learning endowed by private beneficence; (3) houses of worship, and to some extent other ch. property; (4) cemeteries belonging either to towns or to chartered corporations; (5) personal property of individuals, so far as to cover the necessities of life. The propriety of continuing exemptions in the second and third cases named is now much questioned and discussed. The agitation of this question is healthful, as it calls attention to real dangers.

A. L. CHAPIN.

**Tax Sales.** This term denotes the public official sales of lands made in pursuance of law for the non-payment of the taxes which have been laid upon them. The whole subject is regulated by statute, and forms a very important head of Amer. Jurisprudence. In order that a sale may be valid all the statutory requirements which prescribe the prior official proceedings, down to and including the sale itself, must be substantially and accurately complied with. Consult COOLEY on *Taxation*, BLACKWELL on *Tax Titles*, and J. E. UNIO. *Cyc.*, art. TAX SALES.

**Taylor, Tax.** See APPENDIX.

**Taylor** (ARCHIBALD A. E.), D. D., b. at Springfield, O., Aug. 27, 1834, grad. at Princeton Coll. 1854 and at Princeton Sem. 1857; became pastor of Presb. chs. in Dubuque, Ia., Georgetown, D. C., and Cln., and in 1873 pres. of Wooster Univ. Wrote much for religious periodicals.

**Taylor** (BAYARD), b. at Kennett Square, Pa., Jan. 11, 1825, in 1842 became apprentice to a printer; in 1844-45 made a pedestrian tour in Europe at an expense of not more than \$500, and after his return pub. *Views of Foot, or Europe seen with Knapsack and Staff*; in 1847 became one of the editorial staff of the New York *Tribune*. In 1849 he visited Cal.; in 1851 set out upon a long tour in the East, ascending the Nile and going over much of Asia Minor, Syria, and Europe; in 1852 set out from Eng.; crossed Asia to Calcutta, where he joined Perry's expedition to Japan, and made several other journeys. In 1862-63 he was sec. of legation, and for a while *chargé d'affaires* at St. Petersburg; in 1874 went to Egypt, and thence to the millennial celebration in Iceland. Wrote *Journey to Central Afr., Visit to India, China, and Japan, Northern Travel—Summer and Winter Pictures of Suez, Den., and Lapland, Travels in Gr. and Rus., Colorado, a Summer Trip, Egypt and Iceland*, etc., beside novels and poems. *Memoirs*, 2 vols., 1884. U. S. minister at Berlin, and d. in office there Dec. 19, 1875.

**Taylor** (BROOK), b. at Edmonton, near Lond., Aug. 18, 1685, entered St. John's Coll., Cambridge, in 1701; distinguished himself in music, painting, and math.; in 1708 wrote his treatise on *The Centre of Oscillation*; in 1712 was chosen F. R. S., of which he became sec. 2 yrs. later, and put forth several papers on magnetism and math.; in 1715 he had a controversial correspondence with Count Raymond de Montmort upon the philosophical theories of Malebranche. He pub. *Methodus Incrementorum*, etc. (1715), containing first announcement of the famous "Taylor's theorem," and *New Principles of Linear Perspective* (1719). D. Dec. 29, 1731.

**Taylor** (REV. CHARLES), D. D., M. D., b. in Boston, Mass., Sept. 15, 1819, entered the Univ. of New York, and grad. with the highest honors of his class in 1840; taught the anc. langs. in the S. C. Conference High School at Cokesbury 1842-44; joined the conference Dec. 1844; grad. in med. in Phila. in 1848, and forthwith went as a missionary to Shanghai, Chi.; while there pub. *Harmony of the Gospels* and several tracts in Chi. During the great rebellion in Chi. ran the blockade of the imperial fleet, and carried books and tracts into the camp of the insurgents. His wife's health failing, he returned to the U. S. in 1854. He was prof. and pres. of the Spartanburg Female Coll., and was general Sunday-school sec. of the M. E. Ch. S. He was 4 yrs. presiding elder of Wadesboro' dist., and 4 yrs. pres. of the Wesleyan Univ. at Millersburg, Ky. Wrote *Five Years in China and Baptism in a Nutshell*.

**Taylor** (CHRISTOPHER), b. at Skipton, Yorkshire, about 1640, was a Puritan preacher, but became a proselyte of George Fox, and joined the Society of Friends, in which he became an eminent minister. He was an excellent scholar; taught classical schools in several places, the last being at Edmonton, near Lond., whence he emigrated to Pa. in 1682; was chosen a representative in the assembly; was made a member of the first provincial council, retaining the office until his death, and was also register-gen. and a justice of the Chester court. He pub. a *Compendium Trum Linguarum*, D. 1688.

**Taylor** (EDWARD T.), b. in Richmond, Va., Dec. 25, 1794, was originally a sailor; united with the Meth. society, and was ordained as a preacher in 1819; about 1830 became preacher at the Seamen's Bethel in Boston. He went as







but a handful of men against a large force of Indians which he attacked him; was one of the first marked military achievements of the war of 1812; was brevetted major, and in 1814 promoted to the full rank. During the remainder of the war T. was actively employed on the W. frontier. After the war became lieutenant-col. 8th Inf. in 1819, and in 1823 attained the colonelcy of the 1st Inf., of which he had been lieutenant-col. since 1821. On different occasions he had been called to Wash., as member of a military board for organizing the militia of the Union, and to aid the gov't. with his knowledge in the organization of the Indian bureau. He served through the Black Hawk war (1832), and in 1837 was ordered to take command in Fla. The battle of Okechohee was fought Dec. 25, 1837, resulting in the decisive defeat of the savages, and virtually ending the war. T.'s loss was 112 wounded and 26 killed. For this T. was brevetted brig.-gen. and made commander-in-chief in Fla.; was transferred to command of the army of the S. W. in 1840. Subsequently he was stationed on the Ark. frontier at Ft. Gibson, Smith, and Jessup. He proceeded, upon the annexation of Tex., with about 1500 men, to Corpus Christi, where his force was increased to some 4000. In Mar. 1846 he was ordered to advance to the banks of the Rio Grande, opposite Matamoros. The battle of Palo Alto was fought on May 8, and that of Resaca de la Palma May 9; Matamoros was occupied without resistance May 18, where he remained until Sept. T. became major-gen. June 29, 1846. After needed rest and reinforcement, he advanced in Sept. on Monterey, which capitulated. The plan for the invasion of Mex. by way of Vera Cruz, with Gen. Scott in command, was now determined upon by the gov't. The battle of BUENA VISTA (which see) was fought Feb. 22-23, 1847. He received the thanks of Cong. and a gold medal. He remained in quiet possession of the Rio Grande valley until Nov., when he returned to the U. S. In the Whig convention which met at Phila. June 7, 1848, T. was nominated on the 4th ballot (June 8) as the candidate of the Whig party for Pres. Gen. T. was inaugurated Pres. Mar. 4, 1849. Among the questions requiring the prompt attention of the Pres. was the organization of the large territories newly acquired by conquest and treaty, the question of the admission of Cal., the formation of new Terrs., and the settlement of the boundary-line between Texas and N. M. The free and slave States being then equal in number, the struggle for supremacy on the part of the leaders in Cong. was violent and bitter. Cal. adopted in convention, in the summer of 1849, a const. prohibiting slavery within its borders. T. advocated the immediate admission of Cal. with her const., and the postponement of the question as to the other Terrs. until they could hold conventions and decide for themselves whether slavery should exist within their borders. This policy ultimately prevailed through the celebrated "Compromise measures" of Henry Clay, but not during the life of the brave soldier and patriot statesman. D. July 9, 1860. [From orig. art. in *J's Univ. Cyc.*, by G. C. SIMMONS.]

**Taylorville**, R. R. June, cap. of Christian co., Ill., 25 m. from Springfield, has a large trade in grain. Pop. tp. 1870, 2180; 1880, 3322, including 2337 in v.

**Tazewell** (HENRY), b. in Brunswick co., Va., in 1753, ed. at William and Mary Coll.; became a lawyer; was a member of the Va. house of burgesses 1775-85, and of the committee which reported the Declaration of Rights and the State const. of June 1776; was chosen to a seat on the supreme bench 1785; was a member *ex-officio* of the first court of appeals, to which position he was again elevated by election 1793, and was U. S. Senator from 1794 to his death, at Phila. Jan. 24, 1799, having presided over the Senate 1795. Liberal in his political views, he favored the abolition of primogeniture and entail and the separation of Ch. and State in Va., took an active part in the discussions on the Jay treaty, and was considered a leader of the Republican party.

**Tazewell** (LITTLETON WALKER), son of Henry, b. at Williamsburg, Va., Dec. 17, 1774, grad. at William and Mary Coll. 1791; began the practice of law at Williamsburg 1796; was chosen to the State legislature 1798; settled at Norfolk 1801; was M. C. 1800-01, a com. under the Fla. treaty 1820, U. S. Senator 1824-33; was a prominent sympathizer with the nullification measures 1831-32, and gov. of Va. 1834-36. D. May 6, 1860.

**Tchad**, or **Tsád**, a large lake in Soodan, Central Afr., about 200 m. long and 150 m. broad. Its elevation above the sea is 500 ft.; its depth varies from 8 to 15 ft. Its shores are low and overgrown with high reeds. It is studded with islands, densely peopled by a finely built race, jet black, and with some civilization. It swarms with hippopotami, crocodiles, turtles, fish, and fowl.

**Tea**. The hist. of tea is intimately bound up with the hist. of Chl., so far as the W. world is concerned. In very late times tea has been procured in considerable quantity from Japan, and the plant can be grown on many soils, but all its W. traditions are associated with Chl. only. The Chl. name for tea is *tsa* or *chia*, but the inhabs. of Fuh-Kien, from whom the first cargoes were probably obtained, so pronounced the word as to give rise to the European name, *the o tea*. The supply for export is obtained mainly from the coast provs. of Fuh-Kien, Cheh-Kiang, and Kiang-Su; these provs. extend from about 23° to 35° N. in the order named, and it is within these lat. throughout the empire that the plant flourishes most. Shanghai, the prin. depot for all the N. black teas and for greens, is in Kiang-Su, close to the borders of Cheh-Kiang.

Tea is usually raised by small proprietors, each family producing what it can, as in the case of silk. There are but few large growers who cultivate extensive gardens. The men that grow the plants sometimes cure the leaves themselves; sometimes they sell them uncured, simply sorting them as to quality. The plants are raised from seeds, gathered generally in Oct., and kept fresh in sand and earth through the winter till they are planted in the spring.

The shrub bears at the age of 2 or 3 yrs., and lasts for a period of 10 to 12 yrs. The average product of a single plant seems to be about 6 ounces in weight, gleaned in 3 gatherings, the first of which, of the young and tender leaves, made when the leaf-buds begin to open, occurs about the middle of Apr.; the second, of the full-sized leaves, occurs about the first of May; and the third is made about the middle of July. There is sometimes even a fourth gathering in Aug., but the last 2 pickings make only the inferior kinds. The method of curing the leaf differs in detail in the different portions of the empire. The leaves are first carefully sorted. The aim in curing is to get rid of more or less of the natural moisture of the leaf, and to preserve by thorough drying; the first point is mainly effected by pressure in rolling the leaf when it is in a flaccid state, and the latter point is attained by the careful firing to which the leaves are subjected. For export the leaves are much more highly fired than for native consumption. For black tea the leaves are exposed to the air a considerable time before firing. They are then tossed about till they are soft and moist, and after remaining an hour or more in heaps, they are roasted for about 5 minutes in iron firing-pans. Immediately afterward they are rolled upon rattan tables, and then exposed again to the air for some hours. The final process is to dry them slowly over charcoal fires, alternately firing and rolling. This frequent exposure to the air and to heat gives their dark color, and the rubbing and tossing explain their somewhat generic name of *congou*—that is, "worked" tea. For green tea the leaves are fired for a short time almost as soon as gathered. They are then rolled into the different forms in which they come upon the market, and immediately afterward are dried over hot fires. This process retains more of the essential oil of the leaf, and imparts a greenish hue that improves somewhat after a little time. The green tea of commerce is artificially colored, but that used by the natives is not. The color is the result of the manner in which the leaf is cured, both kinds being made from the same species of plant. The black color being the result of longer exposure to air and to heat, it is possible to transform green tea into black, but black tea cannot be turned into green. It seems certain that neither the very choicest nor the very poorest grades of tea enter into the export. The question of long transportation probably explains both facts, it being not worth while to transport the one, and impossible to preserve the delicate qualities of the other. The finest qualities exported go overland to Russia.

European trade in tea commenced about 1602. There seems to be little doubt that tea was introduced into Europe by the Dutch, although Port. intercourse with Chl. began in 1518. The English E. India Co. was chartered A. D. 1600; their first order for tea was given in 1667. The first direct shipment, about 100 lbs. in weight, reached Lond. in 1669, and whatever tea was received in Eng. previous to that yr. was probably brought over from Hol. From that date the direct trade increased rapidly. Up to 1834 the E. I. Co. enjoyed a monopoly of the trade with Eng. in tea, as in all Chl. produce. Since then the trade has been open to all. Rus. trade with Chl. began toward the end of the 17th century, being conducted overland *via* Siberia. From the first, tea has been the staple of Chl. exports to Rus., and that mainly in the form of bricks. To this day the trade over the borders is conducted chiefly by barter, though this method has long ceased at the coast-ports. The first Amer. ship sailed for Chl. in 1784; the following yr. 2 vessels were despatched, and brought back 880,000 lbs. of tea. In 1786-87 5 vessels brought home 1,181,860 lbs. Up to 1845 the trade in tea was transacted almost entirely at Canton. In 1842 Shanghai, Ningpo, Foo-Chow, and Amoy were opened to foreigners by the Treaty of Nanking, and the Chl. tea-trade now is mainly done at Shanghai, Foo-Chow, and Amoy. In 1859 the first shipment of tea from Japan was made to Eng. The Japanese leaf was first brought to this country in 1860. Tea is also grown in Brazil to a small extent, but wholly for native consumption.

As late as 1850 all vessels trading in tea carried considerable armaments, a necessary precaution because of the pirates which swarmed in the Chl. seas during the first half of this century. [From orig. art. in *J's Univ. Cyc.*, by SETU LOW.]

**Teachers' Institute**, an official gathering of the teachers of the public schools of a certain dist. for the purpose of receiving instruction in the best methods of teaching and discipline, and the hearing of practical oral lessons from eminent instructors. T. I. have been held in most of the N. States for many yrs. The first was held by Mr. Henry Barnard at Hartford, Conn., in 1839. When ably conducted, these meetings have proved extremely useful means of awakening the enthusiasm and giving a wise direction to the labor of teachers in the public schools.

**Teak**, the *Tectona grandis*, of the order Verbenaceæ, a noble forest tree of India and Farther India, is the best timber known for ship-building. Many all-teak built ships are reported to be over 100 yrs. old, and still seaworthy. Afr. T., the wood of *Oldfieldia africana* an euphorbiaceous tree, resembles true T., but is much inferior.

**Teal**, the Eng. name given to certain ducks of small size, distinguished by the following characters: The bill is but little longer than the foot, its sides nearly parallel, and the lamellæ little or moderately developed; the tail is about  $\frac{2}{3}$  as long as the wing, and subtruncate; the wings have each a bright-colored green or blue speculum. The species thus distinguished present, however, considerable differences in other respects, and have been differentiated into 2 genera, the blue-winged T. and the green-winged T. The species frequent inland lakes and streams, and are among the most edible of the family. Representatives are found in almost every country, and are almost alike at home in the cold North and the heated tropical countries.

**Tea, Paraguay.** See MATE.

**Tea-Plant**, a shrub with bright green and smooth ever-



green leaves, bearing white flowers resembling those of a small camellia, belonging, indeed, not only to the same natural order (*Camellia* or *Tristemiaceae*), but even to the same genus. Linnaeus established the genus *Thea* (Latinizing the Chi. name), and, following the opinion of the time, indicated 2 species—*T. Bohea*, from which black tea was supposed to be prepared, and *T. viridis*, for green tea. It is known, however, that these are mere varieties, of no botanical importance, and that the difference between green and black teas results from the mode of preparation; whereupon the T.-P. generally took the name of *T. chinensis* or *T. sinensis* (of which the latter is the preferable form). But at length it appears that the T.-P. is unknown in a wild state in Chi.; that it was probably introduced into Chi. from some part of Upper India adjacent to the Chi. empire; and that the T.-P. indigenous in Upper Assam, which was discovered there by the Eng. in the yr. 1834, and pub. under the name of *Thea assamica*, is specifically identical with the long-cultivated plant of Chi. Wherefore, the latest authorities, referring the T.-P. to the camellia genus, name it *Camellia Thea*.

**Tea'sel** [*A.-S. tæsel*], the *Dipsacus fullonum* (order Dipsacaceæ), a biennial plant of the S. of Europe, naturalized to some extent in the U. S.; cultivated in Europe, as formerly in the U. S., on account of its burs or heads, covered with hooked bracts. These heads are fastened to a revolving cylinder, and used by woollen manufacturers to raise a nap on cloth. No artificial contrivance has been found to equal the T. for this purpose. "Male" and "female" T. are merely varieties in size and stiffness, each adapted to the dressing of special cloths.

**Tèche**, *tess*, **Bayou**, was once the lower portion of the anc. channel of Red River, extending from the present Bayou Courtaubien, E. of Opelousas, La., around and to the W. and S. of what is now the Grand Lake basin to the Gulf of Mexico, but now, too, the lower Atchafalaya River, S. of Grand Lake. The lower half of the T. is a currentless (except for brief periods) tide-water channel, only navigable for small steamboats to St. Martinsville, about 100 m. above Morgan City on the lower Atchafalaya. Above St. Martinsville the T. is only navigable for flat or keel boats during the flood-season or for brief periods after heavy rains. The anc. channel of Red River, of which the T. formed a part, comprised what are now known as the Courtaubien, Beuf, Robert, Rapides, and Jean de Jean or Cottle, but there is now no connection between Red River, at or above the falls, and the Beuf, which itself is not navigable. The T., below the head of navigation, comprises one of the richest sugar-regions of La.

**Tecum'sch**, on R. R., Lenawee co., Mich., 60 m. S. W. of Detroit. Prin. business, farming, fruit-growing, and manufacturing. Pop. 1870, 2039; 1880, 2111.

**Tecumseh**, on R. R., cap. of Johnson co., Neb., 50 m. S. E. of Lincoln. Pop. pt. 1870, 722; 1880, 2177, 1263 of it in v.

**Tecumseh**, or **Tecumtha**, a celebrated chief of the Shawnee Indians, b. near Springfield, O., about 1770; took part in the war with the Ky. forces about 1791; was engaged in the battle of Mad River and in the attack on Ft. Recovery, 1794; joined his brother, Elskawatawa (called "the Prophet"), about 1805 in the attempt to organize all the W. Indians in a confederacy against the whites; visited all the tribes on the upper lakes and in the Miss. Valley down to the Gulf of Mexico; collected a considerable force on the upper Wabash in the autumn of 1811, which under command of the Prophet attacked Gen. Harrison, and was defeated at Tippecanoe Nov. 7, during T.'s absence among the S. tribes; went to Canada with a band of Shawnees in the following yr. on the outbreak of hostilities with G. Brit.; was a useful ally to the Brit. in the battles of Raisin River and of Maguaga, where he was wounded; made brig.-gen. in the Brit. service; joint commander with Gen. Proctor at the siege of Ft. Meigs, and protected the Amer. prisoners from massacre; wounded at the battle of Lake Erie, and commanded the right wing at the battle near the Moravian towns on the Thames, in which he was killed Oct. 5, 1813.

**Te Deum**. This hymn, commencing *Te Deum laudamus, Te Dominum confitemur*, or, in the Eng. version, "We praise thee, O God; we acknowledge thee to be the Lord," has been sung by the whole W. Ch. "day by day," on all her feasts from time immemorial. It is Morning Service of the Eng. Ch. as far back as the Conquest; very anc. ecclesiastical traditions represent the *Te Deum* as a hymn antiphonally extemporized by St. Ambrose and St. Augustine at the baptism of the latter (A. D. 356), and the title antiently given to it in the Psalter of the Eng. Ch. was "Canticum Ambrosii et Augustini." But there is reason to think it is much older, and that the two names are connected with it merely by their introducing it into their respective chs.

**Teeth** [*A.-S. tōth*; Lat. *dens, dentis*; Gr. *ὀδὸν, ὀδόντος*], certain hard bodies situated in the mouth or at the commencement of the alimentary canal. Under this definition are included not only the T. of mammals and other vertebrates, but the hard bodies that stud the surface of the odontophore or lingual ribbon of mollusks, etc. The lepto-cardians or pharyngobranchiates are entirely destitute of T. The marsipobranchiates have T. developed on the tongue, and more or less from the surface of the oral disk; in the myxinoidea a single tooth is present on the roof of the mouth; but in the petromyzonts numerous T. exist in oblique rows on the disk. The selachians or elasmobranchiates exhibit a very considerable diversity in their dentition. The fishes are, more than any other class, distinguished by the diversity in development and position of the T., as well as form and mode of attachment. As to position, they may be entirely absent from at least the mouth proper, or they may be present on almost all the bones. There may be also a considerable diversity in dentition within the limits of the same natural family, although, as a rule, the differences are inconsiderable.

In form there is great variety. The most common is an

elongated conic, but more or less curved, contour, or some slight modification thereof. In their combinations and mode of attachment there is almost equal variety. In most fishes they are very numerous, and aggregated in many rows on the jaws as well as palate; in many they are uniserial; often they are differentiated into 2 or more kinds—e. g. the foremost tooth or the hindmost ones, and sometimes both, may be developed as canines, while the others are small; often, too, the T. of the anterior row are much larger than the others, or the T. of the front of the jaws are conic or incisorial, and those of the sides molar. In the amphibians there is much less diversity than in the fishes. In form they are mostly slender, conic, and pointed. In position they exhibit much greater diversities; in the salamanders and other tailed species, they are present on the jaws and palate under various combinations. In the Sallentia they are less constantly present; in many (e. g. the frogs) they are suppressed in the lower jaw, and present only in the upper; in numerous others (e. g. the toads) they are absent from the upper as well as the lower jaw; in the frogs T. are developed in the vomer, but in the toads are entirely wanting on the palate as on the jaws. In the reptiles the varieties of dentition are quite numerous, but less so than in the fishes. True T., as far as known, consist of dentine, to which is very generally superadded an investment of enamel, partial or complete, but cementum is only present in a few instances. The birds of the present epoch are entirely destitute of true T., and the mandibles have generally more or less trenchant, unarmed linear edges, but sometimes they are armed with processes of bone simulating T., but in no other respect entitled to that name. In former epochs, however, there existed types actually provided with true T., having all the structural characteristics of those organs, and fitting in sockets in the jaws.

In the mammals T. are confined to the jaws, and are almost always developed, although in a few forms, representing several orders, they are entirely wanting. It may at the same time be recalled that while true T. are confined to the jaws, there are certain asperities on the tongue which are almost as much entitled to be called T. as are analogous processes in other animals. In the marsupials and placental mammals the T. are homologous with each other, and developed in the same manner. The fully developed T. are composed essentially of 3 elements—(1) the dentine, (2) the enamel, and (3) the cement. The T. of mammals are always inserted in sockets in the jaws, surrounded by gums. They are severally divided into 2 portions—the exposed portion or crown, and the inserted portion, known as the fangs or roots. Not increasing in size as do the other parts of the body, a provision must exist for the accommodation of their size and development to that of the animal. This is effected in part by (1) the late development of some of the T., which do not appear until the animal has attained a large size; and, in part, as well, (2) by the replacement of some of the T. developed near the time of birth by subsequent ones of larger size.

The rows of T. in almost all species exhibit interruptions of varying extent. These interruptions most frequently exist between the incisors and canines of the upper jaw for the reception of the canines of the lower, and in the lower jaw between the canines and molars for the reception of the canines of the upper jaw. The interruptions are designated as diastemas or diastemata, and result from the increased size of the canines in the respective jaws, and the necessity for space in the opposite jaw to receive them.

As to structure and functional development, the teeth throughout the series of mammals are differentiated on the whole into 3 groups: (1) Those in the front of the jaws have compressed cutting crowns, and have therefore been denominated *incisors* (*incidere*, to "cut"). (2) On the sides behind the incisors are the *canines*, which are exemplified especially in the dog, whence the name (*caninus*, pertaining to the "dog"); these have generally more or less elongated, compressed, conic, but recurved crowns, but they vary much in this respect. (3) The molars are all the other T. behind the canines, whatever may be their shape. The number of the T. in the lower types of mammals is so variable that a typical number can scarcely be said to exist. In the higher or educabillan series, however, a typical number exists, and in all the forms of that great group or super-order it is generally easy to locate the T., which correspond to those of the primitive series, however much they may be developed or modified, and however few may ultimately remain. The number in question is 44. THEODORE GILL.

**Teeth, Human**. There are 2 stages: (1) the milk or deciduous, and (2) the permanent set.

(1) The deciduous set is composed of 20 T.: in the upper and lower jaws, each, incisors 2, canines 1, deciduous molars 2, on each side. These correspond with the median and second incisors, the canines, and the last 2 of the premolars of the dentition of the complete typical educabillan deciduous number. In the order of development they are cut at the following periods: at the age of 7 months, the median incisors; at 7 to 10 months, the lateral incisors; at 12 to 14 months, the anterior molars; at 14 to 20 months, the canines; and at 18 to 26 months, the posterior molars.

(2) The permanent series is constituted, when complete, of 32 teeth: in the upper and lower jaws, each, incisors 2, canines 1, premolars 2, and true molars 3, on each side. These correspond with the first and second incisors, the canines, the third and fourth premolars, and the several molars of the typical educabillan number. These teeth are erupted severally at the following periods: at the age of 6½ yrs., the first true molars; at 7 yrs., the median incisors; at 8 yrs., the 2 lateral incisors; at 9 yrs., the first premolars; at 10 yrs., the second premolars; at 11 to 12 yrs., the canines; at 12 to 13 yrs., the second true molars; and finally, at 17 to 21 yrs. (whence they are called the "wisdom" teeth), the third true molars. THEODORE GILL.

**Teff**, the *Poa abyssinica*, a cereal grass of the interior of



Afr., where the grain is employed extensively in making bread and beer, while the straw is a forage material.

**Tefft** (BENJAMIN FRANKLIN), D. D., LL.D., b. at Floyd, N. Y., Aug. 30, 1813, and grad. at the Wesleyan Univ., Middletown, Conn., 1835, was pastor of a Meth. ch. at Bangor, Me., and has been prof. in Asbury Univ., Ind., and pres. of the Genesee Coll., N. Y. In 1862 he was U. S. consul and acting U. S. minister at Stockholm, Swe.; in 1866 became pastor at Portland, Me. Wrote *Hungary and Kossuth, Webster and his Masterpieces*, etc.

**Tegnér**, tong-nair' (ESAIAS), b. at Kirkerud, in Wernland, Nov. 13, 1782, went to Lund in 1799, and in 1802 he grad. from the univ. with great honor. In 1805 he became prof. of aesthetics at the same univ., and in 1812 he exchanged this professorship for that of Gr. lit., having in the mean time acquired great fame as a poet by his *Axel, Svea*, and a great number of lyrical poems, and having been elected a member of the Swe. Acad. in 1811. In 1824 he was made bp. of Wexiö. *Frithiof's Saga* is his most celebrated work. His influence on the Swe. people was decisive. D. Nov. 2, 1846.

**Teheran**, teh-he-rah'n', cap. of Per., in lat. 35° 41' N., lon. 51° 23' E., prov. of Irak-Ajemi, 70 m. S. of the Caspian Sea, in a sandy and stony plain at the S. foot of the Elburz Mts., which rise here, in Mt. Demavend, 20,000 ft. above the level of the sea. It is surrounded with a mud wall. The streets are narrow, crooked, ill-paved, and filthy, and the houses low and insignificant, generally built of mud. Some mosques, bazaars, and caravansaries look well, however, and the palace of the shah, forming a city by itself adjoining the N. part of the wall, is a vast and elegant structure. T. became the residence of the shah in 1796, and has increased considerably since that time. It has some manufactures of carpets, cotton and linen goods, shoes and hats, and carries on a brisk trade. Its pop. varies much from winter to summer: during winter it is about 100,000.

**Tehrî, Teerce, or Garwhal**, a small hill-state under Eng. control in the Himalayas, E. of Simla, with an area of 5485 sq. m., inhabited by 200,000 hill-men, famous with the Hindoos for its sacred places of pilgrimage at the sources of the Jumna and the tributaries of the Ganges, and with the Europeans for its magnificent forests consisting of sal (*Shorea robusta*), cedar, and pine trees.

**Tehuantepec**, ta-wahn-tah-pek'. The name is common to the *Isthmus*, the *gulf*, the *river*, and the *city*, but, as the geographical expression for the most N. portion of the Amer. isthmus connecting N. and S. Amer., it has its primary signification. The isthmus derives an especial interest from being one of the available interoceanic routes.

The *Isthmus of Tehuantepec* is that portion of the Mex. terr. which lies between the Gulf of Mex. and the Pacific Ocean, where the 2 seas approach the nearest to each other, and comprises the E. portion of the states of Vera Cruz and Oaxaca. From the mouth of the Coatzacoalcos to the harbor of Ventosa on the Pacific the distance in a direct line is 143½ m. The coast-lines on either side have a general direction nearly E. and W. The isthmus comprises 3 main divisions—the first embracing that portion extending from the Gulf to the base of the Cordillera, the *Atlantic plains*; the second comprising the *mountainous districts* in the central parts; and the third including the level country bordering the ocean on the S., the *Pacific plains*. Of the streams watering the N. slope of the isthmus, the most important is the Coatzacoalcos, the natural channel through which the projected communication between the 2 oceans may, in part, be effected. The river takes its rise in the unexplored part of the Sierra. It is entered over a bar having 14 ft. of water on it, and affords a ship navigation with 20 ft. depth above Mina-Titlan, or 30 m. inland. The total pop. is about 61,000 or 62,000, mostly Indians and half-breeds. The productions are mainly sugar, tobacco, cotton, coffee, cocoa, indigo, maize. The vast forests of the Gulf slopes yield valuable timbers—mahogany, cedar, the India-rubber tree, and gums—while those of the mts. abound in pine and oak. Numerous herds of cattle are found on the table-lands of the central regions and plains of the Pacific coast.

The Tehuantepec River, emptying into the Pacific, and on which is the city of that name, has a short course, and is but little more than a mt.-torrent, of copious volume during the rainy season. The city of Tehuantepec, 11 m. from the Pacific shores of the "Ventosa" Bay, the second town in the state of Oaxaca, has a pop. of 15,000. By the Gulf of Tehuantepec is meant that portion of the Pacific waters comprised in an indentation of the coast of Guatemala and Mex. The bays of Salina-Cruz, of the Ventosa, mere indentations of the coast-line, the inlet of "Boea Barra," and the "lagoons," are important features of the shores of the Gulf in its relations to a ship-canal or to a railroad transit route.

**Teiidæ**, a family of lizards (saurians) of the group *Lepetoglossa*. In form the species essentially resemble the typical lizards, to which they are most nearly allied. The family is peculiar to Amer. (especially the tropical portions), and is quite rich in genera and species. The most noteworthy species is the *Telus teguina* of Brazil. This animal sometimes attains the length of 6 ft. and more, and is quite active and strong. When pursued and brought to bay, it fights with its tail, with which it can inflict violent blows, as well as with its teeth.

**Teignmouth** (JOHN SHORE), FIRST BARON, b. in Devonshire, Eng., Oct. 8, 1751, went to India as a cadet 1769; became Per. translator at Moorshebad 1773; became a member of the supreme council at Calcutta 1786; was made a baronet 1792; was gov.-gen. of India from Aug. 1793 to 1797; was a chief author of the code of laws for Bengal pub. in 1793; was created Baron Teignmouth at the expiration of his term of office 1797; became member of board of control and of privy council Apr. 1807. D. Feb. 14, 1834.

**Tekamah**, Neb. See APPENDIX.

**Tel'edu, or Stinkard**, a small mammal, found in the

mountainous parts of Java and Sumatra. It is said rarely to descend much below the level of 7000 ft. above the sea, and therefore its areas of distribution are quite isolated. It secretes a most intolerably offensive fluid. It is rather nearer the badgers than the skunks in its structure and habits, as well as appearance. It is of a blackish-brown color, with a broad white mark along its back and head. Its motions are slow. Its flesh is eaten by the natives.

**Telegraph** [from Gr. *τῆλε*, "afar off," and *γράφειν*, to "write"]. The etymology of this word implies a means of writing at a distance, but it has come to signify any system of conveying intelligence other than by voice or writing. The idea of speed is also implied. The semaphore was the first really efficient T. It was invented by Claude Chappé, and adopted by the Fr. govt. in 1794. It consisted of an upright post supporting a horizontal bar, which, turning upon a pivot, could be placed at various inclinations. This had 2 smaller arms pivoted to its extremities, and capable of being turned at various angles with them. By independent movements of the parts the apparatus was susceptible of 98 distinct positions, and of exhibiting the same number of different signals, which could be made to represent either letters, numbers, words, or sentences. The speed of transmission under the most favorable circumstances was about 3 signals per minute. The semaphores were placed upon high towers, usually about 4 or 5 m. apart. Another system of ocular telegraphy consists of alternately exposing and cutting off a continuous beam of light directed from the sending to the receiving station, the characters being formed like those of the Morse telegraphic alphabet, by the breaking of a continuous line into sections of varying length.

As soon as it became known that electricity could be conducted by wires to a distance, it began to be regarded as a possible means of conveying intelligence. The earliest suggestion of this kind seems to have been contained in a letter to the *Scots Magazine* dated Feb. 1, 1753. It proposed to employ insulated wires equal in number to the letters of the alphabet, the signals being given by means of frictional electricity. In 1774 Lesage of Geneva constructed the first electric T. It had 24 wires, each connected with a pith-ball electroscope, the signals being given by frictional electricity. From this time forward many ingenious attempts were made to employ frictional electricity for telegraphic purposes. Samuel F. B. Morse of New York, during a voyage home from Fr. in 1832, conceived the idea of making signs at a distance by means of a pencil moved by an electro-magnet and a single conducting circuit, the paper being moved under the pencil by clock-work. Several yrs. were devoted to improving the invention and endeavoring to interest the public in the project. It was not until 1844 that the first public line was completed between Wash. and Baltimore (40 m.), and the first message transmitted May 27 of that yr. Within a few yrs., however, lines were extended to the principal cities of the U. S. The Morse T. became the universal T. of the world.

The earliest experiment on record in submarine telegraphy was made by Dr. W. O'Shaughnessy at Calcutta in 1839. He laid a copper wire, insulated with a coating of cotton thread saturated with pitch and tar, across the river Hoogly, and transmitted signals through it. In 1850 an experimental line was laid across the Eng. Channel, followed in 1851 by a permanent cable, which is still in use. The success of this undertaking at once revived the suggestion of laying a cable across the Atlantic Ocean from Ire. to Newfoundland. In 1854 the attention of Mr. Cyrus W. Field of New York was directed to the subject, and mainly through his efforts a company was formed, principally of Eng. capitalists, to undertake the enterprise. The first attempt was made in Aug. 1857, but it was unsuccessful. The following yr. the attempt was renewed, and the enterprise successfully completed Aug. 5, 1858. Sept. 1 the cable failed altogether. This disastrous result discouraged further enterprise for a number of yrs. The experience gained, however, was of the highest value, and the success of the Malta and Alexandria (1861), Per. Gulf (1864), and other deep-sea cables led to a renewal of the attempt to cross the Atlantic in 1865, which again resulted in the breaking of the cable after 1186 m. had been paid out. The following yr., however, a new cable was successfully submerged, being landed at Newfoundland in perfect working order July 27, 1866, and the great problem was thus at last definitely solved.

All electric T. may be said to consist of 3 parts—first, an apparatus for generating or producing the electric current; second, a conductor for conveying the electricity from one point to another as required; and, third, apparatus for transmitting and receiving the signals.

I. SOURCES OF ELECTRICITY.—The electricity used in telegraphy may be derived either from the voltaic battery, from the magneto-electric machine, or from the thermo-electric battery. Of these, the voltaic battery is the most commonly used, though latterly much has been done in developing the capacity of the dynamo-electric machine, which has in some instances successfully replaced the voltaic combinations heretofore in general use.

II. TELEGRAPHIC CONDUCTORS.—Conductors are usually carried through the air, but when required may be placed under ground or under water. In either case they must be well insulated.

III. TELEGRAPHIC APPARATUS.—The apparatus used in telegraphy may be conveniently divided into recording and non-recording.

A. *Recording Telegraphs* are of two classes. (1) *Marking Telegraphs*.—Morse's is by far the best known and the most extensively used of this class. Its characteristic feature is the *register*, which is constructed in many forms, but upon the general principle shown in the cut. A horizontal lever *a* is mounted upon a fulcrum, and armed at one end with a steel point *c* projecting upward and nearly touching a ribbon of paper *f*, which is carried along at a uniform rate by a grooved roller just above it, the roller being impelled



Telegraphic Register.

formed masses separated by varying spaces.

(2) *Printing Telegraphs*.—The idea of a T, which should record messages in printed Roman letters, is due to Alfred Vail of N. J. (1837). The first model of such an instrument was made by Wheatstone (1841). (a) *Horse's Telegraph* was the earliest practical printing instrument. It was introduced in 1847, and largely used in the U. S., until about 1860. (b) *Hughes's Telegraph* was invented by D. E. Hughes in 1855, and has been extensively used in Europe since 1860. The essential principle of the apparatus is the synchronous movement of 2 constantly revolving shafts at stations. This is effected by means of a governor, consisting of a recoil escapement and a vibrating bar. The shaft at the transmitting station carries a revolving contact-maker, and the corresponding one at the receiving station a type-wheel similar to that of Houdon. The contact-maker travels over a circular row of 28 vertical pins, which are connected with the same number of plano-keys. Each pin represents a letter, and is raised by the depression of the corresponding key when a letter is to be transmitted. The contact-maker, which travels round the circle of pins with a motion uniform with that of the type-wheel at the receiving station, comes in contact with the raised pin at the same instant that the corresponding type upon the type-wheel is passing the platen, and closes the circuit. An electro-magnet at the receiving station releases a cam which throws the platen carrying the paper against the type as it is passing, thus printing the letter. Only one pulsation is thus required for the printing of each letter, and by the use of a peculiar form of electro-magnet a very weak current suffices to do the work. (c) *The combination instrument* is a modification of Hughes's. It was invented in 1859 by G. M. Phelps, and has been used on many of the principal lines in the E. part of the U. S. since that date. (d) *Phelps's Electro-Motor Telegraph*.—This is the most effective printing instrument which has yet been produced. It was invented in 1869. The mechanism is driven by a small electro-motor, which is connected with a special battery. The synchronous movements of the transmitting mechanism at one station and the type-wheel at the other are maintained by means of a centrifugal governor attached to the motor, which instantly reduces the strength of the local current by which the latter is propelled whenever the speed of revolution tends, however slightly, to exceed the prescribed limit. (e) *Telegraphs for Financial and Commercial Reporting*.—The method of reporting the fluctuations of the prices of stocks, gold, merchandise, etc., by means of automatic-printing T. instruments placed in the offices of merchants, brokers, and other interested persons, and of which several hundred are often simultaneously operated by a single person located in the central exchange, originated in New York in 1867, and has since extended to the prin. cities of the U. S. and of

D. *The Harmonic Process*, invented by Elisha Gray of Chi-



cago, is based on discoveries made by him in 1873 in reference to the telegraphic transmission of musical tones. By Gray's process at least 8 communications may be simultaneously transmitted over one wire. The transmitting apparatus consists of a number of steel reeds, each tuned to vibrate at a definite rate, corresponding to some one note of the musical scale. One end of each reed is rigidly fixed, while the other is left free to vibrate by the alternate action of 2 electro-magnets, a local battery, and an automatic device for alternating the current of the battery between the 2 magnets at each vibration, so that the movement of the reed is rendered continuous as long as the current passes; but the rate of vibration of each individual reed must always correspond rigidly with the note to which it is tuned. If a line is to be equipped for 8 simultaneous transmissions, the main battery is divided into 8 equal sections, which are so arranged as to be thrown alternately on and off the line at each vibration of the reed connected with that section. At the receiving station a series of 8 analyzers are placed in the circuit, the current passing through them all in succession. Each analyzer consists of an electro-magnet whose armature is fixed at one end and free at the other, and so arranged as to form a vibrating tongue or reed, which is tuned to the same note as the transmitting reed to which it is intended that it shall respond. When the transmitted vibrations pass through the series of analyzers, each armature takes up its own set of vibrations, rejecting all the others, and consequently gives forth its own musical note. The several transmitting keys at the sending stations break up the continuous tone into the dots and dashes of the telegraphic alphabet, which may be read from the sound of the analyzer as readily as from an ordinary sounder. Indeed, by the addition of a secondary spring attached to the analyzer, having a slower rate of vibration, it may be readily made to operate the usual Morse sounder by opening and closing a local circuit. No difficulty is found in transmitting 8 simultaneous communications over one wire to a distance of several hundred miles, each pair of operators sending and receiving at the same rate of speed as in the ordinary single transmission. It is obvious that musical tones may be perfectly reproduced at any distance by this method; and in fact this has often been accomplished with remarkable success.

**E. Submarine or Cable Telegraphy.**—Owing to the embarrassment arising from electro-static induction in long submarine cables, special arrangements have been devised. The method employed on the Atlantic cables is arranged as follows: Two keys, which when depressed transmit respectively positive and negative currents, are employed at the sending station in connection with a battery of a few elements only. The current of the battery does not pass directly into the cable, but into a condenser of considerable capacity composed of tin-foil plates interleaved with paraffined paper, the opposite side of which is attached to the cable, and the condenser transmits a wave of electricity through the cable. As there is no actual circuit from one terminus to the other, this arrangement serves to cut off the earth-currents, which would otherwise be troublesome. The receiving instrument employed is Thomson's reflecting galvanometer.

**F. Pneumatic Telegraph.**—Brass tubes  $2\frac{1}{4}$  inches in diameter are laid in trenches under the streets. The messages are rolled up and placed in a cylindrical carrier of leather or felt about 8 inches in length, closed at the front, and provided with a flange loosely fitting the inside of the tube, while the rear end is left open. The carriers are driven in one direction by compressed air, and in the other by an exhaust, both operated by a powerful air-pump at the central station. Packages of 10 or 12 messages are sent a distance of half a mile in a few seconds. This method is now extensively used in New York in connection with the telegraphic system. [From orig. art. in *J's Univ. Cyc.*, by FRANK L. POPE.]

**Telemachus**, son of Odysseus and Penelope, was an infant when his father joined in the war against Troy. After the termination of the war he sailed out, accompanied by Athena in the shape of Mentor, and visited Pylos, Sparta, and other places, where he expected to gather some information concerning the fate of his father; and on his return to Ithaca he found Odysseus living there in disguise with the swineherd Eumæus. A recognition took place, and he then aided Odysseus in slaying the suitors and clearing the house of its many burdensome guests.

**Telephone** (from *τῆλε*, "afar off," *φωνή*, "a sound" or "voice"). The word telephone in its widest sense means any instrument by which sound may be transmitted from one point to another. The string T., which in its various forms transmits sound mechanically, was mentioned as early as 1667 by Robert Hooke. As now generally used, however, the word telephone signifies an apparatus by which articulate speech may be electrically transmitted to a distance. The theory of the T. is simple. As sound is a wave-motion, its waves may differ in length, in amplitude, or in form, constituting pitch, intensity, and quality. To transmit pitch electrically nothing is necessary but to cause the sounding body to interrupt by its vibrations an electric circuit. Electric pulses are thus produced on the wire in number corresponding to the pitch of the note. The problem of transmitting quality, though much more difficult, is yet readily solvable. Every sound has its distinctive waveform, which is the more complex the more composite the sound. Simple sounds are represented by sinusoid curves; and according to Fourier's theorem, every compound sound is resolvable into these. To transmit the form of a sound wave, an electric wave must be produced, the intensity of every part of which shall agree with the corresponding part of the sound-wave. To devise a mode of doing this is practically to solve the problem of talking through a wire.

Elisha Gray seems to have been the first to conceive clearly the nature of this problem, and to discover a

method of solving it. In 1875, while engaged on electro-acoustic researches with especial reference to harmonic telegraphy, he devised an apparatus for the purpose, of which he gave an illustrated description in a caveat filed in Washington Feb. 14, 1876. He there claims as his invention "the art of transmitting vocal sounds or conversations telegraphically through an electric circuit." The principle involved depends on varying the resistance of the circuit by means of the sound-wave. To a diaphragm of parchment is attached a wire passing into water and terminating close to a similar wire rising from below. Through these wires and the intervening water the electric current passes, so that when by the impact of a sound-wave the diaphragm is made to vibrate, the distance between the ends of the wires—i. e. the resistance at that point—varies correspondingly, copying faithfully the character of the vibration. Since the current strength is inversely as the resistance, the form of the sound-wave is thus electrically reproduced. It does not appear that this apparatus was ever actually constructed.

Another mode of accomplishing this result was devised shortly after by Graham Bell, who exhibited it in operation at the Centennial Exhibition, June 25, 1876. In principle it is the opposite of Gray's, since it depends upon varying the electro-motive force in the circuit by means of the sound-wave, the resistance remaining constant. The earliest form consisted of a conical vessel, the larger end being closed by a membrane having a thin iron armature attached to its centre. Opposite this armature was an electro-magnet, carrying a current. The vibration of the membrane due to the impact of a sound-wave caused the armature to approach and recede from the magnet, thus generating a counter electro-motive force, and alternately weakening and strengthening the current on the line. Subsequently, as the current served only to maintain the magnetism of the iron cores, these were replaced by permanent magnets, the current now sent over the line being magneto-electric, generated by the motion of the iron diaphragm acting as an armature. The well-known form of the Bell T. was assumed early in 1877.

The receiving instrument, essentially the same form of which was employed by Gray and by Bell, consists simply of an electro-magnet with an elastic armature before its poles. It had been used by Reis in 1861, by Gray in 1874, and by Edison in 1875. The merit of Bell's invention consisted in the discovery that this instrument was reversible and could be used also as a transmitter. Various modified forms of it were constructed by Dolbear, Gray, Phelps, and Edison, for use in telephonic circuits.

It was soon found in practice that the magneto transmitter produced currents too feeble to be serviceable, and attention was directed to the production of a transmitter upon the principle of Gray—i. e. using the sound-wave to modify the resistance of the circuit. Edison began experimenting in this direction in 1876, and in Jan. of the following yr., utilizing a discovery made by him in 1873, that semi-conductors vary their resistance by pressure, he produced his carbon T. Edison was apparently the first to use finely divided conducting material for the purpose of translating sonorous vibrations into electric waves. The material used was lampblack from the chimney of a kerosene lamp; and he found that a disk of this substance varied its resistance from 300 ohms to the fraction of an ohm by increase of pressure alone. Hence, if sound-waves impinge upon such a disk, either with or without a diaphragm, they vary its resistance exactly as the pressure they exert upon it, and so proportionally modify the current flowing through it.

In May 1878 D. E. Hughes of Lond. called attention to loose external contacts of conductors as transmitting agents. Bits of carbon or of wire transmitted distinctly when a current was passed through their surfaces of contact, the Bell T. acting as receiver. A pointed stick of carbon placed vertically between 2 carbon supports, and thus in unstable equilibrium, was found to be extremely sensitive to vibration. A music-box in the room, a watch on the table, a feather-stroke on the frame, or even the step of a fly on the support, varied by its jar the contact surface, and so produced a sound in the T. In consequence of this apparent magnification of small sounds, Hughes gave the name *microphone* to this instrument. In principle it is obviously the same as Edison's carbon disk, the current varying with the resistance at the contact-surfaces. The microphone was the first of a multitude of transmitters founded on the same principle. The one which has come into most general use in this country is known as the Blake transmitter.

In 1877 Edison devised a new and entirely original telephonic receiver, based on the principle discovered by him in 1872, that friction is varied by the passage of an electric current. In 1875 this *motograph* principle, as it was called, was applied to a telegraphic relay. In the T. receiver a flat metallic spring attached to a mica diaphragm rests upon the surface of a moistened chalk cylinder, capable of rotation. When revolved, the friction puts the diaphragm under tension, which is relieved whenever the current passes. Thus an intermittent current gives an intermittent vibration to the diaphragm, and so a sound. The writer received vocal music from Harrisburg on such a T., and it was heard distinctly all over a large room in Phila., 105 m. distant. The instrument is known as Edison's loud-speaking T., and its performances have been remarkable.

All transmitting T., except the magneto-instrument, require the use of an induction coil to intensify the current sent over the line. Gray was the first to employ the coil for this purpose. The transmitter and battery are on the primary circuit, the secondary wire passing to line at one end and to ground at the other. In the loud-speaking T. Edison uses a tertiary circuit which includes the receiver.

Other forms of T. exist, such as the electro-static T. of Dolbear, but space does not permit their consideration here.

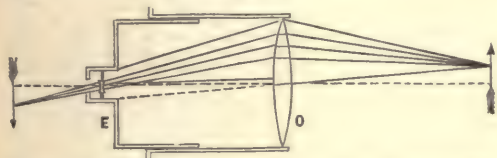
GEORGE F. BARKER.



**Telescope** (from *τῆλε*, "afar," and *σκοπεῖν*, to "see"), an optical instrument for viewing distant objects. Its early hist. is involved in obscurity. Many astrons. concede the invention to Hans Lippersheim of Hol., who used a convex object-lens in 1608. To Galileo belongs the fame of the first brilliant discoveries with an instrument so modest that at this distance it excites our surprise that he should have seen so much. His first discoveries were in 1610. All of his T. were of the opera-glass pattern, and he reached the limit of power with that construction without achromatic lenses. It was not until the middle of the 17th century that T. composed of 2 convex lenses came to be generally used in astronomical observations. The skilled philos. Huyghens, to increase the magnifying power of his T. without encountering the aberrations of unachromatic lenses of short focal, made object-glasses of so great as 210 ft. focal length. These T. were mounted without a tube, and could only be used with extreme difficulty. In 1663 James Gregory proposed that the light from a distant object be brought to a focus by a parabolic reflector. But the first person who actually constructed such an instrument was Newton. In 1672 Cassegrain, a Frenchman, brought forth still a third form of reflecting T. The reflector from this date began to supplant the refracting T., and maintained its lead until Dolond, about 1753, produced the modern achromatic T., an instrument which from that day to this has steadily increased in size with the perfecting of the manufacture of optical flint glass—i. e. flint glass which is homogeneous throughout.

**Theory.**—As in the microscope, so in the refracting T., the image of an object is first formed by a lens or system of lenses, and then in the common form of T. this image is examined by means of a microscope. In the first T. made, however, and in the opera-glass of to-day, the rays of light from the object-glass are brought into the eye before they come to a focus, by means of a concave lens placed as in Fig. 1, where the distance O E equals the difference of the

FIG. 1.

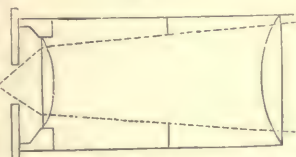


focal lengths of the 2 lenses. The object seen will be erect, and in using it the eye should be placed exactly centrally behind the eye-lens, and the eye-lens should be limited by diaphragm to the size of the pupil of the eye.

**The Object-Glass.**—From a mathematical consideration of the subject it is found that an object-glass can be rendered achromatic for any 2 or more colors of the spectrum by combining together 2 or more lenses of known refractive indices and of certain focal lengths. From the extreme difficulty of centring more than 2 such lenses, it is the custom to combine 2 of the most prominent colors of the spectrum at the focus of the object-glass by means of a convex crown lens and a concave flint lens. The correction for the 2 colors selected depends upon the focal lengths of these 2 lenses. The formation of a sharp image at the focus of the object-glass depends upon the curves of the 4 surfaces of glass, supposing the glass to be perfectly homogeneous, though practically the theoretical curves are slightly altered by the skilled optician to compensate for defects in the glass itself. The determination of the radii of these curves has occupied the attention of geometers from the time of Newton, and the theory is so well understood at present that the manufacture of object-glasses with the minimum of distortion and color is limited by the difficulties in the manufacture of the materials used.

**The Eye-piece.**—If a perfect image could be formed by an object-glass, a single lens used to magnify it would both color and distort it. Accordingly, except in the very highest powers of a few T., opticians have not used single lenses, but a combination of 2 or more. In a positive eye-piece the lenses are placed as shown in Fig. 2. This form is commonly used in all cases where measurements are required. The preceding eye-pieces show the object inverted, an item of little consequence with celestial objects. For terrestrial viewing an eye-piece of 4 lenses is commonly employed, which furnishes an erect image.

FIG. 2.



**Construction.**—The mechanical means for grinding lenses in themselves are simple enough. The disk of rough glass is made to revolve rapidly on a spindle, and its first shape is given by grinding with water and sand, using an iron tool which has the approximate curvature. Next, it is removed to another iron tool, where it is brought still further into shape by grinding the lower surface against the iron tool, which has a spherical surface, pressed against it by means of the hand alone. Five or six grades of emery-powder with water are used before this stage is finished. The iron tool is then covered with a coat of pitch, over which is sprinkled rouge; the polishing is then completed, still using the hand as a motor-power. After each surface of the lens has been polished in this manner, the lens is rigorously tested, and from this point the highest skill of the optician develops itself. The effect of every flaw in the glass itself or imperfection caused by the grinding process

must be counteracted by polishing here and there each of the 4 surfaces, if it be an object-glass. The finger alone, or the finger with a little of the finest rouge and water, is used in this process. It will be readily understood that the most patient trial and perseverance, coupled with conscientiousness, are necessary to produce a fine object-glass. The tube holding the object-glass and eye-piece of a T. in the large Ger. instruments is made of Sp. mahogany, but several of the largest modern equatorials have their tubes constructed of steel or iron rivetted in plates. In the case of some kinds of T. the tube is partly or wholly wanting. [From orig. art. in *J. S. Univ. Cyc.*, by L. WALDO.]

**Telfair** (EDWARD), b. in Scot. in 1735, settled in Va. in 1758; removed to Halifax, N. C., and to Savannah, Ga.; sat in the Continental Cong. 1778 and 1780-83; was a com. to negotiate a treaty of peace with the Cherokees 1783, and gov. of Ga. 1786 and 1790-93. D. Sept. 17, 1807.—His son THOMAS, b. about 1780, grad. at Princeton 1805, was M. C. 1813-17. D. Apr. 1818.

**Telford** (THOMAS), b. at Westerlark, Dumfriesshire, Scot., Aug. 9, 1757, became a stone-mason, studying arch. and drawing; went to Lond. 1783, and was arch. in the Portsmouth dockyard; in 1787 removed to Shrewsbury, where he was engaged upon the alterations in the old castle and in the construction of several bridges, and was appointed surveyor of the co. of Salop. His first great engineering work was the construction of the Ellesmere Canal. In 1803 he was intrusted with the construction of the Caledonian ship-canal, connecting the Atlantic with the N. Sea. Beside other works, as engineer to the coms. of Highland roads and bridges he built about 1000 m. of road in Scot., upon which are more than 1200 bridges; he constructed 8 canals in G. Brit., the Gotha Canal in Swe., and, above all, the beautiful suspension railway bridge over the Menai Strait. D. Sept. 2, 1834.

**Tell** (WILLIAM), according to Swiss legends, a celebrated marksman with the bow, living as a hunter at Bürglen in the canton of Uri, and a member of the conspiracy which was formed against Aus. at Grütli Nov. 7, 1307, and which finally succeeded in freeing the country from the foreign yoke. At this time Gessler, the Aus. bailiff in Küssnacht, raised a cap on a pole in the market-place of Altorf, and ordered all passers-by to bow to the cap in token of submission. T. refused, and was condemned to death, but pardoned on condition that he should shoot an apple from the head of his son. He ventured the shot, and succeeded, but Gessler noticed that he had put 2 arrows in his quiver, and asked why he had done so; and when T. answered that if he had hit his son with the one he would have hit the bailiff with the other, he was again put in chains and taken on board the bailiff's boat to be brought to Küssnacht. While crossing the lake, the boat was overtaken by a fearful storm, and T. was unchained in order to steer it, but at a certain point, known as "Tell's Leap," he jumped ashore, lay in ambush in a defile through which Gessler had to pass on his way to Küssnacht, and shot him, which deed became the occasion of a general rising in the cantons. The whole story is nothing but a legend, common among the nations of the Aryan race.

**Teller** (HENRY M.), b. in Allegany co., N. Y., May 23, 1830, studied law, and was admitted to the bar in New York; removed to Ill. in 1858, thence to Col. In 1861; was elected U. S. Senator (Rep.) on the admission of Col. as a State in 1876; re-elected for 1877-83; chairman of special committee on election frauds (the "Teller Committee") 1877-78. U. S. sec. of interior 1882-85. U. S. Senator 1885.

**Tellez**, tel-yeth' (BALTHAZAR), b. at Lisbon, Port., in 1595, entered the order of Jesuits 1610; pursued for 10 yrs. a critical study of lit., philos., and theol., of which branches he was for 40 yrs. a prof. in the Jesuit colls. at Braga, Evora, Coimbra, and Lisbon; became master of the house of professed Jesuits at Lisbon, and ultimately provincial of his order in Port. Wrote *Summa Universæ Philosophiæ, cum Questionibus quæ inter Philosophos agitantur, Chronica da Companhia de Jesus da Província de Portugal, and Historia Geral de Ethiopia a Alta*. D. Apr. 19, 1675.

**Tellez** (GABRIEL), better known by his nom. de plume of TIRSO DE MOLINA, b. at Madrid, Sp., about 1585, was ed. at the Univ. of Alcalá de Henares; took orders in the Ch. 1613; became a monk of the order of Nuestra Señora de la Merced 1620; was chosen chronicler of his order, inspector of the convents in Old Castile, and prior of the convent of Soria, where he d. in 1648. Next to Lope de Vega and Calderon, he was the most prolific and successful Sp. dramatist. Among his comedies are *Prudencia en la Mujer*, *No hay peor sortio que el que no quiere oír*, and *El Burlador de Sevilla*.

**Telluride**, Col. See APPENDIX.

**Tellurides** [Lat. *tellus*, "earth"], compounds of the amphoteric element tellurium with other metals. They constitute chiefly the native mineral compounds of tellurium. **Telluride of Bismuth** in Va. and Ga. has the composition of found in gold-mines in Va. and Ga. has the composition of pure T. of bismuth. Tetradymite is a steel-gray mineral, inflexible folia or laminae like graphite, soft and marking paper like the latter, hexagonal in form. It may be distinguished from graphite by roasting in a glass tube open at both ends, when a white sublimate of tellurous oxide will appear, fusible to transparent, colorless droplets. It is also fusible and combustible before the blowpipe, tingling the flame bluish-green.

**Telluride of Lead**.—This constitutes the rare mineral *altaite*, a white metallic scintill mineral, sometimes in cubical crystals, like galena, the corresponding sulphide. It is found in the Altai Mts., in Col., and in N. C.

**Telluride of Silver**.—The rare mineral *hessite*. Metallic, iron-gray, and scintill; in crystallization right rhombic. Usually contains some gold in its composition. Found in the Altai Mts., at several Hungarian localities, and in Calaveras co., Cal.

**Telluride of Gold and Silver**.—*Petziite*.—Found at Nagy-Ag



in Transylvania, and the ores of the Red Cloud mine, Col.; 24 and 25 per cent. of gold in the composition of the Col. petzite. It is scarcely to be distinguished in appearance or character from hessite without analysis. The auriferous mineral is, however, somewhat lighter in color and more brittle. It is right rhombic, like hessite.

**Tellurides of Gold**—*Sylvanite*—which, however, always contains also some silver. It is monoclinic, steel-gray or silver-white, and varies in composition and density within quite wide limits, containing from 23 to 30 per cent. of gold. It was found only at 2 Transylvanian localities in Europe, Nagy-Ag and Offenbach, and at the Red Cloud mine, Col.

**Tellurium** [Lat. *tellus*, "earth"], an element of matter belonging to the rarer elements, though contained in certain minerals which are of rather abundant occurrence in some very limited dists. of the earth. It occurs native in elementary form, generally associated with native gold or telluride of gold, the *sylvanite* of Kirwan, named from Transylvania. T. minerals, including native T., were discovered in Boulder co., Col., notably at the Red Cloud mine, near Gold Hill. T. minerals have long been known to occur at several points throughout the auriferous region of Va., N. and S. C., and Ga. A very notable new locality is the Uncle Sam lode, in Highland dist., Mont. It has also been found with gold at the Montgomery mine, Hassayampa dist., Ariz. T. exists in the star Aldebaran and in others.

**Preparation**.—T. is obtained in elemental form from any of the native tellurides by first fusing with black flux at a white heat, then boiling in water, which gives a port-wine-colored solution of telluride of the alkali-metal; which solution on exposure to the air, or more quickly by passing air through it, precipitates T. In metallic scales. The mineral *nagyagite*, which is telluride of gold, may also be made to yield pure T. by first boiling with muriatic acid till all lead and antimony are removed, and then dissolving in hot nitric acid, which gives a solution of tellurous acid, then readily decomposed by a current of sulphurous oxide gas.

**Nature, Properties, and Relations**.—T. is a white, brittle, lustrous metal, highly crystalline in structure, the crystals being hexagonal. It does not conduct electricity or heat very readily. Its fusing-point is placed at 333° F. about a red heat, and above this temperature it volatilizes to a vapor which has the greenish-yellow color of chlorine gas, and has a density about 9 times that of air. When T. is strongly heated, it takes fire and burns with a strong flame of a blue color with green edges, and a smoke of tellurous oxide. T. itself and T. compounds, when heated before the blowpipe, burn with an odor which is likened by some to that of rotten hoseradish, and which is so characteristic as to be readily recognized by those familiar with it. Its soluble compounds are regarded as very poisonous, particularly those obtained by substitution in organic compounds.

**Temperature of Space**. The phrase "temperature of space," derived from the illustrious Fourier, although in quite general use among physicists, is not a very accurate designation of the idea intended. Properly speaking, space itself can no more have T. than it can have illumination. But a body situated in space must attain the T. due to the combined effect of all the radiations received from the heavenly bodies at that particular position. Fourier supposed that this T. could not be much less than the lowest degree of cold observed in polar regions, and estimated it at —58° F. (—50° C.).

**Temperature of the Earth**. See EARTH.

**Tempered or Toughened Glass**. See GLASS.

**Templars, Knights, or Poor Soldiers of the Temple of Solomon**, a military and religious order founded in 1119 by 9 French gentlemen at Jerusalem for the defence of the Holy Sepulchre and of pilgrims. Their rule was prepared in the Council of Troyes and confirmed by the pope in 1128. 9 knights were at first all noble laymen, but in 1172 secular priests were admitted as chaplains. In 1146 the red-cross banner became their distinction. They were at first bound by vows of poverty, chastity, and severe religious exercises. On the loss of the Holy Land (1291) they occupied Cyprus. Their wealth and luxury rapidly increased, and were the occasion of their final overthrow. This was accomplished by the conjoint efforts of Philip IV. of Fr. and Pope Clement V. They were accused of abominable and unheard-of crimes. Their dissolution was proclaimed in 1312 by the Council of Vienne. Their grand master, De Molay, was burned alive in 1314. In Port the order never was suppressed, but in 1317 took the name of the Order of Christ, which name it still bears; but the vows of poverty and chastity have been long since relinquished, so that it is now a strictly military order.

**Temple, Tex.** See APPENDIX.

**Temple** (FREDERICK), D. D., b. in Eng. Nov. 30, 1821, ed. in the gram. school at Tiverton; obtained a scholarship at Balliol Coll., Ox., where he grad. with the highest honors 1842; became fellow and mathematical tutor there; took orders in the Ch. of Eng. 1846; was prin. of the training coll. at Kneller Hall, near Twickenham, 1848-55; one of the govt. inspectors of schools 1855-58, and master of Rugby School from 1858 to 1869, when he was appointed bp. of Exeter; is a chaplain to the queen; was one of the authors of *Essays and Reviews* (1860). Bampton lecturer, 1884.

**Temple** (HENRY JOHN). See PALMERSTON, VISCOUNT.

**Temple** (SIR WILLIAM), BART., b. in Lond., Eng., in 1628, ed. at Emmanuel Coll., Cambridge; was a member of the Irish convention 1660; a joint com. of the Irish Parl. to Charles II. 1662; was sent on a secret mission to the bp. of Münster 1665; was made a baronet and minister resident at the court of Brussels 1666; visited Hol. to urge the formation of a league against Louis XIV. 1667; negotiated the triple alliance between Eng., Hol., and Swe. Jan. 1688; assisted in perfecting the Peace of Aix-la-Chapelle, and was commissioned ambassador to the Hague 1668; was again appointed to negotiate a peace with the States-General 1674; assisted at the Cong. of Nymwegen 1675-79; devised

for Charles II. the plan of his new privy council of 30 members Apr. 1679; lived in retirement during his later yrs. Wrote *Observations Upon the United Provs.*, *The Origin and Nature of Govt.*, *Essay upon Anc. and Modern Learning*, etc. D. Jan. 27, 1699.

**Tenasserim**, a division of the Brit. prov. of Burmah, forming part of the Brit. empire in India, contains an area of 46,730 sq. m., with 825,741 inhabs., and is that tract of country lying between 10° to 17° N. lat., along the E. side of the Bay of Bengal. It includes the Mergul Archipelago. The surface of the country is mountainous, thinly populated, and much intersected by streams. The great boundary range is 5000 ft. high. The whole range is covered with pathless jungle, and may be said to be without a human habitation. The coast is very irregular and low for some miles inland, consisting of uncultivated mangrove islands. The prin. river is the Tenasserim. The soil is clayey, mixed with a good deal of sand. Rice is the staple product; the cultivation of sesamum and fruit trees is very productive. Coal has been discovered, and ores of excellent tin, copper, magnesia, and iron are opened in abundance.

**Tench** [Fr. *tanche*], the Eng. name of the *Tinea vulgaris*, a fish belonging to the family Cyprinidae, abundant in European streams and lakes, and the only member of its genus. It has a compressed, fusiform shape, the trunk covered with small scales, the lateral line little decurved, the head conic in profile, the mouth small, and with a small barbel at each corner, the dorsal above the pectorals, and short, the anal also short, and the caudal little emarginated; the color is generally dark greenish-olive above and on the sides, lighter below; the fins dark-brownish.

**Tenebrio** [Lat. *tenebræ*, "darkness"], a coleopterous insect allied to the *Blaps*, of a dark-brown color, smooth, about half an inch long, with wings and wing-covers, short antennæ and stout legs; is common in granaries, mills, and other places where meal or flour is kept, and is most active during night. Its larva is the meal-worm.

**Tenerife**, ten-er-iff', the largest of the Canary Islands (see CANARIES), comprises an area of about 900 sq. m., with about 90,000 inhabs. The coasts are rocky and wild, and afford only one good harbor, that of Santa Cruz de Santiago. The interior is mountainous, and in the centre the ground rises in the mighty volcano of Pico de Teide to a height of 12,182 ft. Prin. town, Santa Cruz de Santiago.

**Teniers**, ten-er-iz; Fr. *tâ-ne-air'* (D'AMP), called THE ELDER, b. at Antwerp in 1582; studied painting, visited Rome, settled in his native city, and d. there in 1640. He painted genre pieces, mostly scenes of the every-day life of the lower classes of the Flemish pop., and acquired a great reputation, but was outshone by his son, DAVID TENIERS, called THE YOUNGER, who was b. at Antwerp in 1610; ed. partly in his father's studio, partly in that of Rubens, and appointed court-painter to the archduke Leopold William of Aus., gov. of the Flemish provs., and afterward supt. and director of his picture-gallery. He painted both biblical and historical subjects and landscapes, but his masterpieces are genre pictures. D. Feb. 11, 1685.

**Tennant** (SMITHSON), M. D., F. R. S., b. at Selby, Yorkshire, Eng., Nov. 30, 1761, studied med. at Edinburgh 1781-82; was a resident member of Christ's Coll., Cambridge, 1782-86, and of Emanuel Coll. 1786-89; elected prof. of chem. at Cambridge 1813. D. Feb. 22, 1815.

**Tennant** (WILLIAM), LL.D., b. at Easter Anstruther, Fifeshire, Scot., May 15, 1784, studied at the Univ. of St. Andrew's 1799-1801; pub. *The Anster Concert* (1811), a poem in the Scot. dialect, and *Anster Fair, a Poem in Six Cantos* (1812), in *ottava rima*, both descriptive of rural Scot. life, which gradually acquired popularity; was parish school-master of Dunins 1812-16, and at Lasswade 1816-19; acquired the Arabic, Syriac, and Per. langs.; taught Oriental and classical langs. in the acad. of Dollar, Clackmannanshire, 1819-34; became in 1834 prof. of Oriental langs. in St. Mary's Coll., St. Andrew's, and subsequently was also prof. of Heb. in Edinburgh Coll. D. Feb. 15, 1848.

**Tennent** (SIR JAMES EMERSON), BART., LL.D., b. in Belfast, Ire., Apr. 7, 1794, son of William Emerson, a wealthy merchant, was ed. at Trinity Coll., Dublin; became an enthusiast for Gr. independence; pub. *A Picture of Gr. in 1825*, *Letters from the Ægean or Gr. Islands*, and a *Hist. of Modern Gr.*; married (June 1831) the only daughter and heiress of William Tennent, a wealthy banker of Belfast, whose name and arms he assumed by royal license in the following yr.; was chosen for Belfast as a Whig to the first Reformed Parl. 1832; withdrew from the Whigs in what was called the "Derby dilly"; was subsequently an efficient supporter of Sir Robert Peel; was sec. to the Indian board 1841-45; pub. a work on *Belgium* and a *Treatise on Copyright of Designs for Printed Fabrics*; procured the passage of an act establishing copyright in designs 1843; was knighted and appointed civil sec. to the colonial govt. of Ceylon July 1845; filled that post until Dec. 1850; was chosen to Parl. for Lisburn 1851; was sec. to the poor law board under the Conservative administration of 1852; was subsequently (1852-67) one of the joint secs. to the board of trade, and retired from office with a baronetcy Feb. 5, 1867. Wrote *Christianity in Ceylon, Ceylon, an Account of the Island, Physical, Historical, and Topographical*, etc. D. Mar. 6, 1869.

**Tennent** (WILLIAM), D. D., brother of Gilbert, b. in co. Antrim, Ire., Jan. 3, 1705, came to Amer. with his family 1718; studied theol. under his brother at N. B.; had a remarkable catalepsy or trance which continued 8 days, during which he had every appearance of being dead, and so completely lost all memory of his past life that he had to be taught to read anew; recovered his memory by a sudden shock in the head, and related extraordinary visions of heaven as seen during the state of trance, and of being sent back to earth by a heavenly messenger; was ordained pastor of the Presb. ch. at Freehold, N. J., Oct. 25, 1733, as successor to his brother John, and filled that post 44 yrs. until his death, Mar. 8, 1777.



**Tennessee**, one of the central States of the Union, lying between 35° and 36° 30' N. lat. and 81° 37' and 90° 28' W. lon.; bounded on the N. by Ky. and Va., on the S. E. by N. C., on the S. by Ala., and Miss., and on the W. by Ark. and Mo.; greatest length from E. to W., 432 m.; extreme width, 109 m.; the State is rhomboidal in shape. Area, 42,050 sq. m. or 26,912,000 acres.



**Face of the Country and Topography.**—The State comprises 8 great natural divisions: (1) The mt.-ridges of the Appalachian chain, called the Unaka Mts., forming the E. border of the State; average elevation, 5000 ft. above the sea; area, about 2000 sq. m.; the region is of little agricultural value. (2) Adjoining this on the W., and lying between the Unakas and the Cumberland Table-land, is the valley of E. T.; arable and fertile. (3) Next comes the Cumberland Table-land, a rocky plateau 2000 ft. above the sea; area, 5100 sq. m. (4) From the W. edge of this Cumberland Table-land, the Highlands, Rim-lands, or Terrace-lands extend to the Tenn. River. This is a region of great agricultural importance; area, 9300 sq. m. (5) In the centre of these Highlands lies the great Central Basin, elliptical and resembling the bed of a drained lake. Its soil is fertile and highly productive. (6) Beyond the W. edge of the Highlands, and penetrated by outlying spurs from them, is the narrow W. valley of the lower Tenn. and its smaller affluents. Its area is 1200 sq. m. It is fertile, but in some places marshy, with cypress swamps. (7) The plateau or slope of W. T., a broad, rolling plain, about 84 m. wide, and sloping toward the Miss. River. The soil is light, porous, silicious, and for the most part abundantly fertile. The area is about 8850 sq. m. (8) The bottoms of the Miss., forming a flat alluvial plain, with frequent lakes and morasses, often overflowed. The soil is of exuberant fertility, and the vegetation tropical in its rank luxuriance. Its area is about 900 sq. m.

For civil purposes the State is divided into E. T., extending from the E. boundary to the middle of the Cumberland Table-land; Middle T., from the dividing-line on the Cumberland Table-land to the lower Tenn. River; and W. T., from the Tenn. River to the Miss. Though there are hills and bluffs in Middle T., yet E. T. is the only portion of the State which can be called mountainous. The highest portions of the mts., usually destitute of trees, and hence called "Balds," have usually a thin soil, but furnish excellent pasturage.

**Rivers.**—The Miss. washes its W. border, and often overflows its alluvial lands; and its affluents within the State are large streams. Loosahatchie and Wolf rivers are smaller streams, discharging into the Miss.: but the prin. rivers are the Tenn. and the Cumberland, which, together with their affluents, drain more than ¾ of the State. Reelfoot Lake is rather an expansion of a stream in the bottom-lands than a lake. There are several islands in the Miss. opposite the State, and several in Tenn. River.

**Mineralogy.**—The coal-measures are coextensive with the Cumberland Table-land, of which they form the superficial covering, varying in thickness from 600 to 2000 ft. They form an irregular quadrilateral, 71 m. wide at the N. end and 50 at the S., and have an area of 5100 sq. m., covering portions of 21 cos. This coal-field is a part of the great Appalachian coal-field extending from W. Pa. and O. to Central Ala. The veins of coal are of varying thickness—in some places from 4 to 9 ft., in others from 1 to 4 ft. There are in the S. part of the coal-field at least 21 distinct strata or layers of coal, but not a third of them capable of profitable working. The coal is bituminous, but generally contains very little sulphur, and is admirably adapted for smelting and other purposes. The supply is ample, not only for the furnaces and manufactories of that region, but for the steam-boats, locomotives, and family use of that and the adjacent States for ages to come. Next in value to coal are the iron deposits. There are 4 distinct iron dists. in T.—viz. (1) The E. iron belt, along the base and in front of the Unaka Mts., the ore being mainly limonite, or, as it is frequently called, brown hematite. (2) The dyestone belt, skirting the E. base of the Cumberland Table-land, and extending into the E. T. Valley and along Waldron's Ridge. The ore belongs to the hematites. (3) The Cumberland Table-land belt, in which the ores are argillaceous, occur in nodules and layers, and yield but about 30 per cent. (4) The W. iron belt, extending through the Rim-lands or Highlands on both sides of the central basin. The ore here is limonite, and occurs in immense masses in banks. Copper ores are found in great quantities in Polk co. Gold is found in the State, but not in paying quantities. There is lead also at several points. Zinc is also found in Union co., and mines have been worked there. The zinc ores are smithsonite and calamine, and both are very rich. The other prin. minerals are black oxide of manganese, iron pyrites, sulphate of iron, barytes, gypsum, salt, nitrate of potassa, petroleum, lignite (in W. T.), alum, sulphate of soda, sulphate of copper, a great variety of mineral waters. There are also marble, black, gray, red, and variegated, of great beauty and in immense quantities,

in E. and W. T., breccia in the Little Tenn. River, roofing-slates in E. T., millstone grit in Middle T., hydraulic rocks in E. Middle, and W. T., limestones, sandstones, and granite for building, potter's clay and fire-clay.

**Vegetation.**—T. has about 13,000,000 acres in timber or forest lands. The following are the most abundant of the forest trees of the State: white, blue, and water ash; beech, birch, buckeye, red cedar, chestnut, wild cherry, cottonwood, cypress, dogwood, white, slippery, and witch or cork elm; the balsam and black fir; the black gum and the liquidamber or sweet gum; 6 species of hickory, all very abundant; the linden or basswood; the black or yellow locust and the honey locust; 3 species of maple; the red mulberry; 12 or 15 species of oak, including the white oak in great abundance and of excellent quality, the post, chestnut, black, scarlet, and other species; the yellow and white pine; the blue, white, and yellow poplar or tulip tree; the sassafras, both as a shrub and a forest tree; the sycamore or buttonwood; the tupelo; the black walnut and white walnut, or butternut; the yellowwood; the cucumber tree; the laurel or bay; the holly, hop-hornbeam, box-elder, chinquapin, crab-apple, hackberry, a great number of species of willow, the persimmon, etc. Fruit trees and small fruits are abundant and of the best quality. Apples, pears, peaches, cherries, plums, apricots, nectarines, and in W. T. the fig, papaw, the most luscious grapes, and all the smaller fruits and berries abound. The flora is of the most varied character. The State has several valuable indigenous grasses, and all the cultivated grasses succeed well there.

**Zoology.**—In E. and Middle T. bears are seen rarely in the mt.-forests, while deer, raccoons, foxes, opossums, squirrels, and hares exist in great numbers. The serpent tribes include the rattlesnake and moccasin and a large number of harmless snakes. Lizards, horned frogs, etc. are common, and the alligator occasionally finds his way into the bayous of the Miss. The birds of prey, as well as those remarkable for plumage and song, abound.

**Climate.**—Along a line running E. and W. through the middle of the State the mean temperature of the yr. is 57° in E. T., 58° in Middle, and 59° in W. T.; along the S. boundary of the State it is 58°, 59°, and 60° in these respective localities; and along the N. border, 56°, 57°, and 58°. Annual rainfall—Knoxville (lat. 35° 56', lon. 83° 58' W., elevation 993 ft.), 59.25 inches; Memphis (lat. 35° 07', lon. 90° 07' W., elevation 299 ft.), 49.39 inches.

**Agricultural Products.**—Cotton and Indian corn are the prin. staples cultivated. Of the latter there were raised, in the last census year, 62,764,429 bushels, T. ranking ninth among the States in the amount of corn raised. Of cotton the yield was 330,621 bales, produced on 722,562 acres. Of wheat there was grown 7,331,353 bushels; oats, 4,722,190 bushels; rye, 156,419 bushels; buckwheat, 33,434 bushels; barley, 30,019 bushels. The wool clip of 1880 yielded 1,918,265 lbs. The tobacco crop of T. was 29,365,062 lbs., produced on 41,532 acres, and valued at \$1,538,757. This State ranks fifth among the tobacco-growing States.

**Farm Animals.**—The census of 1880 reported—horses, 266,119; mules and asses, 173,496; cattle, 753,674; sheep, 672,789; swine, 2,160,495.

**Manufactures.**—Though not a heavy manufacturing State, T. has diversified industries. Its iron and steel manufactures amounted to \$2,274,203 in 1880. It had 1068 cotton-loom, with 46,268 spindles, employing 1312 persons, and using 11,699 bales of cotton. Lumber, furniture, etc. are also largely manufactured. Tons of coal mined in 1880, 750,000.

**Railroads.**—There were in operation, Jan. 1882, 1974 m. of railway, costing \$114,775,774, and paying in interest and dividends \$1,621,883; total net earnings, \$2,172,728. The most important lines in length and traffic are the Louisville and Nashville, the E. Tenn. Va. and Ga., Cincinnati Southern, Mobile and O., and Nashville Chattanooga and St. Louis.

**Finances.**—The assessed value of T. property was—real estate, \$196,165,644; personal, \$16,952,036; total, \$213,117,680. Rate of State tax, 10 cents on \$100, producing \$626,529. Total raised by taxation, State and local, \$2,788,781. Amount of State debt, Dec. 1880, \$20,206,300, funded; unfunded debt (being unpaid interest), \$6,636,550; total indebtedness, State, county, and town, \$37,357,900. A new funding act has been passed (1882), by which the credit of the State is likely to be restored.

**Commerce.**—T. has no direct foreign commerce, being without ports of entry, but the interior commerce is large, both by rivers and R. R. Shipping in 1881 consisted of 92 steam vessels, measuring 14,401 tons.

**Banks, Etc.**—In Oct. 1881, T. had 25 national banks, with \$3,430,300 capital and \$2,627,495 circulation; U. S. bonds to secure circulation, \$2,988,000; deposits, \$8,648,964. There were also 26 State banks and trust cos., with \$1,748,019 capital and \$3,356,347 deposits; and 5 private bankers, with \$118,240 deposits. Insurance cos. 12, paying losses, 1881, \$785,600; premiums collected, \$562,705.

**Education.**—Number of children of school age (6-21 yrs.) in 1880 was 544,862, of whom 291,500 were enrolled in public schools, with average attendance of 205,061. Total expenditure for public schools, \$786,088, of which teachers' salaries required \$634,587. Separate colored schools are maintained, there being 4344 white schools and 1188 colored. Number of school-houses, 4045, valued at \$1,027,064. There were 1450 of school-houses, with 41,000 pupils. T. has 30 univs. and private schools, with 178 instructors and 3257 students, paying \$46,810 colls., with 178 instructors and 3257 students, paying \$46,810 colls. in 1880. The prin. of these are the Univ. of Nashville (with the State Normal Univ. at Knoxville), and Cumberland Univ. (colored), E. Tenn. Univ. at Knoxville, and Cumberland Univ. (Presb.) at Lebanon. Law, theol., and med. There are taught in the Vanderbilt and Cumberland Univs. There were pub. in T. in 1882, 160 newspapers and periodicals, 9 of which were daily.

**Churches.**—The Bap. denomination leads, with 1303 chs., 769 ministers, and 110,245 members; the M. E. South has 370



ministers, 92,085 members; M. E., 190 ministers, 28,849 members; Christian (or Disciples of Christ), 275 chs., 195 ministers, 38,850 members; Cumberland Presb., 492 chs., 280 ministers, 27,367 members; M. E. colored, 196 chs., 78 ministers, 14,921 members; Presb. South, 184 chs., 87 ministers, 12,267 members; R. Cath., 29 chs. and 30 priests; and 18 other denominations, numbering from 7000 to 40 members each.

**Population.**—In 1860, 1,109,801; 1870, 1,258,520; 1880, 1,542,359 (white 1,138,831, colored 403,517, Chl. 25, and Indians 352). **Principal Cities and Towns.** Pop. 1880.—Nashville (cap.), 23,350; Memphis, 33,592; Chattanooga, 12,892; Knoxville, 9093; Jackson, 5377; Clarksville, 3880; Murfreesborough, 3300; Columbia, 3400; Lebanon, 2296; Bristol, 1647.

COUNTIES.	*Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
Anderson	6-I	8,704	10,820	Clinton	263
Bedford	7-F	24,333	26,025	Shelbyville	1,869
Benton	6-D	8,234	9,740	Candem	200
Bledsoe	7-H	4,570	5,617	Pikeville	145
Blount	6-K	14,397	15,893	Smithville	1,595
Bradley	7-H	11,652	12,124	Cleveland	1,874
Campbell	6-I	7,445	10,005	Jacksborough	274
Cannon	6-F	10,509	11,859	Woodbury	393
Carroll	6-C	15,437	22,103	Huntingdon	646
Carter	6-K	7,309	10,012	Elizabethton	362
Cheatham	6-E	6,678	7,956	Ashland City	170
Chester	7-C			Henderson	493
Clatsborne	5-J	9,321	13,373	Tazewell	342
Clay	5-G		6,887	Celina	
Cocke	6-J	12,458	14,308	Newport	347
Coffee	7-F	19,337	19,894	Manchester	408
Crockett	6-B		14,109	Alamo	276
Cumberland	6-H	3,461	4,538	Crossville	96
Davidson	6-E	62,897	79,626	Nashville	43,350
Deaton	7-D	7,772	8,408	Decaturville	252
De Kalb	7-D	11,405	14,793	Smithville	
Dickson	6-E	9,340	12,450	Charlotte	
Dyer	6-B	13,706	15,118	Dyersburg	1,010
Fayette	7-B	26,145	31,871	Somersville	84
Fentress	5-H	4,717	5,941	Jamesstown	836
Franklin	7-F	15,470	17,000	Winchester	1,008
Gibson	6-B	25,666	32,655	Trenton	1,383
Giles	7-E	32,413	36,014	Pulaski	2,089
Grainger	6-J	12,421	12,884	Rutledge	126
Groves	6-J	27,668	24,005	Greenville	1,066
Grundy	7-G	5,250	4,589	Memont	110
Hamblen	6-J		10,187	Morristown	1,350
Hamilton	7-H	17,241	23,642	Chattanooga	12,892
Hancock	5-J	7,118	9,098	Sneadville	157
Hardenman	7-B	18,074	22,921	Bolivar	1,043
Hardin	7-B	17,708	14,793	Savannah	1,006
Hawkins	5-J	15,837	20,610	Brownsville	740
Haywood	7-B	26,094	26,057	Lexington	329
Henderson	7-C	14,217	17,430	Paris	1,767
Hickman	6-C	20,380	22,143	Crittville	287
Hickman	6-E	9,866	12,095	Erin	495
Houston	6-D		4,295	Waverly	510
Humphreys	6-D	9,326	11,379	Gainesborough	352
Jackson	5-G	12,583	12,008	Ooltewah	263
James	7-H		5,187	Dandridge	431
Jefferson	6-J		15,846	Twinsburg	278
Jinsson	5-L	5,852	7,168	Knoxville	278
Knox	6-I	28,990	39,124	Tiptonville	946
Lake	6-B	9,428	3,968	Ripley	353
Lauderdale	6-A	10,938	14,918	Lawnburg	503
Lawrence	6-E	7,611	10,383	Newburg	2,104
Lewis	7-E	1,896	2,181	Loudon	832
Lincoln	7-F	29,050	26,960	Athens	1,100
Loudon	6-I		9,148	Purdy	
McMinn	7-I	13,969	15,064	La Fayette	5,277
McNairy	7-C	12,736	17,271	Jasper	541
Macon	5-F	8,932	9,321	Lewisburg	469
Madison	7-C	32,480	30,574	Columbia	3,400
Marion	7-G	6,841	10,910	Madisonville	175
Marshall	7-E	16,207	19,259	Clarksville	3,880
Mary	7-E	36,289	29,904	Lynchburg	345
Meigs	7-H	4,511	7,117	Warburg	159
Monroe	7-I	12,589	14,283	Livingston	341
Montgomery	5-E	24,747	28,481	Linden	189
Moore	7-F		6,233	Byrdstown	
Morgan	6-H	9,969	5,156	Benton	183
Obion	6-B	15,584	22,912	Cookeville	279
Overton	5-H	11,297	12,132	Washington	126
Perry	7-D	6,925	7,174	Kingston	588
*Pickett	5-H			Springfield	
Polk	7-I		7,269	Murfreesborough	3,800
Putnam	6-G	7,369	11,501	Huntsville	116
Rhea	6-H	6,538	7,070	Dunlap	131
Roane	5-H	15,622	15,247	Sevierville	953
Robertson	6-E	16,166	18,861	Memphis	33,592
Rutherford	5-H	33,289	36,741	Carthage	327
Scott	7-G	4,054	6,021	Dover	317
Sequit	5-G	9,335	5,565	Blountville	1,447
Sevier	6-J	11,028	15,541	Gallatin	1,938
Shelby	7-A	76,378	78,430	Covington	799
Smith	6-G	15,994	17,799	Hartsville	604
Stewart	5-D	12,019	12,690	Erwin	178
Sullivan	5-K	13,136	15,321	Maynardville	217
Sumner	5-F	23,711	29,625	McMinnville	1,244
Tipton	7-F	14,884	21,033	Jamesborough	895
Trousdale	6-A		6,646	Wynnesborough	296
Unicoi	6-K		5,645	Dresden	314
Union	6-I	7,605	10,390	Sparta	
Van Buren	6-G	9,725	2,353	Franklin	1,632
Warren	5-K	12,714	14,079	Lebanon	2,296
Washington	5-G	16,317	17,181		
Wayne	7-D	10,309	11,391		
Weakley	6-B	20,755	24,538		
White	6-G	9,375	11,176		
Williamson	6-E	25,328	26,313		
Wilson	6-F	25,881	28,747		
Total		1,258,520	1,542,359		

\* Reference for location of counties. See map of Tennessee.

† Organized since census of 1880.

**History.**—When N. C. was separated from S. C., she claimed what was afterward T. as a part of her domain, and defined its boundaries as of equal width with her own and extending to the Miss. River. In 1757 Ft. Loudon was erected on Little Tenn. River. It was captured by the Indians in 1760. They were severely punished. The settlers soon entered the region of Holston River from N. C., and a few also from S. C. and Va. The growth of the settlements on the Watauga was very rapid. At the beginning of the Revolutionary war these Watauga colonists were all pat-

riots. They met in a mass convention in 1776, chose 13 men as coms., and 5 others to form a court for the settlement of all disputes. They defeated the Indians signally in June 1776, and subsequently fought bravely at King's Mountain and elsewhere. In 1784 N. C. made a provisional cession of the terr. W. of the mts. to the U. S., but repealed it the next year, and from that time to 1788 or 1789 opposed the independence of the colonists. Early in 1785 the settlers in E. T. resolved to form a State gov't. of their own. They formed a const. similar to that of N. C., submitted it to the people, and chose a gov., elected a legislature, appointed judges, organized courts, and held treaties with the Indians. They named their new State Franklin or Frankland, and held the first and only session of their legislature at Jonesborough in 1785. N. C. looked upon all these proceedings as irregular, and exercised her own legislative authority over the settlements. In 1789 N. C. ceded the "territory beyond the mountains" to the U. S., and the next yr. the Territorial gov't. of T. was organized. June 1, 1796, T. having adopted a const. and otherwise complied with the requisitions of the U. S., was admitted into the Union. The first cap. was Knoxville. The growth of the State was rapid, and in 1860 of its 1,109,801 inhabs. 14 were slaves. An ordinance of secession was passed May 6, 1861. During the war the State was the scene of many bloody battles—Island No. 10; the conflicts around and in Memphis; the severe battle of Pittsburg Landing or Shiloh; the numerous skirmishes and slight actions during Buell's retreat to Louisville, and the heavier fighting of Rosecrans's march to Nashville, whence he expelled the Confed. State gov't.; the battle of Stone River; the capture of Murfreesboro', Tullahoma, and Chattanooga; and, though the battle of Chickamauga was over the line in Ga., the subsequent battles around Chattanooga; the siege and relief of Knoxville; the actions of Cumberland Gap and Bean's Station; the battles of Columbia, Franklin, and Nashville; the retreat and pursuit of Hood, were all in this State. But the war over, the citizens of the State hastened to acknowledge their allegiance to the Union. In Apr. 1865 the State legislature ratified the 13th amendment to the const., and July 12, 1866, the 14th amendment. The same month the State was restored to the Union.

#### Governors.

State of Franklin or Frankland.	Aaron V. Brown	1845-47
	Neil S. Brown	1847-49
Territory of Tennessee.	William T. Rousdale	1849-51
	William B. Campbell	1851-53
William Blount.	Andrew Johnson	1853-57
State of Tennessee.	Isaham G. Harris	1857-62
	Andrew Johnson	1862-65
Archibald Roane	William G. Brownlow	1865-69
John Sevier	De Witt C. Senter	1869-71
	John C. Brown	1871-75
William Blount	James D. Porter	1875-79
Joseph McMinn	Albert S. Marks	1879-81
William Carroll	Alvin Hawkins	1881-83
Samuel Houston	William B. Date	1883-87
William Carroll		
Newton Cannon		
James K. Polk		
James C. Jones		

REVISED BY A. R. SPOFFORD.

**Tennessee River,** the chief affluent of the Ohio, originates in the confluence of Holston and Clinch rivers at Kingston, Tenn. It flows S. W. to Chattanooga, thence W., and again S. W. Sweeping through N. Ala., it turns northward, traverses Tenn. and Ky., and joins the Ohio at Paducah, Ky. Its drainage-area is 41,000 sq. m. Total length to the head of the Holston, nearly 1200 m.; below the confluence, 800 m. It is navigable without obstruction 280 m. to Florence, Ala., at the foot of the Muscle shoals, which are 20 miles long.

#### Tennessee University. See APPENDIX.

**Tenney (SAMUEL), M. D., b.** at Byfield, Mass., Nov. 27, 1748, grad. at Harvard 1772; studied med.; commenced practice at Exeter, N. H., 1775; entered the military service as surgeon in the Mass. line June 17, 1775; served through the war, being at Saratoga and Yorktown; was an early member of the Amer. Acad. of Arts and Sciences, to whose *Memoirs* he contributed an account of the mineral waters at Saratoga and his *Theory of Prismatic Colors*; furnished the Mass. Historical Society an account of Exeter, N. H., and of the "dark day," May 19, 1780; was a member of N. H. constitutional convention 1788; judge of probate for Rockingham co. 1793-1800; M. C. 1800-07. D. Feb. 6, 1816.

**Tenney (SANBORN), b.** at Stoddard, N. H., Jan. 13, 1827, grad. at Amherst Coll. 1853; afterward studied under Agassiz at Cambridge; was lecturer on nat. hist. in the Mass. Teachers' Inst. 1856-65; was for three yrs. from its foundation a prof. at Vassar Coll.; became in 1868 prof. at Williams Coll.; lectured on *Physical Structure and Natural Resources* before the Lowell Inst. at Boston 1873. Wrote *Geol. for Teachers, Classes, and Private Students; A Manual of Zoology, Nat. Hist. of Animals, Elements of Zoology*, etc. D. July 9, 1877.

**Tennyson (ALFRED), D. C. L., F. R. S., b.** at Somersby, Lincolnshire, Eng., in 1809, being the third of the 7 sons of Rev. George Clayton Tennyson, D. D., rector of Somersby. The 3 eldest sons, Frederick, Charles, and Alfred, who have all become known as poets, entered Trinity Coll., Cambridge, together about 1827. A small anonymous vol. of *Poems by Two Brothers* (1827) contained the earliest pub. verses of Charles and Alfred. In 1829 Alfred carried off the chancellor's medal for an Eng. poem of 250 lines on *Timbuctoo*. While still an undergraduate, Alfred pub. a small vol. of *Poems chiefly Lyrical*, which made no great sensation. It was in his third vol. of *Poems* (1832) that he first stamped himself as a genuine poet by such classical pieces as *The Lady of Shalott*, *Enone*, *The May Queen*, and *The Lotus-Eaters*. He established his permanent reputation as the first poet of the age by the new edition of his *Poems* (2 vols. 1842). The author of *Morte d'Arthur*, *Locksley Hall*, and *The Two Voices* had nearly reached the summit of his powers. *The*



CHAPTER I  
THE HISTORY OF THE  
CITY OF BOSTON



MAP OF  
**KENTUCKY**  
AND  
**TENNESSEE**

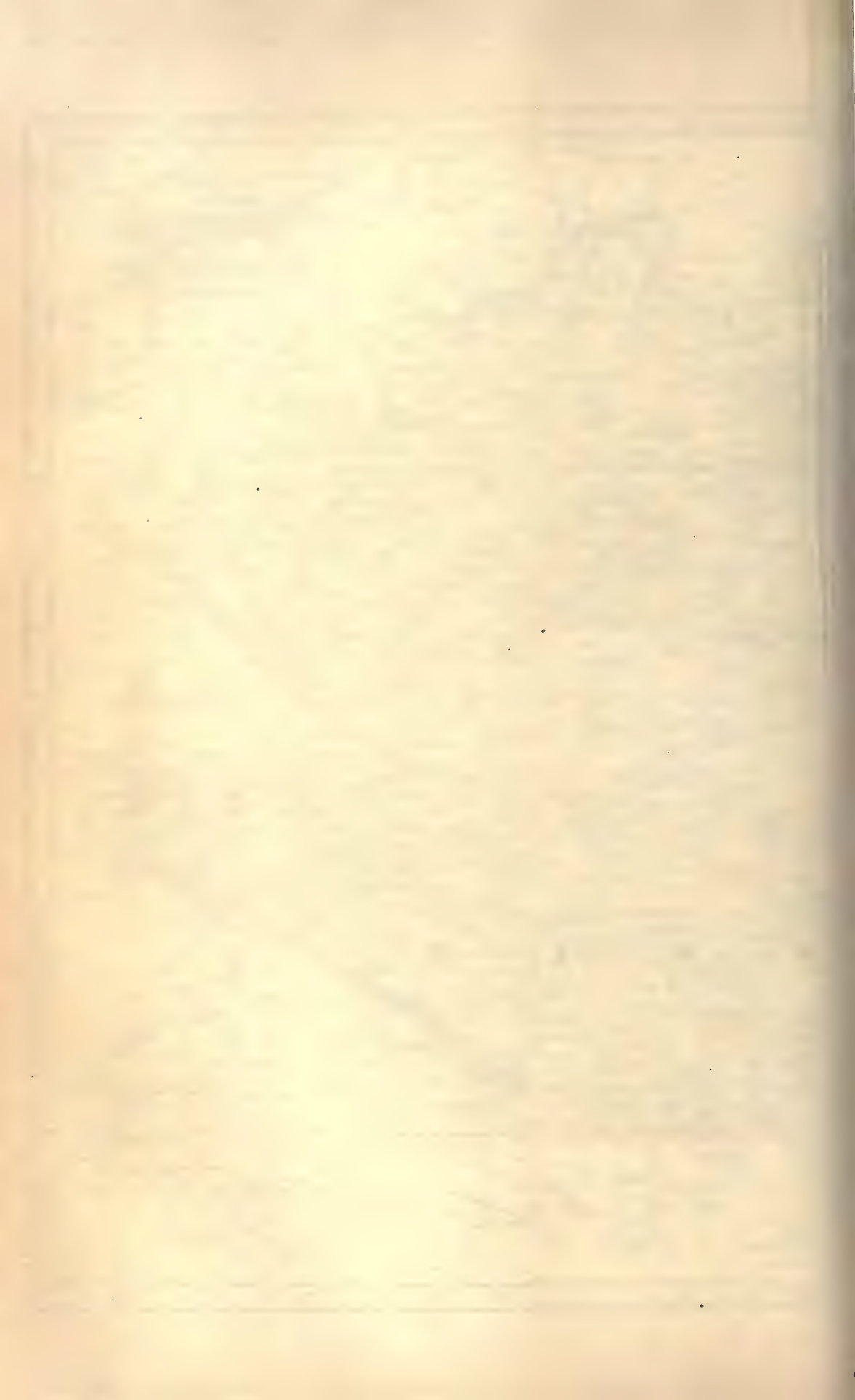
Drawn and Engraved on Copper-Plate  
EXPRESSLY  
FOR  
**JOHNSON'S CYCLOPEDIA**  
Scale of Miles  
10 20 30 40 50













*Princess, a Medley* (1847), his first long poem, was "a brilliant serio-comic *jeu d'esprit* upon the noise about woman's rights." In *Memoriam* (1850) is still to many minds the poet's masterpiece. In 1850 T. succeeded Wordsworth as poet-laureate, and produced on the day of the funeral of the duke of Wellington (Nov. 1852) his immortal *Ode*. The Crimean war exerted a depressing effect upon the poet's sensitive genius, as evidenced by his poem *Maud* (1855). After a silence of several yrs. the first series of *Idylls of the King* (1859), embracing 4 stories in blank verse drawn from the Arthurian legends, restored the poet's waning popularity, and was generally accepted as his greatest poetical effort—a verdict confirmed 10 yrs. later when the cycle was completed by the publication of *The Holy Grail, and other Poems* (1869). In the interval between the publication of the 2 parts of his *Idylls*, T. had issued *Enoch Arden, and other Poems* (1864). He has since pub. *The Window, or the Songs of the Wrens* (1870), *Queen Mary, a Drama* (1875), and in 1877 another drama, *Harold*.

**Tenterden** (CHARLES STUART AUBREY ABBOT, THIRD BARON), b. in Eng. Dec. 26, 1834, succeeded to the title Apr. 10, 1870; was for some yrs. assistant under-sec. of state, and won a high reputation for ability in international law by his services at Wash. (1871) and Geneva (1872) as counsel for G. Brit. in the Alabama claims. D. Sept. 1882.

**Tenterden, LORD.** See ABBOTT (CHARLES).  
**Tē'os**, one of the most prominent of the Ionian cities in Asia Minor, was situated in Lydia, 25 m. S. W. of Smyrna, between the promontories of Corycum and Myonesus, and N. of the island of Samos. It had 2 good harbors, and carried on a considerable trade.

**Teratology** [Gr. *τέρας*, *teratos*, "monster," and *λόγος*, "discourse"]. Under the term *teratology* is comprised all that is usually included in the several terms "malformation," "monster," "double monster," "parasitic monster," "fœtus-in-fœtu," etc., or a summary of the principal deviations from the normal type occurring in the vegetable and animal kingdoms.

**Histology.**—For many centuries the more remarkable deviations from the normal type of the human or animal body were called monsters. They not only attracted the attention of philo., but excited the wonder and superstitious awe of the illiterate. While in ancient times remarkable malformations among the lower animals were regarded as monsters portending dire calamities, human monstrosities were considered as evidences of divine anger or as the direct result of demoniacal influence. The general belief that monsters had a satanic origin gave rise to the horrid practice of destroying them, either by drowning, strangling, or casting them into the flames. It was not until the early part of the 18th century that painstaking observations of the anatomical structure of monsters were fairly instituted.

**Causes of Malformation.**—Original malformation of the germ has been reckoned among the causes of anomalous development. The germ is now considered a product of ovarian secretion upon which the male sperm acts; hence we may suppose it possible for the germ to be malformed. This view of the embryogenesis of at least some of the primitive anomalies receives force from the fact that repetition of the same kind of malformation by the same parents has been observed in a number of cases. It may be ascribed to the mother when the malformation is repeated, and to the father where his children, by different wives, are malformed in the same manner. An additional evidence of original defect in the germ is the hereditary transmission of certain deformities through several generations, examples of which in an excessive number of digits, hare-lip, hypospadias, and other structural vices, are not very infrequent.

**Diseases of the Ovary and of the Fœtus.**—Many malformations may be ascribed to diseases of the fœtus. Chronic inflammation of the brain may produce dropsy of the ventricles, and this the malformation called *acrania* (no cranium). Spontaneous amputation of the limbs *in utero* by constriction of the umbilical cord, and also some other congenital deformities, are described under this head. But the chief cause of malformation is impeded or retarded development of the fœtus from whatever cause. Retardation or arrest of development may be confined to one part or extended to others, as seen where several malformations coexist. It has been observed by embryologists that transient forms of the human fœtus, in its several stages of development, bear a striking resemblance to the persistent types of the lower orders of animals; hence the human malformations which result from arrest of development often acquire the appearance of brutes. There is a limit beyond which abnormalities never pass. In reaching her ultimate anomalies Nature observes the law of propriety. Dissimilar parts and organs are never found fused or united together, nor transpositions of viscera beyond the limits of their natural locality, as *e. g.* the brain in the abdomen, or intestinal tube in the cranial cavity. There are several facts which have been observed in relation to monsters which are so constant that they can be considered as fixed organic laws: 1. That they occur in definite number, the relation being about 1 to 3000 births; that in the greater part of malformations the sex is female; that certain species of animals are more liable to produce monsters than others; in the constancy of form in monsters, even among animals of the most diverse orders; and, lastly, the greater predisposition to monstrosity among certain animals, being greater among domestic than wild animals, 75 per cent. among mammals to 25 among birds.

**MALFORMATION OF THE OVUM.**—(1) The so-called moles are the product of disease of the ovum. The vesicular masses which have been so often regarded as hydatids are but degenerations of the chorion, consisting of its enlarged villi filled with serous fluid. Occasionally the mass contains a small fœtus which has been blighted at an early stage of development. (2) The placenta and cord may undergo various alterations, the former divided into large lobes, the

latter being abnormally long or thick, or vary in number of vessels or in persistency of the umbilical vesicle.

**MALFORMATIONS OF THE FŒTUS.**—*Cleft Malformations*, or such as result from non-closure of those parts of the body which are open in an early stage of normal development, but which at a later period should become closed, furnish an explanation of many forms of foetal anomaly.

**Non-closure of the Anterior Parts of the Body.**—*Fissure of the Thorax.*—The cavities of the chest and abdomen are open in the earlier periods of embryonic development, and close in the later months of foetal life. The sternum does not commence to ossify until the fourth or fifth month of pregnancy; the ossific centres in the broad cartilage are at first widely separated in the middle of the sternum, but subsequently fuse into one bone. This furnishes an explanation of some of the malformations of the sternum. In rare cases the breast-bone is absent, and no other defect. In still more rare instances the front walls of the chest and abdomen consist merely of the skin, the bony and fleshy parts being entirely wanting. Congenital umbilical hernia, or rupture of the navel, is the result of a less degree of fissure of the anterior walls of the belly, the parts near the navel being the last to close.

**Fissure of the Pubic Region.**—It sometimes happens that this region alone remains open.

**Fissure of the Face.**—Originally, there is a common oral and nasal cavity. The place of the nose is occupied by 2 fissures. There is at this period not the least indication of a palate. The rudimentary palate is in the form of an arc, which is gradually completed on the sides, so as at first to be open at its back part, but subsequently closed. Arrest of development at these different stages results in the production of the various forms of facial fissure. When the fissures are restricted to the upper jaw, double hare-lip, with cleft palate, results; if confined to one side, single hare-lip, with or without cleft palate; or cleft palate may occur without hare-lip.

**Fissure of the Skull (Acrania).**—This malformation has received various names—microcephalia (small head), anencephalia (no head), and hemicephalia (half head). All of these forms are the result of arrested and defective development of the skull and brain.

**Spina bifida**, split or cleft spine, is doubtless generally caused by inflammation and dropsy of the sheath of the spinal cord. It is analogous to acrania, above described. Acephalia, or headless monsters, occur under many forms and in different degrees of development.

Want and defective formation of the trunk have already been alluded to. In its extreme degrees neither body nor limbs are formed; several cases are described in which the head was the only part found. In less degrees of malformation the upper part of the body is found without the lower limbs.

Want of all of the extremities is an arrest of development at that period in which the limbs are not yet formed, and in which small tubercles occupy their places. The upper may alone be wanting. Cases have been met with in which the intermediate parts of the limbs are wanting, so that the hands are attached to the shoulder and the feet to the hips. In less degrees the limbs are merely too short, all their elements being present. Another deformity is where one or more of the limbs terminate abruptly in a stump. Where the stump presents a cicatrix, it is due to amputation *in utero*. In cases where the stump is terminated by one or more rudimentary fingers, the cause is from arrest of development.

**Cyclopia**, or one-eyed monster, arises from defective development of the middle line of the face—cleft deformity—and fusion, more or less complete, of the 2 eyeballs, in which case the nose forms a sort of proboscis, and hangs from above the compound eye.

**Compound monsters** include all cases in which more than belongs to a single being is developed. (1) *The Law of Unity of Sex.*—The individuals of a double fœtus will always be found to have the same sex, either both males or both females. It is also a fact that in the vast majority of cases they have been found to be females. (2) *The Law of Homologous Union.*—The union of the 2 fœtuses of a compound monster obeys the law of homologous union as uniformly as in the union of the 2 lateral halves of a single fœtus in normal embryogenesis. The same muscle of one fœtus unites with the same muscle of the other; bone to bone; the same nerve or blood-vessel to the corresponding parts; and so on until all the parts and organs which are situated adjacent to each other are fused, heart to heart, stomach to stomach, etc. (3) *The Law of Right and Left Symmetry.*—On examination of the structure and relative position of the internal organs of a double fœtus there will be found a transposition of the viscera of each individual in order to dispose them symmetrically in relation to the common median axis of the compound body. If the double fœtus has 2 hearts, they will be right and left, and their apices will converge toward the line of fusion of the 2 bodies.

The so-called parasitic monster is the minus proportional, the lesser or imperfectly developed half, of a double monster. When the 2 individuals of a compound monster are equal and symmetrical, they represent the plus quantity. [From orig. art. in *J.'s Univ. Cyc.*, by GEORGE J. FISHER, M. D.]  
**Ter'ebinth, Tiel Tree, or Turpentine Tree** (Heb. *elāh*), the *Pistacia terebinthus*, of the order Anacardiaceæ. It is some 30 or 40 ft. high, and grows in the Levant. It produces the valuable Chian turpentine. The T. tree is noted for its extreme longevity.

**Teredin'idæ**, a family of conchiferous mollusks, notable in connection with the so-called "ship-worms," which are its chief representatives. The several forms are common to worms, and the only feature common between the two is the elongation of the body and of the tube which they form; they have, however, the true molluscan organization. The abdominal or shell-covered portion of



the animal is comparatively very small and almost sub-globular, and the siphonal portion is in proportion extremely long and worm-like; the siphons are united for the greater part of their length, but free toward their ends, and there armed with 2 peculiar elongated shelly appendages called "styles" or "siphonal palettes"; the mantle is well developed, its lobes united except at the pedal opening, reflected behind over the valves of the shell, and developed above into lobe-like expansions, which are also reflected over the hinges of the shell, and serve to keep the valves in place; the gills are large, and extend far into the siphonal portion; the mouth is provided with palpi, the foot is subcylindrical and sucker-like, with a foliaceous margin, moderately protractile, and well supplied with nerves, the shell is composed of 2 equal valves of peculiar form; these valves are not united at the hinge, but are only kept in place by the reflections of the mantle above referred to, and are thus susceptible of much independent interaction; the valves are, in the typical forms, severally divisible into 8 regions, indicated by a decided anterior notch as well as groove, and by a posterior furrow or groove crossing the shell in a curved line from behind the umbonal region; these limit (1) the anterior projecting cockle-like part, (2) the median deep part, and (3) the posterior true shell-like part. The animal forms a long trachea in which it conceals itself. The family has quite a number of representatives, most of which bore in wood, but a few live in the bottom of the water, and the tubes they form in that case serve to protect them from the inflow of mud into their burrows. Representatives of the family are widely diffused, and some, more or less, are found in the seas of almost every country. Great ravages have been committed by species of the genus *Teredo*.

I. *The Mechanism of the Apparatus by means of which the Teredo navalis perforates its galleries.*—The excavations of the animal are effected by the continuous action of the valves, whose hard anterior surfaces act by attrition in the manner of a file, and gradually rasp away the wood attacked. The foot is a delicate organ of touch, and serves to guide the animal.

II. *The Mode of Life of the Teredo.*—The sexes are divided, and in unequal number, there being about 20 males to 1 female. The female is oviparous, and expels the eggs through the branchial siphon in the months of June and July in Middle Europe. The young attach themselves to wood, and soon (within even 2 weeks) perforate into it, the openings being naturally small and the holes increasing with the size of the animal. The wood is bored in different directions, but the several individuals skillfully avoid intrusion into the burrows of their neighbors, although frequently leaving very narrow partitions. Thus, the wood is often honey-combed, and, yielding to very slight force, is readily demolished. The fine particles of wood ground away are conveyed through the shorter siphon into the open water. The animal flourishes in a clear pure water. Its most formidable enemy is a kind of worm, the *Lycoris fucata*, which penetrates into its burrows and devours it.

III. *Circumstances which favor the Ravages of the Teredo.*—It has been found that the ravages of the animal have suddenly increased in certain yrs., and it has been ascertained by elaborate investigations that this increase was co-ordinated with 3 concurrent circumstances—viz. (1) the fall of a diminished amount of rain; (2) the consequent diminution of the inland bodies of water; and (3) the resulting increase of the saltiness of the sea. In other words, the saltier the sea is within certain limits, the better flourishes the *Teredo*.

THEODORE GILL.

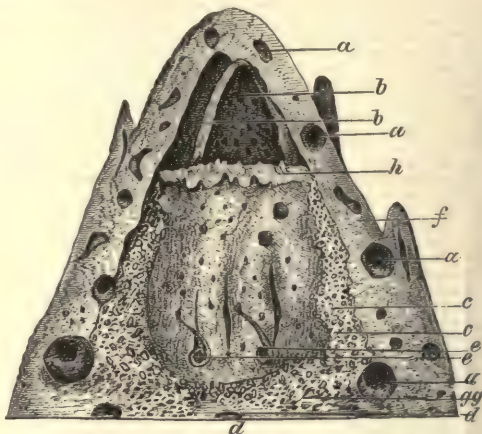
#### **Teredo.** See TEREDINIDÆ.

**Terence** (PUBLIUS TERENCE AFER), b. at Carthage 185 B. C., became slave of a Roman senator, Publius Terentius Lucanus. On account of the talents he early evinced he received a careful education, was manumitted, and lived, after the performance of his first comedy, *Andria*, in 166 B. C., in intimate intercourse with some of the best men in Rome, such as the younger Scipio, Lælius, and others. In 160 B. C. he went to Gr. He died probably 159 B. C., after returning from Gr. Six of his comedies have come down to us—namely, *Andria*, *Hecyra*, *Heauton-timoroumenos*, *Eunuchus*, *Phormio*, and *Adelphi*. They all are *fabule palliate*—that is, they represent Gr. characters, Gr. customs, and Gr. life; and they all are borrowed, to some extent, from Gr. originals by Menander, Apollodorus, or Diphilus, two Gr. comedies being often melted down into one by the Lat. author.

**Termites**, improperly called **White Ants**, belong to the order Neuroptera, sub-order Pseudoneuroptera. Though most abundant in hot climates, this family of insects reach far beyond the tropics, extending in our hemisphere N. and S. from N. Eng. to Chili, and E. and W. from ocean to ocean. The Afr. species build great pinnacled nests, 15 ft. in perpendicular height and 60 ft. in circumference at the base. In founding a nest the T. erect first a single pinnacle several ft. high, and very small about the base, and then others near it; finally, these are all consolidated into a single dome, and the middle pinnacles, having performed their part as scaffolding, are removed. When it has reached its maximum size, the nest is a rounded dome. The outer shell (Fig. 1, *f f*) is built of hard, solid clay, which the sun bakes to a light-yellow color; within is the dwelling proper. In the centre, at or above the level of the base, lies the queen's chamber *d d*. Above and around this cell are irregular clay chambers *g g*, forming anterooms, where the royal attendants wait; or magazines stored with gums and inspissated juices of plants; other chambers are scattered among these, which are formed of bits of wood glued together by means of what appears to be vegetable gums. These cells are nurseries, and in them the eggs are placed and the young reared. Between the roof of the cells *h* and the inclosing clay wall *f f* is left the arched hollow chamber *b b*, which serves as an air-chamber, and secures the proper degree of warmth and moisture. The walls of the dome are penetrated with many galleries *a a a*, and by means of

these all parts of the dwelling intercommunicate; in some places arched bridges *e e* are sprung from the lower to the upper stories to secure quick and easy transit. There are no direct openings from the nest to the outside air; but from the interior long underground passages, sometimes 12 or 15 inches in diameter and many ft. long, open into the outer world.

Fig. 1.



In each nest there are several kinds of individuals: (1) sexual individuals, kings and queens; (2) neuters, abortive males and females, which are both workers and soldiers; (3) larvæ of males and females, workers and soldiers; and (4) nymphs of the same. The males and females when they come to maturity have wings. (Fig. 4.) The size of a perfect king or queen is about 30 times that of a worker. The king retains this size, but the queen soon begins to grow; the skin (Fig. 5, *s*) between the abdominal rings *r* extends till the abdomen measures 4 inches or more in length and about 3 in its largest circumference. The queen is the common mother of the community, and is estimated by some observers to lay 80,000 eggs a day. The workers measure from  $\frac{1}{8}$  to  $\frac{2}{3}$  of an inch in length, according to the variety. They have soft white bodies, 2 articulated antennæ, 2 man-

Fig. 2.

Fig. 4.

Fig. 5.

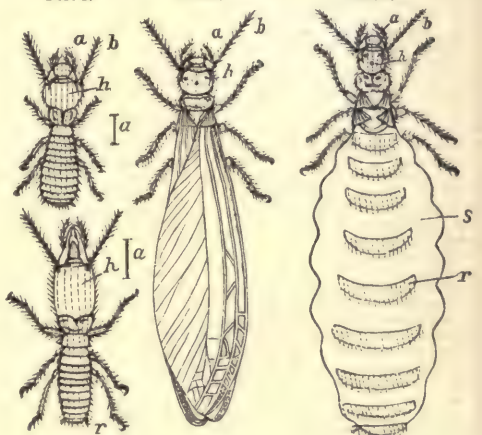


Fig. 3. Worker. Perfect insect, male and female. Fully developed Queen.  
Fig. 4. Soldier.  
*a*, real length.

dibles, and no eyes or ocelli; their business is to take the eggs when laid by the queen, carry them to the nurseries, where they are slightly glued to the walls, care for the larvæ when they hatch, and feed them, sometimes taking down the food themselves, and then regurgitating for the young. When the time comes for the metamorphosis of the nymphs, the workers assist in effecting it. Beside this, they collect the material for the nest, and build it, excavate the galleries, procure and store away the food, tend the sick, and provide for the royal wants. The soldiers (Fig. 3) form about 1 per cent. of the neuters; they resemble the workers except about the head, which is long, cylindrical, and furnished with large and strong serrated mandibles, which snip like a pair of sharp scissors; like the workers, they are totally blind. They stand posted at the entrances of the galleries in times of peace, but when the nest is attacked, one or more rush out, survey the ground, return to the nest, and soon return, accompanied by hosts of comrades. They attack everything which comes in their way, striking about in a blind fury.

The injuries wrought by these insects are terrible. They habitually avoid the air and light. In consequence of this peculiarity their ravages are unobserved till everything sinks into ruin. Though so destructive, these little insects perform an important office in hot climates. They never attack living wood, but they hasten to assist and render



harmless the rapid decomposition of vegetable matter in the tropics. [From orig. art. in *J. s. Univ. Cyc.*, by S. B. HEARSH.]

**Ternay, de** (CHARLES LOUIS D'ARSAC), b. in Fr. in 1722, commanded the squadron which captured St. John's, Newfoundland, June 2, 1762, and was in command of the fleet sent by Fr. to the assistance of the U. S. in 1780, which conveyed the army of Count Rochambeau, landing at Newport, R. I., July 10. D. Dec. 15, 1780.

**Terni, Falls of**, otherwise called the **Cascade of the Marmore**, about 5 m. from the town of Terni, It., formed by the waters of the Velino, which are brought hither by an artificial canal and dashed over an almost perpendicular precipice, the height of which is variously estimated at from 700 to 1200 ft., and the foot of which they reach by 3 unequal leaps. The canal, cut through the living rock of the Marmore Mts., was executed by the Roman censor M. Curius Dentatus in the year of Rome 481, the object being to drain the marshes near Rieti.

**Terpsichore**, one of the 9 Muses, presided over song and choral dancing.

**Terra Cotta**. See POTTERY.

**Terra del Fuego** ("the land of fire"), a group of islands between lat. 52° 40' and 56° S., at the S. extremity of S. Amer., from which it is separated by the Strait of Magellan. It consists of one large island (King Charles's South Land or E. Terra del Fuego), 21,260 sq. m. in area, and a number of small isles, of which the southernmost, Cape Horn, is the most remarkable. All the islands are high. The E. shores are much indented and well wooded; the W. are rugged, barren, and desolate. The climate is the most wretched on earth: storms of rain, hail, and snow drift in from the Atlantic, Antarctic, and Pacific oceans in everlasting succession, only broken by violent gusts of wind. Perpetual snow and ice cover the tops of the mts., and glaciers, greenish-gray, descend from the sides to the sea. The animal kingdom is represented by shellfish, sea-otters, fowls, mice, and dogs, and mankind by an ugly, savage race. T. del F. was discovered in 1520 by Magellan.

**Terra Japonica** [Lat.], an old pharmaceutical designation of catechu, which was formerly regarded as an earthy mineral.

**Terrapin** [Fr. *terrapène*], a name given to tortoises (Testudinata) of the family Emydidae. In the U. S. it is used for the *Malaclemmys* (*Malaclemmys*) *paustris*, or salt-water terrapin. This species is an inhab. of the salt-water marshes from N. Y. to Texas. It has a large head, covered with a soft naked skin; the neck is short and thick; the shell oval, moderately convex, slightly keeled, and the scales marked with concentric, generally impressed lines; the skin is gray, spotted, and otherwise marked with black. It rarely much exceeds 8 inches in length, and is generally less. It is the most esteemed for the table of any species of the family. It is shy and active in the water, swimming well, and on land running with considerable speed.

**Terre Haute**, ter'eh hōt; Fr. air hōt, city and important R. R. centre, cap. of Vigo co., Ind., on Ft. Harrison Prairie (a long, narrow area of gently rolling prairie-land in the W. portion of the State) and on Wabash River. In Vigo and adjacent coos. is found a superior quality of block coal in almost inexhaustible quantities; T. H. has many extensive manufactories. It contains the State Normal School and Rose Polytechnic Inst. Pop. 1870, 16,103; 1880, 26,042.

**Terrell**, city, on R. R., Kaufman co., Tex., 31 m. E. of Dallas. Pop. 1880, 2003.

**Terrier** [from *terra*, the "earth," since they were once employed to enter the burrows of game], a name for a large number of breeds of small dogs distinguished for vivacity and courage. Among the best known are the Eng. or black-and-tan T.; the bull-T.; a miniature bull-dog in courage, and often in shape; the fox-terrier, formerly used to unearth foxes, etc.

**Territories**, a term technically employed in the U. S., and in some Sp.-Amer. republics which have derived it from the U. S., to denote an incipient State before being endowed with the plenitude of sovereignty, and still under the direct control of Cong. T. are erected by Congressional enactment from the unsettled or sparsely settled public lands now confined to the Upper Mo. and the Pacific slope. The gov. and the administrative and judicial officers are appointed by the Pres., but a Territorial legislature is intrusted with limited powers, subject to the approval of Cong. When a T. attains a pop. sufficient to entitle it to 1 Rep. in Cong., it is usually given permission by a special act to form a State const., and is then admitted into the Union with rights equal to those of the other States.

**Terry** (ALFRED HOWE), b. at Hartford, Conn., Nov. 10, 1827, ed. at schools in New Haven and at the law school of Yale Coll.; entered upon the practice of law in 1848, and was clerk of the superior and supreme courts of Conn. from 1854 to 1860. Since 1854 he had been in command of the 2d Conn. militia, which regiment was mustered into the service of the U. S., and with T. still in command, was engaged in the first battle of Bull Run. T. organized the 7th Conn. Volunteers, of which regiment he was appointed col. Sept. 1861, and which he commanded in the expeditionary corps of Gen. T. W. Sherman at the capture of Port Royal, S. C. At the siege of Ft. Pulaski he was commended for zeal, and placed in command of that work upon its capture. Promoted to be brig.-gen. of volunteers in Apr. 1862, he served in the operations about Charleston. In the Va. campaign of 1864 he was engaged at Drury's Bluff, Bermuda Hundred, and siege of Petersburg. Upon the failure of the first attempt to capture Ft. Fisher, N. C. T. was selected in Jan. 1865 to command the new expedition, which successfully carried that work by assault Jan. 15. In the capture of Wilmington he rendered efficient aid, and in Mar. 1865 was placed in command of the 10th corps, which he held during the subsequent operations of the campaign in N. C. In June 1865 he was placed in command of the dept. of Va.; com-

manded the dept. of the South 1869-72, and the dept. of Dak. 1872. In 1876 he took the field in the active operations against the hostile Sioux Indians.

**Tertiary Strata and Tertiary Time**. See GEOLOGY. **Tertullian**, ter-tu'li-an (QUINTUS SEPTIMIUS FLORENS), father of Lat. theol. and of the Ch. lang., one of the greatest men of the early Ch., was b. probably in Carthage, flourished in the reigns of Severus and Caracalla; received a liberal secular education; was well trained in learning of the day; lived in heathenism till his conversion at age of 30 or 40; entered ministry of the Ch., and served at Carthage, and perhaps at Rome; remained a presbyter through life. In 202 followed bent of his ascetic spirit and joined puritanic sect of Montanists. They were orthodox in doctrine, but stern in spirit and discipline. He was a representative of the Afr. opposition to Rome. He d. still a Montanist, about 220.

**Testaments, Old and New**. See BIBLE.

**Tetanus** (Gr. *tetanos*), a dangerous spasmodic disease characterized by paroxysms of muscular contraction, succeeding each other with varying frequency for days or weeks. The condition popularly known as "lockjaw" is present. Such a spasm lasts several seconds, and may cause death by arrest of respiration. Death is the more common issue in acute cases, occurring in 2 or 5 days. The causes of T. are wounds, especially ragged and punctured wounds in parts richly supplied with nerves. It is probable that T. arises from unknown causes independently of injury. It has been successfully treated by chloral hydrate, opium, chloroform, cannabis indica, curara, and by timely removal or separation of the nerves which are irritated by the wound. E. D. HUDSON.

**Tetrahedron** [Gr. *τετρα-*, "four," and *ἔδρα*, "side"], a solid having 4 bounding planes, 4 angles, and 6 edges. If regular, its sides are equilateral triangles.

**Tetrapolitan Confession** [that is, the "confession of the four cities" of Constance, Strasburg, Memmingen, and Lindau], the confession of faith of the Sacramentarians, a former body of Lutherans, who held the doctrine of Carlsstadt and Zwingli with regard to the Eucharist. The confession was drawn up in 1531.

**Tetrarch** [Gr. *τετραρχος*, "governor of the fourth part"], strictly designated, in anc. times, the viceroy of the fourth part of a country. In later times it was a title bestowed upon the minor tributary princes of the East.

**Tetz-el**, or **Tezel** (JOHANN), b. at Leipzig between 1450 and 1460, studied theol. and philos. at the univ. of his native city. In 1502 he was appointed to preach an indulgence in Zwickau and its vicinity, and he made so much money for the papal treasury that henceforward he was steadily employed in the indulgence business for 15 yrs. His terr. was enlarged and his authority increased. At Innsbruck in 1512 he seduced the wife of a citizen, and was sentenced as an adulterer to be sewn in a sack and thrown into the river, but the Ch. could not spare him; he was soon again active in his business. Leo X. commissioned him to preach the indulgence through the whole of Ger. T. now appeared in his highest glory; but when from Brandenburg he approached the Saxon frontier in the middle of 1517, he was unexpectedly met by Luther's theses nailed to the ch.-door in Wittenberg Oct. 31. In the beginning he considered this event simply as a tedious and impertinent disturbance. But this illusion did not last long; and when, in 1518, Miltitz, the papal ambassador, arrived at Leipzig and suspended T., he fell sick of fright and humiliation, and d. in July 1519.

**Teucer**, according to anc. Gr. legends, was the first king of Troy, and the Trojans are sometimes called *Teucri*, after him. Homer mentions another T., son of Telamon, king of Salamis, and Hesioid of Troy. He accompanied his step-brother, Ajax, to Troy, and was the best archer among the Grs. But when the Grs. returned after the capture of Troy, Telamon would not receive T. in Salamis because he had not avenged Ajax, and he then sailed to Cyprus, where he founded the town of Salamis.

**Teutonic Forest**. See APPENDIX.

**Teutonic Knights**, a military-ecclesiastical order organized at Acre in 1190 by Frederick, duke of Swabia, and confirmed by Celestine III. in 1192. In 1220 they were offered the sovereignty of Poland; in 1241 they were expelled from Acre by the Templars; in 1243 the pope gave them Prus. They served in the crusades of St. Louis 1248-50, and hence quartered the *fleur de lys*; founded Königsberg in 1225; attacked the heathen Lithuanians in 1283; removed their head-quarters from Pal. to Venice 1291, to Marienburg 1309. In 1466 Königsberg became their cap. In 1525 their grand master, Albert of Brandenburg, became hereditary duke of Prus., and in 1527 their seat was transferred to Mergentheim in Swabia. In 1805 the emp. of Aus. became grand master of the order. In 1809 Nap. declared the order abolished, and gave its lands to various Ger. sovereigns. In 1840 the Aus. emp. recognized the T. K., and in 1865 the order was still further reorganized.

**Teutons**. (1) *The Name*.—The earliest indigenous form of the noun was *thiuda*, "the people"; the indigenous adjective derived therefrom was *thiutisc*, the later *deutsch*; but our words Teutons and Teutonic are rather the Lat. corruptions "Teutones" and "Teutonicus."

(2) *The Peoples embraced under the Name*.—The Gr. and Lat. authors seem to have used the word to designate only a certain portion of the great race then inhabiting the lands N. of the Alps and E. of the Rhine—that portion which undertook, in company with the Cimbrs, to invade the Rom. empire about 113 a. c., and whose original abode had been the terr. about the mouth of the Elbe. The Romans took the word which this tribe used, in common with all the other tribes, to designate itself, and adopted another word, the Belgic-Celtic word *Germani*, for the name of the entire race. We find, however, that some of the Latin authors used the adjective *Teutonicus* as of like meaning with *Germanicus*, and after the beginning of the 10th century the Lat. "Teu-



tonious" displaces the indigenous "Theotiscus" as the comprehensive race-adjective, while we of this modern age designate the race by the term Teuton, and that portion of the pure stock inhabiting the European continent by the term *German*. In this broadest sense we must include under the name Teuton, in first degree, the Germans of the Continent; in the second degree, the Eng., the inhabs. of Lower Scot., and the inhabs. of the U. S.; while in the ethnological composition of almost every truly European nation—that is, every nation W. of Rus. proper and Tur.—the Teutonic component enters in a greater or less degree. At the close of the 5th century, when the great movement known in European hist. as the "migration of the peoples" ended, we find the T. the ruling race from Carthage to the Vistula; the Vandals in Afr. from Carthage to Gibraltar; the Visigoths from Gibraltar to the banks of the Loire; the Suevi in the present Port.; Burgundians from the upper course of the Loire to the centre of the present Switz.; the Ostrogoths from the last-mentioned boundary to that of the present Tur. empire on the E., and from the Mediterranean Sea on the S. to the Danube on the N.; the Franks from the lower Loire to Thuringia; Saxon conquerors upon the Eng. coasts; Saxons, Frisil, Thuringians, Marcomanni, Bavarians, and Longobardi upon Ger. soil, the latter moving down (last half of the 6th century) into It., and occupying the plain of the upper Po, while the Scandinavian branch occupied the 2 N. peninsula, and reached round the entire E. and S. E. shore of the Baltic and far inland. In 1876 Privy Councillor von Löher, in a lecture before the Acad. of Science at Munich, affirmed that he had discovered in the Guanches of the Canary Islands descendants of the old Vandals, who wandered through Hispania in the 5th century, and emigrated to these islands as early as the 8th. In the far-off lands of Afr., Hispania, S. W. Gaul, and Middle and S. Italy the Teutonic element disappeared almost entirely in the amalgamation with the great mass of the Romanic pop.; while, on the other hand, the inhabs. of N. and N. E. Fr., of Belg., of N. Italy, and of Russia's Baltic provs. manifest still most strongly the ethnological characteristics of the T.

(3) *Characteristics of the Teuton.*—(a) *Physical.*—Beside the usual Caucasian peculiarities of the "oval head; the lines of eye and mouth dividing the whole face into 3 nearly equal parts; the large eyes with their axes at right angles with the line of the nose; the 90° facial angle; the full beard, covering to the ears; the white complexion, and the tall, straight, and well-proportioned stature"—which the T. possesses in common with all Europeans, he is further somewhat distinguished from these by a larger frame, a whiter and more florid complexion, a bluer eye, and a lighter shade of hair. (b) *Mental.*—The distinction between the Teutonic and the Romanic nature is even more manifest in the mental than in the physical constitution. The Greco-Roman world mediated the connection between the anc. civilization and the modern. Its geographical position and historical connections with the Oriental world preserved in the Gr. and the Rom. the inheritance of the Oriental traits, which the differences of climate and soil, geography and topography, have indeed modified, but not destroyed. The prevailing temperament of the Romanic peoples is still a mixture of the sanguine and the melancholic, the latter element predominating, while fancy and imagination, vacillation and mysticism, are among the chief traits in their intellectual, moral, and religious character. The T., with more of the phlegm and the choler in his temperament, evinces the deeper insight, the more constant purpose, and the greater *éclaircissement*.

(4) *Institutions.*—These differences of mental constitution are most clearly seen in the fundamental institutions which they have produced. We may take the Rom. Imperium and the Rom. Ch. as the great historical product of the Rom. spirit. In both of these the sum and substance of all authority is viewed imaginatively and mystically, as inherent in an office, and all law as proceeding out of it, from above down, over, and independent of the governed. On the other hand, personal individual liberty and worth were the fundamental principles of the old Teutonic life and polity. In the old assemblies of the v., the hundred, and the tribe it was the will of the freemen which was the authority of law. While in Rome the central power was the strongest, and there existed no local power worth the name save as an imperial agency, among the Teutons, again, the local power was always the strongest, and centralization always opposed, defied, and overthrown. When Marbodius the Marcomannic duke, and even the brave Arminius, to whom the Ger. tribes were indebted for the expulsion of the Rom. legions from their soil, attempted to retain in time of peace the centralized authority which they had exercised as leaders in war, the one was obliged to flee to Rome in order to save his life, while the other fell a victim to his fatal ambition. And thus we see at the very first contact of the Teutonic with the Romanic world, the irrepressible conflict between freedom and authority enkindled which has shaken Europe from that day to this. Then it was Teutonic liberty against the Rom. Imperium. In the Middle Ages, after contact and connection with the Rom. world had given the Ger. kings and emps., it was the emp. against the pope; in the transition period from the mediæval age to the new time, it was the Ger. Prot. against the R. Cath.; and to-day it is Teutonic science against the Syllabus and the Vatican. The Teutonic spirit has given to the modern civilization its freedom of thought and conscience, its estimation of the man above the institution, its science, its Protestantism, its doctrine of popular authority, its local self-government, and its national development. It can therefore be truly said to be the spirit of the modern civilization. [From orig. art. in *J.'s Univ. Cyc.*, by Prof. J. W. Burgess, LL.B.]

**Texarkana**, R. R. June, cap. of Miller co., Ark., on the boundary-line between Tex. and Arkansas. Pop. 1880, 3223 (1890 in Ark. and 1893 in Tex.).

**Texas**, a S. W. State of the American Union, lying be-



tween 25° 51' and 36° 30' N. lat., and 93° 27' and 106° 43' W. lon.; bounded on the N. by Ind. Terr., N. E. and E. by Ark. and La., S. E. by the Gulf of Mexico, S. W. by the Mex. republic, and N. W. and N. by the Terr. of New Mex.; extreme length from S. E. to N. W., somewhat more than 800 m.; greatest breadth,

about 750 m.; area, 265,780 sq. m. or 170,099,200 acres.

*Face of the Country.*—T. has every variety of surface and soil. The coast is low and sandy, and there are bars at the mouths of all the rivers. The alluvial deposit known as the "low coast belt" extends inland from 40 to 60 m.; much of it is barren and waste, and when there is vegetation it is in the form of impenetrable thickets of cactus and other thorny shrubs. Beyond this, for a breadth of 150 m. or more, lies the "prairie belt," rolling lands with a rich and fertile soil. Beyond (that is, N. and N. W. of the prairie belt) the land rises to a height of about 1000 ft., and presents a rough, broken surface, with abrupt slopes and sharp bluffs. These lands are excellent for grazing, and much of them for cultivation, but toward the N. W. and W. they continue to rise to the arid plateaus or *mesas* of the Llano Estacado, or Staked Plain, where the vegetation is scanty from the limited rainfall. Farther W. the region lying between the Rio Pecos and the Rio Grande is filled with mts., outlying spurs of the great Rocky Mt. range.

*Rivers, Bays, Etc.*—The Canadian River, an affluent of the Ark., crosses Bexar terr. in the extreme N. of the State. The Red River, which forms part of the N. boundary of the State, has its source in the Llano Estacado. The Sabine, which forms part of the E. boundary, and the Neches, both discharge their waters into Sabine Lake. Trinity River, rising in Grayson co. in the N., and the San Jacinto, a smaller stream, both discharge their waters into Galveston Bay. The Brazos, one of the largest rivers in the State, has its source in the N., near the Llano Estacado, and flows into the Gulf of Mexico about 36 m. below Galveston; the Colorado, another large river having its source in the Llano Estacado, pursues a course nearly parallel with that of the Brazos, and empties into Matagorda Bay. The Guadalupe and San Antonio rivers unite just before their entrance into San Antonio Bay. Passing the Aransas River, a little stream falling into Aransas Bay, we come to the Nueces, a larger river. The Rio Grande del Norte, a very long but shallow river, having its source in Col., divides the State from Mex., and with its prin. tributary, the Rio Pecos, and numerous small streams and creeks, drains most of W. T. The only bays not already mentioned are E. and W. Bays, forming a part of Galveston harbor; Trespalacios, Lavaca, and Espiritu Santo bays, all connected with Matagorda Bay and harbor; and Copano Bay, lying W. of Aransas Bay.

*Minerals.*—Copper is the most abundant metallic product. The copper belt extends from the Red River across to the Rio Grande through Pecos and Presidio cos., and yields in immense quantities an ore which will smelt on an average 55.44 per cent. of pure copper. Argentiferous galena, very rich in silver, is found in large quantities in N. W. T.; manganese, cobalt, nickel, and bismuth are found in such quantities as to make the deposits of commercial value. Iron occurs in the same region as copper, and in magnetic, spathic, specular, and hematite ores. Magnetic iron is found in true veins in immense quantities. The large coal-field, about 6000 sq. m. in extent, is an outlying spur of the great Mo. coal-field, and yields a bituminous coal. The smaller coal-field, in Brown, Coleman, Comanche, and Hamilton cos., is said to be anthracite or semi-anthracite of good quality. The lignites or brown coals of the Tertiary formation occupy larger tracts. In Webb co., on the Rio Grande, is a canal coal belonging to the Tertiary which is dense and fine in texture, and proves to be a fine gas-coal. Asphaltum is found in different parts of the State. Salt is extensively produced in the State in the salt lakes near the coast and in salt springs in Lampasas, Llano, and El Paso cos. Caves in Burnet and Blanco cos. yield saltpetre largely. Gypsum is a geological formation rather than a mineral. It is found throughout the Cretaceous deposits. Potter's and fire clays, marble, roofing-slate, grindstones, soapstones, feldspar, alum, antimony, arsenic, mineral oils and pigments, marls and other fertilizers, are found in great quantities.

*Vegetation.*—E. T., E. of Trinity River, is a region of abundant timber, and more than one half of its surface is still covered with forests. There are 2 species of pine here, known as the "long-straw" and "short-straw" pine, both of large size and producing excellent lumber, while the long straw yields a superior quality of turpentine. There are also in E. T. several species of oak, including the live-oak, which is found all over the State, the post-oak, and black jack; the ash, elm, black walnut, butternut, pecan, box elder, pride of China; and, toward the coast, the magnolia (here a stately tree), the cypress, palmetto, etc. In N. T. there are 2 immense belts of woodland extending from the Red River southward, called the "Lower" and "Upper



**Cross Timbers.**—They are each about 40 or 45 m. wide, and extend southward from 150 to 200 m. Central T. is mainly rolling prairie, but with plenty of timber, generally of good quality, though sometimes cottonwood, buckeye, black gum, and sweet gum in the river and creek bottoms. There are also islands of forest trees, live-oak, cypress (which grows on the hills here), post-oak, and mesquite, scattered through the prairies. The coast belt has no forest trees, but frequent "chapparals," composed mainly of cactus. This region has also in the spring and early summer rich and nutritious grasses and a profusion of brilliant flowering plants; W. and N. W. T. is scantily wooded.

**Zoology.**—There are herds of buffaloes and antelopes in the N. W. part of the State. In W. T. the mustang, the Mex. wild horse, still feeds on the prairies; the wolf, of great strength and ferocity, the black bear, the puma, the jaguar, the wild-cat, and the lynx are found in the wooded and thinly inhabited dists.; and deer, foxes, peccaries, raccoons, opossums, hares, and squirrels are very numerous, especially in the wooded dists. The principal game-birds are the wild turkey, pheasant, quail, snipe, many species of wild ducks, brant, and teal, wild geese, etc., and the birds of prey, the vultures, hawks, kites, pelicans, herons, kingfishers, flamingoes, cranes, etc. The streams abound in fish, of which the black bass is perhaps the finest of the fresh-water tribes, and the fish of the bays and Gulf are much the same as those of the other Gulf States. Alligators, turtles, etc. are abundant in the lower portion of the rivers and bayous, and more rarely the manatee, octopus, etc. are seen. There are in the mountainous and wooded dists. rattlesnakes, moccasin snakes, and the milk adder, several species of the black snake, and numerous harmless snakes. The gecko and other lizards, horned frogs, salamanders, etc. are found, and the insect tribes are both numerous and formidable, including the centipede, the large jumping spider, the horse flies, buffalo gnats, and mosquitoes.

**Climate.**—The isothermal curve indicating a mean annual temperature of 68° passes nearly along the parallel of 29° 40', or from the mouth of the Sabine to the junction of the Pecos River with the Rio Grande. S. of this line the temperature increases, till at Brownsville, near the Rio Grande, in lat. 25° 57', the annual mean is 75°; northward this mean decreases with the greater elevation, till in the Llano Estacado, about lat. 32° 55', it falls to near 55°. The prevailing winds for most of the year are S. and S. E. from the Gulf, but from Nov. to Feb. there are occasional N. winds, culminating at times in the cold wind-storms known as "northers." The rainfall ranges from 54.47 inches at Galveston to 36.90 at San Antonio, 30 inches in the Pecos Valley, and 12 to 16 in the Llano Estacado.

**Agricultural Productions.**—The leading staples are cotton, corn, and grass, T. being the most extensive cattle-raising State in the Union. The cereal crops were, by the census of 1880, Indian corn, 29,065,172 bushels; wheat, 2,567,737 bushels; oats, 4,893,359 bushels; barley, 72,786 bushels; rye, 25,399 bushels. The cotton crop was 805,284 bales, produced on 2,178,435 acres, T. being the third cotton State in rank in the Union. In tobacco there were only 685 acres, producing 281,283 lbs. Of rice only 62,132 lbs. were grown, and of sugar 4951 hogheads; molasses, 810,605 gallons. The wool clip of 1880 was 6,928,019 lbs.

**Farm Animals.**—By the census of 1880 T. had 805,606 horses, 182,447 mules and asses, 4,084,605 cattle, 2,411,633 sheep, and 1,950,371 swine.

**Manufactures.**—T. has as yet but a moderate number of manufacturing establishments, importing most fabrics. There were, in 1880, 71 cotton-looms, with 2648 spindles, employing 71 persons, and using 246 bales of cotton.

**Railroads.**—There were in operation, Jan. 1882, 5344 m. of railway, costing \$142,654,627, with net earnings of \$4,577,739, paying \$3,898,235 interest on bonds. Several are important trunk lines; the prin. are T. and Pacific, Mo. Kan. and T., Galveston, Harrisburg and San Antonio, Int. and Great Northern, Houston and T. Central, and Gulf, Col. and Santa Fé.

**Finances.**—Amount of taxable property assessed, real and personal, \$303,202,424; rate of State tax, 5 mills on the dollar, with poll-tax of \$2 on all males between 21 and 60. Amount raised by State taxation, 1881, \$1,396,170; total taxation, State, co., and town, 1880, \$4,568,716. State debt, Sept. 1881, \$4,491,100; aggregate indebtedness, State and local, \$11,604,913.

**Commerce.**—T. has 5 ports of entry, from which large amounts of cotton, live stock, etc. are exported. Total domestic exports of the State, 1881, \$28,947,718; imports, \$5,614,697. The shipping in 1881 included 230 sailing vessels and 132 steam vessels, 12,739 tons. The domestic commerce by R. R. is very heavy, but no general statistics exist.

**Banks, Etc.**—In Oct. 1881 T. had 13 national banks, with \$1,475,000 capital and \$905,439 circulation; U. S. bonds to secure circulation, \$1,030,000; deposits, \$4,018,597. There were also 13 State banks and trust cos., with \$1,457,013 capital and \$1,777,789 deposits; and 107 private bankers, with \$2,560,951 capital and \$7,033,240 deposits. The insurance cos. (chiefly foreign) did a large business, paying losses in 1881 to the amount of \$1,140,100.

**Education, Etc.**—The number of children of school age (8-14 yrs.) was 230,527, of whom 186,786 were enrolled in public schools. Total expended for public education, 1880, \$782,735, of which salaries of teachers required \$715,908. There were 3623 white schools and 905 colored schools. T. has provided liberally for its school fund, devoting thereto one half the entire public domain of the State, amounting to over 44,000,000 acres reserved for this purpose, being a terr. larger than most States of the U. Half the poll-tax of \$2 annually and 1/4 of the other taxes are expended for school purposes. There are 9 colls. and univs., with 67 instructors and 1482 students, paying in 1880 \$90,630 tuition fees. The State agricultural coll. is established at Bryan; Galveston and Austin have med. colls. In 1882 there were pub. 271 newspapers and periodicals, 32 of them daily.

**Churches.**—The M. E. South leads, with 414 ministers and 82,939 members; M. E., 172 chs., 191 ministers, 17,701 members; Bap., 1460 chs., 754 ministers, 76,857 members; Christian (Disciples), 165 chs., 138 ministers, 16,000 members; Cumberland Presb., 378 chs., 210 ministers, 13,387 members; Presb. South, 154 chs., 80 ministers, 5300 members; M. E. colored, 87 chs., 56 ministers, 7372 members; R. Cath., 104 chs. and 117 priests; and 12 other denominations, numbering from 5000 to 60 members each.

**Population.**—In 1870, 818,579; 1880, 1,591,749 (white 1,197,287, colored 394,512, including 136 Chl. and 692 Indians).

**Principal Cities and Towns, Pop. 1880.**—Galveston, 22,248; San Antonio, 20,550; Houston, 16,513; Austin (cap.), 11,013; Dallas, 10,358; Waco, 7205; Fort Worth, 6668; Sherman, 6068; Marshall, 5624; Brownsville, 4988; Brenham, 4101; Paris, 3880; Denison City, 3975; Laredo, 3521; Corsicana, 3373; Jefferson, 3260; Corpus Christi, 3257; Palestine, 2997; Tyler, 2423; Calvert, 2280; Weatherford, 2046; Bryan, —.

COUNTIES.	Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
Anderson.....	3-J	9,229	17,395	Palestine.....	2,997
* Andrews.....	3-I	.....	.....	.....	.....
Angelina.....	4-J	3,985	5,529	Homerville.....	244
Araucaria.....	7-I	.....	596	Rockport.....	.....
Archer.....	2-G	.....	596	Archer.....	.....
* Armstrong.....	3-E	.....	31	.....	.....
Atascosa.....	6-G	2,915	4,917	Pleasanton.....	393
Austin.....	5-I	15,087	14,429	Bellville.....	280
* Bailey.....	1-D	.....	.....	.....	.....
Banda.....	5-G	649	2,128	Banda.....	.....
Bastrop.....	5-H	12,290	17,215	Bastrop.....	1,546
Baylor.....	2-G	.....	715	Seymour.....	183
Bea.....	6-I	1,082	2,298	Bea.....	.....
Bell.....	4-H	9,751	20,418	Belleville.....	1,297
Bexar.....	5-G	16,043	30,470	San Antonio.....	20,550
Bexar Dist.....	5-G	1,077	.....	.....	.....
Blanco.....	5-G	1,187	3,583	Blanco.....	345
Brewster.....	2-E	.....	35	.....	.....
Brewster.....	3-I	4,381	11,217	Meriden.....	995
Bowie.....	2-K	4,654	10,965	Bowie.....	257
Brazoria.....	6-J	7,527	8,754	Brazoria.....	676
Brazos.....	4-I	9,205	13,576	Bryan.....	.....
* Briscoe.....	1-E	.....	.....	.....	.....
Brown.....	3-G	744	8,414	Brownwood.....	725
Burleson.....	4-I	8,072	9,243	Caldwell.....	291
Burnet.....	4-H	3,688	6,855	Burnet.....	490
Caldwell.....	5-H	6,572	11,757	Lockhart.....	718
Callahan.....	4-I	5,443	1,538	Callahan.....	921
Callahan.....	2-G	.....	3,453	Little Plain.....	47
Cameron.....	8-H	10,999	14,959	Brownsville.....	4,988
Camp.....	2-J	.....	5,831	Pittsburg.....	745
* Carson.....	3-D	.....	.....	.....	.....
Casa.....	2-K	8,565	16,724	Llano.....	.....
* Castro.....	1-D	.....	.....	.....	.....
Chambers.....	5-K	1,503	2,187	Wallisville.....	tp. 383
Cherokee.....	3-J	11,079	16,723	Rusk.....	626
* Childress.....	1-F	.....	.....	.....	.....
Clay.....	5-H	.....	5,045	Hearne.....	.....
* Cockran.....	2-H	.....	.....	.....	.....
Coleman.....	3-G	347	3,693	Coleman.....	.....
Collin.....	2-I	14,013	25,358	McKinney.....	1,479
Collingsworth.....	5-E	.....	.....	.....	.....
Colorado.....	5-I	8,296	16,672	Colorado.....	1,859
Comal.....	5-H	5,283	5,546	New Braunfels.....	1,908
Comanche.....	3-F	1,001	8,608	Comanche.....	704
Concho.....	3-G	.....	900	Pant Rock.....	2,667
Cooke.....	5-H	5,315	20,391	Saintsville.....	434
Correll.....	3-H	4,124	10,924	Gatesville.....	.....
* Cottle.....	1-F	.....	24	.....	.....
Crockett.....	5-F	.....	127	.....	.....
* Crosby.....	2-E	.....	82	.....	.....
Dallam.....	7-D	.....	.....	.....	.....
Dallas.....	1-I	13,214	31,488	Dallas.....	10,358
* Dawson.....	2-E	.....	24	.....	.....
* Deaf Smith.....	2-J	.....	38	.....	.....
Delta.....	3-D	.....	5,927	Cooper.....	894
Denton.....	2-H	7,251	15,143	Denton.....	1,194
De Witt.....	6-H	6,443	10,982	Clinton.....	190
* Dickens.....	2-F	.....	28	.....	.....
Dimmit.....	6-E	109	645	Carrizozo Springs.....	.....
* Donley.....	3-F	.....	160	.....	.....
Duval.....	7-H	1,083	5,132	San Diego.....	1,579
Eastland.....	2-G	88	4,855	Eastland.....	539
Edwards.....	5-F	.....	266	.....	.....
Ellis.....	3-I	7,514	21,294	Waxahatche.....	1,354
El Paso.....	3-B	3,671	3,943	El Paso.....	708
Erath.....	7-G	927	1,902	.....	.....
Encinal.....	3-H	1,501	11,796	Stephenville.....	125
Falls.....	3-I	9,951	16,240	Marlin.....	.....
Fannin.....	2-I	13,267	25,501	Bonham.....	1,789
Fayette.....	5-I	16,963	27,996	.....	.....
* Fisher.....	2-F	.....	136	.....	.....
* Floyd.....	1-E	.....	3	.....	.....
Fort Bend.....	5-J	7,114	9,380	Richmond.....	1,156
Franklin.....	2-J	5,280	5,280	Mt. Vernon.....	311
Freestone.....	3-I	8,128	14,921	Eastfield.....	359
Frio.....	6-G	309	2,130	Frio.....	334
* Gaines.....	2-D	.....	.....	.....	.....
Galveston.....	6-J	15,290	24,121	Galveston.....	22,248
* Garza.....	2-E	.....	35	.....	.....
Gillespie.....	5-G	3,466	5,229	Fredericksburg.....	1,085
Goliad.....	6-I	3,629	5,832	Goliad.....	808
Gonzales.....	5-H	8,951	14,340	Gonzales.....	1,581
* Gray.....	8-E	.....	56	.....	.....
Gregg.....	2-I	14,297	38,108	Sherman.....	6,063
Grimes.....	3-J	8,530	15,903	Longview.....	1,895
Guadalupe.....	4-I	13,218	14,603	Anderson.....	412
* Hale.....	5-H	7,282	12,292	Saginaw.....	1,363
* Hamilton.....	1-F	.....	36	.....	.....
* Harbison.....	2-H	733	6,465	Hamilton.....	277
* Hardeman.....	7-E	.....	18	.....	.....
Hardin.....	1-F	.....	.....	.....	.....
Harris.....	5-K	1,460	1,870	Pecos.....	.....
Harrison.....	3-J	17,373	27,385	Houston.....	16,513
* Hartley.....	2-K	15,241	25,177	Marshall.....	5,624
Haskell.....	2-F	.....	100	.....	.....
Hays.....	5-H	4,088	48	.....	.....
* Hemphill.....	7-E	.....	149	.....	.....
Hemphill.....	3-J	6,786	9,735	Atkins.....	366
Hidalgo.....	8-H	2,387	4,347	Hidalgo.....	259
Hill.....	3-H	7,453	16,554	Hillsborough.....	.....
* Hockley.....	2-D	.....	6,125	Granbury.....	524
Hood.....	3-H	9,585	15,461	Sulphur Springs.....	1,454
Hopkins.....	3-J	12,451	.....	.....	.....

\* The counties marked thus were formed from parts of Bexar and Young terms.  
 † Reference for location of counties. See map of Texas.



COUNTIES.	†Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
Houston.....	3-J	8,147	16,702	Crockett.....	599
*Howard.....	3-E	50	50	Big Spring.....	223
Hunt.....	2-I	10,291	17,930	Greenville.....	77
Hutchinson.....	7-E	.....	50	.....	.....
Jack.....	2-F	694	6,626	Jacksborough.....	387
Jackson.....	6-I	2,278	2,723	Texas.....	152
Jasper.....	4-K	4,218	5,778	Jasper.....	377
*Jefferson.....	5-K	1,906	3,489	Beaumont.....	1,855
Johnson.....	4-H	4,923	17,911	Cleburne.....	.....
Jones.....	2-F	.....	546	Phantom Hill.....	.....
Karnes.....	6-H	1,705	3,270	Helena.....	.....
Kaufman.....	2-I	6,065	15,443	Kaufman.....	490
Kendall.....	5-G	5,536	2,763	Boerne.....	346
*Kent.....	2-F	.....	92	.....	.....
Kerr.....	5-G	1,042	2,168	Kerrville.....	156
Kimble.....	5-G	72	1,343	Junction City.....	.....
*King.....	2-F	.....	40	.....	.....
Kinney.....	5-F	1,904	4,487	Brackettville.....	1,126
Knox.....	2-G	.....	77	Paris.....	3,980
Lamar.....	2-J	15,790	27,193	.....	.....
*Lamb.....	1-D	.....	5,421	Lampasas.....	653
Lampasas.....	4-H	1,800	759	Cofulla.....	.....
La Salle.....	7-G	69	.....	Hallettsville.....	588
Lavaca.....	5-I	9,168	13,641	Giddings.....	624
Lee.....	4-I	.....	8,937	Centerville.....	225
Leon.....	4-I	6,533	12,617	Groesbeck.....	402
Liberty.....	5-J	4,114	4,599	.....	.....
Limestone.....	2-I	8,591	16,246	.....	.....
*Lipscomb.....	7-E	.....	69	.....	.....
Live Oak.....	6-E	852	1,994	Oakville.....	235
Llano.....	4-G	1,379	4,962	Llano.....	213
*Lubbock.....	2-E	.....	25	.....	.....
Lynn.....	5-E	.....	9	.....	.....
*McCulloch.....	3-G	173	1,533	Brady.....	115
McLennan.....	3-H	13,500	26,934	Waco.....	7,295
McMullen.....	7-G	230	701	Tilden.....	.....
Madison.....	4-J	4,061	5,393	Madisonville.....	.....
Marion.....	2-K	8,562	10,983	Jefferson.....	3,260
*Martin.....	3-E	.....	12	.....	.....
Mason.....	4-G	678	2,655	Mason.....	575
Matagorda.....	6-J	3,377	3,540	Matagorda.....	438
Maverick.....	6-F	1,851	2,967	Eagle Pass.....	1,381
Medina.....	6-F	2,078	4,495	Castroville.....	731
Menard.....	4-F	667	1,239	Menardville.....	67
*Midland.....	3-D	.....	.....	.....	.....
Milam.....	4-I	8,964	18,659	Cameron.....	441
*Mitchell.....	2-F	.....	117	Howard.....	.....
Montague.....	2-H	890	11,257	Montague.....	328
Montgomery.....	5-J	6,483	10,154	Montgomery.....	414
*Moore.....	7-D	.....	.....	.....	.....
Morris.....	2-J	.....	5,032	Dangerfield.....	395
*Motley.....	1-F	.....	24	.....	.....
Nacogdoches.....	2-J	9,614	11,590	Nacogdoches.....	333
Navarro.....	3-I	8,879	21,702	Corsicana.....	3,373
Newton.....	4-K	2,187	4,359	Newton.....	68
* Nolan.....	3-F	.....	640	Swet Water.....	.....
Nueces.....	7-H	3,975	7,674	Cooper Christi.....	3,257
*Ochiltree.....	7-E	.....	.....	.....	.....
*Oldham.....	8-D	.....	287	Tasoca.....	.....
Orange.....	5-K	1,255	298	Orange.....	.....
Palo Pinto.....	2-G	.....	5,885	Palo Pinto.....	352
*Panola.....	3-K	10,119	12,219	Carthage.....	290
Parker.....	2-J	4,186	15,870	Weatherford.....	2,680
*Parmer.....	1-D	.....	.....	.....	.....
Pecos.....	4-D	.....	1,807	Fort Stockton.....	.....
Polk.....	4-J	8,707	7,189	Livingston.....	135
*Potter.....	8-D	.....	98	.....	.....
Presidio.....	6-D	1,636	2,873	Fort Davis.....	1,162
Rains.....	2-J	.....	3,035	Emory.....	.....
*Randall.....	8-D	.....	3	.....	.....
Red River.....	2-J	10,653	17,194	Clarksville.....	.....
*Reeves.....	.....	.....	.....	.....	.....
Refugio.....	6-I	.....	2,324	Refugio.....	465
*Roberts.....	7-E	.....	32	.....	.....
Robertson.....	4-I	9,990	22,383	Calvert.....	2,280
Rockwall.....	2-F	.....	2,984	Rockwall.....	215
Runkles.....	3-E	.....	980	Runkles.....	1,686
Rusk.....	2-J	16,939	18,985	Henderson.....	.....
Sabine.....	4-K	3,256	4,161	Memphis.....	.....
San Augustine.....	4-K	4,196	5,084	San Augustine.....	503
San Jacinto.....	4-J	.....	6,186	Cold Spring.....	.....
San Patricio.....	7-H	602	1,010	San Patricio.....	238
San Saba.....	5-G	1,425	5,284	San Saba.....	598
*Scurry.....	2-F	.....	102	.....	.....
Shackelford.....	2-G	455	2,037	Albany.....	129
Shelby.....	3-K	5,732	9,523	Center.....	177
*Sherman.....	7-D	.....	.....	.....	.....
Smith.....	2-J	16,592	21,865	Tyler.....	2,433
Somervell.....	3-H	.....	2,649	Glen Rose.....	132
Starr.....	5-G	4,154	8,304	Rio Grande City.....	.....
Stephens.....	2-G	330	4,725	Breckenridge.....	497
*Stewart.....	2-F	.....	104	.....	.....
Tarrant.....	2-H	5,788	24,671	Fort Worth.....	6,663
Taylor.....	3-F	.....	1,736	Buffalo Gap.....	.....
*Terry.....	2-D	.....	.....	.....	.....
Throckmorton.....	3-G	.....	711	Throckmorton.....	37
Titus.....	2-J	11,339	5,939	Mt. Pleasant.....	452
Tom Green.....	3-E	.....	3,615	San Angelo.....	.....
Travis.....	5-H	13,153	27,028	Austin.....	11,013
Trinity.....	4-J	4,141	4,915	Groveton.....	.....
Tyler.....	4-K	5,010	8,925	Woodville.....	.....
Uphur.....	2-J	19,039	10,265	Gilmer.....	786
Uvalde.....	5-F	851	2,541	Uvalde.....	364
Van Zandt.....	2-J	6,494	12,619	Canton.....	331
Victoria.....	6-I	4,860	6,289	Victoria.....	.....
Walker.....	4-J	9,776	12,094	Huntsville.....	1,322
Waller.....	5-I	9,084	10,587	Hemstead.....	1,612
Washington.....	5-I	23,104	27,568	Brewster.....	4,101
Webb.....	7-G	2,615	5,273	Laredo.....	3,521
Wharton.....	6-I	3,426	4,549	Wharton.....	312
*Wheeler.....	8-E	.....	612	Mobeetie.....	.....
Wichita.....	1-G	.....	433	.....	.....
Wilbarger.....	1-G	.....	126	.....	.....
Williamson.....	4-H	6,368	15,155	Georgetown.....	1,354
Wilson.....	5-H	2,556	7,118	Floresville.....	275
Wise.....	2-H	1,450	16,601	Decatur.....	579
Wood.....	2-J	6,894	11,412	Quitman.....	151
*Yankum.....	2-D	.....	.....	.....	.....
Young.....	2-G	135	4,726	Graham.....	574
Zapata.....	8-G	1,488	3,636	Carroll.....	.....
Zavalla.....	6-G	133	410	.....	.....
Total.....		818,579	1,591,749		

\* The counties marked thus were formed from parts of Bexar and Young terrs.

† Reference for location of counties. See map of Texas.

‡ Formed since census of 1880.

**History.**—The name of Texas was known to De la Salle, who landed at Matagorda Bay in 1687, and erected Ft. St.

Louis on the Lavaca. He was murdered by his own men in 1687, and his colony was short-lived. A Sp. officer, Capt. Alonzo de Leon, in 1690 established on the site of Ft. St. Louis the mission of San Francisco, and soon after the mission and trading-post of Nacogdoches. Capt. de St. Denis, then commanding at Natchitoches, vigorously protested, claiming the country for the King of Fr. His protest was unheeded, but a series of misfortunes led to the abandonment of the settlement. In 1714 Crozat, then commanding the prov. of La., sent Capt. de St. Denis, a son of the one mentioned above, to effect a settlement on the Rio Grande. He was taken prisoner by the gov. of Coahuila, but marrying the daughter of the commandant of the Sp. mission of San Juan, he was instrumental in introducing 3 Sp. missions into T. The Spaniards retained their sway without molestation for 20 yrs., but in 1735 St. Denis removed a Fr. colony from the Red River into T. The Spaniards protested without effect. But neither Fr. nor Spaniards were long at peace with the Indians, and after the massacre of the colonists at the San Saba Mission by the Indians in 1758, the missions declined. In the subsequent cession of La. to Sp. in 1763, its retrocession to Fr. in 1803, and its sale to the U. S. the same yr., T., which had an inconsiderable white pop., was neglected; but after our La. purchase there came a conflict in regard to boundaries, Sp. claiming lands E. of the Sabine, and the U. S. the terr. W. to the Rio Grande. By the treaty of 1819, in which Sp. ceded Fla. to the U. S., our govt. guaranteed to Sp. her possessions W. of the Sabine River. Mex. having become independent, in 1820 Moses Austin of Conn. obtained a grant of lands in T., but died before occupying it. His son, Stephen F. Austin, had the grant confirmed to him in 1823. His colony grew rapidly. The Mex. republic had, like the Sp. authorities, united Coahuila and T. in one govt., and, as Coahuila was exclusively Mex., undertook to govern both entirely by Mex. officers. This led to gross injustice to the T. colonists. In 1830 the Mex. pres., Bustamante, prohibited colonists from the U. S. from entering T. The colonists now resolved to separate from Coahuila. Foiled in this through the craftiness of Santa Anna, there was nothing left for them but a revolution and open war. The first fighting occurred at Gonzales Oct. 2, 1835. On Oct. 9 the Texans captured Goliad, and on the 28th the action of Concepcion occurred. On Nov. 12, 1835, a provisional govt. was organized, Henry Smith being chosen gov., and Gen. Austin, having resigned, was sent as a com. to the U. S., and Gen. Sam Houston succeeded him as commander. After being cannonaded for 6 days, San Antonio de Bexar was captured Dec. 10, 1835, by Gen. Houston, and the Mex. troops, over 1000 in number, who had surrendered, were sent to Mex., and T. was freed from an armed Mex. force. Santa Anna marched for San Antonio. The Alamo, a strong fort not far off, was garisoned by a force of 140 Texans (afterward increased to 172). Santa Anna invested this with a force of 4000 men, bombarded it for 11 days, and finally carried it by storm on Mar. 6, 1836, and put the whole garrison to the sword, sparing only a woman, a child, and a servant. On the 27th he murdered Col. Fannin's command at Goliad in cold blood, after accepting their surrender. But in the mean time the Texans on Mar. 17 had held a convention, adopted a const., and elected David G. Burnet pres. of the republic of T. At San Jacinto, on Apr. 21, was fought the decisive battle of the war, Gen. Houston with 800 troops defeating twice the number of Mexicans and taking 730 prisoners, including Santa Anna himself. This practically concluded the war of independence. In Mar. 1837 the U. S. acknowledged the independence of T. For nearly 10 yrs. T. maintained her existence as a republic—10 yrs. of struggle. Annexation to the U. S. was finally accomplished by the vote of Cong. Dec. 27, 1845, and the acceptance of the act by the Tex. people Feb. 19, 1846. T. increased rapidly in pop., followed the rest of the South in seceding from the U., and was the last of the Confed. States to surrender. The State was under military command till 1869, when, a new const. having been adopted, and the other requirements of Cong. complied with, it was restored to the U. by act of Cong. in Mar. 1870.

#### Executive Officers of Texas.

Provisional Governor before the	George T. Wood.....	1847-49
Declaration of Independence	P. Hansborough Bell.....	1849-53
of Mexican control.	Edward M. Pease.....	1853-57
Henry Smith, Nov. 12, 1835, to	H. G. Runkles.....	1857-59
Mar. 18, 1836.	Sam Houston.....	1859-61
Presidents under the Republic.	Edward Clark (actg.).....	1861
David G. Burnet, Mar. 18,	Francis R. Lubbock.....	1861-63
1836-Oct. 22, 1836.	Pendleton Murray.....	1863-65
Sam Houston, Oct. 22, 1836-	A. J. Hamilton, prov.....	1865-66
Dec. 1838.	J. W. Throckmorton.....	1866-67
Mirabeau B. Lamar, Dec.	Edward M. Pease.....	1867-70
1838-Dec. 1840.	Edmund J. Davis.....	1870-74
David G. Burnet (acting), Dec.	Richard Coke.....	1874-77
1840-Dec. 1841.	Richard B. Hubbard.....	1877-79
Sam Houston, Dec. 1841-Dec.	Oran M. Roberts.....	1879-83
1844.	John Ireland.....	1883-87
Anson Jones, Dec. 1844-Feb.		
19, 1846.		

#### Governors of the State.

J. P. Henderson..... 1846-47

REVISED BY A. R. SPOFFORD.

**Texeira**, tã-shã'e-rah (PEDRO), b. in Port. about 1570, spent several yrs. of his youth in Port. India and Malacca; returned to Port. by way of the Philippine Islands and Mex. 1600-01; went again to Goa 1603; made a voyage up Per. Gulf, and crossed Per. and Tur. to It. 1604. Wrote *Relacion de los Reyes de Persia y Ormuz, Viage de la India Oriental hasta Italia por Tierra el año de 1604*; date of death unknown.

**Thacher** (PETER), D. D., b. at Milton, Mass., Mar. 21, 1752, grad. at Harvard 1769; was ordained minister of Malden 1770; was an active patriot during the Revolution; wrote *Narrative of the Battle of Bunker's Hill*; framed the spirited resolutions adopted by the town of Malden; was a delegate



















to the constitutional convention 1780, and frequently chaplain to the assembly; was famous for pulpit eloquence and colloquial powers, and was pastor of Brattle st. ch., Boston, from 1785 to his death. Wrote *Observations on the State of the Clergy in N. Eng.* D. Dec. 18, 1802.

**Thacher** (SAMUEL COOPER), son of Dr. Peter, b. at Boston, Mass., Dec. 4, 1785, grad. at Harvard 1804; was librarian at Harvard 1808-11; ordained pastor of the New South ch., Boston, May 15, 1811; was considered an elegant scholar and eloquent preacher; contributed much to periodical lit.; prefixed a *Life to Sermons of Rev. J. S. Buckminster*, and pub. several essays and addresses. D. Jan. 2, 1818. —His brother, PETER OXENBRIDGE, b. at Malden Dec. 22, 1776, grad. at Harvard 1796, became a distinguished lawyer at Boston, and was municipal judge from 1823 to his death, Feb. 22, 1843.

**Thacher** (THOMAS), b. at Salisbury, Eng., May 1, 1620, came to Boston, Mass., 1635; studied theol. under Chauncy; was ordained pastor of the ch. at Weymouth Jan. 2, 1644; moved to Boston 1664, and practised med. there until chosen first pastor of the Third (Old South) ch. Feb. 16, 1669. He was an ancestor of the distinguished persons of the name above mentioned. D. Oct. 15, 1678.

**Thacher** (THOMAS ANTHONY), LL.D., b. at Hartford, Conn., Jan. 11, 1815, grad. at Yale. He has been prof. of Lat. in Yale since 1842, and has pub. an ed. of Cicero, *De Officiis*, of Madvig's *Lat. Gram.*, etc.

**Thackeray** (ANNE ELIZABETH), daughter of William Makepeace, b. in Eng. about 1842, wrote *The Story of Elizabeth, The Village on the Cliff, Old Kensington, Toilers and Spinners, Bluebeard's Keys, Miss Angel*, etc.

**Thackeray** (WILLIAM MAKEPEACE), b. at Calcutta, India, in 1811, came to Eng. 1818; was ed. at the Charter-house School, Lond., and at Trinity Coll., Cambridge, but left without taking a degree; was left an orphan in youth with a fortune estimated at £20,000; was noted from boyhood for literary and artistic proclivities; spent a season (1830-31) at Weimar, enjoying free access to the ducal court and becoming intimate with the aged Goethe and his brilliant circle; did not formally devote himself to a profession until about 1838, when, having lost most of his fortune, he resolved to support himself by his pen; became a correspondent of the *Times*; wrote humorous papers for the *New Monthly Magazine*, for *Fraser*, and for *Punch* over a variety of signatures; pub. collections of his magazine articles, as *The Paris Sketch-Book*, by Mr. Titmarsh, *Comic Tales and Sketches*, etc., which were read with great satisfaction; visited the East in 1845, and pub. *Notes of a Journey from Cornhill to Grand Cairo*; was first recognized as a literary celebrity upon the publication of his novel *Vanity Fair*; studied law and was called to the bar May 26, 1848, but never practised; brought out his second novel, *The Hist. of Pendennis*, which confirmed his already high reputation; lectured with brilliant success on the *Eng. Humorists of the Eighteenth Century* in Lond. 1851, and in the U. S. 1852; pub. *The Hist. of Henry Esmond, The Newcomes, and The Virginians*; lectured in the U. S. 1855-56, and afterward in Eng., on *The Four Georges*; and was the first editor of the *Cornhill Magazine*. D. Dec. 24, 1863, and was buried in Westminster Abbey.

PORTER C. BLISS.

**Thalberg**, tahl'bërg (SIGISMUND), b. at Geneva Jan. 7, 1812, a natural son of Prince Dietrichstein; received his musical education at Vienna under the guidance of Hummel, and made his first concert-tour as a pianist in 1830; visited subsequently the prin. cities of Europe; went in 1835 to Brazil, in 1856 to U. S., in 1863 again to Brazil. D. Apr. 27, 1871.

**Thales**, thá'lez (Θαλῆς), the earliest of the Gr. philos., with justice called "the father of philosophy." b. at Miletus about 640 B. C., and d. about 550. He was of Phœnician descent. He was one of the Seven Sages, a practical man, an astron. and a math., as well as a philos. He was the first man in the W. world who placed reason above sense, looking for the ground of things in the former—i. e. in an abstraction. He defined his abstract, universal ground of things as *water*.

**Thalia**, in Gr. mythology, one of the 9 Muses, presided over dramatic and idyllic poetry; later, more especially over comedy, and was generally represented with a mask in one hand and a shepherd's staff in the other.

**Thallium** (Gr. θαλλός, "young shoot"), one of the rarer elements, a metal, discovered in 1861. It is characterized by a green band, which makes up its whole spectrum. Occurrence.—Found as a small constituent of some iron and copper pyrites found in many parts of the world, in both native and artificial sulphur, in blende and calamine, in lepidolite, etc.

**Preparation**.—The most productive source of T. has been from the condensed fume found in the flues of furnaces in which thalliferous pyrites is burned for the manufacture of sulphuric acid. The dust from these flues is washed with boiling water, which dissolves sulphate of T.; muriatic acid is then added to precipitate thallous chloride. The impure chloride is treated with hot oil of vitriol, and the resulting acid-sulphate fused, dissolved in water, and treated with sulphuretted hydrogen, which may throw down some lead, silver, mercury, antimony, arsenic, or bismuth; the filtrate boiled with excess of ammonia, which separates iron and alumina, and then concentrated. On cooling, pure sulphate of T. separates in long prisms. From the solution of this salt metallic T. may be obtained by precipitation with metallic zinc or by electrolysis. It deposits in brilliant metallic plates and needles, like those of the so called tin tree.

**Properties**.—It is nearly as white as silver, with a high lustre. It is a very soft metal, even softer than lead. It is destitute of elasticity, and acquires none by hammering or rolling. It is nevertheless crystalline in its internal structure, and gives, when bent, a "cry" almost equal to that of tin. It fuses about 555° F., expanding considerably. It may be welded perfectly at the ordinary temperature by pressure. Its spectrum is the simplest one known; but in sparks from an induction coil, between T. points, 5 more

lines come out, and the photographic spectrum is by no means simple. It is strongly diamagnetic, and conducts electricity about like tin and lead. At a red heat it volatilizes in the air, giving brown-colored oxidized vapor, and boils at a heat below whiteness. It burns brilliantly in oxygen. It is attacked with some difficulty by dilute sulphuric acid, but scarcely at all by muriatic acid; by nitric acid with violence. Its salts are highly poisonous. It alloys with copper to a hard, brittle, white compound; with lead, to a malleable alloy; with platinum, very readily, with evolution of great heat; with tin, to a malleable compound. Mercury readily amalgamates it, forming a crystalline mass. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. HENRY WURTZ, Ph. D.]

**Thal'lus** (Gr. θάλλος, a "shoot"), in cryptogamic bot., an expanded structure, which may be regarded as a fusion into one mass of what in the higher plants would be root, stem, leaves, etc.; in its simpler forms reduced to separate threads or rows of cells. The term is practically restricted to the lower orders of the Cryptogamia.

**Thames**, temz, a river of Eng., rises under the name of Isis near Cirencester, at an elevation of 376 ft. above the sea, and flows in an E. direction to the N. Sea. At Lond. Bridge its width is 290 yards; at Woolwich, 490 yards; at Gravesend, 800 yards; 3 m. below Gravesend it expands into a large estuary, 6 m. broad at its mouth, at the Nore Light. Its entire course is about 250 m., and it is navigable for vessels of 1400 tons burden up to Blackwall, 6 m. below Lond. Bridge, and barges may ascend as far up as 200 m. from the mouth. Through a vast system of canals it communicates with the S. and W. coasts.

**Thames**, a river in Conn., is formed at Norwich by the junction of Yantic, Shetucket, and Quinebaug rivers. It is a navigable tidal channel 14 m. long, and reaches the sea at New London.

**Thane** [A.-S. *thegen*, a "servant"], in Eng. hist., was the title among the A.-S. and early Normans of certain military tenants and freeholders in the king's service. Subsequently classed with the barons, the title of the thanes disappears in Henry II.'s time. In Scot. the thanes were a class of non-military tenants of the Crown.

**Thanks-giving Day**, an annual religious festival in the U. S., celebrated in N. Eng. from the first settlement by the Pilgrims, and long peculiar to the N. States, but which in recent times has extended to nearly all the States, and has become a national institution since 1862. The day, usually the fourth Thursday of Nov., is designated by a proclamation signed by the gov. or the Pres.

**Thacher** (BENJAMIN BUSSEY), b. at Warren, Me., Oct. 8, 1809, grad. at Bowdoin Coll. 1829; became a lawyer at Boston; was a frequent writer for the press, especially during 2 yrs.' travel and residence in Europe 1836-38. Wrote *Indian Biography, The Boston Tea-Party, Tales of the Amer. Revolution*, etc. D. July 14, 1848.

**Thatcher** (HENRY KNOX), b. May 26, 1806, in Me., entered the navy as a mdpn. Mar. 4, 1823; became a lieut. in 1833, commander in 1855, com. in 1862, rear-admiral in 1866; retired in 1868. Commanded the first division of Porter's fleet in both the Ft. Fisher fights, and the W. Gulf squadron during the bombardment of Ft. Alexis and Spanish Ft. In Apr. 1865, just prior to their being stormed and carried by the army, their surrender being immediately followed by that of the city of Mobile. D. Apr. 5, 1880.

**Thaumaturgus, St. Gregory**. See GREGORY THAUMATURGUS.

**Thayer**, thá'er or thair (JOHN MILTON), b. at Bellingham, Mass., Jan. 24, 1820, grad. at Brown Univ.; studied law and came to the bar; went to Neb., where he became brig.-gen. of militia and member of the Territorial legislature; in Mar. 1863 was appointed brig.-gen. of volunteers for services at Ft. Donelson and Shiloh; Senator from Neb. for term ending 1871, and gov. of Wyo. 1875-78.

**Thayer** (JOSEPH HENRY), D. D., b. in Boston, Mass., Nov. 7, 1825, grad. at Harvard in 1850 and at Andover in 1857; supplied the Evangelical Congl. ch. in Quincy, Mass., 1 yr.; was settled over the Crombie st. ch. in Salem, Mass., Dec. 29, 1859; chaplain of the 40th Mass. Volunteers, 9 months, from Sept. 1862; was professor of sacred lit. in Andover Theological Sem. from 1864 to 1882. Has pub. a translation of Winer's *N. T. Grammar* and a translation of Alex. Buttmann's *N. T. Grammar*.

**Thayer** (SYLVANUS), LL.D., b. at Braintree, Mass., June 9, 1785, received a classical education at Dartmouth, and Feb. 23, 1808, grad. at U. S. Military Acad.; was called to the field in 1812, and was chief engineer to Gen. Dearborn on the Niagara frontier; of the right division of the N. army under Gen. Hampton on Lake Champlain line of operation in 1813; of Gen. Moses Porter's troops in the defence of Norfolk, Va., in 1814, where he was brevetted major Feb. 20, 1815. In July 1819 he was selected as supt. of the Military Acad., which office he filled for 15 yrs., during which time that institution was organized upon its present basis. On being relieved from the superintendency July 1, 1833, he was charged with the construction of the fortifications of Boston harbor. During a period embracing parts of 1857 and 1858 he was in command of the corps of engineers, exercising the functions of chief engineer of the U. S.; declined to transfer his headquarters to Wash., and on his own application was placed on leave of absence. He so remained till July 1, 1863, when he was placed on the retired list with the rank of col. Previous to his death he had founded at Dartmouth Coll. the Thayer School of Civil Engineering. He had also bestowed the sum of \$10,000 upon the town of Braintree for the establishing of a public library, and in his will he bequeathed a large sum in trust for a free school, limited to scholars who "shall have been born in Quincy, Braintree, or Randolph." D. Sept. 7, 1872.

**Thayer** (THOMAS BALDWIN), D. D., b. at Boston, Mass., Sept. 10, 1812, and ed. in that city, was ordained Dec. 5, 1832, and was pastor in Lowell, Mass., from 1833 to 1845, then



from 1845 to 1851 in Brooklyn, N. Y.; in 1851 returned to Lowell until 1857; from 1857 to 1867 was pastor at Boston, Mass. He became ed. of *The Unit. Quarterly*, and wrote the *Theology of Universalism*, etc.

**Thayer** (WILLIAM MAKEPEACE), D. D., b. at Franklin, Mass., in 1820, grad. at Brown Univ. 1843, was pastor of a Congl. ch. at Ashland, Mass., 1849-68; returned to Franklin. Author of a *Youth's Hist. of the Rebellion*; ed. of the *Home Monthly* and the *Mother's Assistant*, etc.

**Theatines**, the'a-tins [named from the bp. of *Theat*, afterward Pope Paul IV.], a R. Cath. order of regular clerks and nuns, founded in 1524 by the bp. of Theate and several of his friends. They spread into various countries, opposed Protestantism, and labored for the reform of the clergy and the extension of the Oriental missions.

**Theatre** [Gr. *θεατρον*, a "show-place"]. The anc. T. established by the Grs. and only slightly modified by the Romans, reflects very strikingly in its architectural construction the ideal character of the anc. drama. The ground-plan of an anc. T. may be most easily understood by imagining a circle divided by a diameter. In the centre stood the thymele. The space on the one side of the diameter, between the thymele and the first row of seats, which rose in semicircles, one behind the other, was called the orchestra (dancing-place), and was occupied by the choir. On the other side of the diameter, a little behind the thymele, rose the stage, a long parallelogram of comparatively little depth, raised to the same height as the first rows of seats, and closed on the 3 sides by walls of the same height as the last row of seats. The scene generally represented the front facade of a palace, and was stationary. The back wall showed 3 doors, and the very character of a person was indicated by the door through which the actor entered the stage.

The hist. of the modern T. is closely connected with the history of the modern drama. From the time when the miracle-plays and moralities disappeared, and up to the time when T. were built and theatrical representations maintained at every court as a part of the royal household, during the whole period from the 15th to the 17th century, all theatrical matters are involved more or less in obscurity. Certain general traits, however, are well authenticated. In most cases only the stage was roofed, while the pit was left open. Hence the custom that noble and wealthy people were seated on both ends of the stage itself. That a stage thus occupied by spectators could have no decoration resembling the scenery of our days is self-evident. The stage directions with which Jacob Ayer accompanies the texts of his plays, an old print dating from Shakespeare's time and representing the stage of the Red Bull Theatre in Lond., the technical construction of Shakespeare's dramas, etc., give us some ideas of the general outfit of the stage. In the centre of the background was found a platform raised a few steps from the floor. From front corners of this platform arose 2 pillars on which rested a balcony, and the space between the pillars was filled with a movable curtain hanging down from the balcony. This device formed the principal feature in the scenery of that time. Meanwhile the revival of letters in It., and the attempts at representing the antique tragedy, occasioned the construction of stages and T. after the antique model. In the middle of the 16th century Palladio built theatres in Vicenza and Venice after the rules of Vitruvius. The stage had here a merely architectural ornamentation, and its various parts—doors, balconies, etc.—a merely conventional signification. This plan was afterward adopted in Fr., and carried out in the tragic stage of the Palais Royal, erected by Richelieu in 1639, and forming the scene on which the tragedies of Corneille were enacted, and in the comic stage of the Hôtel de Bourgogne, finished in 1645. The combination, however, and gradual amalgamation of these 2 types of stages, the medieval originating from the courtyard of the inn, and the classical originating from an imitation of the Gr. scene, cannot be traced in details; but in the middle of the 18th century it was consummated, and by this combination the modern stage was formed.

CLEMENS PETERSEN.

**Thebaine, or Paramorphine**, an organic base contained in opium. In its preparation the extract of the opium is treated with an excess of milk of lime, and the resulting precipitate washed with water, dried, and then digested with hot alcohol, which upon evaporation deposits a residue from which the alkaloid is extracted by ether. T. crystallizes in square prisms possessing a silvery lustre, and an acrid and styptic taste. It is highly poisonous, producing tetanic symptoms.

**Thebes**, the *Diopolsis* of the Grs. the *No* or *No-Ammon* of Script., was for a long time the cap. of Egypt, and was regarded by the anc. as the oldest city of the world. It stood in Upper Egypt, in lat. 25° 41' N., on both sides of the Nile, and covered the whole plain between the 2 mt.-chains which inclose the valley of the Nile, being 3 m. broad and 5½ m. long. It was one of the largest and most magnificent cities which has ever been built; but when Lower Egypt began to rise and Memphis became the seat of the govt., it began to decline. In 525 B. C. Cambyses conquered and sacked it, and in 86 B. C. Ptolemy Lathyrus pillaged it and left it in ruins, which are most stupendous, and give evidence of gigantic, sublime, and most admirable art.

**Thebes**, town of Gr., is regularly laid out and well built. It has about 5000 inhab., and is celebrated for the excellent meerschaum which is dug on the adjacent Sphinx Mt. The anc. T. occupied the same site as the modern town, and was one of the most famous and most magnificent cities of Gr. It stood at the head of the confederacy of the Ægean cities, and when the Spartans, after the Peloponnesian war, became supreme in Gr., it was T. which checked them. In her wars with Philip of Macedon she was unfortunate, and was compelled to receive a Macedonian garrison within her walls. On the death of Philip she expelled the foreign garrison. But Alexander razed the whole city to the ground and sold the inhabs. into slavery.

**The Dalles**, or. See DALLES CITY.

**Theism** [Gr. *θεός*, "God"], is distinguished from pantheism by the relation which it establishes between God and the world, and from deism by the relation which it establishes between God and man. To the pantheist, God and the world are one and the same, while to the theist, God is not only an existence, with all the attributes of personality, but also absolutely independent of the world. In the abstract the deist's idea of God may be very similar to that of the theist, but as he rejects the doctrine of God's revelation to man, he denies that whole series of relations between God and man which to the theist results from that very doctrine.

**Theiss**, tice, a river of Hungary, is formed by the junction of the Black and White Theiss, both of which rise in the Carpathian Mts., and flows with a winding S. course to the Danube, which it joins 22 m. E. of Peterwardein. Its length is 828 m., the greater part navigable for large vessels.

**The'nis**, a daughter of Uranus and Ge, the wife of Zeus, and mother to the Horæ, Eunomia, Dice, Eirene, the Mæræ, the Hesperides, etc., lived in Olympus on good terms with Hera, and held the office of convening the assembly of the gods. She represented the order of things, such as it was established by law, custom, and equity.

**Themistocles**, b. at Athens about 514 B. C., became the political leader of Athens after the expulsion of Aristides by ostracism in 483. After the battle of Marathon (490) people generally believed that the Per. war was ended. T., however, felt that a still heavier storm was coming, and he understood that a strong fleet would be the most effective means of victory, and the only safe means of rescue in case of defeat. After the pass of Thermopylæ was forced, he persuaded the Athenians to leave their city to the protection of its tutelary deities, to bring their women and children in safety to the island of Salamis, and to go on board the fleet. In the morning (Sept. 20, 480) the Per. fleet stood up the narrow sound between Salamis and the mainland; the battle began, and it terminated in a most glorious victory for the Grs. After the Per. war, however, he was accused of treasonable connections with the Pers., but acquitted; then ostracised in 471, exiled to Argos, and again accused of treason by the Spartans; an order to arrest him was issued, and he fled from Argos to Corecyra, Thrace, Ephesus, and arrived finally at Susa, the residence of the Per. king. At the Per. court there was a party, headed by the widow of Xerxes, which demanded his execution immediately; but T. understood how to impress the reigning monarch, Artaxerxes, so favorably that he was not only left unmolested, but received rich donations and acquired considerable influence. Deeply implicated in the Per. plans for the subjugation of Gr., he d. 449 B. C.

**Theobroma**. See CACAO, and THEOBROMINE.

**Theobromine** [Gr. *θεός*, "God," and *βρώμα*, "food"], an organic base present in cacao-beans, and therefore in chocolate. It is prepared by treating the beans with warm water, adding neutral plumbic acetate to the strained solution, conducting a current of sulphuretted hydrogen through the filtrate from the lead precipitate, evaporating the second filtrate, and by crystallizing from alcohol. It may be further purified by heating between 2 watch-glasses, when it is obtained as a dazzling white sublimate. T. is a colorless crystalline powder, sparingly soluble in boiling water, and less so in alcohol and in ether. It has a bitter taste, and gives crystalline salts with several of the acids.

**Theocritus**, b. at Syracuse about the beginning of 3d century B. C., resided for some time in Alexandria, where he enjoyed the friendship of the poet Aratus and the favor of the king, Ptolemy Philadelphus, but returned afterward to Syracuse, and lived at the court of King Hiero II. He was the originator of the so called pastoral or bucolic poetry. Beside 22 epigrams, 30 idyls ascribed to him have come down to us. These idyls give pictures of the every-day life of the Sicilian peasantry. Their character is often erotic, sometimes tragical, humorous, or even satirical.

**Theodore'tus**, b. about A. D. 393 at Antiochia, the only son of rich and influential parents, entered when only 7 yrs. old a monastery in his native city, and was in 420 elected bp. of Cyrrus, or Cyrrhus on the Euphrates, where he d. in 437. He had a strong sympathy for Nestorius, and in 449 he was deposed from his see by the synod of Ephesus, though he was reinstated by the synod of Chalcedon in 451. His best work is the *Hist. of the Ch.* from 325 to 429.

**Theodor'ic the Great**, b. about 455, the son of Theodemir, king of the Ostrogoths, who at that time were settled in Pannonia and Mœsia under the authority of the E. Rom. emp., was ed. at the Byzantine court. In 475 he succeeded his father as king of his nation, and for some time was a true ally of Zeno, the Constantinopolitan emp. But in 488 Zeno persuaded T. to remove to It. and fight the usurper Odoacer. Late in the fall the whole nation broke up. Odoacer was defeated in 3 great battles. He then shut himself up in Ravenna, was besieged there for over 2 yrs., and finally assassinated 493. After his victories T. naturally considered the soil of It. as belonging to himself. During his long reign It. was quiet and progressive. The last days of his life were sombre. He and his nation were Arians, and the Arians were persecuted throughout the E. empire. He tried to interfere, but failed. Embittered, he began to retaliate and persecute the orthodox in It. The pope was thrown into prison. In the heat of the conflict his passions, barbarian at the bottom, took fire, and he d. at Ravenna, Aug. 30, 526, amid murder and bloodshed.

**Theodos'ius**, a celebrated Rom. gen. from whom a line of emps. descended, was sent in 367 by Valentinian I. to Britain; expelled the Picts and Scots; drove them back behind the rampart of Antoninus; strengthened the military positions on the frontiers, and restored security and order in the country. After his return (in 370) he was for some time stationed on the upper Danube, where he defeated the Alemanni, but in 372 was sent to Afr., where the maladmin-



istration of the gov. had caused Firmus, one of the prin. Moorish chiefs under Rom. authority, to rise in revolt. But T. defeated him, and reduced the province to submission. Shortly after (in 376), T. himself was beheaded at Carthage by order of the emp. Valens.—His son, THEODOSIUS I., THE GREAT, Rom. emp. from 379 to 395, was b. in Sp. in 345, and d. in his father's camp. After the defeat and death of Valens in the battle of Hadrianopolis (in 378), Gratian made him commander-in-chief against the Goths, and even declared him *Augustus* (Jan. 19, 379), placing Egypt, Asia, Thrace, Macedonia, and Dacia under his sceptre. The new emp. of the E. was very successful. He dissolved the union between the Ostrogoths and the Visigoths, drew the latter over to his side, overpowered the former, and finally (in 382) succeeded in settling all the Goths as peaceful allies within the boundaries of the Rom. empire. In 389 Gratian was defeated and killed by Maximus at Lyons, and T. acknowledged the usurper as emp. of Britain, Sp., and Gaul, but secured Afr., It., and Illyricum for Gratian's brother, Valentinian II. In 387 Maximus broke from Gaul into It., and Valentinian II. fled for safety to T. T. became so infatuated with Valentinian's sister, Galla, that he promised to restore him to the throne in order to obtain her hand. Maximus was defeated and put to death in 388, and Valentinian II. was reinstated as emp. of the W., but in 392 was killed by Arbogastes, who raised the rhetorician Eugenius to the throne. In 394 T. marched against Eugenius and Arbogastes, and defeated them at Aquileia, thereby uniting the whole Rom. empire under his sceptre. He d. shortly after (Jan. 17, 395), at Milan. T. was very zealous in all religious matters. During his reign the orthodox Ch. of the religion of love feasted on persecutions and devastations.—His grandson, THEODOSIUS II. (408-450), b. in 401, divided his time between prayers, hunting, and calligraphic exercises. The gov't. was carried on by his sister, Pulcheria, and for some time by his wife, Eudoxia.

**Theognis** flourished at Megara in the middle of the 6th century B. C. He was both by birth and conviction an aristocrat, and was exiled with the leaders of the aristocratic party, but returned to Megara, and d. there after 490. Of his poems, all belonging to the elegiac and gnomic kind of poetry, 1389 verses are still extant.

**Theology** [Gr. *theos*, "God," and *logos*, "word"] signifies, literally, "discourse concerning God." It may be defined as the science which treats of God and man in all their known relations to each other. It has sometimes been defined as "the science of the supernatural," and very commonly as "the science of religion." The last 2 definitions, however, are vague and inexact. Religion exists as an inward state of feeling, and as an outward expression of that feeling in acts of worship and service. The science of religion, therefore, should analyze and classify the various religions of the world. T., on the other hand, deals exclusively with the facts from which religion proceeds, and, educing the truths and principles which the facts embody, it formulates and groups them into the doctrines which constitute T.

T. has been divided into 2 kinds, natural T. and revealed T. By the first is meant that knowledge of God which may be gathered from nature—i. e. from the external world and from the mental and moral constitution of man; and by the second is meant that knowledge of God and man, and of their mutual relations, which may be gathered from the Bible alone. T. as a science has had a clearly marked hist. This hist., beginning with the time immediately succeeding that of the apostles, naturally divides itself into 3 great periods, the first extending to A. D. 730, the second from 730 to 1517, and the third from 1517 to our own time. During the first period, T. was in its forming state, but not unproductive of results. It gave to the Ch. universal the Apostles' Creed. Among the chs. of the E. were elaborated the doctrines of the Trinity and of the person of Christ, which were formulated in the creeds adopted by the Council of Nice in 325, of Ephesus in 431, and Chalcedon in 451. Within the same period also the doctrines of anthropology (specifically of the fall of Adam and its effects on the human race) were discussed, chiefly among the chs. of the W. under the leadership of Augustine and Pelagius. Augustine maintained that all men sinned in Adam; that by his fall all were physically and morally corrupted (original sin), and incapacitated to will or do aught but evil; that all there is of good in any one is by sovereign grace in fulfillment of a predestinating purpose. Pelagius maintained that Adam alone was injured by the fall; that every one of his descendants begins life with a nature as pure as his was, and with a will as free to choose good as evil; that grace simply assists natural power, and is bestowed on those who by right use of natural power deserve it. Augustinism was adopted as the orthodox doctrine of the Ch. by Council of Ephesus (431).

The second period (from 730 to 1517) produced John of Damascus, Peter the Lombard, and Thomas Aquinas. John (d. 754) wrote *An Accurate Summary of the Orthodox Faith*. He drew his materials from the earlier Fathers, and was the first to apply the formulas of Aristotle to theological investigation. His views of the moral state and ability of man are much less rigid than those of Augustine. His work is chiefly of value to one who would understand the hist. of the doctrine of the person of Christ. Peter the Lombard (d. 1164) compiled from the Latin Fathers *Four Books of Sentences*. He shows great acuteness and skill in his aim at reconciling the opposing views of the authors whom he quotes. The work of Peter became the great authority in the Roman Ch. But the greatest of medieval theologians was Thomas Aquinas (d. 1274). He wrote *Sum of Theology*. He is pre-eminently scholastic in method, but transparent in thought and exhaustive in treatment. The Lombard simply recognized the rising controversy between the Realists and the Nominalists; Aquinas was a pronounced and earnest Realist. He was also more Augustinian in his anthropology than Lombard, and setting aside the mythical

theory of the atonement, which Lombard had accepted from the Fathers, and which made the death of Christ to have been a ransom paid to Satan, he maintained that the death of Christ was a satisfaction for sin to the justice of God. The *Summa* of Aquinas is one of the highest authorities in the R. Cath. Ch.

The third great period, covering the last 350 yrs., has been more fruitful of treatises on scientific T., and has contributed more to its progress, than all the Christian centuries preceding. From the middle of the 16th century T. presents itself under 3 clearly defined types—the Lutheran, the Reformed (the Calvinist), and the R. Cath.

**The Roman.**—The R. Cath. Ch., in which theological studies had fallen into neglect, was roused into immediate activity by the outbreak of the Ref. But in the canons of the Council of Trent (1545-93) it reaffirmed the T. of its mediæval writers, and authorized the preparation of the Rom. Catechism. Its great writers, such as Bellarmine and Petavius, contented themselves with acting on the defensive.

**The Lutheran.**—The *Locci* of Melancthon, first pub. in 1521, became at once the great Lutheran authority. Theologians immediately succeeding Melancthon contented themselves with writing commentaries on the *Locci*; but during the 300 yrs. following his death (d. 1561) the Lutheran Ch. abounded in great writers on T. Of these may be mentioned Chemnitz, Gerhard, Callixtus, Calovius, Quenstedt, and others. But the simultaneous appearance of Rationalism and Pietism about the middle of the 18th century interrupted the sluggish flow of Lutheran T. The Rationalists were too intent on their work of destruction to construct a scientific T., and the Pietists, regarding religion as much more a matter of the heart than of the intellect, were indifferent to doctrinal discussions.

**The Reformed (Calvinist).**—At the head of all the Reformed theologians stands John Calvin. He was but 27 when he pub. the first edition of his *Institutes of Theology*. The Reformed T. has gained wide currency among different nations. Thus we have the Swiss-French or Geneva Ch., founded by Calvin; the Anglican, which expressed itself in the XXXIX. Articles, 1551; the Ger. Reformed Ch., which crystallized around the Heidelberg Catechism, 1562; the Dutch (Netherlands), which culminated in the Synod of Dort, 1618; the Anglo-Scotch, which proclaimed itself in the Westminster Confession and Catechism, 1646-48; and finally, we have the Amer. type of T., which, having begun under the Westminster Symbols, now presents itself under new and ever-increasing variations.

**Theologies in Antagonism with the Reformed.**—**Socinianism.**—The opponents of trinitarianism gathered in Transylvania, and, organized by Faustus Socinus (d. 1604), became known as Socinians. The views of Socinians are found in *Racovian Catechism* and in *Bibliotheca Fratrum Polonorum*.

**Arminianism.**—In reaction against the rigid high Calvinism of the Netherlands, Arminius denied the doctrine of absolute predestination, and propounded in its stead a predestination founded on the foreknowledge of God. Violent controversies ensued. Episcopius and Limburg elaborated the Arminian T. into a self-consistent system.

**Existing State of Theology among the Different Divisions of Christendom.**—The Greek Church has produced no complete system of T. It has contented itself with its early Fathers and John of Damascus. The Roman Catholic Church has had its full share of conflicting theories. To say nothing of mediæval controversies, of the bitter doctrinal disputes between the Jansenists and their opponents, it is only by ecclesiastical power that the dissidence of some of its living writers from the authority of its dogmas can be kept in check. The most complete of modern theological treatises is that of Cardinal Perrone (*Predlectiones Theologicae*), which appeared in 1835. The Anglican Church and the Protestant Episcopal Church of this country have taken little or no interest in the cultivation of systematic or scientific T. The Lutheran Church has made but little progress in its T. as a whole since the period of its great writers in the 16th and 17th centuries. The Reformed theologians have in our day been actively engaged in a resurvey of the whole domain of systematic T. Among the Gers. may be mentioned, of the orthodox wing, Ebrard, Lange, and Heppel, and of the rationalist, Schweizer and Schenkel. The Methodists have produced no theologian since Watson. [From orig. art. in *J.'s Univ. Cyc.*, by PRES. E. G. ROBINSON, D. D., LL.D.]

**Theopaschites.** See PATRIPASSIANS.

**Theophrastus**, b. at Eresus, in the island of Lesbos, about 372 B. C., studied philos. in Athens, first under Plato, then under Aristotle, whose favorite he became, and whom he succeeded in the Lyceum. He is said to have had 2000 disciples, and d., highly respected, at Athens about 287 B. C. There are now extant of his works two treatises on botany and portions of others, among them his *Ethical Characters*.

**Theophylact**, b. at Eubœa, seems to have come early to Constantinople, where he obtained great reputation for learning, and was appointed teacher to Constantine Porphyrogenitus. In 1078 he was made abp. of Bulgaria, and took up his residence at Achrida, where he d. in 1107. He wrote commentaries on the N. T., which are still consulted with advantage.

**The'ra, or Santorin**, an island of Gr., one of the Cyclades. The whole island is really only but one side of an immense volcanic crater, whose other side has fallen down, and from whose middle several small islands have been raised at different periods, the last in 1710. The soil is dry but fertile; wine and cotton are produced in large quantities. The inhabs. carry on extensive fisheries and a large shipping business. Pop. about 21,000.

**Theramenes**, an Athenian politician whose name figures in all political transactions during the last yrs. of the Peloponnesian war, now on the side of the demagogues, now on the side of the oligarchs, always in the character of a traitor. He was elected one of the 30 tyrants, but as he opposed the violent measures of that body, he became sus-



pected by Critias, was accused by him as an enemy of the state, and finally forced to drink poison.

**Therapeutæ** [Gr. *θεραπευται*, "worshippers," "servants," or "healers"], a sect of Jewish contemplative ascetics, kindred to though distinct from the Essenes. Their chief seat was on Lake Mareotis in Egypt. They were not strictly celibate, but rejected wine and animal food. It has, however, been denied that they were Jews at all, and some critics question their existence at any time.

**Theresia**, or **Teresa** (SAINT), b. at Avila, Sp., Mar. 28, 1515, her full name being *TERESA SANCHEZ DE CEBEDA*; entered (Nov. 2, 1536) the Carmelite monastery at Avila, and in 1562 founded a reformed branch of Carmelite nuns. She made a prolonged study of theol., and wrote several mystical and ascetic treatises, which are among the Sp. classics, and obtained her a great reputation. D. Oct. 4, 1582.

**Thersopel**, or **Maria-Thersopel**. See *SZABADKA*.

**Thermal Springs**. Warm water having a greater power of dissolving the mineral constituents of the rocks through which it passes, T. S. are usually at the same time mineral springs and are used for medicinal purposes. They are classified, in this respect, according to the characteristic and prevailing gaseous or mineral elements which they contain. Carbonic acid gas abounds in the gaseous, *acidulous* waters of Pyrmont and Seltz in Ger., Spa in Belg., and Vichy in Fr. Sulphur compounds predominate in the *sulphurous*, like the celebrated waters of the Va. Springs in the Alleghenies, and Saratoga, Barèges in the Fr. Pyrenees, Louèche in Switz., Aix in Savoy; common salt, associated with many others, in the *saline* waters of Plombières in the Vosges, Aix in Provence, Schlangenbad in Ger., Baden in Switz., Seidlitz in Bohemia; a great variety of salts, without especial preponderance of any one, in the *complex* springs of Carlsbad and Töplitz in Bohemia, Wiesbaden, Ems, and Baden-Baden in Ger.; salts of iron in the *chalybeate* springs which abound in all countries rich in this metal. The number of mineral springs is very great: there is scarcely a country which cannot boast of many. Europe, however—in which, among all the continents, the earth's crust is most broken and dislocated—is perhaps also the richest in mineral springs. Over 800 have been described in Fr., 400 in Sp., a greater number still in Ger., Bohemia, Switz., It., and Eng., their various temperatures ranging as high as 180° F. In this country the numerous springs found in Ark. vary from 110° to 165° F. A. GUYOT.

**Thermidor** ("hot month"), the 11th month of the Fr. republican calendar; began on the 19th day of July and ended with the 18th of Aug.

**Thermodynamics**. The science of T., as the term implies, relates to the principles of dynamics applied to the phenomena of heat. In addition to the elementary principles of dynamics for the ordinary forms of dynamical problems, the science of T. embraces special theorems or laws depending on observations and experience in connection with heat, and also special forms of mathematical investigation by which the applications of these laws may be brought within the scope of mathematical analysis.

**Thermometer**. See *THERMOMETRY*.

**Thermometry** [Gr. *θερμ*, "heat," and *μετρον*, "measure"], the art of measuring temperatures by the expansion of solids, liquids, and gases, or by means of some electrical, acoustic, or other physical phenomena. Alcohol and mercury possess many advantages for thermometrical purposes. Alcohol does not solidify at any known degree of cold. Mercury has a very high boiling-point, follows nearly the same law of expansion as gases, possesses a wide range of liquidity, has a low specific heat, but a high conducting power, and can be obtained in a state of great purity. The ordinary mercurial thermometer consists of a glass tube, at the end of which is blown a spherical reservoir, termed the bulb. In its manufacture 3 operations are comprised—viz. the calibration of the tube, the introduction of the mercury, and the graduation of the scale. The calibration of the tube is effected by introducing a column of mercury about an inch in length, and ascertaining that it retains the same length in all parts of the tube, care being taken that the metal is maintained at a uniform temperature. The tube, which is advantageously provided at its open extremity with a funnel or a bulb, is next filled with mercury by gradually introducing the metal, inclining the tube, and heating the bulb, in order to expel the air, until both the bulb and stem are completely filled. The mercury is then heated to boiling, and the tube hermetically sealed by melting it below the funnel or upper bulb. The graduation of the thermometer is accomplished by first determining the 2 fixed points—i. e. the melting-point of ice and the boiling-point of water. The former is ascertained by immersing the bulb and part of the tube in snow or pounded ice which is contained in a vessel provided with an aperture allowing the escape of the water; the latter, by surrounding the thermometer with steam, external contact with the air being prevented. The interval or range between the freezing and boiling points is next subdivided into equal parts or degrees. In the thermometer used for ordinary purposes in this country and in Eng. and Hol., *Fahrenheit's* (1720) scale is employed, in which the range between the freezing and boiling points of water is subdivided into 180 degrees. In Fr., and on the continent generally, the scale introduced by *Celsius* (1742) is employed. In this thermometer, which is commonly known as the *Centigrade*, the interval between the freezing and boiling points is subdivided into 100 equal parts. For scientific purposes the *Centigrade* thermometer is, at present, almost universally used. A third scale, suggested by *Réaumur*, is still employed in Rus. and Ger. In the range between the fixed points, which are the same as in the *Centigrade* scale, is divided into 80 degrees. The degrees indicating the temperature of melting ice, the intermediate range, and the temperature of boiling water in the 3 scales are as follows:

	Temperature of melting ice.	Intervals.	Temperature of boiling water.
Centigrade scale (C.)	0°	100°	100°
Fahrenheit's scale (F.)	32°	180°	212°
Réaumur's scale (R.)	0°	80°	80°

*Breguet's metallic thermometer* is founded on the unequal expansion of metals, and is very delicate in its indications. It consists of 3 exceedingly thin ribbons of platinum, gold, and silver, which are coiled in a spiral form, one end of which is fixed, the other being connected with a light needle, which moves round a scale, graduated in Centigrade degrees by comparison with a standard mercurial thermometer. The most expansible metal, silver, forms the internal side of the spiral, platinum forming the external; gold is placed between the other 2 metals, as its expansibility is intermediate between that of silver and platinum. When the temperature rises, the silver expands more than the gold or platinum, and the spiral unwinds, and communicates a motion to the index-needle, an opposite motion being produced by decrease of temperature.

In meteorological observations it is often necessary to know the highest temperature of the day and the lowest temperature of the night. The instruments which most readily permit of these determinations are termed *registering* or *maximum* and *minimum* thermometers. *Rutherford's maximum and minimum thermometer* consists of a mercurial thermometer with a horizontal stem, in the bore of which a small piece of steel wire is included above the mercury. Upon an increase of temperature the mercury expands, pushing the steel wire before it, but as it contracts and recedes the wire is left in a position corresponding to the greatest temperature recorded by the thermometer. The minimum temperature is observed by an alcoholic thermometer, arranged like the mercuric one, but having an index consisting of a small piece of enamel sunk below the surface of the liquid. As the alcohol contracts, the index is carried along by capillary attraction; when the temperature rises, the liquid readily passes the enamel, which is thus left in a position indicating the greatest point of contraction of the alcohol. The same object is attained by the use of *Six's maximum and minimum thermometer*, consisting of a large bulb filled with alcohol, to which is joined a tube bent in the form of an inverted siphon, in the lower part of which a small column of mercury is contained. The extreme points reached by the mercury, as it is moved by the expansion and contraction of the alcohol, are registered by a small enamelled wire index, sliding in the leg of the bent tube, which is prevented from falling by its own weight by means of a small spring. [From orig. art. in *J.'s Univ. Cyc.*, by J. P. BATTERSHALL, Ph. D.]

**Thermopylae**, a narrow defile between Mt. Ceta and the Maliac Gulf, leading from Thessaly into Locris. It became celebrated as the scene of the heroic death of Leonidas and his 300 Spartans in their attempt to prevent the Per. hordes from passing through the defile.

**Thermotics**, the science of HEAT (which see).

**The'seus**, in Gr. mythology, the national hero of Attica and the founder of the city of Athens, where he established the Panathenæan festival and the Syneccla; was a son of *Aegæus* and *Æthra*, and was married first to *Antiope*, the queen of the Amazons, whom he carried off, afterward to *Phædra*. He took part in the campaign of the Argonauts, in the Calydonian hunt, in the battle with the Centaurs, etc., but his most famous exploit was the slaying of *Minotaur*. Attica was bound to send annually a tribute of youths to Crete to be sacrificed to this monster. In order to put an end to this misery, T. repaired to Crete and won the affection of *Ariadne*, the daughter of King *Minos*, who provided him with a clew to the labyrinth and a sword to kill *Minotaur*; he slew the monster and carried off *Ariadne*, whom he afterward left on *Naxos*. During a revolution in Athens he fled to *Scyros*, where he perished by the treachery of King *Lycomedes*, but in 469 a. c. *Cimon* conquered *Scyros* and brought his bones back to Athens.

**Thes'pis**, a native of Icaria in Attica and a contemporary of *Pisistratus*, became the inventor of the Gr. tragedy by introducing between the dithyrambic choros at the festival of *Dionysus* an interlocutor, an actor, who in monologues, or perhaps in dialogues with the leaders of the choros, narrated, or gave a mimetic representation of, the incidents to which the songs referred.

**Thessalonians**, **First Epistle of St. Paul to the**, was written from the city of Corinth in 53 A. D. to the ch. at Thessalonica. It contains encouragement for the infant ch., and warnings against licentiousness and avarice. **THE SECOND EPISTLE TO THE THESSALONIANS** was written by St. Paul from Corinth soon after the first, to counteract certain misapprehensions as to the speedy second advent of Jesus Christ, and the consequent disposition to idleness. They are first in chronological order of Paul's Epistles.

**Thessalonica**. See *Salonica*.

**Thess'aly**, or **Thessa'lia**, a large division of anc. Gr., bounded E. by the *Ægean Sea*, N. by Macedonia, and W. by Epirus. The surface is a plain, inclosed on all sides by mts. The soil is very fertile, and the land was in anc. times famous for its wheat and its fine breed of horses. The inhabs. were *Æolians*, but very early the Epirotes invaded and conquered the country, and made them their slaves.

**Thet'is**, in Gr. mythology, a daughter of *Nereus* and *Doris*, was married to a mortal, *Peleus*, king of the *Myrmidons* in Thessaly. She bore several children to *Peleus*, but they all perished under her attempts to make them immortal, except the youngest, *Achilles*, whom the father saved. Provoked, *Thetis* left *Peleus* and returned to the waters whence she had come.

**Thian-Shan** ("celestial mountains"), a lofty mt.-chain in Central Asia, extends in lat. 42° W. from lon. 80° to 90° E., forming the boundary between *Thian-Shan-Nanloo*, or *Toorkistan*, and *Thian-Shan-Peloo*, or *Soongaria*. It is volcanic, and several of its peaks rise 21,000 ft.



**Thib'et**, or **Tibet** [contracted from the Tibetan words *thub-pa* and *phod-pa*, both meaning "to be able," and combined for the purpose of increasing the power of the expression], **Eastern** and **Western**, became after Marco Polo's travels the name applied to the longitudinal valley between the Himalayas in the S. and the Karakorum or Thangla in the N., and drained on the E. by the Tsang-Po, and on the W. by the Indus and Sutlej. Its E. and W. boundaries are formed by 2 mt.-ranges. Its total area is estimated at 1,480,100 sq. m. With respect to its surface T. forms an elevated, undulating valley hemmed in between high mt.-ranges. Lakes are numerous and of large size. In S. T. are the Byanbrog, commonly written *Yandok* or *Chamdok*; the Namtso or Tengrinor, and beyond this 4 other lakes, as yet unexplored. In the region of the sources of the Sutlej are the 2 fresh-water lakes Mapang, or Mansarantar, and Lang-Tso or Rakatal, both of which play a conspicuous part in the mythology and pilgrimages of the Hindus. Of the numerous salt lakes in Cashmerian T. the largest are the Tsomoriri, and the Tsomqualari, or Pang-Kong. Numerous rivers originate in T. The chief stream to the E. is Tsang-Po. To the W. the country is drained by the Sutlej, an affluent of the Indus, and the Indus. The streams descending from the Karakorum and watering E. Toorkistan unite in the Tarim River. In spite of the low N. lat., the climate is very cool, even at the bottom of the valleys, on account of the great elevation of the surface. The rich gold-deposits of T. were known to the anc. writers, and gave rise to the myth of the gold-digging ants. Rich coal-deposits are found, and borax has become an article of the world's commerce. Hot springs are numerous. Agriculture is of subordinate importance; the chief wealth of the country consists in its pastures and cattle. The prevalent characteristic of the landscape is its absolute destitution of forest; from the snow-fields far into the valleys the eye meets nothing but yellow, purple, or brown tints, square miles of bare rock without one speck of green. Meadows and fields are found only at the bottom of the larger valleys. Single trees may be cultivated at an elevation of 12,000 ft. Coarse-fibred plants and dung serve as fuel. Fruit trees can be cultivated with profit only in the S. E. and W. dists.; here apricots and currants form valuable articles of export. Among the cereals barley and various kinds of leguminous plants yield good crops; rye and wheat succeed in the valley of the Tsang-Po, but do not ripen until the end of Sept. The meadows are neglected. Hay is not made. The cattle are a cross between the Tibetan bull, the yak, and the Indian cow. Sheep are employed as beasts of burden. The horse is small but vigorous; asses are kept only by the leaders of caravans. The goat has under its covering of long, overlapping hairs a coat of fine wool. Goats are so numerous that they have become a nuisance. Poultry was introduced from Cashmere about 25 yrs. ago. Game is abundant in the higher locations. The musk-deer is the most valuable game; the kyang, a kind of wild horse; the yak, a colossal mt.-sheep, and another kind of sheep, of the size of a common deer. A bear of small size and a kind of leopard are the largest beasts of prey. Pop. about 5,250,000; cap. Lassa. Ethnographically, the Tibetans belong to the Mongolian, more especially to the Tur. race.

History and religion are more closely connected in T. than anywhere else. Tradition reaches back to the 1st century B. C. At that time the country was divided into numerous small kingdoms. But in the 1st century A. D. 53 of these kingdoms became tributary to the dragon throne of China, and a prince of India united the others, on the Yarlung River, into one state. Under his successors commerce with India and agriculture flourished. The religion of Booddha was introduced in T. under King Srongtsan Gampo (617-698 A. D.). It was brought to T. by some priests from Sindh. These priests brought also the art of writing with them, and translated the sacred books of the Indian Booddhists into Tibetan. Monasteries were built. At the same time the empire was strengthened by conquests, the administration was improved, and the royal residence was removed from the Yarlung River W. to Lassa. Imprudent preference showed to the priests led in the 9th century to interior disturbances and the decay of the empire. In place of Booddhism the old worship of evil demons, the Bumpa religion, was once more established, and the king was expelled. But after the lapse of 80 yrs. a descendant of the legitimate dynasty came again into power, and with him the Booddhist priests. The W. part of the country, however, separated, formed an independent state under the name of Maryul or Ladak, and became in the 16th and 17th centuries the cause of the establishment at Lassa of the temporal power of the Dalai Lama. The clergy, called lama—that is, the "upper," "superior"—soon recognized the unassailable position of their chief as an excellent means of extending their influence. The number of monasteries increased rapidly. The high priest took up his residence in the celebrated monastery, Chabrang in Lassa. Some gross impositions by which, in the beginning of the 18th century, a prime minister succeeded in concealing the death of the Dalai Lama for several yrs. led to a Chi. interference. The Chi. govt. assumed superintendence over the election of the Dalai Lama and the administration of the country, and from that time it has kept a standing army in the country, and appoints all the officials. Thus T. became a Chi. prov. W. T., or Ladak, was in the last century exposed to frequent invasions of Tur. tribes from Toorkistan. The kings devoted themselves exclusively to religious exercises. The people became enervated, and the great number of monasteries ate up the substance of the nation. Thus the country fell without a blow to Cashmere when (in 1834) the ambitious ruler of that country, Runjeet Singh, invaded it and incorporated it with his kingdom as a prov. Cashmere also attempted to conquer the W. valleys of Gilgit, Hunza, Nagar, and Yassin. The conquest of Gilgit was partly successful; the minor communities, however, in the

more elevated valleys, are still independent and inaccessible to Europeans.

**Language and Literature.**—The lang. is monosyllabic, and forms words and sentences by juxtaposition of roots and particles; with the verbs, however, changes in the roots are quite frequent. There is considerable resemblance between the Tibetan lang. and the dialects of N. Burmah. A circumstance of particular interest is this: the Tibetan became a written and literary lang. more than 1900 yrs. ago; nevertheless, on account of the religious or idolatrous reverence with which the written word is regarded by the Booddhists, the Tibetan lang. has maintained its written forms of sounds unchanged up to this very day, while the style and the oral speech underwent considerable alterations. In 632 A. D. the Indian Devanagari alphabet was adapted to the Tibetan lang., and from it are derived the quadrangular letters of the Mongols; it is written from the left to the right. King Srongtsan Gampo ordered the sacred Indian books treating on Booddhist doctrines to be translated into Tibetan. The work of translation was carried on with a remarkable zeal. King Srongtsan Gampo and his learned translators also issued books written in their native tongue, and native lit. developed itself on a larger scale; even Mongolians write in Tibetan, as it is the lang. in the divine service. In the beginning of the 18th century all the Sans. translations were collected in 2 large and voluminous works, to which were added the sacred and profane native publications of different periods. These compilations bear the title of *Kanjor* ("The Translated Word" of Booddha) and *Tanjor* ("Translation of the Doctrine"). The *Kanjor* contains 100 vols., which are classed under 7 divisions—discipline, transcendental wisdom, association of Booddhas, jewel-peak aphorisms, deliverance from emancipation, from existence, mysticism. The *Tanjor* comprises 225 vols., divided into mysticism and discipline; its contents are of a more miscellaneous character. [From orig. art. in *J.'s Univ. Cyc.*, by E. SCHLAGINTWEIT.]

**Thibodeaux**, tib-o-dô', cap. of Lafourche parish, La., on R. R. and Bayou Lafourche, 55 m. W. of New Orleans. Prin. business, planting and mechanical working. Pop. 1870, 1922: 1880, 1515.

**Thick-Knee**, a name applied to the species of the genus *Edicnemus*. These belong to the family of Charadriidae or plovers, and are distinguished among them by the moderately long and straight bill, which is compressed and wedge-shaped at the terminal half, the linear open nostrils, some distance from the base of the bill, and the elongated tarsi covered with hexagonal scales. The species are peculiar to the Old World, save one, which has been described from Peru. They are migratory birds, and resort to the temperate regions to rear their young.

**Thierry**, té-à-re' (JACQUES NICOLAS AUGUSTIN), b. at Blois May 10, 1795, ed. at the coll. of his native town and the normal school of Paris; attached himself in 1814 to Saint-Simon; became in 1817 a contributor to *Le Censeur européen*, edited by Comte, and afterward to the *Courier français*, in which he pub. in 1830 *Lettres sur l'Histoire de la France*; put forth in 1835 his *Histoire de la Conquête de l'Angleterre par les Normands*. To the latter period of his life belong *Dix Ans d'Etudes historiques et Récits des Temps mérovingiens*. By Guizot he was appointed to edit one part of the *Collection des Monuments inédits de l'Histoire de France*—namely, the *Recueil des Monuments inédits de l'Histoire du Tiers État*, which led him to write his *Essai sur l'Histoire de la Formation et des Progrès du Tiers État*. D. May 22, 1856.—His brother, AMÉDÉE SIMON DOMINIQUE THIERRY, b. at Blois Aug. 2, 1797, became prof. of hist. in Besançon in 1828, prefect of the dept. of Haute-Saône in 1830, member of council of state in 1838, senator in 1860. Wrote *Histoire des Gaulois jusqu'à la Domination romaine*, *Histoire de la Gaule sous l'Administration romaine*, *Histoire d'Attila*, etc. D. Mar. 26, 1873.

**Thiers**, té-àir' (LOUIS ADOLPHE), b. at Marseilles Apr. 16, 1797, studied law at Aix; was admitted to the bar in 1818, and removed in 1821 to Paris. Here he became a contributor to the *Constitutionnel*. In 1823 he began to publish his *Histoire de la Révolution française*, finished in 1827; and this book at once gave him rank among the great historians and made his name popular throughout Fr. In 1830 he founded the *National* in connection with Mignet and Armand Carrel, drew up the protest against the *ordonnances* of July 26, and took an active part in the revolution. On Oct. 11, 1832, he was made minister of commerce and public works in Dec.; returned to it 1834; resigned with all his colleagues in Jan. 1836, but was made prime minister and minister of foreign affairs in Feb.; in Aug., however, he retired from the govt. altogether. On Mar. 1, 1840, he was again made prime minister, but he resigned in Oct. He now retired from public life for several yrs.; visited Eng., Sp. It., and Ger., studying battle-fields, ransacking archives, and making other preparations for his great work, *Histoire du Consulat et de l'Empire*. When, after the revolution of 1848, the Empire began to develop from the policy of the pres., T. immediately went into opposition, and on Dec. 2, 1852, he was arrested, and shortly after banished from Fr. He returned, however, in Aug., but lived in retirement until 1863, when he was elected a member of the Representative Assembly by Paris. After the downfall of the Empire he developed an astonishing energy to save his country from utter ruin. On Sept. 17, 1870, he started on a tour to Lond., St. Petersburg, Vienna, and Florence in order to procure foreign intervention, and on his return in the last days of Oct. he opened negotiations with Bismarck concerning an armistice. After the capitulation of Paris and the conclusion of the armistice he was elected a member of the National Assembly by 26 depts., Feb. 8, 1871, and on Feb. 17 the Assembly chose him chief of the executive. On Aug. 31 his term of office was fixed at 3 yrs., and his title "president of the republic." He was very successful in negotiating the peace; he saved Belfort and one milliard for Fr. And he was still more successful in procuring the



means of fulfilling the conditions of peace; the payment of the indemnification and the liberation of Fr. soil from Ger. occupation were effected in a surprisingly short time. The insurrection of the Commune was promptly put down, and order and regularity established in the administration. But his attempt at consolidating the "conservative republic" by legislative enactment failed, May 24, 1873, and he resigned. D. Sept. 3, 1877.

**Thin Plates, Colors of.** When any naturally colorless transparent substance is observed in extremely thin laminae by means either of reflected or of transmitted light, it exhibits vivid prismatic tints which vary with the thickness of the lamina and with the obliquity of the incident light. Such colors are beautifully seen in soap-bubbles resting on the surface of the liquid of which they are formed. In consequence of the subsidence of the material, the thickness gradually and uniformly increases down to the base. The tints therefore appear in parallel and horizontal zones or rings, the violet being uppermost. In this case the film is more dense than the surrounding medium (the air); but similar colors occur in films of liquid compressed between glass plates and in the fissures of transparent minerals; and inasmuch as they appear in such fissures *in vacuo*, it is evident that the presence of a material substance between the bounding surfaces of the fissure is not essential to their formation. The conditions under which these colors are produced were investigated by Newton. A concise account of his processes and results may be found in the article under this title in *J.'s Univ. Cyc.*

F. A. P. BARNARD.

**Thionville**, te-on-veel' [ancient *Theodonis Villa*; Ger. *Diedenhofen*], town of the present Ger. prov. of Alsace-Lorraine, on the Moselle, 19 m. N. of Metz, and in the midst of the broad level plain which the valley here exhibits. It is a walled city of the old school of fortification, ranking under that system as a third-class fortress. Bombarding batteries were commenced by the Prus. Nov. 16, and T. was bombarded from Nov. 22 until Nov. 24, 1870, when it capitulated. Pop. about 8000.

**Third Estate.** See *ESTATES, THE THREE*.

**Thirl'wall** (CONNOP, D. D., b. at Stepney, Middlesex, Eng., Feb. 11, 1797, at the age of 11 put forth *Essays and Poems on Various Subjects*, etc. (1809); took the Craven and Bell scholarships at Trinity Coll., Cambridge, 1815; grad. as senior chancellor's medallist 1818; became fellow and tutor there; studied law, and was called to the bar at Lincoln's Inn 1825; took orders in the Ch. of Eng. 1828; became rector of Kirby Underdale, Yorkshire; was for several yrs. examiner for the classical tripos at Cambridge, classical examiner in the Univ. of Lond., and visitor of St. David's Coll., Lampeter; wrote for Lardner's *Cabinet Cyc.* a popular *Hist. of Gr.*; was one of the eds. of the Cambridge *Philological Museum*, and became bp. of St. David's 1840, which post he resigned June 1874. D. July 27, 1875.

**Thirty-nine Articles of Religion.** When the Ref. was fairly introduced into Eng. under Edward VI. (1547-53), Abp. Cramer at first entertained the noble but premature project of framing an evangelical catholic creed in which all the Reformed chs. could agree in opposition to the Ch. of Rome, then holding the Council of Trent, and invited the surviving continental Reformers, Melancthon, Calvin, and Bullinger, to Lond. for the purpose. Failing in this scheme, he framed, with the aid of his fellow-Reformers, Ridley and Latimer, the royal chaplains, and the foreign divines, Bucer, Peter Martyr, and John à Lasco, whom he had drawn to Eng., the *Forty-two Articles of Religion* for the Eng. Reformed Ch. After passing through several revisions they were completed in Nov. 1552, and pub. in 1553 by "royal authority" and with the approval of convocation. The re-establishment of the papacy under the short but bloody reign of Mary (1553-58) set them aside, together with the *Edwardine Book of Common Prayer*. Under Elizabeth (1558-1603) the Articles were revised and permanently restored. They were reduced to *thirty-nine*, and brought into that shape and form which they have ever retained since in the Ch. of Eng. The Lat. edition was prepared under the supervision of Abp. Parker, with the aid of Bp. Cox of Ely (one of the Marian exiles) and Bp. Guest of Rochester, approved by convocation, and pub. by the royal press 1563. The Eng. edition, which is of equal authority, though slightly differing from the Lat., was adopted by convocation in 1571, and issued under the editorial care of Bp. Jewel of Salisbury 1571. They were made binding on all ministers and teachers of religion and students in the univs., but subscription was not always enforced with equal rigor, and bitterly complained of by nonconformists, who had scrupulous objections to the political articles. The Act of Uniformity under Charles II. imposed greater stringency than ever. But the Toleration act of William and Mary gave some relief by exempting dissenting ministers from subscribing Articles XXXIV. to XXXVI. and a portion of Article XXVII. Subsequent attempts to relax or abolish subscription resulted at last in the University Tests act of 1871, which exempts all students and graduates in the univs. of Oxford, Cambridge, and Durham, except divinity students, fellows, professors, and heads of colls., from subscription, and throws these insts. open to dissenters.

The P. E. Ch. in the U. S., after effecting an independent organization in consequence of the Amer. Revolution, adopted the *Thirty-nine Articles* of the mother Ch. at the General Convention held in Trenton, N. J., Sept. 12, 1801, but with sundry alterations and omissions in the political articles, which the separation of Ch. and State made necessary. The only doctrinal difference is the omission of all allusion to the Athanasian Creed, which is also excluded from the American editions of the Prayer Book.

(See HARDWICK, *History of the Articles of Religion*, Cambridge; SCHAFF, *Creeds of Christendom*, vol. i. 592, and iii. 485-522.)

PHILIP SCHAFF.

**Thirty Tyrants**, a body of 30 magistrates in Athens (404-403 B. C.). They were appointed from the aristocratic party by the Spartans, victorious in the Peloponnesian war. The tyrants were guilty of the most cruel and shameful acts, and after 1 yr. were expelled by Thrasybulus.

**Thirty Tyrants of Rome** were a set of military adventurers who from 253 to 288 A. D. attempted to establish their own power in various parts of the empire during the reigns of Valerianus and Gallienus. The number 30 is borrowed from that of the famous Athenian tyrants.

**Thirty Years' War, The** (1618-48), originated as a contest between the Prot. and R. Cath. parties in Ger. But the interference of foreign powers brought many non-religious interests into play. On the one side, during the whole struggle, stood Aus., supported by Sp. and Bavaria; on the other side the parties changed—first, Bohemia and the Palatinate, next a combination of N. Ger. princes under the leadership of Den., then Swe., and finally Swe. and Fr.; and in accordance with these changes the course of the war falls into 4 distinct periods.

Having no children of his own, Matthias (1612-19) appointed his cousin, Ferdinand of Styria, his heir, and Ferdinand, who had been educated by the Jesuits and was a fanatic, had made an oath while still a young man to extirpate Protestantism from his countries. In 1617 he was crowned king of Bohemia, and the persecutions immediately began. But the Prots., under the leadership of Count Thury, penetrated into the castle of Prague (May 23, 1618), threw the imperial councillors out of the windows, organized a general rising throughout the country, established a connection with Bethlen Gabor, prince of Transylvania, and invoked the aid of the Evangelical Union in Ger. Ferdinand, nevertheless, succeeded in being elected emp. of Ger. Aug. 28, 1619, after the death of Matthias, and secured the active support of Maximilian of Bavaria and the Holy League. An army of 30,000 men was organized and placed under the command of the Bavarian field-marshal Tilly, and the Prot. army which stood before the walls of Prague on the White Mountain was completely routed Nov. 8, 1620. Frederick now gave up in despair, and through the intervention of his father-in-law opened negotiations with Ferdinand. But Ferdinand knew no feeling but vengeance, and when Frederick in foolish confidence dissolved his army, Tilly rapidly overran the whole Palatinate, plundering and devastating, and at the diet at Regensburg (Mar. 6, 1623) Frederick was placed in ban, bereft of all his possessions, and the Palatinate was given to Maximilian of Bavaria.

At this point the war might have ended but for the imprudence and stubbornness of the emp. The discontent which his violent measures caused contributed much more than the exertions of the emigrants and the intrigues of the Eng. and Fr. courts to the formation of a union of the N. Ger. princes under the leadership of Den. The Dan. king, Christian IV., entered the scene in 1625 with a well-appointed army, subsidized by Eng. and Hol., but was defeated at Lutter-am-Barenberge, Aug. 27, 1626, by Tilly, who conquered Pomerania and Mecklenburg, and expelled the princes who had revolted against the emp. He then penetrated into the Dan. peninsula, and compelled Christian IV. by the Peace of Lubeck (May 22, 1629) to withdraw altogether from any interference in the affairs of Ger. In reward he was made duke of Mecklenburg by the emp. Here, again, a point was reached at which the war might have ended, and many circumstances pointed toward peace. But on Mar. 6, 1629, Ferdinand issued the "edict of restitution," ordering that all ecclesiastical estates secularized since 1552 should be returned to the Ch., and all immediate sees held by Prots. transferred to R. Cath. prelates, etc.; and in spite of the protest of Brandenburg, Sax., Hesse, Magdeburg, and other states, the edict was carried out by force in all the free imperial cities, such as Augsburg, Ulm, Regensburg, etc., and Tilly was ordered to move northward and crush all resistance. At this critical moment Gustavus Adolphus stepped forward, and the third phase of the war began.

In the latter part of June 1630 he landed in the island of Usedom, drove away the imperial garrisons from Pomerania and Mecklenburg, where he reinstated the expelled princes, and formed alliances with Hesse, Saxe-Weimar, Magdeburg, and Fr. But he proceeded with great caution, moving only on the basis of solid alliances guaranteed by the surrender of important fortresses and actual support of troops. While difficult negotiations with the electors of Brandenburg and Sax. detained him, Tilly pushed forward and took Magdeburg by storm, May 20, 1631. The electors of Brandenburg and Sax. now joined Gustavus Adolphus, and on Sept. 17, 1631, they met Tilly at Breitenfeld, near Leipsic, where in a murderous battle his army was nearly annihilated. The 2 electors then passed into Bohemia, while Gustavus Adolphus pushed onward into the Palatinate. On Apr. 15, 1632, Tilly was defeated a second time in the battle on the Lech. On May 17 Gustavus Adolphus and Frederick V. entered Munich. In this emergency the emp. commissioned Wallenstein to organize an army. Wallenstein saw the difficulties of the emp., and exacted very humiliating conditions. With an army as yet only half organized he cleared Bohemia in less than a month, and he then entered the Palatinate and took up a position at Nuremberg opposite the camp of Gustavus Adolphus. For 3 months the 2 armies stood facing each other without stirring. At last Wallenstein moved into Sax.; Gustavus Adolphus followed. At Lützen (Nov. 16, 1632) the battle took place. Gustavus Adolphus fell, but Wallenstein was defeated, and retreated to Bohemia.

With the death of the Swe. king the war changed character entirely. The religious motives disappeared, and gave place to merely political interests. Richelieu, who had subsidized Swe. from the beginning, and who considered the humiliation of the house of Hapsburg as the principal aim of his foreign policy, now declared war against Aus., and the participation of Fr. in the war forms the most bloody chapter. During the Fr. campaigns in Bavaria and Hesse



these countries were fearfully devastated. In 1646 over 100 v. were burned in Bavaria, and the inhabs. driven away. In Hesse 17 towns, 47 castles, and 400 v. had been destroyed during the war. The last contest took place in Bohemia, where the Swe. general, Count Königsmark, had conquered one part of Prague, and was about attacking the other when news came that the Peace of Westphalia had been concluded at Münster (Oct. 24, 1648). Negotiations of peace were first attempted in 1641, but failed on account of certain questions of etiquette. The final success in establishing peace was due to the complete exhaustion of Aus. The emp. gave up not his title, but the greatest part of his authority as head of the Ger. empire, while the power of the princes was so considerably extended that the empire became nearly dissolved. Hol. and Switz. were declared independent; Alsace was given to Fr., Pomerania to Swe. In the interior still greater changes took place. Only the religious affairs were now found comparatively easy to settle; the Peace of Passau (1655) was taken as a basis for the order established. (See Sir EDWARD CURT, *Lives of the Warriors of the Thirty Years' War.*) CLEMENS PETERSEN.

**Thistle** (A.-S. *thistle*), a name given to many stout spiny herbs of the order Compositae and of the genera *Cirsium*, *Carduus*, *Centaurea*, *Oenopordon*. A few have medicinal qualities, and some have fine flowers. The roots and leaves of some species were once eaten as food. The Canada T. (*Cirsium arvense*) is a noxious weed of European origin, now naturalized extensively in Amer.

**Thistle-Bird**, a name given to the *Chrysomitris tristis*, generally designated as the yellow-bird.

**Tholuck** (FRIEDRICH AUGUST GOTTFRED), b. at Breslau Mar. 30, 1799, studied theol. and Oriental langs. at the univs. of Breslau and Berlin; visited Eng. in 1825 and Rome in 1828; was appointed prof. of theol. at Berlin in 1824, and removed to Halle in 1826. Wrote *Speculative Trinitätslehre des spätern Oriens*, *The Sermon on the Mount*, *Wahre Weihe des Zweiflers*, etc. D. June 10, 1877.

**Thomas, or Didymus** ("the twin"), SAINT, one of the 12 apostles, of whose personal character and hist. nothing is known except by two or three allusions in the Gospel of John. The most important of these is his refusal to believe in the resurrection of Jesus until convinced by tangible proof.

**Thomas** (BENJAMIN FRANKLIN), LL.D., grandson of Isaiah, b. at Boston Feb. 12, 1813, removed to Worcester 1819; grad. at Brown Univ. 1830; admitted to the bar 1833; judge of probate for Worcester co. 1844-48; judge of Mass. supreme court 1853-59; resumed legal practice at Boston 1860, and M. C. 1861-63. Wrote *Law of Towns and Town Officers* and *Suggestions upon the Personal Liberty Law*. D. Sept. 27, 1878.

**Thomas** (EDWARD), F. R. A. S., b. in Lond., Eng., in Dec. 1813, received a careful education; entered the civil service of the E. I. Co. at an early age, and rose to posts of great responsibility, having been for several yrs. Brit. resident at Delhi; was distinguished for historical, antiquarian, and philological researches on Oriental subjects, and became on his return to Eng. prof. in the E. I. Coll. at Haileybury. Wrote *Coincidence of the Sassanids*, *The Hindu Kings of Kabul*, *Miscellaneous Essays on Oriental Subjects*, *Early Sassanid Inscriptions*, etc.

**Thomas** (FRANCIS), b. in Frederick co., Md., Feb. 3, 1799, ed. at St. John's Coll.; was admitted to the bar 1820; was a member of the house of delegates 1822, 1827, and 1829; M. C. 1831-41, and again 1861-69; gov. of Md. 1841-44; was pres. of the Chesapeake and O. Canal co. 1839; member of the State constitutional convention 1850; an active Union man during the c. war; delegate to Phila. "Loyalists' Convention" 1860, and U. S. minister to Peru 1872-75. D. Jan. 22, 1876.

**Thomas** (GEORGE HENRY), b. in Southampton co., Va., July 31, 1816. In 1836 young T. was appointed a cadet at the U. S. Military Acad., where he graduated July 1, 1840; was sent to Fla. with his company, participating in Major Wade's capture of 70 Seminoles, Nov. 6, 1841. In the war with Mex. T. was engaged in the defence of Ft. Brown, in the battle of Monterey and in that of Buena Vista. Transferred to W. Pt. in 1851, he served as instructor of cav. and artill. at the Military Acad. until 1854, when ordered to Cal. with his regiment, in which he had attained a captaincy Dec. 24, 1853. In May 1855 T. was appointed major of the newly organized 3d Cavalry. On Apr. 17, 1861, Va. in convention was hurried into passing a resolution of secession; two months later T. crossed the Potomac at the head of his command, and entered his native State to aid in the maintenance of the Union. In the latter part of Apr. he was promoted to be lieutenant-col. of 2d Cav. and col. May 3, 1861. Transferred to the field of active operations in the Shenandoah Valley, he commanded a brigade at the action of Falling Waters July 2, at Martinsburg July 2, and at Bunker Hill July 15, and was promoted to be brig.-gen. of volunteers in Aug. The battle of Mill Springs (Jan. 19-20, 1862), resulting in the defeat of Crittenden, was the most important victory yet gained in the W. The effect was to bring T. into general notice. Continuing in command of his division until Sept. 30, 1862, he was engaged in the movement on Nashville (Feb.-Mar.); in the Tenn. and Miss. campaign (Mar.-Apr.); in the march on Pittsburg Landing, where held in reserve; in command at Corinth June 5-22; and in operations in Ala., Tenn., and Ky. On the advance into Ky. he was appointed second in command of the Army of the Ohio; commanded the right wing at the battle of Perryville (Oct. 8) and subsequent pursuit of the enemy. In the battle of Murfreesboro' T. withstood the furious assaults of the enemy; he was engaged in the campaign of Middle Tenn., the passage of the Elk and Tenn. rivers (July-Sept.). At the battle of Chickamauga he commanded the right and centre, where the great struggle took place for the repossession of Chattanooga. The Rossville road was successfully held by T. during the first day's fighting. The hist. of the second day's battle justly entitles him to be

called the "Rock of Chickamauga." He now retired upon Chattanooga, which he proceeded to fortify, and here (Oct. 19) orders reached him placing him in command of the Army of the Cumberland; a week later (Oct. 27) he received the commission of brig.-gen. in the regular army; distinguished himself at the storming of Missionary Ridge, and throughout the campaign of 1864 during the almost daily engagements from May to Sept., resulting in the capture of Atlanta (Sept. 1). On Sept. 27 T. was detached from the main army in Ga., and placed in chief command in Tenn. with large discretionary powers. The advance of the Confed. gen. Hood was skillfully resisted at Duck River and Spring Hill; the battle of Franklin occurred Nov. 30, in which Hood suffered a severe defeat. By Dec. 16 the whole country knew of the disastrous defeat of the enemy, which was further supplemented by the intelligence of their pursuit beyond the Tenn. and utter destruction as an army. The appointment of maj.-gen. in the regular army was now bestowed upon him, and Cong. at its next meeting tendered him a vote of thanks. He commanded the military division of the Tenn. (1865-66); the dept. of the Tenn. (1866-67); the 3d military dist. (Ga., Fla., and Ala.), and the dept. of the Cumberland (1867-69). From May 15, 1869, he commanded the military division of the Pacific. D. Mar. 28, 1870. [From orig. art. in *J.'s Univ. Cyc.*, by GEORGE C. SIMMONS.]

**Thomas** (ISAIAH), LL.D., b. at Boston, Mass., Jan. 19, 1749, was a partner with his former master, a printer, in establishing the *Mass. Spy*, of which the first number appeared July 17, 1771; became obnoxious to the Brit. authorities on account of the support given by his paper to the movements preparatory to the Revolution; transferred his printing-office to Worcester 1774; pub. a long series of reprints of popular Eng. works, displaying good judgment in their selection; conducted for 26 yrs. (1775-1801) the celebrated *N. Eng. Almanac*; was author of a carefully prepared *Hist. of Printing in Amer.*; was founder and first pres. of the Amer. Antiquarian Society. D. Apr. 4, 1831.

**Thomas** (Rev. JESSE B.), D. D., b. in Edwardsville, Ill., July 29, 1832, grad. from Kenyon Coll., Gambier, O., in 1850; commenced a course of theological study at Rochester Theological Sem. in 1852, but relinquished it in consequence of ill-health; studied law, and was admitted to the Ill. bar 1855, and engaged in mercantile pursuits in Chicago for some yrs. In 1862 he entered the ministry in the Baptist Ch., as pastor of a ch. in Waukegan, Ill.; in 1864 was called to the Pierrepont St. Bap. ch. in Brooklyn, N. Y.; accepted a call to San Francisco in 1867; returned to Chicago as pastor of Michigan avenue Baptist ch. in 1871, and in 1874 became pastor of the consolidated First and Pierrepont st. Bap. chs., Brooklyn. Pub. *The Old Bible and the New Science and Significance of the Historic Element in Scripture*.

L. P. BROCKETT.

**Thomas** (JOHN), M. D., b. at Marshfield, Mass., in 1725, became an eminent phys.; was surgeon on the med. staff of Gov. Shirley's regiment 1747, but exchanged that post for the rank of Lieut.; attained the grade of col. 1759; commanded a regiment under Amherst at Crown Point 1760, and took part in the capture of Montreal the same yr.; was a delegate in 1774-75 to the Mass. provincial cong., by which he was appointed brig.-gen. Feb. 9, 1775; received the same rank from the Continental Cong. June 22, and was promoted to maj.-gen. Mar. 6, 1776; was in charge of the fortification of Dorchester Heights Mar. 4, 1776, which led to the speedy evacuation of Boston by the Brit.; succeeded to the command of the remains of the army then besieging Que., where he arrived May 1, finding the smallpox prevalent in camp; was forced to raise the siege and retreat, but was attacked by the epidemic, and d. at Chambly June 2, 1776.

**Thomas** (JOHN J.), b. near Aurora, Cayuga co., N. Y., in 1810, became a distinguished writer on agriculture and pomology; was assistant ed. of the *Genesee Farmer* 1834-39, horticultural ed. of the *Albany Cultivator* 1841-53, assistant ed. of the same and of the *Country Gentleman* for many yrs. from 1853; contributed to and conducted various reviews and periodicals, etc.

**Thomas** (JOSEPH), M. D., LL.D., b. in Cayuga co., N. Y., about 1811, ed. at the Rensselaer Inst., at Yale Coll., and in med. at Phila.; resided in India 1857-58, engaged in the study of Oriental langs.; spent some months in Egypt with a similar object; was prof. of Lat. and Gr. at Haverford Coll., Pa., and gave private lessons in the classics at Phila. He was co-ed. with Thomas Baldwin of a *Pronouncing Gazetteer* and of a *New and Complete Gazetteer of the U. S.*; pub. *A First Book of Etymology*, etc., and has made pronunciation and etymology a special feature in all the works of reference published by him.

**Thomas** (LORENZO), b. in Newcastle, Del., Oct. 26, 1804, grad. from the U. S. Military Acad. in 1823, serving with the 4th Inf. in Fla. until 1831; as adjutant 1829-31; on duty in the adjutant-gen.'s office at Wash. from June 1833 to Sept. 1836; on quartermaster duty in the Fla. war 1836-37, and at Wash. 1837-38; served as chief of staff of the army in Fla. 1839-40; at Wash. 1840-46; in the war with Mex. he served as chief of staff to Maj.-Gen. Butler. In 1852 he became lieutenant-col., and served as chief of staff to Lieut.-Gen. Scott from Mar. 1853 to Mar. 7, 1861. Brig.-gen. and adjutant-gen. of the army Aug. 3, 1861, but from 1863 employed on special duty in organizing colored troops, inspection tours, etc., until Feb. 1869, when retired from active service. D. Mar. 2, 1875.

**Thomas** (PHILEMON), b. in N. C. in 1764, served in the war of the Revolution; resided some yrs. in Ky., where he was chosen to the legislature; afterward settled in La.; headed the insurrection in W. Fla. against the Sp. gov't. 1810-11; was maj.-gen. of La. militia in the U. S. service 1814-15, and M. C. 1831-35. D. Nov. 18, 1847.

**Thomas** (PHILIP FRANCIS), b. in Talbot co., Md., Sept. 12, 1810, was admitted to the bar 1831; was elected to the State constitutional convention 1836; was a member of the legislature 1838 and 1843-45; M. C. 1839-41; subsequently



judge of the land-office court of the E. Shore of Md.; was gov. of Md. 1848-51; became U. S. com. of patents 1860; succeeded Howell Cobb as sec. of the treas. in Pres. Buchanan's cabinet from Dec. 1860 to Jan. 11, 1861; was elected U. S. Senator Mar. 1867, but not admitted to a seat, and was elected a Rep. in Cong. 1874.

**Thomas** (THEODORE), MUS. D., b. in kingdom of Hanover in 1835, received his musical education from his father; in 1845 accompanied his family to Amer., where he joined orchestra of the Italian Opera in New York, and played first violin in the orchestra which accompanied Jenny Lind in her first Amer. concerts; in 1861 established the orchestra which became famous under his management, and in 1864 gave his first symphony concerts in New York. In 1869 started on his first annual tour of the prin. Amer. cities; director of Coll. of Music, Cincinnati, O., 1877, but resigned in 1880.

**Thomas à Kempis.** See KEMPIS.

**Thomas Aquinas.** See AQUINAS (THOMAS).

**Thomas, Christians of St.** See CHRISTIANS OF ST. THOMAS.

**Thomas the Rhymer.** See RHYMER, THE.

**Thom'aston,** on R. R., Litchfield co., Conn. Pop. tp. 1880, 3,225.

**Thomaston,** Knox co., Me., on R. R. and St. George River, specially noted for its large shipments of lime, is the site of the Me. State prison. Pop. tp. 1870, 3,092; 1880, 3,017.

**Thom'sville,** on R. R., cap. of Thomas co., Ga., and centre of trade for a productive region. Pop. 1870, 1,651; 1880, 2,555.

**Thomists.** See AQUINAS (THOMAS).

**Thompson** (BENJAMIN). See RUMFORD, COUNT.

**Thompson** (CEPHAS G.), b. at Middleborough, Mass., about 1812, son of a portrait-painter, by whom he was trained to the same business; became one of the leading portrait-painters of New York; gained also much reputation by his ideal pictures; went to New Bedford 1847; soon afterward returned to Boston; spent 7 yrs. (1852-59) in it; made nearly unique copies of the Staffa Madonna of Raphael and the famous *Beatrice Cenci*.

**Thompson** (DANIEL PIERCE), b. at Charlestown, Mass., Oct. 1, 1735, settled at Montpelier, Vt., 1824; became register of probate; was clerk of the legislature 1830-33; compiled a vol. of statutes (1835); was co. judge of probate 1837-40; clerk of the co. 1843-45; afterward clerk of the supreme court and sec. of state 1853. Author of several novels, chiefly illustrative of Vt. life and of Revolutionary history—e. g. *May Martin*, *The Green Mountain Boys*, *Locke Amesen*, or *the Schoolmaster*, etc. D. June 6, 1868.

**Thompson** (ELIZABETH), b. in Eng. about 1850, acquired sudden celebrity from her painting of *The Roll-Call*, exhibited at the Royal Acad., Lond., 1874, highly admired by the Prince of Wales, and purchased by the queen; visited It. 1875; has painted *The Battle of Balaklava*, etc.; was married about 1878 to Capt. W. F. Butler.

**Thompson** (GEORGE W.), b. in O. in 1806, grad. at Jefferson Coll., Pa., 1836, was admitted to the bar; settled in Western Va., where he became U. S. dist. atty. 1849; was M. C. 1851-52, and was subsequently judge in W. Va. Wrote *A Dissertation on the Historical Right of Va. to the Territory N. W. of the O., A Life of Hon. Linn Boyd*, etc.

**Thompson** (JACOB), b. in Caswell co., N. C., May 15, 1810, grad. at the Univ. of N. C. 1831, was admitted to the bar 1834; was a Dem. M. C. 1839-51; chairman of the committee on Indian affairs; opposed the Compromises of 1850; sec. of the interior under Pres. Buchanan from Mar. 1857 to Jan. 7, 1861; gov. of Miss. 1862-64, and subsequently aide-de-camp to Gen. Beauregard and inspector-gen. for the dept. of Miss. D. Mar. 24, 1885.

**Thompson** (JAMES), b. at Middlesex, Berks co., Pa., Oct. 1, 1806, became a practical printer; studied law; was admitted to the bar 1828; sat in the Pa. legislature 1832-34; was speaker of the house 1834, judge of the dist. court 1836-42; a Dem. M. C. 1845-51, and judge of the supreme court of Pa. 1857-72, serving as chief-justice during the latter part of his term. D. Jan. 28, 1874.

**Thompson** (JOHN). See APPENDIX.

**Thompson** (JOHN B.), b. in Ky. in 1810, was a Whig M. C. 1841-43 and 1847-51; afterward lieut.-gov., and was U. S. Senator 1853-59. D. Jan. 7, 1874.

**Thompson** (JOSEPH PARRISH), D. D., LL.D., b. at Phila. Aug. 7, 1819, grad. at Yale 1838; studied theol. at Andover and at New Haven; became pastor of the Chapel st. Congl. ch., New Haven, Nov. 1840; was minister of the Broadway Tabernacle, New York, 1845-72; was one of the founders of the *New Englander* and of the *New York Independent*; was a manager of the Amer. Congl. Union and of the Home Missionary Society; originated in 1852 the plan of the Albany Congregationalist convention; devoted much research to Oriental subjects, especially Egyptology. He resided from 1873 several years in Berlin, Ger. Wrote *Christianity and Emancipation*, *Man in Genesis and Geology*, *Theology of Christ from His Own Words*, etc. D. Sept. 20, 1879.

**Thompson** (LAUNCE), b. in Queen's co., Ire., in 1833, came with his widowed mother to Albany, N. Y., 1847; began the study of med.; learned drawing in the mean time; developed a remarkable talent for medallion portraits; settled in New York Nov. 1858, and became a prominent member and officer of the Acad. of Design. Among his works are busts of Edwin Booth as Hamlet, Bryant, and Gen. Dix, and a colossal statue of Napoleon.

**Thompson** (MORTIMER M.), b. at Riga, N. Y., in 1831, studied for a time at Mich. Univ., but left before graduating; was for some time connected with a travelling theatrical company; became about 1852 a clerk in a jewelry store in New York; wrote some humorous letters in the *Detroit Advertiser*, which procured him employment on the New York press, and subsequently pub. several humorous vols. which had a wide circulation. Wrote *Doesticks—What he Says*, *Pluribustah*, *Nothing to Say*, etc. D. June 26, 1865.

**Thompson** (RICHARD W.), b. in Culpeper co., Va., June 9, 1809, received a classical education; was a clerk in a store in Louisville, Ky.; afterward a school-teacher in Lawrence co., Ind., but studied law at the same time, and was admitted to the bar in 1834. In the same yr. he was elected to the State legislature of Ind., and re-elected in 1835. In 1836 he became a State senator; in 1841 was a delegate to the Republican conventions of 1860, 1864, 1868, and 1876, and entered Pres. Hayes's cabinet in 1877 as sec. of the navy.

**Thompson** (SMITH), LL.D., b. at Amenia, N. Y., in 1767, grad. at Princeton 1788, studied law with Chancellor Kent; became dist. atty. in the middle dist. of N. Y. 1801; was judge of the N. Y. supreme court 1802-1814, chief-justice 1814-18; sec. of the navy in the cabinet of Pres. Monroe 1818-23, and associate justice of the U. S. supreme court from 1823 to his death, Dec. 18, 1834.

**Thompson** (WADSWORTH), b. at Pikesville, S. C., Sept. 8, 1798, grad. at S. C. Coll. 1814; was admitted to the bar 1819; was a member of the legislature 1826-30; served as solicitor for the W. circuit 1830; was appointed brig.-gen. of militia; Whig M. C. 1835-41; in 1840 chairman of the committee on military affairs; was minister to Mex. 1842-44; negotiated 2 important treaties with that country; obtained the release of more than 200 Texan prisoners confined in military prisons, and pub. *Recollections of Mexico*. D. Nov. 23, 1868.

**Thompson** (WILLIAM), b. at Belfast, Ire., Nov. 2, 1805, was a distinguished promoter of science, of the fine arts, and of researches in every dept. of nat. hist.; was long pres. of the Nat. Hist. and Philosophical Society of Belfast; contributed more than 70 papers on bot., zoology, and especially ornithology, to the *Transactions of societies*. Wrote *The Nat. Hist. of Ire.* D. Feb. 17, 1852.

**Thompson** (ZADOCK), b. at Bridgewater, Vt., May 23, 1796, grad. at the Univ. of Vt. 1823; was tutor there 1825; pub. a *Gazetteer of Vt.*, a *Hist. of the State of Vt.*; removed to Hatley, Canada East, 1833; pub. a *Geog. of Canada*; studied theol., and took deacons' orders in the P. E. Ch. May 27, 1835; returned to Burlington, Vt., 1837; became a prof. in the Vt. Epis. Inst.; pub. his chief work, *The Hist. of Vt., Natural, Civil, and Statistical, and The Geog. and Geol. of Vt.*; was State geologist 1845-48; was prof. of chem. and nat. hist. in the Univ. of Vt. 1851-53; visited Europe as Vt. commissioner to the Universal Exposition; was appointed State naturalist 1853. D. Jan. 19, 1856.

**Thompsonville,** on R. R., Hartford co., Conn., 18 m. N. of Hartford. Pop. 1880, 3,794.

**Thompson** (CHARLES), LL.D., b. at Maghera, Derry, Ire., Nov. 29, 1729, came to Amer. at the age of 11; was enabled by an elder brother to enter an acad. at Thunder Hill, Md.; became a teacher in the Friends' acad. at Newcastle; removed to Phila., where he became an efficient teacher and obtained the friendship of Dr. Franklin; served in 1758 on a commission to treat with the Iroquois Indians at Oswego, N. Y.; was also concerned in negotiations with the Delaware Indians; was for some yrs. engaged in mercantile business; was sec. of the Amer. Society, and prominent in literary and patriotic associations; was chosen sec. of first Continental Cong. on its assembling at Carpenters' Hall, Phila., Sept. 5, 1774; filled same post to successive Congs. until 1789. Wrote *A Synopsis of the Four Evangelists*, and translated the Septuagint. D. Aug. 16, 1824.

**Thompson** (EDWARD), D. D., LL.D., b. at Portsea, near Portsmouth, Eng., in Oct. 1810, came with his parents to the U. S. in 1819, and settled at Wooster, O.; received a good classical education; grad. in med. at the Univ. of Pa. 1829; commenced practice as a phys. at Wooster, but, experiencing a change in his religious views, became in 1833 a minister of the M. E. Ch.; preached at Detroit, Mich., 1836; was prin. of the Meth. Sem. at Norwalk, O., 1837-44; ed. of the *Ladies' Repository* at Cin. 1844-46; first pres. of the O. Wesleyan Univ. at Del., O., 1846-60; ed. of the *Chr. Advocate* at New York 1860-64, when he was chosen a bp.; made a missionary voyage around the world. Wrote *Educational Essays*, *Moral and Religious Essays*, etc. D. Mar. 22, 1870.

**Thomson** (JAMES), b. in Roxburghshire, Scot., Sept. 11, 1700, studied for 6 yrs. at the Univ. of Edinburgh; went to Lond. in 1724, where he was for several months tutor in a nobleman's family. In 1726 appeared his poem *Winter; Summer* followed in 1727, *Spring* in 1728, and *Autumn* in 1730, completing *The Seasons*. In the interval he had pub. a *Poem Sacred to the Memory of Sir Isaac Newton*, and written *Sophonisba*, a tragedy. He then travelled for 2 yrs. as tutor to the son of Lord Chancellor Talbot, and wrote a poem on *Liberty*. He wrote also *Agamemnon*, a tragedy; *Edward and Eleanora*, a drama; *Alfred*, a masque; *Tancred and Sigismunda*, a tragedy; *The Castle of Indolence*, and *Coriolanus*, a tragedy. D. Aug. 27, 1748.

**Thomson** (JAMES BATES), LL.D., b. in Springfield, Vt., May 21, 1803. His early life was spent on his father's farm, and he enjoyed the advantages of dist.-school training during the winter seasons; attended a neighboring acad. for a few weeks, and commenced teaching a winter dist. school in his own town at 16; was for some yrs. alternately a farm-hand, a teacher, and a student in Chester and Kimball Union acads. He entered Yale in 1830, grad. in 1834, and in 1835-42 took charge of a newly founded acad. at Nantucket, Mass.; resigned and removed to Auburn, N. Y. In 1843 he conducted the mathematical exercises in the first teachers' institutes held in this country, and for 4 or 5 yrs. was actively engaged in attending teachers' institutes and promoting their efficiency. In 1845 he assisted in the organization of the N. Y. State Teachers' Association, and in 1864 was elected its pres. He returned to New York city in 1846, and afterward to Brooklyn, and prepared many mathematical text-books. D. June 22, 1883.

**Thomson** (SAMUEL), M. D., b. at Alstead, N. H., Feb. 9, 1769, was the originator of the "Thomsonian system" of med. practice. Author of *Materia Medica and Family Physician*, *New Guide to Health*, etc. D. 1843.



**Thomson** (THOMAS), b. at Dailly, Ayrshire, Scot., in 1768, ed. at the Univ. of Glasgow; became an advocate 1793, deputy clerk registrar of Scot. 1806, prin. clerk of session 1828, and pres. of the Bannatyne Club 1832; was one of the founders of the *Edinburgh Review*, and occasionally acted as its ed.; was esteemed the most learned antiquary in Scot., and as such is frequently referred to in the writings of Sir Walter Scott. D. Oct. 2, 1852.

**Thomson** (WILLIAM), D. D., F. R. S., b. at Whitehaven, Cumberland, Eng., Feb. 11, 1819, ed. at Shrewsbury School; was successively scholar, fellow, tutor, and provost of Queen's Coll., Ox., where he grad. 1840; was ordained deacon 1842 and priest 1843; preached the Bampton lectures on *The Atoning Work of Christ, viewed in Relation to some Current Theories* (1853); became rector of All Souls', Marylebone, 1855; contributed to the *Oxford Essays* (1855) and to *Sermons at Westminster Abbey for the Working Classes* (1858); was preacher of Lincoln's Inn 1858-61; was appointed chaplain to the queen 1859, bp. of Gloucester and Bristol Dec. 1861, and was "enthroned" abp. of York 1863; is one of the lords of the privy council, gov. of the Charter-house and of King's Coll., Lond.; ed. the *Aids to Faith*; wrote *The Limits of Philosophical Inquiry*, etc. Became pres. of Pal. exploration fund.

**Thomson** (Sir WILLIAM), F. R. S., LL.D., son of Prof. James, LL.D., b. at Belfast, Ire., in June 1824, ed. at the Univ. of Glasgow and at Peterhouse, Cambridge, where he grad. in 1845 as second wrangler, and was elected fellow; became in 1846 prof. of natural philos. at the Univ. of Glasgow; was ed. from 1846 to 1853 of the *Cambridge and Dublin Mathematical Journal*, in which he pub. *The Distribution of Electricity on Spherical Conductors*; invented quadrant and portable electrometers of extreme delicacy; was also the inventor of the mirror galvanometer and the siphon recorder, instruments of great value in submarine telegraphy; made important experiments in magnetism, and especially in heat, among which were the specific heat of substances, the heating of india-rubber by sudden stretching, and the relation between the force expended and the heat produced in the compression of a gas. His extraordinary and fruitful generalization concerning the universal tendency in nature to the dissipation of mechanical energy was given to the world in the *Philosophical Magazine* in 1852. He delivered in 1855 the Bakerian lecture on *The Electro-Dynamic Properties of Metals*; delivered the Rede lecture in 1866, in which yr. he was knighted; was pres. of the Brit. Association at its Edinburgh session of 1871; elected pres. of the Geological Society of Glasgow 1872, and chosen fellow of St. Peter's Coll., Cambridge, 1872.

**Thomson** (WILLIAM McCLEURE), D. D., b. in Springfield (now Spring Dale), O., Dec. 31, 1806, grad. at Miami Univ. 1826; entered Princeton Sem. 1829; was missionary in Jerusalem 1832-33, and in Beirut 1833-76; went to Scot. in 1876, and returned to U. S. 1877. Beside numerous and important contributions to the *Bibliotheca Sacra*, wrote *The Land and the Book*, one of the best works on Pal.—His son, WILLIAM HANNA, M. D., b. in Beirut, Syria, Nov. 1, 1833, grad. at Wash. Coll. 1857, came to New York 1861, and was made prof. of materia medica and nervous diseases in the Univ. of N. Y. 1869. Wrote *Christ in the O. T.*

**Thor**, the wild god of strength and the terrible enemy of all evil spirits, was the most characteristic figure in the Scandinavian mythology. The prin. attributes with which he was furnished are—the belt which doubles his strength when he fastens it around his waist; the hammer, Mjölnir, with which he can crush mountains, and which always returns to his hand when he throws it; and the chariot in which he rides across the heavens, thereby producing thunder and lightning.

**Thoreau**, tho-rō' or thō'rō (HENRY DAVID), b. July 12, 1817, grad. at Harvard 1837; taught school until 1840; afterward turned his hand to various occasional employments; determined, however, to work no more than necessary to provide for his extremely limited wants, devoting the rest of his time to study and the contemplation of nature; spent 2 yrs. from Mar. 1845 as a hermit in Concord on the shore of Walden Pond. His favorite studies were the classics, especially Homer, old English lit., and Oriental poetry and philosophy. He wrote *Walden, or Life in the Woods*, interesting for its descriptions of natural scenery and of the habits of birds, insects, and wild animals. D. May 6, 1862.

**Thorium**, also **Thorinum**, one of the rare metals, is a hydric silicate of thoria, or oxide of thorium. It is a gray metallic powder, which burns with great brilliancy to snow-white infusible *thoria* or *thorina*. Water does not act upon it, and nitric and sulphuric acids with difficulty, though muriatic acid attacks and dissolves it powerfully.

**Thorn'back**, [i. e. "back with prickles" or "thorns"], the name given in some parts of Eng. to the *Rosa cæcata*. This is a short-snouted ray, whose dorsal surface, especially about the snout and interorbital space, is covered with small spines, and along the middle of the back and tail with a row of large spines; the male has further still larger thorns on the sides of the head and pectoral fins, and the female has numerous spines, each arising from a large roundish base. It is very abundant along some parts of the Eng. coast.

**Thorn'borough** (Sir EDWARD), b. in 1756, entered the Brit. navy; was first lieut. of the Falcon, one of the vessels which participated in the attack on Bunker Hill 1775; took an active part in subsequent naval actions during the war of the Amer. Revolution. D. Apr. 9, 1834.

**Thorn'ton** (Sir EDWARD), LL.D., K. C. B., b. about 1820, entered the diplomatic service in 1842 as attaché at Turin; became paid attaché in Mex. 1845, and sec. of legation there 1851; rendered valuable unofficial services in facilitating the negotiation of the treaty of Guadalupe Hidalgo 1848; was sec. of legation at Buenos Ayres 1852-53; appointed *chargé d'affaires* to Uruguay 1854; also commissioner to Paraguay, which country he repeatedly visited; minister to the Argentine Republic 1859; envoy to Brazil 1865-67, and

envoy to the U. S. Dec. 1867-81; knighted Aug. 9, 1870; a member of the joint high commission on the Alabama claims 1871; a privy councillor 1871; arbitrator of the Mex. and Amer. claims commission 1873, and participated in the Centennial ceremonies at Phila. July 4, 1876. He was appointed Brit. ambassador to Rus. in 1881.

**Thornton** (JOHN WINGATE), b. at Saco, Me., Aug. 12, 1818, grad. at Cambridge Law School 1840; was one of the founders of the N. Eng. Historic-Geological Society, v.-p. of the Amer. Statistical Association and of the Prince Publication Society; contributed to the *Historical Magazine* and other periodicals upon antiquarian subjects, and was the orator before the Genealogical Society Nov. 21, 1870, on the 250th anniversary of the signing of the compacts in the cabin of the Mayflower. Author of *Genealogical Memoir of the Gilbert Family, Lives of Isaac Heath, John Bowles, and Rev. John Eliot, Jr.*, etc. D. June 6, 1878.

**Thornton** (MATTHEW), b. in Ire. in 1714, came to Wicasset, Me., in youth; received an academic education at Worcester, Mass., and studied med.; accompanied Pepperell's expedition against Louisbourg as a surgeon 1745; became a phys. at Londonderry, N. H., and a col. of militia; was pres. of the convention which in 1775 assumed the gov. of N. H.; took his seat as a delegate to the Continental Cong. Nov. 4, 1776; signed the Dec. of Ind.; was afterward chief-justice of Hillsborough co., judge of the N. H. supreme court, and member of both branches of the legislature and of the council (1785). D. June 24, 1803.

**Thornton** (Sir WILLIAM), b. in Eng. about 1775, commanded the light brigade and advance of Gen. Ross's expedition up the Chesapeake May 1814; was severely wounded and made prisoner at Bladensburg; was exchanged for Com. Barney; commanded the advance of the Brit. army sent against New Orleans in Oct., and the detached corps which operated on the right bank of the Miss. in the battle of New Orleans, Jan. 8, 1815, when he was again severely wounded. D. Apr. 6, 1840.

**Thorn'town**, Ind. See APPENDIX.

**Thorn'well** (JAMES HENLEY), D. D., LL.D., b. in Marlborough dist., S. C., Dec. 9, 1812, grad. at S. C. Coll., Columbia, 1831; studied and taught till the summer of 1834, when he spent some weeks at Harvard Univ.; was settled over a small Presb. ch. in Lancaster, S. C., June 12, 1835; took the professorship of logic and belles-lettres in S. C. Coll. in Jan. 1838; resigned to take the pastorate of the Presb. ch. in Columbia in 1840; in 1841 went back to the coll. as chaplain and prof. of sacred lit. and the evidences of Christianity; from July to Dec. 1851 was pastor of the Glebe st. ch. in Charleston; went back once more to the coll., this time to be its pres., in Jan. 1852; in 1855 accepted the professorship of didactic and polemic theol. in the Theological Sem. at Columbia. He pub. *Arguments of Romantics Discussed and Refuted, Our Danger and Our Duty, and On the State of the Country*, etc. D. Aug. 1, 1862. R. D. HITCHCOCK.

**Thorpe** (THOMAS BANGS), b. at Westfield, Mass., Mar. 1, 1815, ed. at the Wesleyan Univ., Middletown, Conn.; studied art; resided at New Orleans from 1836 to 1839; raised volunteers for the Mex. war; was the writer of the first newspaper correspondence narrating military events on the frontier; pub. *Our Army on the Rio Grande and Our Army at Monterey*; was an active political speaker in the campaign of 1848; became known, under the pseudonym of "Tom Owen, the Bee-Hunter," as the writer of a series of tales of W. life; settled in New York in 1853, devoting himself alternately to literary and artistic pursuits; pub. *Linda Weiss, an Autobiography, A Voice to Amer.*, etc. His best-known painting, *Niagara as it Is*, was produced in 1860. He was city surveyor of New Orleans during the administration of Gen. Butler (1862-63). D. Sept. 20, 1878.

**Thorwaldsen**, tor'-wald'sen (ALBERT [BERTHEL]), b. at Copenhagen Nov. 19, 1770. His father, a native of Iceland, was a wood-carver and poor, but his ancestry, there is reason to believe, was of the noblest, running back to the old Dan. kings. He followed his father's calling, though with little enthusiasm, and soon excelled him in his humble art. His schooling was short and unprofitable until he was sent to the free school of the Acad. of Arts at Copenhagen. In Mar. 1797 he arrived in Rome. The first yrs. there were disappointing. The country was disturbed by war, and his unaided resources were unequal to his support. He was about returning home when his model of *Jason*, which Canova praised, attracted the admiration of an Eng. connoisseur, Thomas Hope, who gave the artist a commission to execute it in marble. This was the beginning of a great career. The familiar bas-reliefs *Night and Morning* were modelled in 1815, it is said in a single day of mental depression, to which the artist was subject. In 1819 T. revisited Copenhagen, was received with demonstrations of joy, was lodged in the palace of Charlottenburg, and welcomed in triumph by the chief cities of Prus., Sax., and Aus. as he visited them on his way back to Rome. In 1841 he went back to It., stayed a yr., then went to Copenhagen. The chief part of his fortune was left as a perpetual endowment for the museum at Copenhagen, which is raised around his grave, and contains all his works. T.'s works are very numerous—205 as mentioned by Thiele, the chief authority. They are of all dimensions and of every variety of theme, secular and religious, classical and Christian. D. Mar. 24, 1844. O. B. FROTHINGHAM.

**Thoth**. See HERMES TRISMEGISTUS.

**Thou, too, de** (JACQUES AUGUSTE), b. at Paris Oct. 8, 1553, studied law; was made councillor to the Parl. in 1578, councillor of state in 1588, v.-p. of the Parl. and keeper of the Royal Library in 1594. Henry III. and Henry IV. showed him great confidence, and employed him in many difficult diplomatic and political negotiations, but under the regency of Maria de' Medici he was slighted and retired from public life. Wrote *Historia sui Temporis* and an autobiography. D. May 7, 1617.

**Thousand Islands, The**, are in St. Lawrence River,



and are all included in the 40 m. next below Lake Ont. The islands are partly in Canada and partly in Jefferson and St. Lawrence cos., N. Y. Their number is reported to exceed 1800. The T. I. have become a favorite summer resort, and are remarkable for their great and diversified beauty.

**Thought, Train of.** See ASSOCIATION OF IDEAS.

**Thrace** was in anc. geog. the name of that part of modern Tur. which lies between the Black Sea, the Sea of Marmora, the Struma, and the Danube. It was inhabited by a race of unknown descent, whose savage and barbarous character was proverbial. Along the coasts the Grs. had planted several colonies—as, for instance, Byzantium, Calipolis, and Abdera—and during the Peloponnesian war the Thracians began to mix in the affairs of Gr., but without exercising any great influence. They were conquered by Philip of Macedonia, and T. passed from Macedonia into the hands of the Romans.

**Thrasher**, a name applied in different parts of the U. S. to the species of *Turdidae* or thrush-like birds belonging to the genera *Oreoscoptes* and *Harporhynchus*. These have a more or less long and decurved bill, which is scarcely or not at all notched near the tip, rather short and concave wings, and the tarsal scutellate anteriorly. *Oreoscoptes* is distinguished by its wings, which are much longer than the tail, and the slightly notched moderate bill. *Harporhynchus* has the wings decidedly shorter than the tail, the tail long and graduated, and the bill not notched and diversiform, but generally quite elongated and decurved. The color is rather plain, generally brownish or ash above, whitish or spotted on the breast.

**Threshing.** See THRESHING MACHINERY.

**Thrasylus**, one of the prominent leaders of the democratic party in Athens during the latter part of the Peloponnesian war; after the establishment of the 30 tyrants he was banished, and took up his residence at Thebes. The violent measures, however, instituted in Athens by the oligarchical govt. provoked him so much that he invaded Attica and seized the fortress of Phyle, descended into the Piræus and took a strong position on the hill of Munychia, and finally entered the city; a general amnesty was granted, and a democratic govt. established again, though in a modified form (403 B. C.). In 390 T. was killed.

**Three Rivers** [Fr. *Trois Rivières*], city, port of entry, and R. R. centre, is cap. of St. Maurice co. and of the dist. of Three Rivers, prov. of Que., Canada, on N. W. bank of river St. Lawrence, 90 m. above Que. and 90 m. below Montreal, at the mouth of the river St. Maurice, from which vast amounts of lumber are afforded to the commerce of T. R. Lumber, iron, and brick are largely manufactured and exported. A branch of Grand Trunk Railway terminates at Doucett's, on the opposite side of the St. Lawrence, with which point ferryboats ply regularly. Pop. 9296.

**Three Rivers**, R. R. Junc., St. Joseph co., Mich., 28 m. S. of Kalamazoo, on St. Joseph River, deals largely in peppermint oil and wheat, the products of the country. Pop. 1870, 1189; 1880, 2525.

**Thresher.** See FOX SHARK.

**Threshing Machinery.** Threshing is the separation of grain from the straw, as winnowing is the separation of threshed grain from the chaff. There are 2 methods of threshing—one by blows which beat out the grain; the other by a kind of trituration which breaks its hold on the straw. The former appears to have been developed from the latter. The earliest method of threshing was doubtless that of treading the grain to and fro by horses or oxen—a method still in common use on the small farms in our own country and elsewhere, especially for buckwheat, and notably for clover. The primitive method of beating out the grain was by means of a flail, an implement comprising a staff wielded by the thresher, and having at one end a swingle shorter, thicker, and heavier than the staff, to which it is connected by a flexible thong. The flail is uniformly used to this day where only small quantities of grain are to be threshed. These primitive methods, from the very earliest times until a very recent period, were the only ones by which grain was separated from the straw.

The first threshing-machine that could be considered a practical success, and which was the prototype of those that led to the displacement of the hand-flail, was that invented by Michael Menzies of E. Lothian in Scot., who used a number of flails attached to a revolving shaft driven by a water-wheel. This machine succeeded in threshing very rapidly, but the high velocity required soon broke and destroyed the flails. Afterward, in the year 1753, another Scotchman, Michael Sterling in Perthshire, constructed another thresher. This had a vertical shaft with radial arms working within a cylinder, the shaft being turned by a water-wheel. The sheaves were thrown in at the top of the cylinder and were beaten by the radial arms. This was followed by another machine, in which a number of rollers were arranged around an indented drum, the drum being revolved and the rollers rubbing out the grain. At a later date another Scotchman, Andrew Meikle, devised a machine in which rollers and drum were retained, but in which beating was substituted for rubbing. The first machine of this kind was made in 1786. In this, scutches were attached to the drum, and arranged to strike the grain from the straw. At first, this invention was adapted merely to detach the grain from the straw, and threw grain, chaff, and straw in a heap together. But early in the introduction of these machines screens were added, and the grain, separated from the straw, was passed to a winnower. Notwithstanding the comparative excellence of these early British machines, they have of course been much changed, and in fact nearly metamorphosed, and the steam threshing-machines exhibited at the annual agricultural shows in G. Brit. are in fact triumphs of mechanical engineering.

In this country threshing-machines were early invented. Those which first came into common and satisfactory use had the cylinder actuated by intermediate gearing from a

vertical driving-shaft, from the upper end of which extended radial arms. To the outer end of these arms was attached a whippertree, on which draught was exerted by a single horse. The 4 horses walked in a circular path, and thus gave rotatory movement to the vertical driving-shaft and rapid rotation to the cylinder. The sheaves, unbound, were fed with the heads first into the space between the cylinder and its concave. In some of the first of these machines shaking screens were so applied as to sift the grain and chaff from the straw, the latter being carried and deposited by itself, while the former passed to the hopper of a fanning-mill, which cleaned or separated the grain from the chaff, while a graduated system of sieves separated the small seeds, pigeon-weed, devil's-gut, etc.

The ordinary threshing-machine in use in the E. States comprises a railroad horse-power, commonly for 2 horses, and a thresher composed essentially of the toothed cylinder acting in conjunction with the toothed concave. An endless shaker formed with transverse wires, and operated like an endless belt, conveys the straw some distance in the rear of the thresher, a vibrating motion given to the belt shaking out the chaff and grain, these latter being passed to a fanning-mill, which separates the chaff, small seeds, etc. from the winnowed grain. In the Prairie States the threshing-cylinder "is made of skeleton form, having cast-iron heads, and the central annular brace of the same material; wrought-iron bars are arranged on these parts, and form the circumferential parts of the cylinder, being held in position by the external wrought-iron rings. The bars carry the teeth, the shanks of which pass through holes in the bars, and are held by nuts firmly screwed upon their inner ends; the uniformity in shape and size of the teeth arises from their being made by machinery properly shaped in dies under a drop-hammer. The concave is of cast iron, with slots in it which allow the grain to pass through to separate from the straw at the earliest possible stage of the threshing operation. The straw as it leaves the cylinder is flung back over several transverse series of inclined rods, which permit whatever grain may yet remain in the straw to drop upon a laterally vibrating shaker, arranged below at a slight angle to the horizontal, and serving to conduct the grain to the fan-mill, the rotating fan of the latter being placed under the centre of the threshing-cylinder, and securing far greater compactness of structure than was formerly obtained." The latest attempted improvement upon the ordinary thresher in Cal. lies in the utilization of the straw for fuel in the portable engines. The most advanced step, however, is found in the combined reaper and thresher. A large grain frame is supported on 2 heavy driving-wheels, and has 2 lighter ones in front arranged as guiding-wheels. Projecting from the side of this frame is a platform like that of an ordinary reaper, but about 12 ft. long. This runs at such height that the reciprocating sickle at the front will cut off the heads from the standing grain; the heads fall on an endless apron running longitudinally upon the platform, and are carried by this to a hopper that conducts them to a threshing-cylinder having a fanning-mill and straw-separator arranged behind it. The threshed and winnowed grain is thrown out from the fan-mill through a spout at the side directly into the mouth of a sack suspended under the spout. An attendant riding upon the platform ties the sacks when full, and throws them off upon the ground to be collected at leisure. The driving parts receive their motion from the large or driving-wheel by means of suitable bands and gearing. This apparatus was designed to be drawn by 10 horses. Something similar to this has been projected in Australia. [From orig. art. in *J. S. Unto. Cyc.*, by PROF. JAMES A. WHITNEY, LL.B.]

**Thrift**, the *Armeria vulgaris*, a seaside and mt.-plant (order Plumbaginaceæ), often grown in gardens as an edging for flower-borders.

**Thrips** (Gr. *θρίψ*), a genus of insects which gives name to the family Thripidae, an interesting group of degraded organisms, generally considered to be hemipterous, although their position is not quite established. The Thripidae are destructive to grain, flowers, and the bark of growing plants.

**Throat, Diseases of.** All of the several connecting parts of the throat are richly supplied with blood-vessels, lined by a mucous membrane, secreting mucus. They are therefore liable to hypersecretion of mucus, or catarrh, which may be acute, subacute, or chronic; to active and passive congestions, inducing redness, heat, and swelling; to active inflammations, with formation of sub-mucous abscess, erosion of the epithelial covering of the mucous membrane, or ulceration and sloughing of its deeper layers. Such destruction of soft tissue may induce necrosis of the underlying hard structures, the nasal and laryngeal cartilages. Inflammation may terminate in an exudation, developing organized membranes, as those of croup and diphtheria. Repeated congestions and inflammations tend to engorge and hypertrophy the structures of the mucous membrane and glandular bodies embedded in it. The papillæ of the back of the throat and of the columns of the fauces are very often thus enlarged. The surface is seen to be studded with prominent ovoid papules or tubercles, a condition known as "clergyman's sore throat," and technically as "papular pharyngitis." Polypoid growths of variable size develop in the nares, pharynx, and on and around the vocal cords—products of papular growth and of granulation process.

A most alarming and critical condition is acute œdema of the glottis. The secretion of the region of the larynx being suddenly checked, as by cold, or the seat of sudden determination of blood, serum transudes from the overloaded blood-vessels into the loose sub-mucous connective tissue, and creates a sudden dropsy and tumefaction. The distended, swollen structures overlap the opening of the glottis, and occupy the ventricles of the larynx, preventing inspiration, and threaten immediate death by suffocation.



The vocal cords may be affected by spasms, producing hoarseness, aphonia, and labored respiration. One of the vocal cords may be found paralyzed, inactive, and relaxed, while the other remains normal. Ulceration or inflammation may seriously damage the vocal cords. Extensive destruction of the vocal cords often occurs from syphilis and epithelial cancer.

Astringents—as cold water, alum, tannin, tincture of iron, and solutions of nitrate of silver—are employed to contract blood-vessels, lessen congestions and relaxations of surfaces. Caustics are used to remove papular and granular developments, and induce absorption of hypertrophied structure. Local applications are made to heal ulcers. Inflammation is checked, limited, and cured by warm solutions and vapors impregnated with salts of soda, ammonia, and potash, or in other cases by cold gargles or spray. The salines tend to increase and liquefy the secretions of the throat; resin oil and astringent agents lessen them; carbolic acid, chlorine, etc. disinfect them when septic. Anodynes are given to allay pain, either by the stomach or locally. Electricity is applicable directly to the paralyzed vocal cord. The knife is constantly of service in treating throat diseases, for the excision of the tonsils and uvula, opening abscesses, the incision of hard papules, preceding the use of caustics, removal of polypi, the scarification of oedema of the glottis, and for the operations of tracheotomy and laryngo-tracheotomy, whenever, by congestion, inflammation, ulceration, stenosis, tumors, cancer, sudden oedema, croupous or diphtheritic membrane, or whatsoever obstruction, the larynx is closed to the passage of air and death is imminent by suffocation.

E. DARWIN HUDSON, JR.

**Throop** (ENOS THOMPSON), b. at Johnstown, Montgomery co., N. Y., Aug. 21, 1784, studied law, was admitted to the bar in 1806, and removed to Auburn, N. Y.; was appointed clerk of Cayuga co.; elected to Cong. in 1814; appointed circuit judge of the 7th dist. of N. Y.; in 1838 was elected lieut.-gov. of N. Y., with Martin Van Buren as gov., and became acting gov. on the latter's retirement; re-elected in 1830 at head of the ticket; declining a third term, removed to Mich. Returned to N. Y. D. Nov. 1, 1875.

**Thrush**, the Eng. name applied to various species of the family Turdidae, and especially to those of the genus *Turdus*. The group in an enlarged sense corresponds with the family Turdidae, and embraces those birds like the song T., which have booted tarsi and whose breast is spotted in the young at least. In the typical T. the bill is conical, subulate, and shorter than the head, the tip of the upper mandible slightly decurved, the rictus provided with moderate bristles, the wings rather long and pointed, and with the first primary small, the tail nearly even, and the tarsi with continuous plates. The genus includes some of the finest songsters and most familiar birds of the N. hemisphere.

**Thrush**, an abscess in the sensitive frog of the horse's foot. Cleanliness and the paring away of loose pieces of the frog are useful toward a cure. Carbolic-acid lotions or occasional sprinkling with calomel will materially hasten the recovery.

**Thucydides**, generally considered the greatest historian the Gr. people ever produced, was b. at Athens 471 a. c. He descended from a princely family in Thrace, and was connected with the families of Miltiades, Cimon, and Pisistratus. He was also rich; he owned those gold-mines on the coast of Thrace, opposite the island of Thasos, which later were worked with so great profit by Philip of Macedon. In the 8th yr. of the Peloponnesian war (424 b. c.) he commanded an Athenian fleet; was unsuccessful, and driven into exile. In 403 he returned to Athens, but 2 yrs. after he was assassinated, whether in Athens or in Thrace is uncertain. His great work on the Peloponnesian war is unfinished. It reaches only to the yr. 411 b. c.; and the 8th book, which differs considerably from the preceding books, is said to have been written by his daughter.

**Thugs** [from the Hindoo *dhuga*, to "deceive"], a religious association, worshippers of the goddess Kali, who in bands of from 30 to 300 roamed all over India, and had established connections everywhere. They decoyed persons into their company, allured them to distant places, murdered and plundered them. But their motive was not so much lust of plunder as certain religious ideas, and of the spoil  $\frac{1}{4}$  was given to the goddess. Between 1829 and 1837 the Brit. Indian govt. succeeded in breaking up these bands entirely.

**Thule**, the name which Pytheas (at the time of Alexander the Great) gave to a land which he discovered after sailing 6 days in a northerly direction from the Orkney Islands. Later, the Romans used it as a general name for the northernmost parts of the habitable earth.

**Thumb-screw**, or **Thumb-kin**, an instrument of judicial torture formerly used in various parts of Europe, but particularly in Scot. The thumb was compressed by means of a screw.

**Thunder**. See LIGHTNING.

**Thun, Lake of**, in the canton of Berne, Switz., at an elevation of 1775 ft. above the sea, is 10 m. long and 2 m. broad. On its E. shore stands the town of Interlaken.

**ThurLOW** (EDWARD), BARON THURLOW, b. at Ashfield, near Stowmarket, Suffolk, Eng., about 1732; studied the classics at a school in Canterbury; entered Caius Coll., Cambridge, Oct. 1748; studied law at the Inner Temple, where he was called to the bar Nov. 1754; employed as junior counsel in the great Douglas case, the duchess of Queensberry obtaining for him the rank of K. C. 1761; was M. P. for Tamworth 1768; was a zealous supporter of Lord North; became solicitor-gen. Mar. 1770, atty.-gen. Jan. 1771, and lord chancellor and Baron Thurlow June 3, 1778, in reward for his powerful advocacy of the Amer. war; was excluded from the coalition ministry on its formation Apr. 9, 1783, but returned to office on the accession of the younger Pitt Dec. 23, 1783; retained the great seal 8 yrs. longer; was dismissed from office on the demand of Pitt June 15, 1792,

after which he became a bitter enemy of the govt., but lived in comparative obscurity. He opposed the abolition of the slave-trade, and was a warm partisan of Warren Hastings. D. Sept. 12, 1806.

**Thurman** (ALLEN G.), b. at Lynchburg, Va., Nov. 13, 1813, removed to O. in 1819; received an academic education; studied law, and was admitted to the bar in 1835; was Rep. from O. in the 29th Cong.; elected judge of the supreme court of O. in 1851, and chief-justice from 1854 to 1856; Dem. candidate for gov. of O. in 1867; elected to the U. S. Senate Mar. 4, 1869, and re-elected in 1874; was prominent among the candidates for the Dem. nomination for Pres. at St. Louis in 1876.

**Thursday** ["Thor's day," Ger. *Donnerstag*], the 5th day of the week. The name seems to have originated among the later Rom. pagans, who adopted the week of 7 days, and named the 5th day *Jovis dies*, "Jove's Day."

**Thurston** (ROBERT HENRY), son of Robert Lawton Thurston, b. in Providence, R. I., Oct. 25, 1839, was trained in the workshop of his father, and grad. at Brown Univ. in 1859; in 1861 entered the navy as an officer of engineers; served during the c. war on various vessels; was present at the battle of Port Royal and at the siege of Charleston; was attached to the N. and S. Atlantic squadrons until the close of 1865, when he was detailed as assistant prof. of natural and experimental philos. at the U. S. Naval Acad. at Annapolis; in 1871 was appointed prof. of mechanical engineering at the Stevens Inst. of Technology. In 1873 he was appointed a member of the U. S. scientific commission to the Vienna Exhibition, and pub. his *Report on Machinery and Manufactures*. In 1875 he was appointed a member of the U. S. commission on the causes of boiler explosions, and of the board to test the metals used in construction. He is a member of various scientific associations in the U. S., G. Brit., Fr., and Ger., and has written numerous papers on technical subjects. Has written *On Losses of Propelling Power in the Paddle-Wheel, Steam-Engines of the Fr. Navy*, H. B. *Iron-clad Monarch*, etc. Among his numerous inventions are the magnesium-ribbon lamp, a magnesium-burning signal apparatus, an autographic recording testing-machine, a new form of steam-engine governor, and an apparatus for determining the value of lubricants.

**Thyine Wood** [ῥύϊνον ὄξινον, the "wood of the *Thuja*, or yew" (improperly so called), a kind of wood mentioned in the Bible, is probably the arar or sandarach wood, the wood of *Callitris quadrata*, a large tree of Barbary. This tree affords the resin called gum-sandarach.

**Thyme**, ῥίμ [Gr. *thymos*], the name of certain non-Amer. labiate half-shrubby plants of the genus *Thymus*. Two kinds are cultivated in gardens. Both plants afford good bee-pasture. The leaves are used for flavoring soups and forcemeats.

**Thyme, Oil of**, a volatile oil obtained by the distillation of the herb *Thymus vulgaris* with water. It usually has a brownish-red color and a thickish consistency, although when freshly prepared it is nearly colorless and is mobile. It possesses a pleasant pungent odor and an aromatic taste.

**Thymol** (*Thymylic Hydrate*, *Thymylic Alcohol*, *Thymylic Acid*) is a homologue of phenol and an isomere of cymylic alcohol. It is obtained from the oil of thyme by distillation. T. forms crystalline rhomboidal plates, which have a weak odor and a peppery taste. It fuses at about 111° F. to a colorless liquid, which has a boiling-point of 446° F., and dissolves with difficulty in water, but easily in alcohol and in ether.

**Tiahuanaco**, te-ah-wah-noo'-ka, a group of interesting ruins in Bolivia, 12 m. from the shore of Lake Titicaca, on an eminence which may have once been an island in that lake. The ruins at this point are confessedly much older than the age of the Incas, but there seems to be no possible clue to their date. A marked character of the ruins is the use of enormous and finely wrought stone blocks, in some instances clamped together with bronze.

**Tiber** (Lat. *Tiberis*), the most celebrated of It. rivers, rises at the ft. of Mt. Aquilone, at the height of 1600 ft. above the sea, drains a basin of about 6500 sq. m., and after a course of 220 m. empties into the Mediterranean near Ostia, 27 m. below Rome. It is navigable from the sea to Rome for vessels of 140 tons, and with some difficulty 60 or 70 m. farther for vessels of 60 tons.

**Tiberias**. See GENNESARET, LAKE OF.

**Tiberius**, whose full name was TIBERIUS CLAUDIUS NERO CÆSAR, Rom. emp. 14-37, b. Nov. 16, 42 B. C., a son of Claudius Tiberius Nero and Livia Drusilla. In 4 A. D., all the male heirs of Augustus having died one after the other, he was adopted by the emp. and appointed his successor. His long reign of 23 yrs. is by itself not very remarkable. Its most prominent feature is the monstrous development of his own character. His avarice, suspiciousness, and hypocrisy became fiendish and malicious; a feeling of hatred and vengeance filled his heart, and by degrees he sank into brutish sensuality and cruelty. In 26 he retired to Capræa, where he lived not only in retirement, but in seclusion, leaving the govt. mostly to Sejanus, and after his death to Macro. D. Mar. 16, 37.

**Tibet**. See THIBET.

**Tibullus** (ALBIUS), was descended from an equestrian family of good standing in Rom. society; accompanied Messala in 31 B. C. to Aquitania, and subsequently to the E., but returned to Rome on account of his health, and lived on his estates near Rome, devoting himself to poetry and literary occupation. D. very young, probably in 18 A. C. Four books of elegies ascribed to him have come down to us.

**Tibur**. See TIVOLI.

**Tic Douloureux**. See NEURALGIA.

**Tiche'nor** (ISAACON, LL.D., b. at Newark, N. J., Feb. 8, 1754, grad. at Princeton 1775; began the study of law at Schenectady; accepted in 1777 an appointment as assistant commissary-gen. at Bennington, Vt., where he took up his



residence; became prominent in Vt. politics; was judge of the supreme court 1791-94, chief-justice 1795-96, com. for adjusting the boundary dispute with N. Y. 1791, U. S. Senator 1796-97, gov. 1797-1807 and 1808-09, and again U. S. Senator 1815-21. D. Dec. 11, 1838.

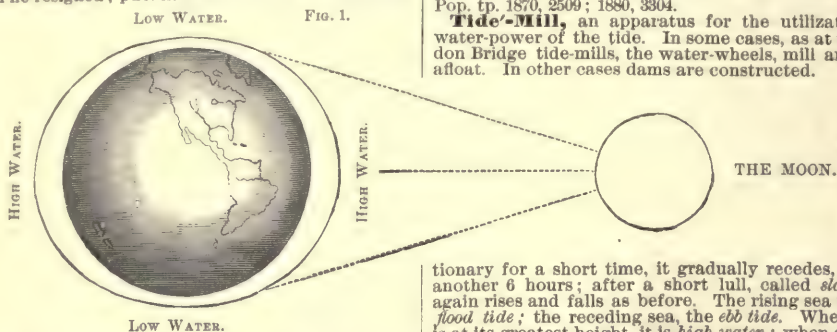
**Tick.** (1) The common name of Arachnids of the group Acarina and family Ixodidae. They "are mites of gigantic size, with bodies of a leathery consistence." (2) Many degraded forms of dipterous parasitical insects are called ticks.

**Ticknor** (GEORGE), LL.D., b. at Boston, Mass., Aug. 1, 1791, received at home a careful training in the classics; entered Dartmouth Coll. at 12, grad. there 1807; studied jurisprudence at Boston; was admitted to the bar 1813, but soon resolved to devote himself to a literary career; resided 2 yrs. at the Univ. of Göttingen, chiefly occupied with classical philology and the modern liter. of Europe; visited most of the European capitals; gave especial attention to the Sp. lang.; was chosen in 1817 to the Smith professorship of modern langs. at Harvard; filled that post from 1820 to 1835, when he resigned; pub. in 1849 in Lond. and New York

his *Hist. of Sp. Lit.*, which speedily became classical; printed some occasional essays, chiefly on educational topics, and several biographical sketches; wrote an elaborate *Life of William Hickling Prescott* (1864), who had been his fellow-laborer in the field of Sp. lit. D. Jan. 26, 1871.

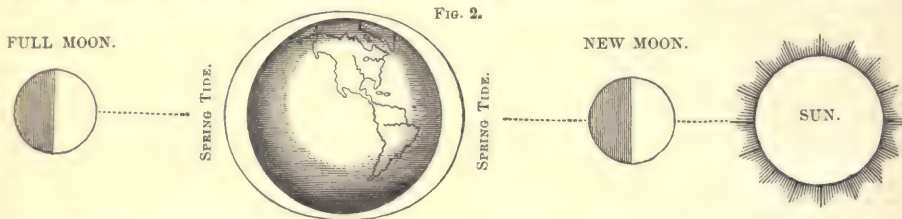
**Ticonderoga**, R. K. Junc., Essex co., N. Y. The town occupies a lofty promontory lying between Lakes George and Champlain, the outlet being 4 m. in length, with a fall of 230 ft., affording excellent water-power. In the tp. are veins and crucibles, valuable deposits of iron ore, etc. T. was prominent in colonial and Revolutionary hist. from its celebrated fortress, built by the Fr. in 1755, and originally named Carillon ("chime of bells") from the music of the neighboring waterfall. It was the head-quarters of Montcalm 1757; was unsuccessfully assaulted by Gen. Abercrombie July 8, 1758; occupied after a siege by Gen. Amherst July 30, 1759; captured by Ethan Allen May 10, 1775; retaken by Burgoyne July 5, 1777, and again by Gen. Haldeman 1780, but soon abandoned on each of the two latter occasions. Pop. tp. 1870, 2509; 1880, 3304.

**Tide-Mill**, an apparatus for the utilization of the water-power of the tide. In some cases, as at the old London Bridge tide-mills, the water-wheels, mill and all, were afloat. In other cases dams are constructed.



**Tides.** Those living on the shores of the ocean see it rise and fall regularly twice every day, as by a mighty process of respiration. These movements are the *tides*. For 6 hours the water rises, or *flows*; then, remaining sta-

tionary for a short time, it gradually recedes, or *ebbs*, for another 6 hours; after a short lull, called *slack water*, it again rises and falls as before. The rising sea is called the *flood tide*; the receding sea, the *ebb tide*. When the water is at its greatest height, it is *high water*; when at its lowest point, *low water*. There are thus daily 2 high T. and 2 low T. The time of high water and low water, at the same place, however, is gradually changing. The interval of time between 2 consecutive high T. or low T. being really



12 hours and 26 minutes, the hour of the day at which high water or low water occurs is later every day by about 52 minutes.

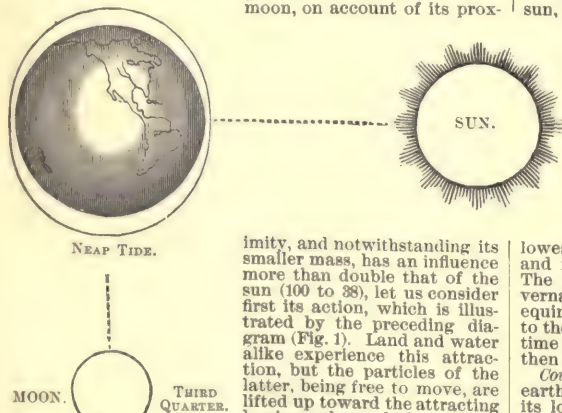
**Cause of the Tides.**—Though the dependence of the T. upon the course of the moon seemed to point out their source, the real cause of these mysterious movements was not understood before the discovery of the law of gravitation by Sir Isaac Newton. Applying here this new principle, Newton showed that the rise of the waters was due to the attraction of the moon and the sun upon the revolving globe of the earth. As the moon, on account of its prox-

imity, and notwithstanding its smaller mass, has an influence more than double that of the sun (100 to 38), let us consider first its action, which is illustrated by the preceding diagram (Fig. 1). Land and water alike experience this attraction, but the particles of the latter, being free to move, are lifted up toward the attracting luminary beyond the normal curve of the surface of the ocean. Thus is formed a vast swell, toward the crest of which the more distant and heavier waters are gathered from both sides, causing there a depression of the surface, or low water. On the opposite side of the globe, the waters

being less attracted than its solid mass, on account of their greater distance from the attracting body, and their less density, are left somewhat behind, as if the solid globe were drawn farther from the surface of the ocean. Another swell is thus produced, directly opposite the first, and occupying, like it, half the surface of the globe. There are thus always simultaneously and directly under the moon 2 high waters opposite each other, and 2 low waters at equal distances between them. Owing to the rotation of the earth, this permanent system of swells and troughs travels from E. to W. over every part of the ocean and of its coasts, and explains the regular succession of rising and falling waters, at equal intervals of time, which we call the tides.

**Spring Tides and Neap Tides.**—The sun also asserts its attractive power on the ocean, and causes a similar system of 4 daily T. Owing, however, to the great distance of the sun, the solar T. are much smaller, and mostly merged in, or masked by, the lunar T. As the relative position of the moon and sun is constantly changing, the solar and lunar T. seldom coincide. But twice a month, at new moon and full moon, the sun and moon being on a line with the earth, as shown in Fig. 2, act together, and cause an unusually high water, which is the sum of the lunar and solar T. These are the *spring tides*. High water is then highest, and low water lowest. When the sun is placed 90° from the moon (Fig. 3)—that is, at the time of the first and third quarter of the moon—its attraction acts against that of the moon, diminishing the height of the high T. and increasing that of low water. These are the *neap tides*. High water is then lowest, and low water highest. The proportion of the rise and fall in the spring T. and neap T. is nearly as 7 to 3. The highest spring T. occur in Mar., a little before the vernal equinox, and in Sept., a little after the autumnal equinox, because the sun is then at the equator and nearest to the earth. The lowest neap T. are those occurring at the time of the solstices, in June and Dec., because the sun is then in a higher lat. and farther from the earth.

**Course of the Tidal Wave.**—If the ocean covered the whole earth with a uniform depth of water, the tidal wave, with its long crest extending from N. to S., would follow the apparent course of the moon, and travel from E. to W. around the globe in 24 hours. It would be greatest in the equatorial regions, and move there with a velocity of over 1000 m. an hour. But the continents which cut the ocean into several large basins oppose its passage, and in each of these basins the course of the tidal wave is subjected to great



ocean. Thus is formed a vast swell, toward the crest of which the more distant and heavier waters are gathered from both sides, causing there a depression of the surface, or low water. On the opposite side of the globe, the waters



modifications. The regularity and velocity of the tidal wave depend upon the size of the basin, the depth of the water, and freedom from all obstacles opposing its progress. Nowhere are these conditions better fulfilled than in the S. half of the Pacific Ocean. There is formed what might be called the parent tidal wave, which, advancing rapidly westward, enters the Indian and Atlantic oceans, and seems to control their T.

*Cotidal Lines.* (See COTIDAL LINES.)

*Tides in the Pacific Ocean.*—In the middle and equatorial part of the Pacific Ocean the advance of the tidal wave is gradually slackened, and becomes very irregular when broken up by the numberless islands of the E. I. Archipelago. The influence of shallow water, and of friction on the bottom and on the coasts of the ocean, is evident in the slow progress of the tide-wave between New Guinea and Australia, and in the China Sea. Its rapid motion, on the contrary, toward the N. W. in the middle of the N. Pacific, shows the influence of deep and open water. Thence, however, the tidal wave ceases to be direct, and assumes the shape of a free reflected wave, which turns N. and E. toward the W. coast of the N. Amer. continent. In the S. Pacific, while the main tidal wave seems to start on its westward course from the 90th meridian, it sends a reflected wave eastward along the W. coast of S. Amer., from which this coast seems to derive its tides. This meets, at Cape Horn, the Atlantic tide coming from the E.

*Tides in the Indian and Atlantic Oceans.*—The tidal wave in both the Indian and Atlantic oceans seems to be but a continuation of the great parent wave from the Pacific. The T. raised directly in these 2 basins are overpowered by or merged into it. Here, also, the course of the wave is

of India; another 12 or 36 hours brings it to the coast of N. Amer.; a few hours more, to the shores of Europe. Therefore the T. on our shores is not the one caused by the last passage of the moon over us, but the one which had its origin 36 hours before in the Pacific Ocean, and is one day and a half old. It is 2 days old in Lond.

*The Height of the Tide.*—The height of the T. depends very much upon local circumstances. In the midst of the Pacific it is scarcely more than from 2 to 5 ft., which may be considered as the natural height of the T. But when dashing against the land and forced into deep gulfs and estuaries, the accumulating tide-waters sometimes reach a very great height. On the E. coast of N. Amer., which is directly in the path of the great Atlantic wave, the T. rises on an average from 9 to 12 ft. In the Bay of Fundy, which opens its bosom to receive the full wave, the T., which, at the entrance, is 18 ft., rushes with great fury into that long and narrow channel, and swells to the enormous height of 60 ft., and even to 70 ft. in the highest spring T. In the Bay of Bristol, on the coast of Eng., the spring T. rise to 40 ft., and swell to 50 in the Eng. Channel at St. Malo, on the coast of Fr. It is obvious that differences so considerable in the level of the water will cause strong currents, constantly varying in force and direction with the T., such as those witnessed in Hell Gate, at the outlet of L. I. Sound into New York harbor. To the same cause may be traced the dangerous whirlpools which have long been celebrated on various coasts. The famous Maelstrom off the Nor. coast is but a tidal current rushing with great violence between 2 of the Lofoden Islands, causing a whirling motion, which is reversed at every new T. So, in the Strait of Messina, are the ill-fated Scylla and Charybdis, so much dreaded by the navigators of old, and many other whirlpools of less celebrity. (See BORE.) A. GUOY.

**Tidioute**, tide-e-out', Warren co., Pa., on R. R. and Alleghany River, 160 m. from Pittsburgh. The prin. product is petroleum, but the lumber interest is large. Alleghany River is spanned here by a fine suspension bridge. Pop. 1870, 1638; 1880, 1255.

**Tieck**, teek (LUDWIG), b. at Berlin May 31, 1773, studied philos., philology, and lit. at Halle, Göttingen, and Erlangen; returned in 1794 to his native city, and opened his long and brilliant literary career with a number of romances, novels, and fantastic tales, which at once revealed the peculiar romantic cast of his own genius: *William Lovell*, *Peter Lebrecht*, etc.; and his contempt for the lit. of enlightenment, which was the pride of the 18th century: *Blaubart*, *Der Gesteirte Kuter*, *Franz Sternbald's Wanderungen*, etc. From 1799 to 1819 he alternately resided in various Ger. cities—Jena, Munich, Vienna, Frankfurt-on-the-Oder, etc.; visited It. in 1805, and Eng. in 1817; lived in intimate connection with A. W. Schlegel, Novalis, Solger, Rumohr, Stephens, etc., and occupied a very prominent position in the Ger. lit. as one of the chief leaders of the romantic school. From 1819 to 1840 he lived in Dresden, where he exercised a considerable and still noticeable influence on the development of the theatre. In 1840 Frederick William III. invited him to Berlin, and gave him a high title and a large pension.

His works, which as he grew older became deeper and clearer, and entirely free of that mystic excitement and confusion of form which characterized his earlier attempts, comprise a few lyric poems, several huge dramas, and 12 vols. of novels. But he exercised, no doubt, the greatest influence by his excellent translations—*Don Quixote*, *Altenglische Theater*, *Shakespeare's Vorschule*, etc.; by his editions of Kleist's and others' works, and by his *Kritische Schriften*. D. Apr. 28, 1853.

**Tien-Tsin**, te-en-tseen', town of Chi., prov. of Pe-Chee-Le, at the confluence of Peking and Yuen-Ling rivers, forms the port of Peking, and was opened to foreign traffic by the Treaty of Peking (1860). It is surrounded by a wall, and its streets are well paved, broad, and straight. As the port of Peking it carries on a considerable trade. The pop. is estimated at 950,000.

**Tierra del Fuego.** See TERRA DEL FUEGO.

**Tiers Etat.** See ESTATES, THE THREE.

**Tiffin**, city and R. R. centre, cap. of Seneca co., O., on Sandusky River, 50 m. from its mouth. It contains Heidelberg Coll. Pop. 1870, 5648; 1880, 7879.

**Tiffin** (EDWARD), M. D., b. at Carlisle, Eng., June 19, 1766, emigrated to the U. S. 1786, settling at Charlestown, Va.; became a Meth. preacher, acting also as a phys.; married Mary, sister of Gov. Thomas Worthington, 1789; removed to Chillicothe, O., 1798; was speaker of the Territorial legislature 1799, pres. of the O. constitutional convention 1802, first gov. of the State of O. 1803-07, U. S. Senator 1807-09, com. of the U. S. land-office 1812-15, and subsequently surveyor-gen. of the N. W. Terr. D. Aug. 9, 1829.

**Tiflis**, town of Rus., cap. of the govt. of Tiflis, and the centre of the whole Rus. terr. S. of the Caucasian Mts., on



mostly determined by the depth of the water and the form of the coasts. Somewhat retarded along the S. coast of Australia, it turns N. with considerable velocity into the deep channel leading to the peninsula of India. Approaching the coast, these waves accumulate, producing high T. in the Gulf of Bengal and the Arabian Sea. Reaching the entrance of the Atlantic Ocean, it passes into that long channel, and moves, at the rate of almost 600 m. an hour, toward the N. W. in the deep trough of 15,000 to 20,000 ft., which runs parallel to the coast of the New World, until it strikes the E. shores of N. Amer. Thence bending toward the N. E., it gradually lessens its speed to 300 and 200 m. an hour, sweeps over the coasts of Europe, and, turning around the continent, loses itself in the Arctic Ocean.

The course of the T. on the coast of Eng., in the Channel, and the Ger. Sea, as shown in the map of cotidal lines in that region, here annexed (Fig. 4), illustrates in a forcible manner the retardation of the tidal wave in shallow and narrow seas. The main tide wave in the broad Atlantic moves on, unobstructed, around the British Isles, reaching the Orkneys in 4 hours, and descends S. along the E. coast of Scot. before the slackened tide-wave has forced its way through the Channel to Dover Straits. Each wave then continues its course, the first along the Eng. coast, that from the Channel along the coast of Hol., causing high water and low water at different hours on the opposite shores.

*The Age of the Tide.*—This course of the tidal wave shows that the tides of the Indian and Atlantic oceans are not generated in these basins, but are mainly derived from those of the Pacific Ocean. But the tide-wave takes some time to travel over this vast extent. In 12 hours the Pacific wave reaches Tasmania; in 12 hours more, the coast



both sides of the Koor, is on R. R., has some manufactures, and carries on an active trade with Per. In its vicinity are naphtha springs, and thermal springs which are much frequented. Pop. 104,024.

**Tiger** [*Gr. tygris*], the name, derived through the learned tongues, applied to certain quadrupeds. (1) Primarily and of right only it belongs to the *Felis tigris*, one of the largest of living Felidae, about equal in size and superior in strength to the largest lions, and more destructive and far more dangerous to man. It is peculiar in the development of spreading thick, whisker-like hairs on the sides of the head; its tail is elongate and smooth-haired, and the color is a tawny yellow transversely striped with black. It ranges N. into S. Siberia, and S. as far as Ceylon and the Spice Islands. E. and W. its habitat extends from Per. to the Pacific. (2) The name is also sometimes applied by hunters to the Amer. jaguar (*Felis onca*). (3) It is further transferred in Van Diemen's Land to the striped *Thylacinus cynocephalus*, a carnivorous marsupial.

**Tiger-Beetle**, a name given to the species of coleopterous insects of the family Cicindelidae, on account of their active, bold, and carnivorous nature. They are distinguished by their large and broad heads, and the very long and formidable falcate jaws, as well as by their long and slender legs. They chiefly affect sunny and sandy places, especially by the shores of streams and lakes.

**Tiger-Cat** is a name applied to quite a large number of striped and spotted wild-cats, mostly rather small tropical animals, often arboreal in their habits.

**Tiger-Flower**, the *Tigridia pavonia*, a superb garden-flower of the order Iridaceae. It is a native of Mex.

**Tig'lath-Pile'ser I.**, a powerful Assyrian monarch who reigned about 1150 B. C. His conquests are recorded on a terra-cotta cylinder now in the Brit. Museum, and is perhaps the earliest Assyrian historical document that has been discovered. In his reign Assyria was probably the most powerful kingdom in the world, except Egypt.

**Tigranes the Great**, king of Armenia (96-55 B. C.), conquered in his wars with Parthia, Mesopotamia, Assyria proper, and Media Atropatene, and in his wars with the Seleucidae, Cilicia, Syria, and Phoenicia. But having been involved in war with Rome through his father-in-law, Mithridates the Great, king of Pontus, he was defeated first by Lucullus, and subsequently by Pompey.

**T'gris**, river of Asiatic Tur., rises in the mts. of Koor-distan, and after a winding but generally S. E. course of about 1000 m., it joins the Euphrates at Korna, and forms the Shatt-el-Arab, which enters the Per. Gulf after a course of about 100 m. The prin. places on its banks are Diarbakir, Mosul, and Bagdad, and the ruins of Nineveh, Seleucia, Ctesiphon, and Opis.

**Til'den** (SAMUEL JONES), b. in New Lebanon, N. Y., Feb. 9, 1814, grad. from Yale; studied law, and was admitted to the bar; entered early into politics, and for 14 yrs. was chairman of the Dem. State committee of N. Y.; was a member of 2 constitutional conventions (in 1846 and in 1867), and also served 2 terms in the lower branch of the State legislature, first in 1846, and second in 1872; took a prominent part in the overthrow of the Tammany Ring, and in 1874 was elected by the Dem. party gov. of N. Y. Nominated by the Dem. national convention, at St. Louis, Mo., June 29, 1876, as candidate for the Presidency.

**Tilghman**, til'man (TENCH), b. in Talbot co., Md., Mar. 25, 1810, grad. at the U. S. Military Acad. in 1832, when appointed brevet second lieut. 4th Artill.; resigned Nov. 30, 1839. From 1841 to 1851 was com. of State public works pres. Talbot Insurance Co. 1846-49, supt. of military dept. of Md. Military Acad. 1847-57, U. S. consul at Turk's Island 1849, and same yr. at Mayaguez; was pres. (1855-61) of Md. and Del. R. R., projected and carried to successful completion by him; also U. S. collector of customs at Oxford 1857-61; was brig.-gen. of State militia 1837-60, and maj.-gen. 1860-61, when he entered the service of the S. Confederacy. D. Dec. 22, 1874.

**Tilghman** (WILLIAM), LL.D., b. in Talbot co., Md., Aug. 12, 1756, removed to Phila.; studied law; practised at the Md. bar 1783-93, and was a member of the legislature several yrs.; was chief-justice of the U. S. circuit court 1801-02; became pres. of the court of common pleas July 1805, and chief-justice of the supreme court of Pa. Feb. 1806; pres. of Amer. Philosophical Society 1824. D. Apr. 30, 1827.

**Tilghman's Sand-Blast**. See SAND-BLAST.

**Tilia'ceæ** [from *Tilia*, one of the genera], a natural order of exogenous trees, shrubs, and herbs, mostly tropical, and allied to Malvaceæ. The well-known basswood and linden trees belong to this order, as do the jute-plant and a number of timber and fruit trees of tropical regions.

**Tilland'sia** [named by Linnaeus in honor of Dr. Elias of the order Bromellaceæ], a genus of epiphytic air-plants which are natives of the S. U. S. Of these, *T. usneoides*, the long or Sp. moss (so called), is the best known. It is abundant in the more humid dists. of the South, where it hangs in long festoons from the trees. Its central fibre is extensively used in stuffing mattresses.

**Tillemont**, tel-môn, de (LOUIS SÉBASTIEN LE NAIN), b. at Paris Nov. 30, 1637, was ed. by the Jansenists of Port Royal; studied theology at the sem. of Beauvais; took holy orders in 1672, and became subdeacon at the St. Lambert; retired in 1677 to the monastery of Port Royal, and, when the govt. closed this inst. in 1679, to his estate of Tillemont, between Vincennes and Montreuil. He wrote *Mémoires pour servir à l'Histoire ecclésiastique des six premiers siècles. Histoire des Empereurs et des autres Princes qui ont régné durant les six premiers siècles de l'Eglise*, etc. D. Jan. 10, 1698.

**Tilley** (SAMUEL LEONARD), C. B., b. in Queen's co., N. B., May 8, 1818, settled at St. John's; took an active part in organizing temperance associations; engaged in politics on the temperance issue; was elected to the provincial assembly 1851; became a member of the cabinet and provincial

sec. Nov. 1854; was leader of the govt. 1861-65; was a com. to confer with the govts. of Canada and N. S. on intercolonial trade and railways 1861, and on the project of confederation 1864; was a delegate to the Brit. govt. on railway question 1861-62, and on that of confederation 1866-67; for several yrs. from organization of Dominion govt. in 1867 was minister of customs in the cabinet.

**Tillinghast** (JOSEPH LEONARD), b. at Taunton, Mass., in 1791, grad. at Brown Univ. 1819; became a lawyer at Providence; was many yrs. a member of the State assembly, and often speaker of that body; was chiefly instrumental in promoting improvements in the judiciary and common-school systems, and was M. C. 1837-43. Wrote *An Oration on Gen. Greene, A Eulogy on Adams and Jefferson*, etc. D. Dec. 30, 1844.

**Til'man** (SAMUEL D.), LL.D., b. at Utica, Oneida co., N. Y., Apr. 1, 1815, grad. at Union Coll. in 1831; studied law at Canandaigua; practised for several yrs. there and at Seneca Falls, but removed subsequently to New York; gave up his profession, and devoted himself exclusively to the study of science; was a prominent member of the Amer. Association for the Advancement of Science; became a member of the Amer. Institute in 1863, and afterward its corresponding sec. and ed. of its *Transactions*. He was the originator of a number of ingenious contrivances. D. Sept. 4, 1875.

**Til'looh** (ALEXANDER), LL.D., b. in Glasgow Feb. 28, 1759, was a practical mechanic, and in 1781 conceived the idea of the production of stereotype plates for printing. In 1787 went to London, where he purchased *The Star*, an evening paper, which he conducted for more than 30 yrs. In 1797 he established the *Philosophical Magazine*, and commenced the publication of the *Mechanic's Oracle*. He was a minister of the Sandemanian sect, and pub. *Dissertations Introductory to the Study of the Apocalypse*. D. Jan. 26, 1825.

**Til'lotson** (JOHN), D. D., b. at Sowerby, Yorkshire, Oct. 1630, was ed. at Clare Hall, Cambridge, where he was made a fellow in 1651. He was originally a rigid Puritan, but at the Restoration went over to the Established Ch., in which he took orders, and became in succession curate of Cheshunt, rector of Keddington, preacher at Lincoln's Inn, dean of Canterbury, prebend of St. Paul's, and finally, in 1691, abp. of Canterbury. He took an active part in measures in opposition to popery, opposed the declaration of Charles II. in favor of liberty of conscience, and was an earnest advocate of the exclusion of the duke of York from the succession. He ranks among the foremost of Eng. preachers. D. Nov. 22, 1694.

**Til'ly, von** (JOHANN TSEERLAES), COUNT, b. in the castle of Tilly, near Gemblours, prov. of Brabant, Belg., in Feb. 1559, was destined for the ch., but preferred the military profession; was in 1610 appointed field-marshal by Duke Maximilian of Bavaria. When the Thirty Years' war broke out he was made commander-in-chief of the army of the Holy League; suppressed the insurrection in Bohemia after the battle of Prague, Nov. 8, 1620; conquered the Palatinate; defeated Christian IV. at Lutter-am-Barenberge Aug. 27, 1626; was made commander-in-chief also of the Aus. army after the dismissal of Wallenstein in 1630; stormed Magdeburg May 20, 1630, but was utterly defeated by Gustavus Adolphus at Breitenfeld, Sept. 17, 1631, and again on the Lech, Apr. 15, 1632, in which battle he was mortally wounded. D. Apr. 30, 1632.

**Til'ton**, N. H. See APPENDIX.

**Tilton** (JAMES), M. D., b. in Kent co., Del., June 1, 1745, ed. at Nottingham Acad. and at Phila. med. schools; practised at Dover, Del., until 1776; when he became surgeon to a Del. regiment, with which he was present at the battles of L. I. and White Plains; was hospital surgeon from 1777 to the end of the war; resumed practice at Dover 1783; served many yrs. in the legislature; was a member of the Continental Cong. 1788-95; com. of loans 1785-1801; was appointed phys. and surgeon-gen. to the U. S. A. 1812; wrote *Economical Observations on Military Hospitals*. D. May 14, 1822.

**Tilton** (THEODORE), b. in New York Oct. 2, 1835, was ed. at the New York Free Acad.; entered upon journalism at an early age, and in 1856 was employed upon the *New York Independent*, a weekly religious journal edited by Rev. Henry Ward Beecher. Mr. Beecher resigning the editorship of the *Independent* in 1863, was succeeded by Mr. T., who in 1871 also became ed. of the *Brooklyn Union*. In 1872 his connection with these journals was discontinued, and he established *The Golden Age*, a weekly journal, which he conducted till 1874. He was a popular public lecturer, and has pub. *The Amer. Board and Slavery*, *Golden-Haired Gertrude*, *The King's Ring*, etc.

**Timber and Timber Trees**. Although the more important of these have been treated of or mentioned under their names or under appropriate heads, yet the most prominent species of timber-trees used in this country may here be referred to, although very briefly.

**INDIGENOUS NORTH AMERICAN TIMBER TREES.**—(1) *Coniferous Division*.—Of those of the Atlantic U. S. and Canada, the most important, and for its uses the best in the world, is white pine (*Pinus strobus*), in Eng. called Weymouth pine. Hard-pine lumber, variously called yellow pine, pitch pine, etc., is most largely furnished, and of best quality, by *P. australis*, the long-leaved pine of the S. States. *P. rigida*, the N. pitch pine, both in the N. and S. States furnishes a similar but inferior and generally smaller timber; and excellent hard pine is yielded by the short-leaved pine (*P. mitis*). Larch or hackmatack (*Larix Americana*) of the N. furnishes a very valuable lumber, important in ship-building. Next are the spruces, with wood tougher than white pine, but more liable to shakes and splits. Black spruce (*Abies nigra*) has the widest range and yields the best lumber, especially prized for spars. White spruce (*A. alba*) is inferior. Hemlock spruce (*A. Canadensis*) furnishes at the N. a valuable but coarse lumber. The balsam-firs are of no account for timber. Of the cypress tribe, the bald cypress



of the S. States (*Taxodium distichum*) furnishes lumber of great size and much durability, but light and shaly; while the arbovitae or white cedar of the N. (*Thuja occidentalis*) and that of the Middle and S. States (*Cupressus thyoides*) yield small T. of exceeding durability, especially for posts; and red cedar (*Juniperus Virginiana*) furnishes a red and fragrant fine-grained wood of the greatest value. In the Pacific States and Rocky Mt. region the coniferous trees are numerous, and some of immense height and girth, but none so valuable as the E. species. For spruces, the *Abies Douglasii* or Douglas spruce, of Or. and Cal., is far the best of the race, as well as the largest. The Menzies spruce (*A. Menziesii*) surpasses our black spruce; and our balsam-firs are represented by nobler species, which furnish better lumber. The cypress tribe is represented by several cypresses of considerable value; also in Or. and northward by an arbovitae (*Thuja gigantea*), vastly surpassing the E. species in size and value for timber, and in Cal. by the famous redwood (*Sequoia sempervirens*), the light and reddish wood of which is incomparable for building purposes and excellent for interior finish. (See *SEQUOIA*.)

(2) *Amentaceous Trees*.—The oaks are the most important, and the most valuable is the white oak (*Quercus alba*). It grows to a height of 70 to 80 ft. and a diameter of 6 or 7 ft., and yields handsome logs. The wood is of a pale reddish color, straight-grained, compact, tough, strong, durable and shrinks but little. It is used for frames of structures where strength and durability are required, coach-making, coopering, ship-building, and for a great variety of purposes in the domestic arts. For cabinet-making and interior decoration it is highly valued. The other annual-fruited species come next to this in value—viz. chestnut-oaks, post-oak, bur-oak, etc. At the S., along the coast, the live-oak (*Q. virginica*) is a peculiar type, and for ship-building is prized above all others, but it does not give large T. Its height is from 40 to 50 ft.; diameter, 1 to 2 ft. The wood is of a yellowish color when first cut, which deepens to a dark brown with age; it is hard, tough, strong, heavy, and very difficult to work; on account of the grain being waved or twisted. The pores are minute, and the silver-grain very bright and distinct. The biennial-fruited oaks have a porous wood unfitted for casks to hold liquids, less durable, and less strong. The best of them—viz. black oak (*Q. tinctoria*)—is found on poorer soils than the white oak, and grows to the height of 50 to 90 ft., with a diameter of 4 to 5 ft. The outer bark is greatly used for tanning, and the inner bark, called quercitron, for dyeing. Red oak (*Q. rubra*) is used for similar purposes, though it is inferior in quality. Sp. oak (*Q. falcata*) and willow-oak (*Q. Phellos*) are superior; and so are laurel or shingle oak (so called because the wood was used for shingles). Cal. and Or. have oaks of peculiar species, some of them good timber-trees, but none which equal white oak. Chestnut (*Castanea vesca*) is a large tree of the Atlantic States only, essentially of the same species as the European, yielding a coarse-grained and porous but durable lumber, easily worked, and valuable for wainscoting, etc. The Amer. beech (*Fagus ferruginea*) has a very close-grained and hard wood, of which joiners' tools are made. Ironwood (*Ostrya*) and hornbeam (*Carpinus*), as the names denote, have very hard wood, but they are rather small trees, peculiar to the Atlantic States. The hickory, in several species, is peculiar to the Atlantic States. The shell-bark or shag-bark (*Carya alba*) is the best, but all have a very tough and hard wood of remarkable strength, much prized for tools and the like. The walnut (*Juglans*) is known in the Atlantic States by 2 species—*J. e.* white walnut or butternut (*J. cinerea*), the favorite wood for gun-stocks and of late for wainscoting and cabinet-work, but a small tree; and black walnut (*J. nigra*), the most important of our woods for the cabinet-maker, a tree of ample size. The heart-wood is of a violet color when first cut, but upon exposure becomes dark. The birches are valuable timber-trees of the second class, having a hard and fine-grained wood, valued by cabinet-makers. Of the 5 species which in the Atlantic States and Canada form good-sized trees, the black or sweet birch, sometimes called cherry birch (*Betula lenta*), is most prized, being excellent for furniture; and yellow birch (*B. lutea*) is equally good, but lighter in color. Poplars or cottonwoods (*Populus*) make large trees, as do some willows, but the wood is weak, soft, and of no durability.

(3) *Other Deciduous Trees*.—Only the most important can be mentioned. Plane tree, buttonwood, or sycamore (*Platanus occidentalis* of the Atlantic States, and a corresponding species in Cal.) deserves notice on account of the size which the trunk may attain, but it soon becomes hollow, and the wood, which is handsome on account of the strong silver-grain, is useless for the purposes it would otherwise be well adapted for. The laurel family is represented in the E. by the sassafras, and in Cal. by a laurel (*Tetranthera Californica*), the light-colored and variegated wood of which is extremely beautiful. Elms are given only to the E. side of our continent, and white elm (*Ulmus Americana*) is the most noted species, a large tree, with handsome but not very durable wood. Slippery elm (*U. fulva*) is a smaller tree, and the reddish wood is tougher. The ashes are timber-trees of the first class, of which there are 6 species in the Atlantic and 2 in the Pacific States. The yellowish wood is very firm and tough, but comparatively light, straight-grained, and easy to work. White ash (*Fraxinus Americana*) is the best and most used, and is unexcelled for purposes where strength, elasticity, and durability are needed. Black ash (*F. sambucifolia*), a smaller tree, has tougher wood, easily separable into layers, and is therefore used for hoops and strong basket-work. Amer. holly (*Ilex opaca*) of the Atlantic States, like the European species, has a very fine-grained and compact white wood, used for ornamental cabinet-work, wooden screws, etc. Tupelo, pepperidge, or sour-gum trees (*Nyssa*) of 2 or 3 Atlantic States species, and sweet-gum (*Liquidambar styraciflua*), mostly have a

very tough wood, of various uses, but not much used as timber; and flowering dogwood (*Cornus florida*), although the wood is prized, is seldom large enough to form a timber-tree. The Ky. coffee tree (*Gymnocladus Canadensis*) is a stately tree, of peculiar aspect, with handsome rosy or brownish wood, well suited for cabinet-work. Honeylocust is of little account, but the true locust (*Robinia pseudacacia*) affords a timber equal to live-oak and red cedar in durability, especially valued for trenails and in naval arch. generally. Maples are fine trees, of which one species on the Pacific coast and 2 or 3 on the Atlantic side are important for timber. Sugar maple (*Acer saccharinum*) is much the most valuable, having a hard and close-grained wood, of light color and silky lustre when polished, and the varieties called "curled" and "birdseye" maple are greatly prized for cabinet-work. The soft maples, so called from the character of their wood, are the white or silver maple (*A. dasycarpum*) and the red or swamp maple (*A. rubrum*), the former a large and the latter a medium-sized tree, the wood of which is used for lasts, for carvings, etc. Lindens or limes, here commonly called basswood, of which there are 3 well-marked species in the Atlantic, but none in the Pacific States, are first-class forest-trees for size, and their soft and white fine-grained wood is excellent for various purposes where lightness with moderate strength is demanded. Tulip tree (*Liriodendron tulipifera*), sometimes called white-wood, but in the W. Atlantic States commonly known as poplar, has a light and soft wood, like that of the linden, but more valuable and much more extensively employed for the same purposes. This noble and most valuable tree is of the magnolia family, which in the cucumber tree and in great-flowered magnolia of S. States furnishes 2 other fine trees of same character of wood, but of comparatively small use. (See *FORESTRY* in APPENDIX.)

**EXOTIC TIMBER TREES**.—Those of Europe need not be enumerated, as they are analogues of our own—*i. e.* different species of pine, larch, spruce, oak, beech, elm, ash, linden, etc., only the chestnut being the same or nearly so—but are far fewer in species and in kind. As to foreign woods of tropical regions imported for the use of cabinet-makers—such as mahogany, Sp. cedar (*Cedrela odorata*), rosewood, lignum-vitæ, and the like—they are mostly treated under their names in this work. ASA GRAY.

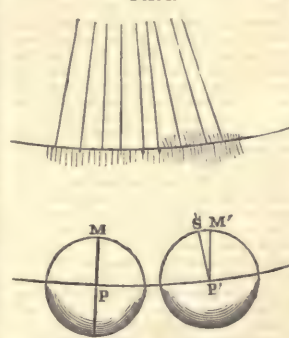
#### Timber, Preservation of. See PRESERVATION OF TIMBER.

#### Timber Trees, Culture of. See ARBORICULTURE.

**Timbuc'loo**, town of Soodan, Central Afr., on a branch of the Niger, near the desert of Sahara. It is an unhealthy and unproductive dist.; provisions have to be brought to it from distant places. But for the traffic between N. and Central Afr. it is of great importance. Dates, European manufactures, firearms, gunpowder, tobacco, and paper are brought here through Sahara, and exchanged for gums, ostrich-feathers, gold-dust, and palm oil. The town is poorly built. Its inhabs., about 13,000, are negroes.

**Time** (Sax. *ima*) has been characterized as that wherein there is room for events to happen, as in space there is room for things to be placed.

FIG. 1.



rotation of the earth about its axis will be found to have in itself all these requisites, though our limits will not admit of the exposition of that.

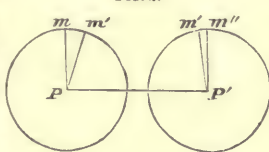
**Of Solar Time, Mean Solar Time, Apparent Solar Time, and the Equation of Time.**—If, as in Fig. 1, P M be, at any instant, the meridian, the plane of which passes through the visible place of the sun, then to all places of which P M is the meridian, to which the sun is visible, the time will be that of apparent noon. Between that and the next succeeding noon the earth will have moved from P to P'. Before this a sidereal day will have been accomplished, the meridian having in that period arrived at the position P' M, parallel to its first position, P M. But in order that the plane of the same meridian should a second time pass through the apparent place of the sun, P' M' must rotate still farther until it arrives at the position P' S, and then, and not before, will be completed the apparent solar day. The time meted out by these motions is apparent solar time. Now, the arc M' S in the plane of the earth's equator is (on a small scale) an arc of right ascension, and P P' in the same plane, measured, on the large scale, the motion of the earth in its orbit, also in right ascension; and the angle at the sun measured by P P' is the alternate angle to M' P S. Hence the angular excess of motion M' P S above a whole rotation, between one noon and the next, is itself equal to the angular motion of the earth (orbital motion, that is) in right ascension in the same interval. Now, the angular motion of the earth in right ascension from day to day is variable. Hence, although the earth's rotation is isochronous, the solar days must be unequal. But by combining a great number of



them, and then dividing by the whole number, we obtain the average or mean solar day. In consequence of the motion of the earth in an orbit oblique to the plane of the earth's equator solar time would be made *too fast*, as the earth was going from the equinox toward the solstice, this variation being, however, exactly overcome at the end of the one quarter of the yr., when the earth would arrive at the solstice. But in going from the solstice toward the next equinox, the effect of the earth's oblique motion would be to make solar time at first *too slow*, as the earth was going from the solstice toward the next equinox; this variation also to be overcome at the end of the one quarter of a yr., when the earth would arrive at the next equinox; and the right ascension of the earth thus be the same at the equinoxes and at the solstices as it would be if the earth had moved uniformly in the plane of the equinoctial, and so had kept mean time. Solar time would thus be *right* when the earth was at either of the equinoxes or of the solstices, while between any equinox and the succeeding solstice solar time would be *too fast*; but between any solstice and the succeeding equinox solar time would be *too slow*.

It remains to be seen how we shall determine the extent of variation from mean time—i. e. the equation of time—and with this, and in order to it, from what limits mean time is to be reckoned. If, as in Fig. 1, M'S represent the excess above a whole revolution required to complete a mean solar day—which angular excess is measured, on the large scale, by the arc P'P' with its centre at the sun—then in the 24th part of a mean solar day this excess so measured by the earth's motion in right ascension will be the 24th part of P'P', or, in arc, also the 24th part of M'S. As, then, a whole mean solar day will consist of the time required to describe an entire rotation + the time of describing M'S, so in 1 mean solar hour the time required will be that of describing  $\frac{1}{24}$  of a whole rotation (i. e.  $\frac{1}{24}$  of a sidereal day), together with the sidereal time required to describe  $\frac{1}{24}$  of M'S. If, then, a terrestrial meridian such as P'm (Fig. 2) be 15° of terrestrial lon. to the W. of P'm, and the plane of P'm pass through the apparent position of the sun, then in the  $\frac{1}{24}$  part of a mean solar day (1 mean solar hour) the rotation of the earth will not only transfer P'm through the 15° belonging to 1 sidereal hour, and bring the W. meridian to the position P'm' (parallel to the original position of P'm), but also (in the completion of the 1 hour of mean solar hour) the arc of excess due to the earth's motion meanwhile

FIG. 2.



In right ascension, and which (on the large scale) is measured by P'P'; so that at the end of the entire 1 hour of mean solar time the 2d meridian will have arrived at the P'm' in a direction then passing through the sun, as did the meridian P'm at first. It appears, then, that a difference of 15° in terrestrial lon. will require a difference of 1 hour in time, whether the time in question be mean solar or it be sidereal time. Having thus ascertained in what measure as to time angular difference of position of meridians is to be interpreted, and having ascertained what would at any given time be the angular position of a given meridian with regard to the sun if the earth moved uniformly in right ascension in the plane of the equinoctial, and the actual angular position of the same meridian with regard to the sun in consequence of the earth's veritable motions, the difference between these two, transformed into time measurement, at the rate of 15° to an hour, will be the equation of time.

*Of Local Time, and the Day of the Week corresponding to the same.*—These may be best illustrated by an example in the determination of an answer to what has been esteemed a puzzling problem—viz. If we could advance westward so rapidly as to keep it always noon, when should we pass from one day of the week into another (suppose from Wednesday into Thursday)? With regard to this, it seems to have been usually forgotten, or else overlooked, that before it can be accurately determined where Wednesday will end we ought to find out where Wednesday is to begin. To determine this, it will be necessary to fix upon some meridian. And then reckoning from that meridian continuously westward, the local time will be found more and more behind that of the first meridian. But reckoning from the same first meridian continuously eastward, the local time will be found to be more in advance of that of the first meridian, until at last, in lon. 180° E., the local time will be found to be 12 hours in advance of that of the first meridian. In passing across the meridian in lon. 180° from the first meridian, we should therefore pass from the region of time behind that of the first meridian to time in advance of the same, or vice versa when proceeding in the opposite direction. In the case supposed it would therefore be on passing lon. 180° from the W. that we should pass from Wednesday into Thursday, and in no other lon. whatsoever. [From orig. art. in *J. S. Univ. Cyc.*, by PROF. S. ALEXANDER, LL.D.] See STANDARD TIME IN APPENDIX.

**Time Signals.** Two methods of transmitting time are in common use. A standard clock at an observatory, which is kept as nearly free from error as possible, and has its small error corrected daily, so that its face indicates the true mean time it is desired to furnish, breaks or makes an electric current automatically each second. This circuit, in one method, passes through the various cities or buildings which are to receive the time. By merely introducing a number of electro-magnets the beats of the standard clock are audible at various points throughout the entire circuit. The beginning of each minute is indicated by the omission of one clock-beat, and the beginning of the 5

minutes is indicated by the omission of any other given number of clock-beats, these omissions being made automatically by toothed wheels in the standard clock. In the second method the clocks are placed in the same circuit as the standard clock, and the electric current is used as a regulating power by causing a helix so placed in the clock to be controlled as to alternately enclose 2 magnets placed with their opposite poles toward each other, and attached to the bottom of the pendulum, to attract and repel the 2 magnets. This latter method is known as the Jones plan.

**Timoleon**, a native of Corinth and a member of one of the most prominent families of the city; put to death his own brother, Timophanes, who attempted to overthrow the democratic const. of their native city and make himself tyrant. In 344 B. C. an embassy arrived from Syracuse in Sic., a colony of Corinth, and demanded the intervention of the mother city in the struggle between Hicetas and Dionysius the Younger, each of whom wished to become master of the city. The aid was willingly granted, and T. was appointed commander of the expedition. He expelled both Dionysius and Hicetas, established a democratic const., repopled the city, and brought it in a very short time into a most flourishing state. This excited the jealousy of the Carthaginians, and under the command of Hasdrubal and Hamilcar they sent an army of 80,000 men against Syracuse, but T. routed them completely in 339 B. C., and a treaty was concluded by which the Halycus was fixed as the boundary between the Gr. and Carthaginian dominions in Sic. D. in 337 B. C.

**Timoor.** See **TIMUR**.

**Timor**, an island of the Malay Archipelago, the largest of the chain which stretches eastward from Java. Area, 8820 sq. m. Pop. estimated at 400,000. It is traversed from E. to W. by a range of lofty mts., which everywhere show marks of volcanic agencies; earthquakes are frequent. Along the shore are very fertile and densely peopled dists., in which rice, sugar, indigo, papaw, sago, pineapples, and cocoanuts are cultivated. Buffaloes, oxen, pigs, and fowls are plentiful; turtles, pearl-oysters, and elegant coral are found along the shores; gold-dust and timber are exported. The inhabs. are partly Malaysians, partly Oceanian negroes. The Dutch have a residency, Koepang, in the S. W. part of the island; the Port, a port, Dilly, in the N. E.

**Timothy, or Herd's Grass** [reputed to have been named from Timothy Herd, who introduced its culture in the U. S.], the *Phleum pratense*, one of the best of forage-grasses, a native of Europe, is much cultivated there and in the U. S. T. will not stand close pasturage, but affords fine crops of the best of hay.

**Timothy** [Gr. Τιμόθεος, "one who honors God"], a disciple and companion of Paul, b. at Lystra or Derbe in Lycaonia, Asia Minor, probably about 30 A. D. the offspring of a mixed marriage between a Greek and a Jewess; was carefully trained in a knowledge of the Jewish Scriptures, by his mother Eunice and his grandmother Lois, who were Chrs., but was not circumcised until Paul in his second missionary journey selected him as a companion. He became the most constant and devoted of Paul's numerous fellow-workers. He appears at the side of Paul while a prisoner at Rome, and finally as overseer of the important ch. at Ephesus, where Paul addressed him 2 canonical Epistles. In the later period of his career we learn from the Epistle to the Hebs. (xiii. 23) that T. had been in prison, had just been released, and the subscription of that Epistle states that he was its bearer, but from whom, whence, and whither have been much debated.

**Timothy, First and Second Epistles to**, two short canonical books of the N. T., addressed by Paul to Timothy as first overseer of Ephesus, the former from Laodicea, the latter from Rome. They are both chiefly occupied with instruction in the duties of a spiritual teacher, mingled with some admonitions of a personal nature and some references to Timothy's personal history; and the Second Epistle is endowed with a peculiar interest from its references to Paul's anticipated martyrdom, this being probably the last extant production of his pen. With the similar letter to Titus they constitute the so called "Pastoral Epistles."

**Timur**, or **Tamerlane** (the latter name being a corruption of **TIMUR LENK**—that is, "Timur the Lame"), b. Apr. 9, 1336, at Kesh. In 1360 he became chief of his tribe, and now began that wonderful evolution of conquering power, which ended by subjugating the whole of Central and W. Asia, from the Chi. Wall to the Mediterranean and from the Siberian steppes to the mouth of the Ganges. In 1393 he stood on the banks of the Dnieper threatening Moscow, but he turned to the S., burned Azof and retreated into Asia. In 1398 he conquered Delhi, whence he sent an immense amount of booty to Samarcand, and meditated pushing onward to the S., when he was called to the W. frontier of his realm. Here the conquest of Armenia, Georgia, and the countries on the Euphrates had brought him into contact with the Tur. empire, ruled over at that time by Bajazet, also a great conqueror. On July 20, 1402, the 2 huge armies, led by Bajazet and T., met each other on the plain of Angora, and the Turks were completely routed; Bajazet himself was taken prisoner. In 1404 T. prepared for a grand expedition to Chi., and in the beginning of the following yr. crossed the Jaxartes at the head of an army of 200,000 veteran troops, but d. at Otrar Feb. 18, 1405, and his empire soon became dismembered. His cruelty and that of his soldiers was beyond description.

**Tin** (Ger. *Zinn*; Fr. *étain*; Lat. *stannum*), a lustrous, white metal, not easily affected even by moist air at low temperatures, soft, malleable, of low tenacity, quite ductile at 212° F. (100° C.), a moderately good conductor of heat and electricity, not sensibly volatile at ordinary furnace-heat, fusing at 442° F. (227.8° C.), having after fusion a specific gravity of 7.292. Very pure tin in blocks is sometimes disintegrated by extreme cold. It is one of the oldest of



known metals, being mentioned in the Pentateuch. Tin ores are largely worked in Cornwall, Eng.; Banca, Billiton, and Malacca in the E. I.; less abundantly in Sax., Bohemia, Fr., Sp., Australia, Ire., Chil., Japan, the U. S. of Colombia, and Mex.; small quantities are found in Greenland, Swe., Finland, and Cal.; other places in the U. S. have afforded very small quantities—viz. Paris and Hebron, Me.; Chesterfield and Goshen, Mass.; near Jackson, N. H.; near Boonville, Id.; and Mo. is said to have furnished it. Tin ores occur in veins in gneiss, granite, mica and chlorite schists, and porphyry, associated with iron pyrites, copper pyrites, zinc-blende, galena, fluor-spar, apatite, topaz, mica, and wolfram. The most important ore is the oxide, called *casiterite*, *tin stone*, and *tin ore*; it occurs in veins, when it is called *mine tin*, and also as rolled pebbles in alluvial deposits, furnishing excellent ore, known as *stream tin* and *wood tin*. It is generally a dark-brown mineral, very hard, of sp. gr. 6.4 to 7.1; crystallizing in tetragonal prisms, with pyramidal ends; generally has a high, vitreous lustre, and contains 78.67 per cent. of tin. Native metallic tin has probably never been found.

**Tincal**. See BORAX.

**Tindal** (MATTHEW), LL.D., b. at Beer-Ferris, Devonshire, in 1657, studied at Ox., where he took his degree in 1676; became fellow of All Souls, and in 1685 was made LL.D., shortly after which he went over to the R. Cath. Ch., but returned to the Ch. of Eng. when the revolution of 1688 seemed imminent. After the revolution he held several legal positions, and received from the Crown a pension of £200. He took an active part in the polemics of his age, and pub. *The Rights of the Ch. Asserted*, in which he took ground against the prevalent High-Church doctrines; *New High Ch. turned Old Presbyterian* (publicly burned), and *Christianity as Old as the Creation*. D. Aug. 16, 1733.

**Tindale** (WILLIAM). See TYNDAL (WILLIAM).

**Tin-Foil**. See FOIL.

**Tin, Geology of, or Tin-Mines**. Though found abundantly in certain localities, and very extensively used by all civilized nations, tin is more sparsely distributed over the earth's surface than any other of the useful metals. It also has a very limited geological range, and is almost always found in the oldest rocks. The most important mines of tin are those of Cornwall, Eng., Island of Banca, Malayan Peninsula, and Australia. Quite recently very extensive deposits of tin have been found in Australia and Tasmania. Those of the latter country have not yet been fully explored, but the Australian tin-fields are already extensively worked, and are producing large quantities of metal. The tin-ground of Australia is said to extend along the MacQuarie River for 150 m., and the quantity of tin obtainable there is reported to be so great that the entire demand of the civilized world could be supplied for an indefinite period from that source. Tin occurs in several localities upon the continent of Europe in sufficient quantity to make it an object of exploitation, as at Altenburg and Zinnwald in Sax., etc., but the quantity produced here is insignificant as compared with that derived from the Cornwall and E. I. mines. In Fr. and Sp. tin ore has been discovered, but the annual production of these countries amounts to but a few tons.

The Amer. continent seems to be remarkably deficient in the ores of tin, and at present the entire consumption of that metal in this country is supplied from Eng. and the E. I. Tin is known to occur, and perhaps in considerable quantity, in Guanuni in Bolivia, but it is only worked to a trifling extent. In N. Amer. the only tin-deposits yet discovered which have any economic importance are those of Durango in Mex., and we have no accurate information in regard to the quantity obtainable there. Within the U. S. tin is known to occur at what is called the Temescal Mine in the S. part of Cal. and in some parts of Mont., but up to the present time no considerable quantity of ore has been found in either locality. In the E. States tin exists in Me., N. H., and Mass., but only as a mineralogical curiosity. The so-called tin ore of Central Mo., about which there was so much excitement a few yrs. since, has been found to contain little or no tin, and it is generally supposed that this mining scheme, like a similar one of which the scene was laid on the N. shore of Lake Superior, was a pure and unqualified fraud.

J. S. NEWBERRY.

**Tintoretto**, whose true name was GIACOMO ROBUSTI, b. at Venice in 1512, the son of a dyer, from which circumstance he received his surname; studied first under Titian, afterward independently, and made it his great aim to connect the drawing of Michael Angelo with the coloring of Titian. He worked with an astonishing ease and rapidity. Among his best pictures are the *Paradise*, in the palace of the doge, containing several hundred figures; the *Marriage in Cana*, in the ch. of Santa Maria della Salute; the *Wonder of St. Mark*, in the Acad.; the *Crucifixion*, etc. D. 1594.

**Tippecanoe River** rises in Tippecanoe Lake, Kosciusko co., Ind. It pursues a devious S. W. course for 200 m., and falls into the Wabash. On the banks of this river, at the present v. of Battle Ground, Tippecanoe tp. and co., Ind., Gen. Harrison defeated the Indian tribes commanded by the Prophet, the brother of Tecumseh, Nov. 5, 1811.

**Tippono Sa'hib**, sultan of Mysore (1782-99), b. Nov. 19, 1749, a son of Hyder Ali; distinguished himself in the war against the Eng., defeating them at Perimbakum, Sept. 10, 1780, and on the banks of the Koleru, Feb. 18, 1782. On Dec. 7, 1782, Hyder Ali died, and Apr. 28, 1783, T. S. took Bednore and Mangalore, but felt compelled to conclude peace—at Mangalore, Mar. 11, 1784—on advantageous conditions. It was his plan to drive the Eng. out of India. The Eng. E. I. Co., which feared him and knew of his vast intrigues in Fr., Per., and Afghanistan, fell upon him in 1790, together with a number of native princes, and compelled him in 1792 to sue for peace by ceding half of his dominions and paying 39,000,000 rupees. This misfortune, however, did not diminish his ardor. On Feb. 22, 1799, the company

declared war against Mysore, invaded the realm with 2 armies, and shut up the sultan in his cap., Seringapatam. Here he fell (May 4, 1799) while fighting on the walls; his dominions were confiscated by the company, and the spoils from his palace were carried to London.

**Tip-toft** (JOHN), EARL OF WORCESTER, b. at Everton, Cambridgeshire, Eng., about 1425, became the most eminent classical scholar among Eng. noblemen of the time; was created earl on the occasion of his appointment by Henry VI. to the post of lord deputy of Ire.; was afterward made lord high constable of the Tower, lord high treas. and knight of the Garter by Edward IV., whose cause he espoused in the "war of the Roses"; became obnoxious to the Lancastrians by the execution of several of their chieftains who had landed on the S. coast of Eng. He was the earliest Eng. patron of William Caxton, who printed his translations of a part of Caesar's *Commentaries*, Cicero's *De Amicitia*, and other works, but did not live to see the establishment of the press in Eng., having been executed by the Lancastrians Oct. 18, 1470.

**Tip-ton**, Ind. See APPENDIX.

**Tip-ton**, on R. R., cap. of Cedar co., Ia., in the exact geographical centre of the co. Pop. 1870, 1346; 1880, 1399.

**Tire'sias**, a celebrated soothsayer in anc. Gr., was blind, but understood the lang. of the birds, and lived to a great age. He had a famous oracle near Orchomenus, but after a plague it became silent.

**Tischendorf** (LOREGOFF FRIEDRICH CONSTANTIN), b. at Lengenfeld, Sax., Jan. 18, 1815, studied theol. and philology at Leipzig 1834-38; was appointed prof. of theology there in 1843; concentrated his study on a critical revision of the text of the N. T. From the monastery of Sinai he brought back the famous *Codex Sinaiticus*, the oldest Gr. MS. of the Bible, which is now preserved in St. Petersburg, and was pub. in 1862 in 4 vols. fol. at the expense of the emp. Alexander II. The prin. results of T.'s researches were several critical editions of the N. T. D. Dec. 7, 1874.

**Tis'ri** (Heb.), first Heb. month of civil yr. and seventh of ecclesiastical yr.; corresponds to part of Sept. and Oct.

**Tissaphernes**, appointed satrap of Lower Asia by Darius II. Notus in 414 B. C. After the death of Darius in 407, his younger son, Cyrus, who was viceroy of Asia Minor, tried to oust his brother, Artaxerxes II. Mnemon, from the throne, but was defeated at Cunaxa in 401 by T., who in reward received the command also in Asia Minor. His attempt to punish the Gr. cities which had supported Cyrus was unsuccessful. On the instigation of Parysatis, the king's mother, he was assassinated at Colosse, Phrygia, in 395.

**Titanic Dioxide**, generally called **Titanic Acid**. This compound alone constitutes 3 distinct mineral species—*octahedrite*, *brookite*, and *rutile*. Of the 3 mineral forms of T. D., *rutile* is far the most abundant, being indeed in some dists. a quite common mineral. The commoner varieties have a peculiar reddish tinge, and a lustre of a peculiar dark metallic brilliancy on the cleavages. Its hardness is between those of quartz and feldspar. The crystals are dimetric or tetragonal, and usually prismatic, sometimes acicular. There are a great many Amer. localities of *rutile*. *Brookite* is trimetric or orthorhombic in crystallization, translucent, with cleavage less distinct than *rutile*, but having the same metallic adamantine lustre. It has been found in small crystals in N. C. placer gold, at Paris in Me., and at Ellenville in Ulster co., N. Y. At the celebrated mineral locality at Magnet Cove, Ark., it is found as the variety *arkansite*.

*Octahedrite*, or anatase, is tetragonal like *rutile*, but with very different angles and cleavages. It is usually octahedral in form, highly lustrous like diamond, and sometimes mistaken for it in placer washings. Only one N. Amer. locality is cited, in dolomite at Smithfield, R. I.

**Titans**, in Gr. mythology, were the children of Uranus and Gea, numbering, according to the most common record, 12. Uranus feared his own children, and shut them up in Tartarus, but by the aid of Gea they broke out of the prison, overthrew their father, and placed Cronos on the throne. The curse, however, which Uranus let fall on his children was fulfilled. Cronos was dethroned by his own son, Zeus, and the T. were once more imprisoned in Tartarus, where the Cyclopes and Hecatoncheires were set to watch them.

**Tithe** [A.-S. *teótha*, the "tenth"], the name of a tax, consisting of  $\frac{1}{10}$  of the annual profit of land, stock, or labor, which, instituted by Moses, was paid by the Jews for the maintenance of the Levites and in compensation for their service in the temple. From the Jewish theocracy the inst. was gradually transferred to the Chr. Ch.

**Titian**, tish'-e-an (TIZIANO VECELLIO), b. in 1477 at Tai in Friuli, was very early sent to Venice, where he studied under Gentile and Giovanni Bellini. Bellini was the founder of the Venetian school, whose head T. afterward became. It is also probable that Titian had studied under Albert Dürer, who visited Venice in 1494 and in 1507, and very striking is the influence which at one time he received from his friend and fellow-student Giorgione. To this period of his career belong the *Visit of Mary to Elizabeth*, in the Acad. of Venice; the *Virgins at Lapin*, in the gallery of the Louvre; the *Christ with the Tribute-money*, in the museum of Dresden, etc. In 1514 he went to Ferrara, where he painted for Duke Alfonso I. the *Arrival of Bacchus in the Island of Naxos* and A *Sacrifice to the Goddess of Fertility*, the *Bacchus and Ariadne*, portraits of Lucrezia Borgia, Ariosto, etc., and in 1516 he returned to Venice, where he continued to reside till 1580. During these yrs. his style ripened into perfect originality. The most prominent feature of this style is the coloring. With respect to composition T. succeeded several times in representing passionate and highly pathetic subjects, such as the *St. Peter Martyr* and the *Martyrdom of St. Lawrence*. Nevertheless, the general character of his compositions is a noble repose—e. g. the *Assumption*, the *Presentation of the Virgin*, the *Entombment of Christ*, *Christ Crowned with Thorns*, the *Last Supper*, the *Holy Family*, etc.



Often the composition comprises only one or two figures, and the situation is almost without movement, like that of a statue, such as the numerous *Madonnas*, *Magdalens*, *Venuses*, *Danaës*, etc. In 1530 he was invited by Charles V. to Bologna to paint his portrait. In 1543 he again visited Bologna, Ferrara, and this time also Rome, where he painted the celebrated portrait of Pope Paul III. In 1548 he went to Augsburg. After 1550 he resided almost constantly at Venice, busy with his art to the last of his life. He was 81 when he painted the *Martyrdom of St. Lawrence*. D. Aug. 27, 1576.

**Titicaca**, te-te-kah'kah, the largest lake of S. Amer., is between lat. 15° 15' and 16° 35' S., and lon. 68° 40' and 70° W., at an elevation of 12,500 ft. above the sea, and surrounded by the high and towering peaks of the Andes. Its area is about 4000 sq. m. It contains a great number of islands, on which remains of old Peruvian architecture are found.

**Titlark**, or **Pipit**, name given to species of birds of the genus *Anthus* and group or sub-family Anthine. These are generally associated with at least the wagtails (*Motacilline*) in a family, *Motacillidae*, and contrasted with them by the comparative shortness of the tail (shorter than the wings), which is emarginated, and has the 2 central feathers shorter than the lateral, and all broadest near their ends, and boldly round at the extremities. They are mostly grayish-brown, and in the under parts variously streaked. They are birds of passage, insectivorous and graminivorous as to food, rather fine songsters, and graceful in appearance and movements.

**Title** [Lat. *titulus*], as a legal term, signifies the means of acquiring property or ownership. The common law divides all T. into T. by descent and by purchase. T. by descent includes the single mode of acquisition through inheritance; T. by purchase embraces all other methods. The arrangement of an able Amer. author separates the means of acquiring property in land other than by descent into T. not by grant and T. by grant. The first class includes escheat, prescription, accretion, estoppel, and adverse possession; the second class, governmental grants (the patents issued by the national govt.), office grants, private grants, devise. The foregoing enumeration embraces the various species of T., or means of acquiring and transferring property in land known to our law. JOHN NORTON POMEROY.

**Titmouse**, **Tit**, **Tomtit**, and **Chickadee**, names given by the Eng.-speaking peoples to species of birds of the group or sub-family Parinae, distinguished by a compressed body, soft and lax plumage, the bill shorter than the head, the wings rounded and short, the tarsi larger than the middle toe and claw, and the expansion of the sides of the toes into a palm. There are about 87 species scattered over all parts of the world. They are rather small birds, mostly between 4 and 6 inches long, and are remarkable for devotion to their young.

**Titmouse, Cape.** See CAPE TITMOUSE.

**Titus**, a disciple and companion of St. Paul, to whom one of the canonical Epistles of the N. T. is addressed. He was a Gentile, his native place probably being Antioch, as he first appears as a delegate from the ch. of that city, accompanying Paul to Jerusalem. He was a companion of the apostle in his next missionary journey to Asia Minor and Macedonia, and was twice charged with important missions to the ch. in Corinth. T. took part with Paul in founding the chs. in Crete, where he was laboring as evangelist when Paul's pastoral Epistle was written. He appears to have rejoined Paul at Nicopolis in Epirus, and was thence sent into Dalmatia, from which time all certain traces of him disappear.

**Titus, Epistle to**, one of the so called pastoral Epistles of the N. T. canon, written by Paul, about a year before his death, to convey instruction as to the work in Crete, with the execution of which T. had been commissioned.

**Titus Flavius Sabinus Vespasianus**, commonly called by his prenomen Titus, Rom. emp. (79-81), b. Dec. 30, 40 A. D., a son of Vespasianus and Flavia Domitilla, was ed. with Britannicus, the son of Claudius, with whom he formed an intimate friendship; in 69 finished the Jewish war by taking and destroying Jerusalem, Sept. 8, 70; after his accession proved a kind and conscientious ruler. Many splendid public buildings, the Colosseum, the baths, etc., were finished; but the emp. deserved most praise for the energy he devoted in aiding the people under the calamities which befell them during his reign—the destruction of Herculaneum, Pompeii, and Stabiae; the conflagration in Rome in the following year, by which the Capitol, the library of Augustus, etc. were destroyed; and, finally, the plague. He d. Sept. 13, 81.

**Titus Livius.** See LIPP.

**Titusville**, city and R. R. centre, Crawford co., Pa., in the extreme S. E. corner of the co., originally a part of Oil Creek tp. It was incorporated as a city in 1867. Oil Creek—originally so called on account of the petroleum which was occasionally found floating upon its surface—flows through the S. part of the city from W. to E., affording good water-power. The prin. streets are well built, laid with block pavements, and lighted with gas. The Holly system of water-works supplies every part of the city with the purest water. Petroleum was discovered in the E. confines of the city in 1859, since which time thousands of wells have been bored, from Bradford on the N. to Butler co. on the S. T. has always been a large oil-refining point. Pop. 1870, 8639; 1880, 9046.

**Tivoli**, tiv'ô-lî [anc. *Tibur*], town of It. prov. of Rome, 19 m. E. N. E. of the city of Rome, on a plateau formed by a spur of Monte Ripoli, about 900 ft. above the sea, and down which the Anio tumbles in its course toward the Tiber. This town, founded at least 500 yrs. before the first stones were laid in old Rome itself, is most interesting not only for its historical associations, but for the extraordinary beauty of the natural scenery in the midst of which it stands. The celebrated falls of the Anio or Teverone, so praised by the Roman poets, are perhaps even more beautiful now

than changes in the bed of the river, brought about by the violence of floods, have compelled the hand of art to lend its aid to nature. The Cascatelle are a series of smaller but most picturesque falls, produced by diverting, for manufacturing purposes, a portion of the water of the main stream of the Anio. On a rock overlooking the cascades stands the beautiful little temple generally called that of the Tiburtine Sibyl, though probably dedicated to Vesta—a circular structure (2½ ft. in diameter) surrounded by an open portico composed originally of 18 columns, only 10 of which now remain. Traces of old Rom. villas are found everywhere. The manufacturing industry is very considerable. Pop. 8105.

**Tlaxcala**, or **Tlascal**, [Mex. "land of maize"], a state of the Mex. republic, occupying a portion of the central table-land, N. of the Valley of Puebla and E. of the Valley of Mex. It is the smallest of the Mex. states, having an area of only 1620 sq. m.; is bounded W. by Mex., N. W. by Hidalgo, and on all other sides by Puebla. The terr. is mountainous on the N. and W., and the centre of the state is occupied by the celebrated mt. Malinche; the N. valley between Malinche and the Sierra de Puebla is traversed by the Mex. and Vera Cruz R. R., and from Apizaco in the N. W. a branch diverges S. to the city of Puebla. The soil is somewhat hard, and usually bare of trees, but extremely productive of maize, and in some parts produces the maguey or pulque-plant. Hemp has lately been successfully introduced. There are no towns of great importance. Pop. 138,988. Cap. Tlaxcala.

**Toad** [A.-S. *tæde*], the Eng. name for various species of Salientia or anurous amphibians, agreeing in having a stumpy body, short legs as compared with the frogs, and a warty skin. The T. is the representative of a group of families called Bufonidae, Rhinophrynidae, and Batrachophrynidae.

1. In the Bufonidae the skin is warty; both a tympanum and cavum tympani are developed; there are well-developed (2) eustachian tubes and parotid glands, and the tongue is free behind. The family is quite rich in species, and very generally distributed. They all live upon insects, and their appetite is almost insatiable.

2. In the Rhinophrynidae the skin is also rough, neither tympanum nor cavum tympani are developed; the eustachian tubes are rudimentary or absent; there are no parotid glands, and the tongue is free in front (fixed behind). The family is represented by a single genus, confined to tropical Amer.

3. In the Batrachophrynidae the skin is smooth; there is neither tympanum nor cavum tympani; no eustachian tubes, no parotid glands; the tongue is mostly adherent, the middle part only of the hind border being free.

**Toad-Fish**, the name applied to the species of fishes representing the families Batrachidae and Malthidae.

1. The Batrachidae belong to the order Teleostei, and are characterized by their subcylindrical body, but compressed backward, and gradually diminishing from the head to the tail; the skin is naked or covered with minute scales. The family is represented by carnivorous fishes in many tropical and temperate seas, although not very rich in species. They are bottom fishes, living mostly in the mud, and in some instances ensconce themselves in the empty valves of shells. The Batrachae are to be feared on account of their bite, as their teeth and jaws are quite strong, and the *Thalassophrynes*, on account of the wounds which they can inflict with their opercular spines. The opercular spines of most of the species are solid, but those of *Thalassophryne* are hollowed, and at their bases are poison-glands.

2. The Antennariidae (or Chironectidae) belong to the order Pediculi, and are distinguished by the high compressed or sack-like body; the skin is generally covered with minute spines, but sometimes naked; the head is large and compressed, but not differentiated externally from the trunk; the mouth is cleft laterally, and almost or quite vertically; the teeth are small and conic on the jaws and palate; the fins in part are singularly modified. The family is quite rich in species, remarkable for their grotesque physiognomy and often rich colors. They are mostly inhab. of the open or deep tropical seas. Not far from 50 species are known.

**Tobacco** [Sp. *tabaco*; Fr. *tabac*; Ger. *Tabak*], an important plant or genus of plants introduced to the knowledge of civilized nations on the discovery of Amer., where it was found in use by the natives of both the islands and the continent as far N. as Va. During the first century of communication with the New World little notice appears to have been taken of it, but after 1650 T. began to enter largely into the trade of the colonies with Europe, and its consumption became general. Though often violently opposed and denounced, it made steady progress, until now there are but few single products exceeding it in importance or in the extent of its use. There are several species of the genus *Nicotiana*. *N. tabacum* is the common T. of the U. S.; *N. frutescens* and *N. repanda* are grown in Cuba and other tropical countries of Amer.; *N. quadrivalvis* and *N. glauca* are species found growing wild in the interior near the upper Mo. *N. rustica* is cultivated on the coasts of the Mediterranean and at Latakia, Tur. The T.-plant is everywhere an annual, forming broad, ovate-lanceolate leaves near the ground, which enlarge to 18 inches in length by 6 inches in width or more as the strong fleshy stem rises, on which other leaves, diminishing in size, alternate to the top. The flowers are in a loose terminal panicle, with purple or light-red petals, with funnel-form corollas, and a small seed-capsule, ripening many small black seeds. In the T.-plant the distinctive and valuable properties are found only in the leaf, which is thick, heavy, and pubescent, becoming oily and semi-resinous as it ripens. This leaf, when the plant approaches maturity, is dried and cured by partial sweating, which effects a chemical change, removing the characteristics of the fresh leaves, and developing a powerful aroma, with strong narcotic and acrid properties. After







of the U. S. supreme court from Mar. 3, 1807, to his death, Feb. 7, 1836.

**Todleben** (FRANZ EDUARD), b. at Mitau, Courland, May 8, 1818, ed. in the schools at Riga and at the school of engineering at St. Petersburg; served in the Caucasus against Schamyl 1843-51; was distinguished in the campaign on the Danube 1853-54, and on the outbreak of the Crimean war in the latter yr. was ordered to Sevastopol on the invasion of the allies. To his genius is attributed the defence by which the place resisted for 349 days the efforts of the allied armies. Within the course of a yr. he had risen from the rank of capt. through successive grades to be maj.-gen. Beside other honors, that of the decoration of the third class of the order of St. George was conferred on him. He was subsequently intrusted with the defense of Nikolaief and Cronstadt. In 1869 he attained the grade of gen. (of engineers). As "adjoint" to the inspector-gen. of engineers in Rus. (the grand duke Nicholas), Gen. T. exercised *de facto* the functions of that office. He wrote the important work, *Défense de Sébastopol. Ouvrage rédigé sous la direction de Lieutenant-Général E. de Todleben*, etc. D. July 1, 1884.

**Tokio, or Tokel**, the new name of Yedo. See JAPAN.  
**Toland** (JOHN), b. near Redcastle, Londonderry, Ire., Nov. 30, 1669, of R. Cath. parents, was originally called JANUS JUNIUS, but changed his name while at school at Redcastle, where he also became a zealous Prot., and under the patronage of some dissenters entered the Univ. of Glasgow 1687; removed to that of Edinburgh, where he grad. M. A. 1690; studied theol. 2 yrs. at Leyden; resided several yrs. at Ox., where he prepared his first work, *Christianity not Mystical*, which was burned by the hangman at Dublin Sept. 11, 1697; the author being then in that city, proceeded to Lond., where he pub. an *Apology for Mr. Toland* (1697); went to Amsterdam; pub. there the first edition of Milton's *Works, with a Life*, in which he made an indirect attack on the Gospels; wrote a rejoinder entitled *Amyntor, or a Defence of Milton's Life*; put forth a pamphlet entitled *Anglia Libera* in favor of the succession of the house of Brunswick, which procured him employment at Berlin and other Ger. courts; returned to Eng. and pub. *Vindicius Liberiis, Socinianism truly Stated*, and *Letters to Serena*; resided abroad in the employ of Harley 1707-10, and was subsequently a voluminous pamphleteer in Lond. Wrote *State Anal. of G. Brit., Nazarenes, or Jewish, Gentile, or Mahometan Christianity, containing the History of the Anc. Gospel of Barnabas, etc.*, a *Life of Servetus*, etc. D. Mar. 11, 1722.

**Toledo**, one of the oldest cities of Sp., and the cap. of a prov. of the same name, is built on an immense granite rock at an elevation of 2400 ft. above the sea, and inclosed on 3 sides by the Tagus, toward which the rock presents steep and abrupt sides, while on the fourth side, where the ground slopes gently, it is defended by 2 walls. From 467 to 714 it was the cap. of the Goths, from 714 to 1085 that of the Moors, and after 1085 it was the residence and cap. of the kings of Castile. Its most remarkable edifice is the cathedral, the metropolitan ch. of Sp., and one of the most magnificent ch. buildings in the world, founded in 587. But the general aspect of the city is gloomy and almost desolate; its once flourishing industry has died out, the only two branches still alive being the manufactures of sword-blades and confectionery. Pop. 21,297.

**Toledo**, on R. R., cap. of Tama co., Ia. It has considerable trade in grain. Pop. 1870, 888; 1880, 1026.

**Toledo**, city and important R. R. and commercial centre, cap. of Lucas co., O., on the bank of Maumee River, 9 m. above its junction with Lake Erie. Incorporated in 1836 on the union of the 2 v. of Ft. Lawrence and Vistula, the straggling settlement then numbering less than 1000 souls. Beside her intimate connection with the great inland lake-navigation of the N. W., it is the terminus of Wabash and Erie and Miami canals. The great development of the city has resulted from remarkable natural and acquired advantages as a collecting, shipping, and distributing point. It has a large trade in grain, lumber, etc. Pop. 1870, 31,584; 1880, 50,137.

**Toledo War, The**, was a strife which almost reached bloodshed between the State of O. and the Terr. of Mich. in regard to their dividing line. In the ordinance of 1787 for the gov't. of the Terr. N. W. of the O. River, Cong. granted certain rights to the inhabs. and reserved to itself the right to form one or two States "in that part of said Terr. lying N. of an E. and W. line drawn through the southerly bend or extreme of Lake Michigan." In the act of 1802 for the admission of O. as a State the same line is described as its N. boundary, but the people specified a more northerly line in their State const. In 1805 Mich. Terr. was organized, the boundary being defined according to the ordinance of 1787. The difference between the acts of Cong. and the const. of O. in regard to her N. boundary caused that State to apply for a survey of the same. A survey was made in 1817. The line then run was called the "Harris line" one run according to the words of the act was called the "Fulton line." The former is the present boundary, while the latter intersects Lake Erie E. of the mouth of the Maumee River, and includes within Mich. the important city of Toledo. This city was the apple of discord, and gave its name to the "war." While measures were in progress for the admission of Mich. into the Union, the legislature of O. passed an act to organize the disputed tract of about 650 sq. m. into tps., and provided for a resurvey of the "Harris line." The authorities of Mich. being informed of the contemplated encroachment, on Feb. 12, 1835, passed an act to prevent any foreign jurisdiction within the limits of the Terr. Gov. Robert Lucas of O. called out the militia to protect his surveyor, and Acting Gov. Stevens T. Mason of Mich. summoned his militia to assist the civil authorities in repelling the expected invasion. Both State and Terr. made urgent appeals to Pres. Jackson to support their respective claims. He referred the matter to Atty.-Gen. B. F. Butler, who wrote an opinion favorable to Mich. The attempt by O. to

exercise jurisdiction over the disputed tract led to several squabbles, and the arrest of officers from O. and their sympathizers by the authorities of Mich. The rival govts. directed the proceedings in courts of law which followed these disturbances. On Sept. 6, 1835, Acting Gov. Mason assumed command of the militia *en route* for Toledo to prevent the organization of Wood co. by the O. authorities, which was to take place at Toledo Sept. 7. Although the Mich. militia occupied the town, a detachment of O. forces, accompanying the proper officers, entered at 3 o'clock A. M., and, having gone stealthily through the formalities, withdrew. O. having gained her point, the militia on both sides were disbanded. Orders to supersede Acting Gov. Mason, on account of his zeal and nerve in the cause of Mich., were issued by the Pres. Aug. 29, 1835. After a sharp debate in Cong., Mich. was admitted into the Union by act of June 15, 1836, on condition of her acceptance of the "Harris line." At the same time she received the addition of the Terr. known as the Upper Peninsula from Wis. A convention of delegates, called to consider this proposition on Sept. 26, 1836, rejected it by 28 yeas to 21 nays. A second convention of delegates, called without authority of law by the Dem. co. committee of Wayne co., was elected, and gave its full assent (Dec. 14, 1836) to the above conditions. Its authority being recognized at Wash., Mich. came into the Union as a State Jan. 26, 1837.

**Toleration** [Lat. *tolerare*, to "endure"] denotes the endurance of religious opinions or practices unlike those of a state religion. In polytheistic countries there was little room for this, since every deity demanded worship in its place and time. A monotheistic faith, on the other hand, which denies all worship but that of one being, may easily suppress the public exercise of any other by law. In the Jewish system nothing but the worship of Jehovah without images was endured at all. Even in heathen countries the introduction of new rites has been often prohibited; thus, the laws of Athens punished *asebeia* or want of veneration for the gods of the country, and Socrates suffered death on charge of this crime. The Ch. of the Middle Ages endured no dissent from the established faith and worship, as if everything had been settled by authorized interpretations of the word of God without appeal. T. in Prot. countries is the intermediate state between persecution for opinion's sake and separation of State and Ch. Its defence has been put either on the ground of the natural right of avowing opinions which the individual holds to be true, or on the practical ground that by suppressing the avowal of personal belief nothing is gained, that the truth in the end prevails, that the state loses the regard of its subjects by putting their convictions under the ban, and that thus the state is weakened if not destroyed.

T. D. WOOLSEY.

**Toltees**, an anc. Indian nation of the Mex. table-land, so called from their cap., Tula, situated about 50 m. N. of the City of Mexico. According to tradition, they had settled there about the 7th century. In the period preceding the advent of the Aztecs and other Nahuatl tribes the T. are represented as having exercised supremacy over a vast region, but to have been conquered by the Chichimecs, and to have emigrated in great numbers to Guatemala, where they are supposed to have founded the Quiché empire. At the time of the conquest there were no pure T. remaining in Mex., but the prin. monuments of Mex. arch. and their civilization were ascribed to the half-mythical T.

**Tolu Balsam**, a balsamic juice obtained from *Myrsopernum toluiferum*, a lofty tree of the natural order Leguminosae, growing in Venezuela and New Granada. The tree averages 70 ft. in height, with a straight trunk rising 40 ft. without branching. The balsam is obtained by slashing the bark of the stem through to the wood in many places, and allowing the juice which spontaneously exudes to collect in small calabashes fixed to the tree. The balsam when fresh is a light-brown, thick, resinous substance. It has a delicate and fragrant odor. Its most important constituents are an amorphous resin and cinnamic acid.

**Toluene** (*Toluol*, *Hydride of Benzyl*, *Hydride of Toluyl*, *Methyl-Benzene*) was discovered in 1837 by Pelletier and Walter in the oily product of the dry distillation of resins. It is obtained by the dry distillation of tolu balsam and many resinous bodies, by the action of potash on benzylic alcohol, and by heating toluic acid with lime; but is most readily prepared by collecting the portion of coal-naphtha which distils between 212° and 248° F., agitating it with sulphuric acid, and redistilling, and collecting the part that goes over between 226° and 230° F.

**Toluic Acid** (*Toluic Acid*, *Toluylic Acid*), an aromatic homologue of benzoic acid and an isomere of methyl benzoate, is produced by the action of nitric acid on cymene or xylene, and by the action of sodium and carbonic acid on bromotoluene. In a pure state it is colorless and tasteless. The fusing-point of the acid is 84° F.

**Toluidine** (*Amido-Toluene*) is produced by reducing nitro-toluene with ferrous acetate or sulphuretted hydrogen. It dissolves in boiling water, and in alcohol, ether, and chloroform. T. fuses at 104° F. to a liquid which boils about 388° F. It imparts a slight blue color to reddened litmus, and forms a series of compounds with many of the acids.

**Tomb**, R. It. junc. Monroe co., Wis., is chiefly engaged in agriculture and lumbering. Pop. 1870, 837; 1880, 1245.

**Tombahawk** (*Algonkin, tomahagen*), strictly, was the war-club of the N. Amer. Indians, but for a long time the name has been given, probably through misapprehension, to the war-hatchet, originally of stone. The natives used this weapon as a battle-axe.

**Tomato** [Mex. *tomatl*], the *Lycopersicon esculentum*, a plant of the order Solanaceae whose fruit is extensively employed as an article of food, both raw and cooked. It is a native of tropical Amer.

**Tom'bac** [Malay, *tambaga*, "copper"], a term applied to different alloys of copper and zinc, with about 85 per cent. of copper. Dutch metal, pinchbeck, imitation bronze,



prince's metal, and Mannheim gold are similar alloys. A *white tombac*, or *white copper*, has been made, containing copper 75 and arsenic 25.

**Tombigbee River** rises in Tishomingo co., Miss., and after a very indirect S. by E. course of 450 m. in Miss. and Ala., joins the Ala. River 45 m. above Mobile, and the united stream is called Mobile River below the junction. It is navigable to Aberdeen, Miss., 410 m. from Mobile Bay.

**Tombstone**, Ariz. See APPENDIX.

**Tomcod**, a name applied in the U. S. to small codfishes, forming the genus *Microgadus*. The species on the E. coast is the well-known *M. tomcodus*, that on the W. (Cal. etc.) the *M. proclivus*. The species are not of much economical importance, although the E. one at least is brought in considerable quantities to the E. markets.

**Tomlinson** (GIDEON), LL.D., b. at Stratford, Conn., Dec. 31, 1780, grad. at Yale 1802, became eminent as a lawyer at Fairfield; was M. C. 1818-27, gov. of Conn. 1827-31, and U. S. Senator 1831-37. D. Oct. 8, 1854.

**Tommaseo** (NICOLÒ), b. at Sebenico, in Dalmatia, in 1802, took his legal degree at the Univ. of Padua. Literary criticism, however, especially attracted him; he went to Florence; was banished and retired to Fr. Previous to his exile, however, he had pub. an important work, *Il Dizionario dei Sinonimi*. In Fr. he wrote 2 novels, *Il Duca d'Atene* and *Fede è Bellezza*; went to Corsica, where he made a collection of popular songs; pub. Tuscan songs, and a collection of Gr. and Illyrian popular songs; returned to Venice, where he pub. *Memorie Poetiche*, and his first *Dizionario Etimologico*. Having taken part in the national movements of 1847-48, he was imprisoned with Daniel Manin. Being liberated at the same time by the people of Venice, and the provisory govt. proclaimed, Manin, as pres., invited T. to take part in it. He accepted the portfolio of instruction, and was soon after sent as minister to Paris. On the fall of the Venetian republic T. retired to Corfu, but in 1854 returned to Piedmont. D. at Florence in 1874.

**Tompkins** (DANIEL D.), b. at Scarsdale, Westchester co., N. Y., June 21, 1774, grad. at Columbia Coll. 1795; was admitted to the bar of New York 1796; was elected to the legislature, and also to the convention for revising the State const. 1801; was M. C. 1804-05; appointed judge of the N. Y. supreme court 1804; was gov. of the State 1807-17; was conspicuous as an advocate of "Jeffersonian principles" and an opponent of the banks; commanded the 3d military dist. during the war of 1812-15; was chosen V.-P. of the U. S. 1816 on the ticket with Monroe, and re-elected 1820; recommended by a special message of Jan. 28, 1817, the abolition of slavery in N. Y., which was effected by an act to take effect July 4, 1827; was chancellor of the Univ. of New York; delegate to the State constitutional convention of 1821, and for a time its pres. D. June 11, 1825.

**Tompkinsville**, N. Y. See APPENDIX.

**Ton's River**, N. Y. See APPENDIX.

**Ton** [A.-S. *tunne*, a "tun," a "large vessel," Fr. *tonne*; D. *ton*], the unit of weight in G. Brit. and the U. S. for heavy and bulky commodities. It is equivalent to 20 cwt., and as, in Britain and in the U. S. custom-houses, the cwt. is reckoned at 112 lbs., the ton contains 2240 lbs. In the domestic commerce of the U. S., however, it has become customary to reckon only 100 lbs. to the cwt., and 2000 lbs. to the ton; and this usage, in some of the States, if not in all, has received the sanction of law. Thus, in the revised statutes of the State of N. Y. it is provided that "the hundredweight shall consist of one hundred avoirdupois pounds, and twenty hundredweight shall constitute a ton."

**Tonawanda**, R. R. centre, on Erie Canal, Erie co., N. Y., at the mouth of Tonawanda Creek, a tributary of Niagara River. Pop. 1870, 2812; 1880, 3864.

**Tone** (THEOBALD WOLFE), b. in Dublin, Ire., June 20, 1763, ed. at Trinity Coll., Dublin; studied law in Lond.; was called to the bar at the Middle Temple 1789; wrote a number of pamphlets to expose Eng. misgovernment in Ire.; was an ardent sympathizer with the doctrines of the Fr. revolution; founded at Belfast the first society of United Irishmen 1791; became sec. and agent of the R. Cath. committee 1792; was involved in secret negotiations with Fr., on account of which he came to the U. S. 1795; sailed for Fr. Jan. 1796; aided the Fr. Directory in fitting out Hoche's projected expedition to Ire.; was captured in Sept. 1798 on board a Fr. squadron bound for Ire.; was taken to Dublin, tried by court-martial, and sentenced to death, but committed suicide Nov. 19, 1798.

**Tonga Islands**. See FRIENDLY ISLANDS.

**Tongue, Diseases of**. The T. may be inflamed from various causes, as hot drinks and irritants. It is often the seat of aphthæ, ulcers, "cancers," the result of catarrh of the mouth. The "coated tongue" may be due to a relaxed, flaccid, and pale condition of the papillæ, and when noticeably coated has an accumulated stratum of thickened saliva and rapidly exfoliated epithelial cells; the yellow color the result of the fatty metamorphosis which the cast-off cells speedily undergo. When the stomach is inflamed or irritable, the papillæ of the T. will often appear as distinct points. The T. is occasionally attacked by epithelial cancer. Ranula is a cystic tumor beneath the T., due to occlusion of some one of the salivary ducts. When any part of the T. is the seat of motor paralysis, loss of sensation or taste, the part so deprived may be experimentally defined, and a study of the nerve-supply of the T. will point to the part of the brain in which the lesion exists. Exceptionally, in infants the "frænum" or fibrous cord beneath the T. is too short; the "tongue-tied" infant cannot nurse well, and when older speaks imperfectly; and the cure is by cutting.

E. D. HUDSON.

**Tonics**, in med., a term used to refer generically to the various means employed by the phys. to remove the condition of *debility*, general or special. Nourishing food, fresh air and exercise, cold bathing, etc. are thus spoken of as having a tonic effect. Among drugs, such as directly im-

prove nutrition, or indirectly accomplish the same end by exciting the appetite and increasing digestive power, are called "tonics."

**Tonqua Bean**, the seed of a noble leguminous tree of S. Amer., the *Dipterix* (or *Coumarouna*) *odorata*. It abounds in the fragrant principle coumarine.

**Tonguin**, Gulf of, an inlet of the China Sea, bounded S. and W. by Cochín-China, N. by China, and E. by the island of Hainan. Its fisheries are very productive.

**Tonsillitis**. See QUINSY.

**Tontine**. See LIFE ASSURANCE.

**Tooke** (JOHN HORNE), b. at Westminster, Eng., June 25, 1738, son of John Horne, a wealthy poulterer, grad. at St. John's Coll., Cambridge, 1758; took orders in the Ch. of Eng.; began his political career in 1765 by writing a defence of Wilkes, entitled *The Petition of an Englishman*; became intimate with Wilkes, and aided him in founding the Society for Supporting the Bill of Rights 1789; was in consequence denounced in the *Junius* letters, and defended himself with vigor 1771; resigned his living and resumed the study of the law at the Middle Temple 1773; started a subscription for the widows and orphans of the Amers. "murdered by the king's troops at Lexington and Concord 1775," for which he was prosecuted by the ministry for libel; wrote while in prison a *Letter to John Dunning, Esq.*; was refused admission to the bar 1779 on the ground of being a clergyman; assumed his additional name in 1782 out of regard to Mr. Tooke of Purley, who made him his heir; pub. his chief work, *ΕΠΕΑ ΠΙΠΕΟΝΤΑ*, or *The Diversions of Purley*, an ingenious treatise on etymology; wrote several political pamphlets; was an active member of the Society of Correspondence formed by the admirers of the Fr. revolution, on which account he was committed to the Tower, tried for high treason 1794, but acquitted; obtained a seat in Parl. for Old Sarum 1801. D. Mar. 18, 1812.

**Tooke** (THOMAS), son of William, b. at St. Petersburg, Rus., in 1774, was for more than 40 yrs. successfully engaged in the Rus. trade; was a pioneer of free-trade doctrines. Author of numerous writings on the currency, the corn laws, finance, and banking, including a valuable *Hist. of Prices and of the State of the Paper Circulation from 1795 to 1856*, etc.; wrote the famous "Merchants' Petition" for free trade in 1820; was the founder of the Political Economy Club (1831), etc. D. Feb. 26, 1858.

**Toola**, or **Tula**, town of European Rus., cap. of the govt. of Toola, on the Oopa, is well built and has a fine cathedral. Its manufactures of hats, silks, leather, platinumware, jewelry, and ironware are very important. Locks, tea-urns, cutlery, bells, muskets, pistols, sword-blades, etc. are made to perfection in large quantities. Pop. 60,744.

**Toombs** (ROBERT), b. in Wilkes co., Ga., July 2, 1810, ed. at the Univ. of Ga., and at Union Coll., Schenectady, N. Y., where he grad. in 1828; took a law course at the Univ. of Va. in 1829; in every dept. of study he was regarded as an intellectual prodigy; was admitted to the bar in 1830, before his majority, by special act of the legislature. Few men ever rose more rapidly in his profession. Washington, Wilkes co., is his residence, and has been since he entered active life. Capt. in war against Creek Indians in 1836, member of legislature 1837-40 and 1842-43. In 1844 was elected to Cong.; remained in the House until 1853, when he was transferred to the Senate. He was very prominent in the agitations on the slavery question during this period, and contributed much by his ability and eloquence to the success of Mr. Clay's adjustment measures in 1850. He favored secession in 1860, and in 1861 resigned his seat in the Senate after Ga. passed her ordinance of secession; member of Montgomery cong., and upon the earnest request of Mr. Davis became Confed. sec. of state temporarily, and only until his successor could be found. He resigned in July, when Mr. Hunter of Va. took his place. Mr. T. entered the military service as brig.-gen.; for causes that need not be stated he resigned that commission and became a brig.-gen. in command of the State militia, upon the invasion of the State by Sherman in 1864. In 1865 he left the country, and sojourned in Europe until the restoration of the privileges of the writ of *habeas corpus* in 1867. The reconstruction measures of Cong. he denounced at the beginning, and still continues to denounce, with all the force of his power of language.

ALEXANDER H. STEPHENS.

**Toon**, the *Cedrela Toona*, a large timber tree of India, belonging to the order Cedrelaceæ. It is found throughout a wide area in Asia, and its wood, though soft, is very useful. The bark is a strong astringent.

**Toorkistan**. See TURKESTAN.

**Toothache**. The cause of T. should, if possible, be discovered. It is usually due to diseased teeth, which should be filled or extracted. Abscess of the gums should be incised. When purely neuralgic, improved diet, out-of-door life, and tonics are indicated. Malaria demands quinine; anæmia, iron; struma, cod-liver oil. The nervous cases yield to opiates, sedatives, and nervines. For the immediate relief of T. local leeching, cupping, poulticing, fomenting, lotions of chloroform, laudanum, and aconite, embrocations of oil of peppermint and cloves and chloral camphor, and the use of opiates, chloral-bromides by the mouth, are useful measures.

**Toothache Tree**. See PRICKLY ASH.

**Topaz**, a gem named from its locality, an island in the Red Sea. The mineral species *topaz* is orthorhombic in crystallization, with a fine basal cleavage which causes it to split into lustrous plates. Its hardness is 8, lying between quartz and sapphire. The diamond will therefore scratch it very easily. It contains silica, alumina, and fluorine.

**Tope**, the Eng. name of the *Galeorhinus Galeus* (or *Galeus canis*), a shark common in the Brit. seas, and widely distributed elsewhere, but not found in the Amer. waters. It belongs to the family Galeorhinidae, attains a length of about 6 ft., and does not differ in habits or economy in nature from the common sharks of the Amer. coast.



**Tope'ka**, city and R. R. centre, cap. of Kansas and of Shawnee co., on Kansas River, 68 m. W. of the State line between Mo. and Kan. The location of the city is high and commanding. The legislature, supreme court, and the U. S. circuit and dist. courts hold sessions here. The U. S. is just completing a building costing \$300,000 for the use of the P. O. and U. S. courts. The city has excellent public schools, and also several collegiate insts. The Coll. of the Sisters of Bethany, for the education of girls, is under the auspices of the P. E. Ch. The coll. edifice cost \$50,000, and is one of the most complete and thorough educational insts. for young ladies, W. of the Alleghany Mts. Washburn Coll. is a Congl. inst., situated on 160 acres of land adjoining the city.



State Capitol (Topeka, Kan.).

The edifices cost \$100,000, and the endowment fund is \$200,000, which will soon be \$1,000,000. The Sem. of the Assumption is a R. Cath. school for boys and girls. The gen. offices and prin. machine-shops of the Atchison, Topeka and Santa Fé R. R. Co. are at T. Within 2 m. of the city is one of the State insts. for the insane, with a capacity for 300 patients; when completed as intended, it will cost \$500,000. Within 4 m. of T. is a State Reform School, with accommodations for 150. The city has water-works and gas. The wings of the State capitol are completed at a cost of \$800,000, and work commenced on the central part; estimated cost, \$1,500,000. There are 3 daily, 6 weekly, and 3 monthly newspapers. Pop. 1870, 5790; 1880, 15,452; by State census Mar. 1, 1882, 22,300. F. P. BAKER.

**Top'het**. See GERENNA.

**Top'knut**, a name given in Eng. books to flat fishes of the genera *Zenogopterus* and *Scophthalmus*. These resemble each other in physiognomy, the wide (high) oval body, ciliated scales, sinistral and fringed eyes, narrow interorbital ridge, and long based ventrals.

**Topography** [Gr. *τόπος*, "place," and *γράφειν*, to "write"]. T. and hydrographic T. come in general terms under the head of surveying, but their object is only to determine the relative positions of points of the earth that can be referred without error to a tangent plane, and therefore independent of the sphericity of the globe. The operations of a topographical survey are 2—viz. to first project a system of points upon such a tangent plane, and secondly, to find the distances of the same above or below the plane; or, in other words, measure the lengths of the projecting normals. The first process is ordinary surveying; the second, levelling. If the tangent plane be assumed at the centre of the country to be embraced in the survey, it will result that for a surface extent even of one degree the errors will be less than in the ratio of  $\frac{1}{100,000}$ , and may be considered inappreciable.

**Torbert** (ALFRED T. A.), b. in Del. July 1833, grad. at the U. S. Military Acad. July 1, 1855; served on frontier duty in Tex. and Fla. 1856-57, on U. expedition 1857-60. In the c. war he was engaged, Apr.-Sept. 1861, in mustering N. J. volunteers into service, and Sept. 16 was appointed col. of the 1st regiment, which he led in the Va. Peninsular campaign of 1862 at Yorktown, West Point, Gaines's Mill, and Charles City Cross-roads; assigned to command of a brigade in the 6th corps Aug. 28, 1862, and engaged in the second battle of Bull Run, at S. Mountain (wounded), and Antietam. Promoted to be brig.-gen. of volunteers Nov. 20, 1862, he was engaged in the battle of Gettysburg, July 2-3, 1863, and subsequent operations of that corps during the winter of 1863-64. In the Richmond campaign of 1864 he was engaged in the frequent actions from May 15 to Aug. 1864, and in all operations in Shenandoah campaign, Aug. 1864-Jan. 1865. Brevet major for gallantry at Gettysburg, lieutenant-col. for Hawes's Shop, col. for Winchester, brig.-gen. for Cedar Creek, and maj.-gen. for gallant and meritorious services during the war. Became consul-gen. to Havana 1871, and U. S. consul-gen. at Paris 1874. D. Aug. 28, 1880.

**Torch-Wood**, the *Amorpha floridana*, a small tree or shrub of S. Fla., having shining leaves, clusters of yellowish-white flowers, and a resinous juice.

**Tornadoes**. See STORMS.

**Tornea**, river of N. Europe, forming the boundary between Swe. and Rus. It is rapid, and celebrated for its beautiful cataracts and salmon fisheries.

**Toron'to**, city of the Dominion of Canada, cap. of the prov. of Ontario, is in lat. 43° 39' N., lon. 79° 21' W., on the N. shore of Lake Ont., 333 m. from Montreal, 513 m. from Que., 500 m. from New York, and 593 m. from Boston. It has a spacious and well-sheltered harbor, and various railway lines connect the city with all the prin. points of the provs. of Ont. and Que. and with the U. S. The place was called York till 1834, when it was incorporated as a city. It was cap. of Upper Canada till 1841, the seat of the united govt. alternately with Quebec 1849-58, and has been cap. of

Ont. since 1867. The city is finely laid out, the streets crossing each other at right angles, generally well built, and containing several fine parks and many handsome public buildings, of which the most remarkable are the univ., completed in 1859; the cathedral of St. James, commenced in 1852, with a spire 316 ft. high; the cathedral of St. Michael; the city hall, the opera-house, the P. O., and the Osgood Hall. The commerce and manufacturing industry of the city are considerable. Pop. 1871, 36,092; 1881, 86,455.

**Torpedin'idæ** [from *Torpedo*, the ancient name of a species], a family of selachians of the order Raia, famous for their electrical apparatus, by means of which they are capable of giving quite severe shocks, and species have on this account been also named "cramp-fish," "cramp-ray," "numb-fish," etc. The electrical apparatus of the T. is situated between the head (eyes and spiracles) and the inner concealed bases of the pectorals; this is composed of numerous approximated hexagonal columns, at right angles to the surfaces of the body, and with their ends often visible through the skin above and below, occupying as the apparatus does the entire depth between the upper and under surfaces of the body; these batteries are provided with nerves from the "eighth pair." The shock transmitted from the fish is co-ordinated with a depression of the convexity of the upper surface, and immediately after it has been given the normal form is resumed; the shock is quite subject to the volition of the animal. It is used probably for offensive as well as defensive purposes. In ancient days the animal was impressed into use for medicinal purposes, and was the original electro-therapeutic medium. Representatives of the family are quite generally distributed throughout the warm and temperate seas of the globe. About 20 species are known.

**Torpedo**. See TORPEDINIDÆ.

**Torpe'do** [Lat.], the modern name given by Robert Fulton to a submerged military mine designed to destroy hostile shipping.

**Historical Notes**.—The earliest "infernal machine" on record dates from the siege of Antwerp in 1585, where an It. engineer, Zambelli, destroyed an important bridge laid by the enemy over the Scheidt by setting adrift against it 4 scows, each carrying a masonry mine heavily charged with gunpowder. Ignition was to be effected either by a slow match or by a gun-lock discharged by clock-work after the lapse of a certain time. But an Amer. engineer officer of the Revolution, Capt. David Bushnell, won the right to be considered the originator of submarine mining as practised at the present day. His first practical trial was made in 1776. The attack was directed against the Eagle, the flagship of Lord Howe, lying in New York harbor, and the vessel narrowly escaped destruction. In 1777 Bushnell caused the blowing up of a prize schooner by means of a drifting T. which was ignorantly taken on board the schooner. In the following winter he set adrift many T. to annoy the Brit. fleet in the Delaware. Twenty yrs. later Robert Fulton attempted to introduce submarine warfare in the Fr. navy. He made a submarine boat named the Nautilus, by which in Aug. 1801 he blew up a launch in the harbor of Brest. His system included 4 classes of torpedoes: (1) Buoyant mines, anchored in the channel to be defended, and exploded by a mechanical device set in action by contact with the enemy's hull. (2) Line T., designed to be set adrift and fouled by the cables of the hostile fleet at anchor. (3) Harpoon T., to be discharged from a gun, and thus attached to a vessel and fired by clock-work. (4) Block ship T., to be carried on booms projecting from vessels of a peculiar type, and exploded by contact with the enemy. The modern system includes all these devices in a modified form, except the third.

During the next 30 yrs. T. warfare was neither forgotten nor neglected in Europe, but it was again left to an Amer., Col. Samuel Colt of Hartford, to make the next great advance. Colt elaborated a system of buoyant submarine mines, to be planted quincuncially in the threatened channel and operated by electricity. To convey the current he devised one of the very first submarine cables ever attempted, which in the winter of 1842-43 he successfully laid across E. River, New York harbor. When designed for T. purposes, each cable included 2 separate conductors, which, entering the mine, were united by a fine platinum wire imbedded in gunpowder. The operator, by sending at pleasure a strong current of voltaic electricity through this bridge, heated the platinum to redness and determined the explosion.

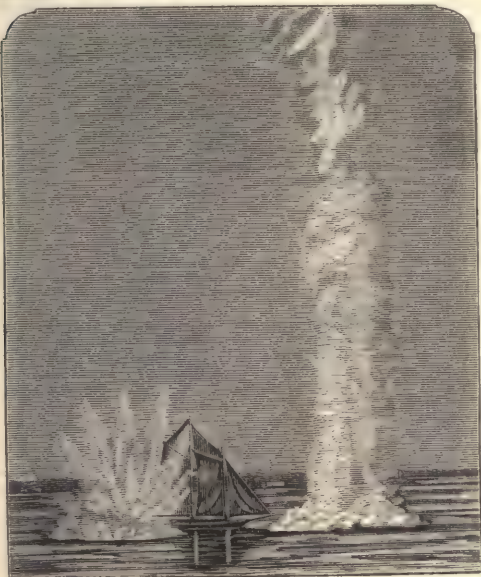
The Anglo-Fr. war with Rus. in 1855 furnished the next occasion for the application of submarine mines to harbor defence. Sevastopol, Cronstadt, and Swaborg were protected in this manner by devices of Prof. Jacobi. The fuse consisted of a small bottle of sulphuric acid imbedded in a mixture of potassium chlorate and sugar; the mechanical breaking of the bottle by contact with the vessel effected ignition. In fine, it was reserved for Amer. engineers to demonstrate upon a grand scale the important part which the modern T. can be made to play in maritime warfare. The c. war of 1861-65 offered conditions peculiarly favorable to its development. The Southern Confederacy was possessed of no fleet worthy of the name, while a long line of seacoast and many navigable rivers exposed its territory to easy assault by water. Every variety of T. became, therefore, admissible. After some preliminary trials, an efficient bureau was established at Richmond, which continually extended the scope of its operations until the end of the war. Seven U. S. iron-clads, 11 wooden war-vessels, and 6 army transports were destroyed by T., and many more vessels were more or less injured. The Confeds. lost 8 vessels by their own mines, and a fine iron-clad, the Albemarle, by the counter-operations of the U. S. fleet.

**Submarine Boats**.—But one boat of this character won a record during the c. war, and hers was sufficiently tragic to deter imitation. She was of boiler iron, 35 ft. long, was



propelled by hand at a maximum speed of 4 knots, and could remain submerged to any desired depth for half an hour. Her crew consisted of 9 men. In the preliminary trials she sank 3 times, drowning 23 men. Finally, under Lieut. Dixon, C. S. N., she sailed out of Charleston harbor, attacked and sunk the Federal steam-sloop Housatonic, and disappeared forever with her crew. She was designed to pass under the enemy, dragging a floating T., which would explode when brought in contact with his hull, but on this occasion she was used like an ordinary "David" (a small steamer with a ram T.).

Some of the more important of the recent improvements in submarine mining are the following: The modern explosives have largely superseded gunpowder, because greater power with less bulk may thus be secured. The latter is an important matter, since upon the size of the T. depends the depressing effect of the current, and hence the amount of buoyancy necessary to keep the case always high enough to be touched by the enemy in passing. This buoyancy, of course, regulates the weight of the anchors and the size of the mooring connections, and, in fact, the principal dimensions of the system. The increase in intensity of explosive action is also important, for efforts are now making to give increased strength to the hulls of war-vessels by employing iron in the form known as the double-cellular bottom, thus reducing the destructive range of the T., and exacting the employment of more powerful charges. At our own engineering school of defensive submarine mining at Willett's Point, N. Y., a long series of trials has been conducted to determine the effective range of different charges of different explosives sunk at different depths below the surface;



Torpedo practice at Willett's Point, New York harbor.

and by the careful measurements of several hundred explosions the matter has been successfully brought within the scope of mathematical analysis. The formulae and results confirm the fact of restricted destructive range. To illustrate one striking feature developed—viz. the effect upon the jet caused by varying the depth of submergence—the cut is given. The original picture was made by the instantaneous photographic process, and advantage was taken of the passing of a schooner to obtain a convenient scale of comparison. Both charges consisted of 100 lbs. of mortar powder, the one on the apparent right sunk 4 ft., and the other 10 ft., below the surface. The height of the columnar jet exceeded 400 ft.

Electricity is now chiefly used as the igniting agent in submarine warfare, because this enables the obstructed channels to be safely traversed by friendly vessels. The mines are usually arranged to be fired at will, or automatically by the touch of the vessel. The best systems are designed to work either on an open or closed circuit at pleasure, because this largely increases the danger of tampering with the T. By the use of proper fuzes ignition may be effected with certainty. To cause the explosion to occur automatically by the touch of the vessel, a device called a circuit-closer or circuit-breaker, according to the circuit chosen, is employed.

In the matter of T. cases, experience has shown that metal, usually iron, must be employed where the mines are to remain submerged for long periods. Wood in such cases cannot be trusted to exclude water, although lager-beer kegs supply a good temporary expedient. It is an essential condition that the form shall be symmetrical, in order to reduce the tendency to rotary motion to a minimum. Wire rope is found to supply the best moorings. The electric current is conveyed by armored cable, not unlike that employed for the Atlantic telegraphs. The details of our own system of submarine mines are as follows: Two types of electrical mine are in use, the ground and the buoyant. The former is employed in comparatively shallow water, and consists of a case resting upon the bottom and containing a large charge of dynamite. Floating near it, but so far below the water-surface as to be concealed from view, is a

buoy carrying a circuit-closer or breaker to regulate the current through a fuze imbedded in the former. The buoyant mine is designed for use in deep water, and consists of an anchor holding in position a T. floating just below the surface; the latter contains the charge of dynamite, the fuze, and the circuit-closer or breaker. The channel to be defended is thickly studded by lines of these mines, so arranged with respect to each other that no vessel can pass without coming in contact with one or more of them. Single-conductor electric cables running from each mine combine in multiple cables, and are extended through a subterranean gallery to a secure bomb-proof casemate within the fort, where is placed the apparatus by which, at the will of the operator, the mines may be fired by judgment, or be rendered either inert or automatically explosive when struck by a vessel. The system is arranged to permit easy electrical tests, by which any injury at once becomes known, as well as its nature and locus. Wires also extend from the casemate to flanking guns, so that if a boat succeeds by night in cutting a cable or in disturbing a mine, by so doing it draws upon itself a heavy automatic discharge of canister, grape, or case shot, according to its distance from the fort. Electric lights are arranged to sweep the lines of mines, and thus give additional security against hostile operations conducted under cover of the darkness. The casemate is connected by telegraph with a lookout, so that the whole system is under the perfect control of an officer who can see what is required, and instantly give the needful orders. For instance, one of our vessels might be chased by a cruiser. She could pass with absolute safety the mines, which for her pursuer would at once become deadly engines of destruction. [From orig. art. in *J's Univ. Cyc.*, by GEN. HENRY L. ABBOT.]

**Torquatus** (TITUS MANLIUS), a member of the Manlii gens, of anc. Rome, received his surname TORQUATUS in 361 B. C. for slaying a gigantic warrior among the Gauls in single combat on the Anio, and ornamenting himself with the neck-chain (*torques*) of the fallen foe. He was several times consul and dictator, and finished the wars with the Lat. League.—Another member of the same family, LUCIUS MANLIUS TORQUATUS, was prætor when the c. war broke out in 49 B. C., and was opposed to Cæsar, but his soldiers went over to Cæsar. He subsequently joined Pompey in Gr., but was compelled to surrender to Cæsar, who, however, sent him away unmolested. He immediately joined Pompey again. After the battle of Pharsalia he went to Afr., and here he was taken prisoner and slain.

**Torquemada, de (JUAN)**, CARDINAL, b. at Valladolid, Sp., in 1388, entered the Dominican order of friars in Valladolid 1403; grad. at the Univ. of Paris 1424; was papal theologian at the Council of Bâle, where he contributed to the condemnation of the doctrines of Wycliffe and Huss, and advocated the doctrine of the Immaculate Conception; participated in the same capacity in the Council of Florence 1439, where he drew up the project of union between the Gr. and Lat. chs., for which he received from the pope the title of "defender of the faith" and the rank of cardinal; attended the Council of Bourges 1440; became bp. of Palerina 1455, and of Sabina 1464. D. Sept. 26, 1468.

**Torquemada, de (TOMAS)**, b. at Torquemada, Sp., about 1420, became a Dominican monk and prior of the monastery of Santa Cruz at Segovia; was appointed by Ferdinand and Isabella first inquisitor-gen. of Sp. 1483; labored with great vigor in organizing the Inquisition throughout Sp.; drew up the code of procedure subsequently followed; was influential in causing the expulsion of Jews and Moors from Sp., and burned at the stake during 16 yrs. from 9000 to 10,000 persons. D. Sept. 16, 1498.

**Torrens** (ROBERT), F. R. S., b. in Ire. about 1780, entered the naval service 1797 as lieut. of marines; rose to be col. 1837; subsequently became maj.-gen. in India; was for some yrs. M. P., where he was a vigorous supporter of the Reform bill; received from 1852 a pension of £200 from the civil list. Wrote *Essay on the Production of Wealth, The Budget, a Series of Letters on Financial, Commercial, and Colonial Policy, Tracts on Finance and Trade*. D. May 27, 1864.

**Torrey** (CHARLES WARREN). See APPENDIX.

**Torrey** (JOHN), M. D., LL.D., b. in New York in 1798, grad. in med. in the Coll. of Phys. and Mineralogy in the Military Acad., W. Pt., 1824-27, of chem. and bot. in the Coll. of Phys. and Surgeons 1827-55, and of chem. and nat. hist. in the Coll. of New Jersey 1830-54; was chief assayer of the U. S. 1858-73; was one of the founders of the New York Lyceum of Nat. Hist., of which he was for many yrs. pres. Pub. a *Catalogue of Plants growing spontaneously within Thirty Miles of the City of New York* and vol. i. of a *Flora of the N. and Middle States*; was appointed botanist of the geological survey of N. Y. 1836; pub. a monograph on the *Cyperaceæ of N. Amer.*; began in 1838, in connection with his former pupil, Dr. Asa Gray, the publication in numbers of a *Flora of N. Amer.*; pub. the *Flora of the State of N. Y.*; was from 1832 to 1858 the chief botanical ed. of the reports of U. S. surveying and exploring expeditions. D. Mar. 10, 1873.

**Torrey** (JOSEPH), D. D., b. at Rowley, Mass., Feb. 2, 1797, grad. at Dartmouth Coll. 1816, and at Andover 1819; was pastor of a Cong. ch. at Royalton, Vt., 1819-27, prof. of Gr. and Lat. in the Univ. of Vt. 1827-42, prof. of intellectual and moral philos. 1842-67, and pres. of the Univ. 1863-65. Wrote *A Theory of Art*, and translated Neander's *Gen. Hist. of the Chr. Religion and Ch.*, accompanied by notes, which was the great literary work of his life. D. Nov. 26, 1867.

**Torrey** (JOSEPH W.). See APPENDIX.

**Torreya** (named in honor of Dr. John Torrey, the illustrious botanist), an interesting genus of trees of the order Conifera, allied to the yews, but easily distinguished by the naked drupe and the ruminated albumen of the seeds. *T. californica* is a fine ornamental species; *T. taxifolia* of Fla. has a durable, strong-scented, heavy, and close-grained wood and horizontal whorled branches.



**Torricelli** (EVANGELISTA), b. at Faenza Oct. 15, 1608, studied math. and physics in Rome under Castelli, and in Florence under Galileo, whom he succeeded in 1642 as prof. at the Acad. Invented the barometer. D. Oct. 25, 1647.

**Torrijos**, tor-re'jōs (JOSÉ MARIA), b. at Madrid, Sp., May 30, 1791, served with credit in the war of independence; distinguished himself by his zeal for the const. of 1812, which occasioned his imprisonment 1817-20; was appointed by the Cortes in 1820 field-marshal and commander-in-chief of Navarre and the Basque provs.; held out to the last against the Fr. intervention of 1823, but was finally forced to capitulate at Cartagena; lived several yrs. in exile at Lond.; obtained sufficient funds to equip an expedition for the liberation of Sp. from the despotism of Ferdinand VII., but was captured, tried by court-martial, and shot Dec. 11, 1831.

**Torrington**, Conn. See APPENDIX.

**Tor'sion Balance**, for measuring delicate electrical or other attractions and repulsions, was invented by Coulomb. The attraction or repulsion is measured by the resistance offered to it by the twist of a filament of spun glass or other fibre.

**Torsk**, or **Dorse** (Dan. *torsk*). (1) The *Morrhua callarias*, or Baltic cod, a valuable food-fish of the N. European seas. (2) Torsk or Tsk, the *Bromius vulgaris*, a valuable European food-fish, by some considered the same as the *cusk* (*B. flaveacens*) of our Amer. Atlantic waters. (3) Our Pacific coasts have another T., *Bromophrys marginatus*.

**Torstenon** (LENNART), b. at Torstena, W. Gothland, Swe., Aug. 17, 1603, was ed. as a page at the court of Gustavus Adolphus, whom he accompanied in 1630 to Ger.; distinguished himself in the battle on the Lech, Apr. 5, 1632; was taken prisoner before Nuremberg Aug. 24, 1632; was appointed commander-in-chief of the Swe. army in Ger. in 1641; resigned his command in 1646; was made count of Örtala by Queen Christina and gov.-gen. of the prov. of W. Gothland. D. Apr. 7, 1657.

**Tortoise-Plant**. See ELEPHANT'S FOOT.

**Tortoise** [Lat. *tortus*, alluding to its crooked feet], an order of reptiles, peculiar in the box-like case, formed chiefly by an outgrowth of the ribs, into which they can wholly or in part withdraw their head and members. The general form is universally familiar. The order is well represented in the present epoch, and members thereof are found in all continental areas and almost all the older islands; but in this respect there are some notable contrasts. Thus, while there are numerous species in N. Amer., there are very few in Europe and none in G. Brit. They existed during the Jurassic and succeeding epochs. (See CHELONIAN.)

**Tortoise-shell**, the scales which form together the carapace of *Caretta imbricata*, a large turtle found in the Indian and Pacific oceans and in the Red and Arafoora seas, and occasionally taken in the Atlantic. T.-S. is remarkable for its plastic quality, which enables the artificer to give it almost any desired shape while under the influence of heat. It is chiefly used for making combs, inlaying boxes and toilet-articles, etc. It is successfully and cheaply imitated.

**Tortricidae**. See LEAF-ROLLERS.

**Tortugas**. See DRY TORTUGAS.

**Torture**, tort'yur [Lat. *torquere*, to "twist," to "torture"], the production of severe bodily pain for the purpose of extracting an avowal of guilt, the revelation of accomplices, or evidence in general. It was quite common among the Grs. But it was inflicted only on slaves. From Gr. it was introduced to Rome. It became a part of the code of Justinian. Hence it was adopted during the Middle Ages by all European states in which the Rom. law was made the basis of legislation. It was not entirely abolished in Ger. until the beginning of this century. In Eng. it was known in the 14th century. During the reign of Henry VIII. T. became quite common. It was, however, never recognized by the common law except in the one case of *peine fort et dure*. The last case occurred in 1640. Its worst application it found in the hands of the Inquisition. In the 13th century the Rom. law concerning *crimen læsæ majestatis* began to be applied to heresy as a *crimen læsæ majestatis divine*, and in 1282 Pope Innocent IV. called on the secular powers to put to the T. persons accused of heresy in order to extract confessions against themselves and others. In the 18th century Thomasius, Voltaire, Beccaria, and others wrote with some effect against the application of T., and finally the Fr. revolution swept it out of existence.

**Torula Cerevisiæ**, or **Yeast-Plant**. In 1680 Anthony Leeuwenhoek discovered that yeast consisted of "little globules collected into groups of 3 or 4 together." Fabbri (1787) considered the yeast to be a "vegeto-animal" body, like gluten. In 1803 Thénard stated that yeast contains a nitrogenous "animal" substance common to all ferments. Payen in 1846 recorded the opinion that all vegetable cells contain materials similar in composition to animal organisms, and in the same year Von Mohl, a Ger. botanist, invented for the active compound in living cells the term "protoplasm." These investigations attracted little attention, even after Cagniard de la Tour in 1837 rediscovered the yeast-plant, and "declared that by some effect of their vegetation the equilibrium of the sugar was destroyed." He measured the yeast-cells and found them to be about  $\frac{1}{2500}$  of an inch in diameter; and he also noticed that by a process of budding they multiplied during fermentation, and increased 6 or 7 fold. About 30 yrs. ago Pasteur made the conclusive investigation which finally established the germ-theory.

The study of this subject has involved the questions of spontaneous generation and the germ-theory of disease. This arose from the necessity of accounting for the presence of living yeast-cells in fermenting and putrefying liquids, which decompose spontaneously without the addition of yeast. Early in this century it was found that by boiling such perishable articles, and sealing them up so as to exclude the air, they could be preserved indefinitely. This was explained by many by supposing that the oxygen of the air, which is necessary to initiate decomposition, was excluded.

It was long supposed that a large number of animals were produced spontaneously. In the yr. 1668 Francis Redi, an It., showed that maggots were the progeny of the flies. His experiments demonstrated the fact that insects were produced from eggs. As investigations continued, the idea of spontaneous generation was narrowed down to include only the microscopic organisms, the Infusoria. Schwann in 1857 showed that the Infusoria were not produced spontaneously, but from spores or germs floating in the air. In 1864 it was established that the germs of the yeast-fungus and of Infusoria float in the air, fall into organic solutions, and give rise to fermentation and putrefaction, and, as many think, to infectious diseases. There are still many advocates for the theory of spontaneous generation.

The yeast-fungus consists of little cells composed of cellulose, containing a fluid, in which may be seen granules or germinal cells; it multiplies by budding (gemmation). The name *Torula* or *Torvula cerevisiæ* was first applied to it; it was subsequently called *Mycoderma vini*, *Cryptococcus*, *Hormiscium*, etc. Dr. Max Reess in 1870 found that there is a variety of yeast-fungus, and proposed for the genus the name *Saccharomyces*. Beer-yeast is *S. cerevisiæ*, which develops in 2 different ways, according to the temperature. At about 72° F., as in the brewing of ale, the fermentation is rapid, and the yeast is carried to the surface of the liquid by the bubbles of carbon-dioxide; this is *top-yeast*. When the fermentation proceeds at a temperature between 40° and 50° F., in brewing lager-beer, it proceeds much slower, and the yeast appears as a sediment—*bottom-yeast*. The after-fermentation of beer is caused by the development of another species, *S. æguis*, the smallest of all yeast-fungi. There is a greater number of species noticed in the fermentation of wine; *S. ellipsoideus* is the most common, and often the only form seen. Next in frequency occurs *S. apiculatus*.

The chemical composition of yeast consists chiefly, as do all plants, of cellulose, albuminoids, fat, and metallic salts. It contains no chlorophyll. An elementary analysis gives about the following percentages: carbon, 48.9; hydrogen, 6.8; nitrogen, 10.8; oxygen, 29.9; sulphur, 0.6; ash, 3.

**Tory**, a name first applied to the R. Cath. outlaws who lived in the bogs of Ire. during the reign of Charles II.; afterward extended (1679) to all those, whether Eng., Scotch, or Irish, who were opposed to the bill excluding the duke of York from the succession. Finally, the name came to designate the conservative party in Brit. politics. In the Revolutionary war of the U. S. the loyalists were called Tories.

**Totem** [Algonkin, *totém*], a rude figure of some object, generally of an animal, used by the N. Amer. Indians as the symbol of a tribe. The same custom prevails in N. Asia, Australia, Oceania, etc.

**Totila**, chosen king by the Ostrogoths in 540 after the defeat and capture of Vitiges at Ravenna by Belisarius, besieged and conquered Rome in 540, and extended and consolidated the Ostrogothic empire in It. after the recall of Belisarius in 549, but was defeated and mortally wounded in the battle at Taginæ by Narses in 552.

**Totten** (JOSEPH GILBERT), b. at New Haven, Conn., Aug. 23, 1788, grad. from U. S. Military Acad. July 1805; Feb. 23, 1808, began his career as military engineer, and was engaged on the construction of Castle Williams and Ft. Clinton, New York harbor, 1808-12. At the commencement of the war with G. Brit., T. was assigned to duty as chief engineer of the army under Gen. Van Rensselaer in the campaign of 1812, on the Niagara frontier, and in that capacity took part in the battle of Queenstown. He was subsequently chief engineer of the army under Gen. Dearborn, in the campaign of 1813, and of the army under Gens. Izard and Macomb, in the campaign of 1814 on Lake Champlain. In Nov. 1816 a board of engineers was constituted, with T. as a member, with instructions to make examinations of the sea-coast, and to prepare plans for defensive works. In 1817 T. was relieved and placed in charge of the fortifications at Rouse's Point, N. Y., but was again made a member of the board in 1819. A series of reports drawn up by this board, mostly from the pen of T., exhibit in a masterly manner the principles of sea-coast and harbor defence, and their application to our own country. In 1825 T. (a major since 1818, and brevet-col. 1824) took charge of the construction of Ft. Adams, Newport Harbor, and continued until Dec. 1838. Advanced to the grade of lieutenant-col. in 1828, he conducted (1830-31) a series of experiments on the expansion and contraction of building-stone by natural changes of temperature, and the effect of these variations on cements employed to secure the joints of stone copings; also to ascertain the relative stiffness and strength of various kinds of timber. His work on *Hydraulic and Common Mortars* was pub. in 1838. Col. T. was appointed col. of the corps of engineers and chief engineer Dec. 7, 1838, and took up his residence in Wash.; assumed in 1847 the immediate control of the engineering operations of the army destined to invade the Mex. capital, directing in this capacity the siege of Vera Cruz; was brevetted a brig.-gen. Mar. 29, 1847; was an active member of the light-house board from its organization in 1852; a regent of the Smithsonian Inst. from its establishment in 1846; a corporator of the National Acad. of Sciences, created in 1863; one of the harbor coms. for the cities of New York and Boston, and a member of various scientific associations. D. Apr. 22, 1884. [From orig. art. in *J.'s Univ. Cyc.*, by G. C. SIMMONS.]

**Toucans**, tou'kanz, or **Rhamphastide**, are birds distinguished by their enormous bill, which is decurved and has serrated edges; it, however, is very light, its substance being filled with air-cells. They are numerous in the hot regions of S. Amer. They live in considerable flocks in the forests, and sit in company on the trees, making an abominably harsh noise. They are omnivorous, feeding not only upon sweet pulpy fruits, but also upon animal matter of various kinds.

**Toucey**, tōw'se (ISAAC), LL.D., b. at Newtown, Conn.,



Nov. 5, 1796, received a private classical education; was admitted to the Hartford bar 1818; M. C. 1835-39, atty.-gen. of Conn. 1842-44, gov. 1846-47, U. S. atty.-gen. 1848-49, U. S. Senator 1852-57, and sec. of the navy under Pres. Buchanan 1857-61. D. July 30, 1869.

**Touch-Paper** is a loose bibulous paper which is soaked in solution of saltpetre and then dried. It was used in lighting fires with flint and steel, and is sometimes burned in a room to relieve the paroxysm of asthma.

**Touch-stone**, a piece of black basalt, or, better, of the bituminous jasper called Lydian stone. Small bars of gold, silver, and of various known alloys are prepared, and kept as standards of comparison. The goldsmith makes a streak upon the T. with the metal to be tested, and beside it makes other streaks with the bars, which are called *touch-needles*. A rude qualitative analysis is made in this way, the artisan judging of the purity of the gold or silver by the known fineness of that metal which makes the streak nearest like that of the metal tested.

**Touch-wood**, or **Spunk**. (1) The dried fungus *Polyporus igniarius*, used in getting fire with flint and steel; also employed as a port-fire. (2) Also, the decayed and crumbling wood of ash or willow which has undergone dry rot. It is used for the same purposes as the foregoing.

**Toulon**, too-lôn', town of Fr., dept. of Var, at the head of a narrow but deep inlet of the Mediterranean, from which it rises like an amphitheatre. Next to Brest, T. is the prin. naval station of Fr., and a fortress of immense strength. The harbor is double; one part, given up to commerce, is lined with convenient quays; the other, arranged for naval purposes, is surrounded with ship-building docks, cannon-foundries, ropewalks, etc., and this part of the harbor is separated from the roadstead by hollow but bombproof moles lined with batteries. Pop. 70,103.

**Toulon**, Ill. See APPENDIX.

**Toulouse**, too-looz', city of Fr., cap. of the dept. of Haute-Garonne, on the river Garonne and the Canal du Midi; contains several beautiful and interesting monuments, but as a whole it has no architectural interest, the streets being narrow, crooked, and badly paved, the houses built of brick and without any characteristic style. Of the cathedral, dedicated to St. Stephen, the nave dates from the 12th and 13th centuries, the front façade from the 15th. The ch. of St. Sernin is one of the most beautiful Romanesque structures in Fr., commenced in the 11th century. Very interesting are the edifices of the Jacobins from the beginning of the 14th century; and among the other public buildings the Hôtel de Ville, a magnificent building, constructed by Cammas (1750-60), and ornamented with columns and beautiful sculptures; the palais de justice, in front of which stands the bronze statue of Cujas by Valois; the museum, formerly an Augustine monastery, containing a unique collection of objects from the Stone age, and rich collections of paintings and sculptures, among which are 40 marble busts of Rom. emps., found at Calagorris, etc. The manufacturing industry is very important, especially in cloth, woollen and cotton fabrics, machinery and agricultural implements, candles, oil, soap, oilcloth, paper, paper-hangings, etc. The commerce is very active, especially in grain (2,000,000 hectolitres annually), wine, marbles from the Pyrenees, wood, etc. Four large fairs for cloth, woollens, and cattle are held annually. Pop. 136,627.

**Tourgee** (ALBION WINEGAR), LL.D., b. May 2, 1838, at Williamsheld, O., ed. at Univ. of Rochester, N. Y.; served in U. S. A. in the c. war of 1861-65, and was twice wounded; after the war settled in the practice of the law at Greensboro', N. C., and at the Southern loyalist convention in Phila. in 1866 prepared the report on the condition of the S. States; became judge of the N. C. superior court 1868. With Messrs. Barringer and Rodman prepared *A Code of Civil Procedure for N. C.* Wrote *A Fool's Errand, Bricks without Straw, An Appeal to Caesar*, etc.; became ed. of *Our Continent*, a literary weekly paper in Phila., 1882.

**Tourmaline**. See PRECIOUS STONES.

**Tournament**, or **Tourney**, a military pageant of the Middle Ages, in which 2 armed bands of knights contended in a mock fight for the purpose of exhibiting their strength, skill, and courage, or for the honor of the ladies attending. The knights were armed with lance and sword. The contestants were usually mounted, and the object of each party was to unhorse as many gentlemen and to break as many spears as possible. From a dangerous struggle the T. finally degenerated into a frivolous court pageant.

**Tourniquet**, tur-ne-ket (Fr.), an instrument for checking the flow of blood from wounds or during surgical operation by means of pressure applied to the principal artery supplying the blood. A rude T. may be made by tying a handkerchief around the wounded limb between the heart and the wound, passing a stick through the handkerchief, and then twisting it till the flow of blood is checked.

**Touro** (JUDAH), b. at Newport, R. I., June 16, 1775, son of Rev. Isaac, a native of Hol., who in 1793 became rabbi of the Jewish synagogue at Newport; engaged in mercantile business in the counting-house of an uncle, in whose employ he sailed to the Mediterranean as supercargo 1798, on which occasion he was victorious in a desperate conflict with a Fr. privateer; settled in New Orleans as a merchant 1802; served as a volunteer at the battle of New Orleans 1815, where he was severely wounded and permanently injured by a cannon-ball; acquired a large fortune, of which he made a most liberal use. D. Jan. 18, 1854.

**Tours**, tour, town of Fr., cap. of the govt. of Indre-et-Loire, on a small strip of land between the Cher and the Loire, which here is crossed by one of the most magnificent bridges in Europe, and lined with handsome quays and finely planted promenades. It has a magnificent cathedral, several other fine edifices, and many good educational insts. Its manufactures of silk stuffs, ribbons, serges, rugs, starch, and wax candles are extensive. Pop. 52,309.

**Tous les Mois**, the starch of the tubers of *Canna*

*edulis*, a marantaceous plant cultivated in Peru, Trinidad, and St. Kitts. It is prepared much as arrow-root. It is agreeable food for invalids and infants.

**Toussaint**, too-san' (FRANÇOIS DOMINIQUE), surnamed L'OUVREUR, b. at Breda, near Cape St. François, Hayti, in 1743, of slave parents of pure negro blood; advanced from the position of coachman to the supervision of the sugar manufactory; was much impressed by reading the denunciations of slavery in the Abbé Raynal's *List. of the European Colonies in the E. and W. Indies*; remained quiet during the slave insurrection and massacres of 1791, but finally entered the negro army; was soon advanced to the post of brig.-gen.; distinguished himself by the capture of an entire army of whites under Brandicourt, the occupation of Donon, Marmelade, and Gonaives (1795), and the defeat of the Fr. col. Desfourneaux; rose to be commander-in-chief of the negroes; concluded to accept the proposals of the Fr. republic, which offered the abolition of slavery and an integral union with Fr.; joined his forces with those of Laveaux, the Fr. commander, who gave him the rank of gen. of division; brought the whole N. division of the island under the control of Fr.; was appointed commander-in-chief of the entire island by Southax, the com. of the Directory, 1796; came into conflict in 1797 with Hédoüville, the new Fr. com., who incited the mulatto leader Rigaud to an insurrection; arrested, imprisoned, and sent to France Roume, the new Fr. com., for having countenanced the slave-trade; assumed the civil govt. in the name of the Fr. Directory Nov. 26, 1800; took possession of the E. part of the island Jan. 1801, thereby becoming ruler of the whole island; administered the govt. with considerable skill and success; assumed great state; created a council of state consisting of 8 white proprietors and 1 mulatto, by which body free trade was proclaimed; a const. was drawn up, and the presidency for life conferred upon him. T. sent this const. with a respectful letter dated July 16, 1801, to Bonaparte, then first consul, on receipt of which the latter determined to give employment in Hayti to a large body of his officers, and in Nov. 1801 despatched his brother-in-law, Leclerc, with 66 vessels of war and 30,000 veterans, who arrived on the coast of Hayti Jan. 1802. T. manifested his intention to resist the invasion; was declared an outlaw Feb. 17, 1802; maintained for some months a desperate resistance in the mt.-fastnesses; was at length induced to surrender by assurances of personal immunity and a guaranty of the liberty of the negroes; was seized, and carried to Fr., kept a prisoner at the Temple without trial, afterward transferred to the castle of Joux, dept. of Doubs, where he was found dead Apr. 27, 1803. PORTER C. BLISS.

**Towanda**, R. R. Junc., cap. of Bradford co., Pa., on Susquehanna River, contains a collegiate inst., large mills, shops, and iron-works. Pop. 1870, 2696; 1880, 3814.

**Tower** (DAVID BATES), b. in Mass. in 1808, grad. at Middlebury Coll. 1828; became a highly successful teacher; was prin. of the inst. for the blind at Phila. 1839-41; for some yrs. prof. of math. in the City Univ. at St. Louis, Mo., and afterward prin. of the Park Lat. School, Boston. Author of a series of *Gradual Readers, Lessons in Arithmetic*, grammars, speakers, etc. D. July 1868.

**Tower** (ZEALOUS BATES), b. at Cohasset, Mass., was grad. from the U. S. Military Acad. July 1, 1841; was recalled to W. Pt. Aug. 1842, serving as assistant prof. until Apr. 1843, and as prin. assistant prof. of engineering Apr.-Aug. 1843; served as assistant engineer in the construction of the defences of Hampton Roads, Va.; accompanied Gen. Scott's army to Mex.; was engaged at the siege of Vera Cruz and subsequent operations resulting in the capture of the City of Mex.; was brevetted capt. for Contreras, where he led the storming column, and Churubusco, and major for Chapultepec, where wounded. From 1848 to 1853 he was engaged in the construction of fortifications at Portland, Me., and Portsmouth, N. H.; of the defences of San Francisco, Cal., 1853-58; in Feb. 1861 he proceeded to Ft. Pickens, which work he placed in an efficient state of defence, and as chief engineer remained there until May 1862, being brevetted lieut.-col. for gallant services, and appointed brig.-gen. of volunteers from Nov. 23, 1861, the date of its bombardment; was engaged in the battle of Cedar Mountain, Aug. 9, and in the actions of Rappahannock Station, Aug. 21, and Thoroughfare Gap, Aug. 28, and battle of Manassas, Aug. 30, where severely wounded and disabled until June 1864. From July 8 to Sept. 8, 1864, he was supt. of the U. S. Military Acad.; was appointed chief engineer of the defences of Nashville, which city he thoroughly fortified; was engaged in the battle of Nashville Dec. 15-16, 1864; and from Oct. 1864 was inspector-gen. of the fortifications of the military division of the Miss.; chief engineer of the military division of the Tenn. July 1865-Jan. 1866; 1866-67 had charge of the construction of the defences of Portsmouth, N. H. Became col. of engineers Jan. 1874. Retired, 1883.

**Tower City**, Dak. See APPENDIX.

**Tower of London**, The, stands just *without* the anc. city, on the left bank of the Thames. "This tower" (says Stow) "is a citadel to defend or command the city; a royal palace; a prison of state for the most dangerous offenders; the armory for warlike provisions; the treasury of the ornaments and jewels of the Crown; and general conservator of most of the records of the king's courts of justice at Westminster." Its govt. has been intrusted since the days of the Conqueror to a high officer called the constable. The oldest portion is the isolated donjon or keep called the *White Tower*, built by William the Conqueror. This is now surrounded by a rampart and moat, with inner wall (the *Inner Bail*), flanked by half-circle towers, each of which has a distinctive name, as the *Bell Tower*, the *Beauchamp Tower*, *Wakefield Tower*, *Bloody Tower*, *Bowyer Tower*. There is also St. Peter's ch., where are interred many celebrated victims of the headsman. Closely adjacent to the T. is *Tower Hill*, the famous place of execution.

**Town** (SALEM), LL.D., b. at Belchertown, Mass., Mar.



5, 1770, was for 40 yrs. a teacher in the State of N. Y.; was at one time elected to the N. Y. senate, and resided many yrs. in Aurora. Author of *A System of Speculative Masonry, An Analysis of the Derivative Words of the Eng. Lang., of a Speller and Definer*, etc. D. Feb. 24, 1864.

**TOWNS** (GEORGE W. B.), b. in that part of Wilkes co., Ga., now embraced within the co. of Taliaferro, May 2, 1802; began life as a merchant; afterward studied law; was admitted to the bar in 1824, and was M. C. from 1835 to 1839; was re-elected and served from 1845 to 1847. In the latter yr. he was elected gov. of Ga. for 2 yrs., and re-elected in 1849. The most marked event in his administration was the calling of the sovereign State convention in 1850 to consider what action Ga. would take in reference to the admission of Cal. into the Union. D. July 15, 1854.

**Townsend** (EDWARD DAVIS), b. at Boston Aug. 22, 1817, ed. at the Public Lat. School in Boston; entered Harvard Univ. in 1832; the next yr. entered the U. S. Military Acad., graduating in 1837; served in Fla. and the Cherokee country. Made capt. in the adjutant-gen.'s dept. In 1846, he served as assistant adjutant-gen. of the military division of the Pacific 4 yrs.; as chief of staff to Lieut.-Gen. Winfield Scott in 1861, and on his retirement was attached to the adjutant-gen.'s office, war dept., of which (Mar. 1863) he was placed in charge; had charge of arrangements for rehoisting the U. S. flag over the ruins of Ft. Sumter, Apr. 1865; promoted adjutant-gen., with rank of brig.-gen., Feb. 22, 1869; brevet maj.-gen. Mar. 13, 1865.

**Townsend** (GEORGE ALFRED), b. at Georgetown, Del., in 1841, grad. at Phila. High School 1859; became in 1862 war-correspondent of New York *Herald*, in which he reported the Peninsular campaign; visited Eng. and Fr.; returned to U. S. in 1865; war correspondent of the New York *World*, for which he narrated over his own signature the incidents of the close of the war, the assassination of Pres. Lincoln, and the disbandment of the great armies, on which subjects he lectured with great success; visited Europe 1866-67; described in correspondence with Amer. papers the Austro-Prussian war of 1866 and the Paris Exposition of 1867; was for several yrs. from 1868 on the staff of the Chicago *Tribune* as editorial writer and correspondent. Wrote a vol. of poems and a novel, *Lost Abroad*.

**Townshend** (CHARLES), SECOND VISCOUNT TOWNSHEND, b. at Rainham, Eng., Mar. 10, 1674; was successively appointed lord lieutenant for the co. of Norfolk, com. for treating of a union with Scot. 1706, capt. of the Yeomen of Queen Anne's guard 1707, privy-councillor and joint-plenipotentiary with Marlborough (1709) at the conferences of Gertruydenburg for negotiating a peace with Fr., and ambassador to the States-General of Hol. 1709-10; signed the "Barrier treaty" at the Hague Oct. 29, 1709; resigned his embassy and returned to Eng. on the fall of the Whig ministry 1712, when he was dismissed from his captaincy; was censured by the House of Commons for having signed the Barrier treaty, and declared by vote of the same House an enemy to the queen and kingdom; entered into correspondence with the elector of Hanover, who on his accession to the throne of Eng. made him sec. of state and prime minister Sept. 14, 1714; became pres. of the council June 1730, and was again sec. of state from Feb. 10, 1731, to May 15, 1730. D. June 21, 1738.

**Townshend** (CHARLES), grandson of the second viscount, b. in Eng. Aug. 29, 1725, entered the House of Commons 1747 as a supporter of the Pelham administration; was appointed a com. of trade and plantations 1749, and a com. for executing the office of lord high admiral 1751; acquired prominence by an eloquent speech on the Marriage bill 1753; became a lord of the admiralty 1754, treas. of the chamber and member of the privy council 1756; was sec. at war from Mar. 24, 1761, to Feb. 1763; became first lord of trade and plantations Feb. 1763, paymaster of the forces June 8, 1765, chancellor of the exchequer and lord of the treas. Aug. 2, 1766; supported Grenville's Stamp act 1765; introduced the celebrated resolutions for taxing the Amer. colonies June 2, 1767. For the instability of his political opinions he was commonly known as the "Weathercock," but had an immense parliamentary reputation for oratory. D. Sept. 4, 1767.

**Townshend** (GEORGE), FIRST MARQUIS TOWNSHEND, eldest son of the third viscount, b. in Norfolk, Eng., Feb. 28, 1724, entered the British army at an early age; distinguished himself at the battles of Dettingen, Fontenoy, Culloden, and Lafeldt; entered Parli. 1747; took part as brig.-gen. in Wolfe's expedition to Canada 1759; succeeded that officer in the command on his death; received the capitulation of Que. Sept. 18, 1759; contributed to the victory of the allied forces at Fellinghausen 1761; served in Port. 1762; was lord-lieut. of Ire. from Aug. 12, 1767, to 1772; became master-gen. of the ordnance Oct. 17, 1772; was created earl of Leicester 1784, and Marquis Townshend Oct. 27, 1787. D. Sept. 14, 1807.

**Towson** (JOHN THOMAS), b. at Devonport, Eng., in 1804, was the first person to note the fact that the luminous and chemical foci are not of the same length; was also the inventor of the process of taking photographs on glass, and the first to use in photography the reflecting camera; devoted himself in 1846 to the determination of the quickest routes across the ocean to distant countries; constructed a set of tables to facilitate great-circle sailing and for the reduction of ex-meridian altitudes, invented and brought into practice methods of composite and windward great-circle sailing; since 1850 was scientific examiner of masters and mates at the port of Liverpool; aided Dr. Scoresby at the meeting of the Brit. Association in 1854 in securing the scientific investigation of the deviation of the compass on board iron ships; prepared *Practical Information on the Deviation of the Compass, for the Use of Masters and Mates of Iron Ships*. D. Jan. 3, 1881.

**Towson** (NATHAN), b. near Baltimore, Md., Jan. 22, 1784, was capt. of a volunteer company of artill. and adjutant of

the 7th Md. regiment at the outbreak of the war of 1812, when he was appointed capt. of the 2d U. S. Artill. (Mar. 1812); aided in the capture of the Brit. brig Caledonia under the guns of Ft. Erie Oct. 9; was engaged in the actions of Queenstown and Stony Creek, and in the capture and defence of Ft. George, on which latter occasion (July 17, 1813) he was wounded; took part as commander of a battery in Scott's brigade in the capture of Ft. Erie July 4, 1814; bore a prominent part in the battles of Chippewa (July 5) and Niagara (July 25); rendered valuable service in the defence of Ft. Erie Aug. 15; brevetted major and lieutenant in May 1816; paymaster-gen. 1819; brevetted brig.-gen. 1834; served in the Mex. war, and brevetted maj.-gen. in Mar. 1848. D. July 20, 1854.

**Towson town**, cap. of Baltimore co., Md., on Md. Central R. R. and Baltimore and Yorktown turnpike road, 7 m. N. of Baltimore, with which it is connected by a horse railway. Pop. 1880, 1316.

**Toxicology** (Gr. *τοξικόν*, "poison," and *λόγος*, "discourse," a treatise on poison). Poisons are classified with reference to their source, as (1) animal, (2) vegetable, (3) mineral, and also with reference to their method of action: (1) corrosive and irritant poisons, such as corrode or inflame the stomach; (2) narcotic and sedative poisons, which, being absorbed by the mucous membrane, enter the blood and act on the nerve-centres. *The corrosive poisons are*—1. Acids—oxalic, hydrochloric, sulphuric, nitric. 2. Strong alkalies—ammonia, caustic potassa, and soda; alkaline earths—baryta and lime. 3. Metallic and other bases and their salts—corrosive sublimate, arsenic, sulphate of copper, tartar emetic, acetate of lead (sugar of lead), sulphates of iron and zinc, nitrate of silver, phosphorus, iodine, creosote, carbolic acid. *The narcotic and sedative poisons are* chiefly opium, belladonna, stramonium, hyoscyamus, aconite, digitalis, veratrum, tobacco, lobelia. Chloral hydrate is anæsthetic and depressant in large doses. Hydrocyanic acid depresses the heart or is immediately fatal. Strychnia and nuxvomica act specifically on the nervous system, causing muscular rigidity and spasmodic contractions. Poisons are often taken with suicidal intent, by accident, as by children or by adults erroneously as med. or drink, and when carelessly dispensed by druggists, as oxalic acid instead of salts, morphia or strychnia instead of quinine. The symptoms of poisons are chiefly extreme disturbance of the stomach, breathing, and pulse, often with impairment of sight and great bodily weakness, pallor, and cold surfaces. Corrosives and irritants cause burning pain in stomach.

Antidotes for poisons should be given immediately, while waiting the arrival of a phys. *For poisoning by acids* give alkalies, solutions of soda, potassa, lime, ammonia; afterward white of eggs and sweet oil to soothe the stomach; *for poisoning by alkalies* give dilute acids, as vinegar or lemon-juice, and olive oil, which unites with the alkalies to form a soap and renders them inert; *for corrosive sublimate*, white of eggs and wheat flour; *for arsenic*, the hydrated peroxide of iron, kept by most druggists and in many phys. It can be made by adding aqua ammonia to liquor ferri-sulphatis, or even to common tincture of iron; the resulting precipitate is to be used in tablespoonful doses. The new dialyzed iron is a ready and efficient antidote; magnesia may be used if no other remedy is obtainable. *For sulphate of copper*, white of eggs, milk, flour; *for tartar emetic*, oak-bark, tannin; later, opium to allay pain in the stomach. *For sugar of lead* (acetate of lead), sulphate of magnesia, making an inert sulphate of lead in the stomach and system; *for sulphate of iron* (copperas) and sulphate of zinc, bicarbonate of soda, freely given. *For nitrate of silver*, common salt, freely given, converting it to chloride of silver. *For phosphorus*, a mustard emetic; later, opium and ice to quiet the stomach; *for iodine*, boiled starch; *for creosote and carbolic acid*, olive oil and white of eggs. *In opium poisoning* (opium, laudanum, morphine, paregoric), emetics, as sulphate of zinc or copper, the stomach-pump, frequent draughts of strong coffee, constant exercise, as walking to prevent sleep, belladonna by the mouth, atropine hypodermically, and the electric battery to the diaphragm and chest to keep up breathing; *for belladonna*, opium; *for stramonium*, hyoscyamus, aconite, digitalis, veratrum, tobacco, and lobelia, alcohol freely, to restore the pulse; *for chloral hydrate*, alcohol and the electric current. Hydrocyanic acid is usually instantly fatal; in small doses it depresses the pulse, and alcohol is the remedy. *Poisoning by wild fruit and berries* is usually due to the sedative effect of their juices, and demands vomiting, and alcohol to sustain the heart; so also in poisoning by the flesh of pigeons or game which has fed on wild berries. Strychnia (and nuxvomica) poisoning requires inhalations of chloroform and chloral by the mouth or hypodermically. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. EDWARD CURTIS, M. D.]

**Toy** (CRAWFORD HOWELL). See APPENDIX.

**Trachyte**, trā'kit (Gr. *τραχύς*), a variety of lava which is often porphyritic, and when containing hornblende and augite passes into the varieties of trap called basalt.

**Tractarianism, and Tracts for the Times**. The movement in the Ch. of Eng. indicated by these words was one of the most remarkable that has occurred since the Ref. It was partly theological and partly ecclesiastical, and betokened the revival of Anglo-Catholic sentiments, such as had been strongly developed, in some respects, under Abb. Laud, and in others by the nonjuring clergy at the end of the 17th century. Much stress was laid upon the teaching of the Nicene and Ante-Nicene Fathers of the first 4 councils, and of divines in the Ch. of Eng. The doctrine of the Trinity in its Athanasian form and of salvation by grace in an anti-Lutheran form were salient points in the creed of those who were leaders of the revival. To the views of salvation entertained by the evangelical section of the Eng. Ch. they were decidedly opposed, and they looked askance at the whole theol. of the Genevan school. Equally did they bring out extremely high ecclesiastical opinions, touch-



ing the relation of Ch. and State, clerical orders, sacraments, discipline, and worship. They lamented the control which the civil power exerted over the spiritual; they insisted upon episcopacy as divine and essential, upon apostolical succession, upon baptismal regeneration, upon the real presence in the Lord's Supper, and upon the desirableness of exercising ch. discipline. The movement was a reaction against tendencies of the age manifesting themselves very strongly at the time—against the rationalism of Ger.; against the deadness and dullness and dryness of the High-Ch. party, and also against the enthusiasm in some respects, and the indifference and carelessness in other respects, of the Low-Ch. party; against prevalent irreligion and spiritual insensibility; against the spread of political liberalism and the ascendancy of the Whig party; against the reduction of the number of bishoprics; against certain ecclesiastical appointments of a latitudinarian kind; and, in short, against what they denounced as the Erastian spirit of the day.

A good deal of thought and feeling of the description thus indicated existed in the Univ. of Ox. in the early part of the second quarter of the present century. It laid hold of a few earnest and able men—John Henry Newman, Robert I. Wilberforce, Richard Hurrell Froude, William Palmer of Worcester Coll., Arthur Percival, Hugh Rose, and John Keble. The *Christian Year* by the last of these did much to pave the way for what followed. Newman went abroad in 1832, and came back in July 1833 greatly invigorated in health and spirits, and determined to set vigorously to work in the new direction. He now, as he says, "out of my own head began the *Tracts*." The first, without date, was entitled *Thoughts on the Ministerial Commission, respectfully addressed to the Clergy*. It dwelt upon their responsibility, and pointed to efforts for the renewal of ch. authority. Another tract, on *The Catholic Church*, followed, and on Sept. 9, 1833, the first bearing a date then appeared; a third, containing *Thoughts respectfully addressed to the Clergy on Alterations in the Liturgy*, resisted stoutly any measure of the kind. These publications excited considerable alarm in the minds of some of Newman's friends, but he persevered, and was in 1835 and 1836 fully joined by Dr. Pusey, whose accession he deemed an event of immense value and importance. Dr. Pusey had written a tract on *Fasting*, which appeared Dec. 21, 1833, but his tract on *Baptism*, in 1836, was his first great contribution. Much, however, as Dr. Pusey did to promote the enterprise, Newman remained its life and soul.

No doubt, a great impetus was given to the movement by Pusey, Keble, and others. On and on it went, one tract appearing after another—some very short and pithy, and others long and elaborate, learned treatises in fact, on Anglo-Catholic theology, containing large citations from early Fathers and 17th-century divines, with the view of pointing out a distinction between it and that of Rome as settled by the Council of Trent. The tracts collected together form 6 vols. At last came No. 90. It was entitled *Remarks on Certain Passages in the Thirty-nine Articles*. It condemned any attempt to alter them, and protested against ordinary political methods by which professed reforms are carried or compassed in this day. This last tract created a greater sensation than any preceding one. At a meeting of the vice-chancellor, heads of houses, and proctors it was resolved that modes of interpretation such as were suggested in the tract were inconsistent with the statutes of the univ.; and 4 tutors, including A. C. Tait, late abp. of Canterbury, wrote to the editor to say that, in their apprehension, the tract had a highly dangerous tendency. This letter was dated Mar. 8, 1841. On the 16th of Mar. Newman wrote, acknowledging his authorship of the tract in question. In 1846 he entered the Ch. of Rome.

This last event illustrated the tendency of the movement, and the tendency was further proved beyond all question by the numbers who just before or afterward took, under the same training, precisely the same step. The fact is, that in the space of a few yrs. a transition occurred which epitomized the hist. of the Nicene and subsequent ages. Certain men began by being priestly, ascetic, and catholic, like Chrysostom, Ambrose, and Jerome, and they ended in being Roman Catholic, like Thomas Aquinas and the schoolmen. [From orig. art. in *J.'s Univ. Cyc.*, by Rev. JOHN STOUGHTON, D. D., LL.D.]

**Tract Societies.** See APPENDIX.

**Tracy**, Minn. See APPENDIX.

**Tracy** (EDWARD D.), b. in Norwich, Conn., Mar. 1, 1791, went to Ga. and studied law; moved to Macon in 1823; was elected its first mayor, and as such received Gen. La Fayette and his party. Represented Bibb co. in the house and in the senate at different times; in 1840 was elevated to the bench of his judicial circuit. D. Feb. 20, 1849.

**Tracy** (JOSEPH), D. D., b. at Hartford, Ct., Nov. 3, 1794, grad. at Dartmouth Coll. 1814; studied theol.; was pastor of the Congl. chs. at Thetford and W. Fairlee, Vt., from June 26, 1821 to 1829; subsequently preached at his native place; edited the *Vt. Chronicle* 1829-34; was 1 yr. ed. of the *Boston Recorder*, and for nearly 40 yrs. filled at Boston the post of N. Eng. sec. of the Amer. Colonization Society. His residence for several yrs. was at Beverly, Mass., where he d. Mar. 24, 1874. Author of *The Three Last Things, The Hist. of the Amer. Board of Coms. for Foreign Missions, and a Refutation of Charges against the S. I. Missionaries*.

**Trade.** See FREE TRADE AND PROTECTION.

**Trade, Balance of.** See BALANCE OF TRADE.

**Trade-Mark.** A T.-M. is a distinctive word, mark, symbol, or device affixed to an article of trade to indicate its origin or ownership. Very few products bear in their own external appearance sufficient evidence of their real character to protect the purchaser against fraudulent imitations. Integrity in manufacture and uniformity in quality are sought for by all users and consumers of merchantable goods, and when, by long experience, the public have learned to associate these with a special brand, the wide

and profitable sale of articles bearing this brand is assured, and the exclusive possession of their distinguishing mark becomes, therefore, valuable and important. A T.-M. may be any sign, word, symbol, or device not descriptive in its character, and not used by others on the same kind of articles or goods. As a rule, the simpler and more arbitrary a T.-M., the less liable it is to be evaded by colorable imitations. But a T.-M. is not fully a T.-M. until actually affixed to an article of trade and for commercial purposes, although the com. of patents has decided that a T.-M. may be registered, in accordance with the patent law of July 8, 1870, previous to its actual use, the applicant for registry setting forth in his application that he proposes to use the mark upon a certain specified class of goods. The law in question, it must be remarked, is designed to supplement, not to supersede, the rights secured under the common law, and, when preferred, actions for infringement, instead of being brought in U. S. courts, may be proceeded with in State courts in the same manner as before the passage of the act. This law provides for the issue of certificates of registration protecting the use of the mark for a period ordinarily of 30 yrs. from the date of registration, after which time the remedy for infringement lies in the common law. But T.-M. owned by persons in foreign countries affording rights of registry to Amer. citizens may also be registered here, but the function of the registration will cease with the registry abroad, and the T.-M. will be remitted to the same position as by expiration of the term; but in all cases the T.-M. may be re-registered if application to that effect be made to the com. of patents 6 months before the expiration of the original term.

As possession of a T.-M. is assumed to rest upon natural right, and not exclusively upon statute law, it might reasonably be inferred that any one could register and be protected in the use of a T.-M., but it has been plausibly argued that many persons are excluded. For example, a T.-M. being no mark unless upon an article of trade, the person registering must, to a greater or less extent, be a trader, or, at all events, his position must not be wholly inconsistent with trade. A firm or corporation making or selling any vendible article may hold a T.-M. It is uncertain whether one registry will cover the same mark or symbol for an entire class of articles, or whether it must be registered for each variety included in the class. For example, whether a device can be registered broadly for, say, agricultural implements, under a single certificate, or whether separate certificates must be secured for hoes, spades, ploughs, etc. The former plan is followed in the practice of the patent office, but the latter is, for many reasons, to be preferred.

It is difficult within the narrow limits of an article to make plain the delicate shading that in many instances defines the boundaries of a valid T.-M. It is true that a geographical name is not a T.-M., although it may form part of a label, yet "Congress Spring Water" for mineral water from the Congress Spring at Saratoga, "Rockland Lake Ice," for ice from Rockland Lake, N. Y., and "Codorus" for a peculiar iron ore found in Codorus tp., Pa., and for iron and steel made from that ore, have all been adjudged to be lawful T.-M. It is also true that in general a proper name cannot be a T.-M. Yet when the name is of such character that it affords no opportunity for two or more manufacturers or dealers of the same name to correctly indicate the origin of their wares by the same cognomen, a name may form a valid T.-M. Thus, Bismarck gloves or Kossuth hats or Roger Williams cloths or Garibaldi guns or Paul Jones whiskey would be valid trade names. Pseudonyms, if arbitrarily chosen, may be used as T.-M., and so may a person's own signature or its facsimile, the shape of the latter making it an entity distinct from the name itself as displayed in the common or conventional imprint of type. It is true that a fanciful name may be a valid T.-M., and frequently constitutes a most valuable one, but this fanciful name must not either truly or falsely attempt to indicate the character of the article to which it is appended. If such indication is true, the mark is descriptive, and is properly a label; if false, the mark is void on the ground of fraudulent suggestion. So also an heraldic symbol may be a valid T.-M., and *per se* would be so held in this country. But if registered abroad, and there declared invalid because included in the arms of some existent family, the validity of the mark in the Amer. market might very properly be disputed on a transcript of the national insignia of any country, but the connection therewith of his name or of another word or symbol may form a perfect T.-M. The adoption of Masonic emblems as T.-M. is not recognized by the U. S. patent office. Simple letters and numerals are among the most treacherous of trade symbols, being the most open to evasion on plausible grounds. A clean-cut, newly coined word, not purely descriptive or grammatically derived from pre-existent terms, is perhaps the best, and after this a word indicative of excellence, but not descriptive.

But care must be taken that the mark makes no false suggestion. Thus, "Night-blooming Cereus" was declared void as a T.-M. when it was shown that the perfume to which it was applied was made not from the flower, as was pretended, but from other substances. If it had been the product of distillation from the flower of that name, it would, however, have been void for a quite different reason—viz. it would then have been simply descriptive of the article; any one has the right to distill the perfume of any flower, and to call the product by its proper name. Medicated Mexican Balm may serve as an illustration of the thin division between a T.-M. and a label. In one sense it is arbitrary and unconventional; in another merely descriptive. In either aspect it may be assumed as including a false suggestion of the place of its origin.

As has been herein previously intimated, a lawful T.-M. holds good under the common law, independent of registration, for an unlimited time, and that registration holds good



for 30 yrs., with the right of re-registration for a second period of equal duration. But to all this there is—according to the dictum of the patent office—an exception in the case of patented articles, by which it is held that the mark or term designating an article while patented becomes generic and lapses to the public with the expiration of the patent. I doubt if this is in accordance with sound justice or sound law. The question has never been definitely settled.

If a dealer permits his T.-M. to go into use by others without asserting his exclusive right to it, he will be held to have abandoned it, and he will have no remedy. So also, if he ceases to use it during a period so long that its original connection with his name and business is lost, another may adopt it, and by *bona-fide* use hold it even against the original owner. But mere non-use will not throw open the T.-M. to another so long as such use by another would tend directly to enable the infringer to trade on the reputation of his rival. [From orig. art. in *J.'s Univ. Cyc.*, by Prof. JAMES A. WHITNEY, LL.B.]

**Trades-Unions** originated in Eng., mainly in consequence of the break-down, before machinery and the growth of large capitals, of the old industrial system. Production had formerly been carried on chiefly by small capitals; in a great number of employments the competition of workmen was limited by a law of apprenticeship; wages in many cases were fixed by public authority; and the poorest apprentice might look forward with confidence to becoming a master and enjoying a position of comfort and independence. The steam-engine revolutionized the whole organization of industry, altered profoundly the relations between capital and labor, and led to the repeal of the laws of apprenticeship; and hence workmen in various trades formed societies to protect themselves against both the new power of capital and the new competition to which they were exposed. The conditions under which these early trade-societies were evolved, and the temper and spirit of an age far ruder than the present, must be taken into account. Under these conditions T.-U. assumed a hostile and aggressive attitude toward both capital and external competing labor; some of their rules are as unjust as impolitic, and their practice was often worse than their rules.

In the minds of a part of the public, T.-U. are identified with strikes as their promoters and principal cause. Nor can there be any doubt that the accumulated funds of which they have the disposal, do enable them to carry on much more extensive and prolonged strikes than could otherwise take place. Nevertheless, it would be nearer the truth to say that trades-unionism tends to prevent strikes and disputes with employers. The rules of many unions provide that no strikes shall take place until amicable negotiations have failed. And it was proved by the evidence before the Brit. royal commission on T.-U., which reported in 1869 that there had been fewer disputes with employers and greatest permanence in the rate of wages in the trades with the strongest, richest, and most extended unions. It is true that the diminished frequency of strikes through the action of unions has partly arisen from the fact that they have been powerful enough to obtain concessions without resort to a strike; but it is almost self-evident that responsible and intelligent leaders are less likely to resort to rash and ill-advised measures than a multitude of ordinary laborers; and that it is the direct interest of the paid officers of a union not to waste its funds in struggles which are likely to end either in defeat or in success which may cripple the trade which is the ultimate source of those funds. Every member of the union, moreover, has a vested interest in the conservation of funds to which he looks for assistance in sickness and when otherwise out of employment.

It is true that some Eng. T.-U. maintain unreasonable and unjust restrictions on the admission of workmen and the modes of work, but this is no more than may be said of some of the regulations of the legal and med. professions in Eng. And when we consider the vast improvement which has already taken place in the rules and objects, and still more in the spirit and practice, of Eng. T.-U., we may reasonably look for the removal of all just ground of complaint against their organization and policy. [From orig. art. in *J.'s Univ. Cyc.*, by Prof. T. E. CLIFFE LESLIE, LL.B.]

**Trade Winds.** See WINDS.

**Tradu'cianism** (from Lat. *tradux*, a "vine-layer"), as opposed to Creationism, and the doctrine of Pre-existence, the belief that the human soul is derived from the souls of the parents, as the body is from their bodies. Tertullian, Athanasius, Gregory Nazianzen, and the Lutheran Fathers were Traducians.

**Traer**, on R. R., Tama co., Ia., is in the centre of a fine agricultural region. Pop. 1880, 1100.

**Trafalgar**, a low promontory of the S. W. coast of Sp., on the Strait of Gibraltar. Off its shores was fought, Oct. 21, 1805, the great battle between the Eng. fleet under Nelson and the allied Fr.-Sp. fleet under Villeneuve. The allied fleet was completely routed.

**Trag'acanth** (see GUM) [Lat. *tragacanthum*; Fr. *gomme adragante*; Ger. *Tragant*; It. *dragante*], a gummy exudation from the *Astragalus veris*. The dried gum is slightly translucent, resembling horn in appearance. It is hard, but difficult to pulverize; has no smell, and but very little taste. It does not dissolve in water, but absorbs it, swelling up and forming an adhesive paste. Upon adding an additional quantity of water to this paste, a uniform mixture is formed, from which, however, the greater part of the gum is gradually deposited. It is insoluble in alcohol.

**Tragedy**, trad'je-de [Gr. *τραγῳδία*], that kind of drama which represents a tragical situation or a tragical character. A tragical situation occurs when 2 powers, over which the individual has no control, and from which he cannot escape, clash together and crush him by their conflict. A character becomes tragical when he must perish simply because he is such as he is, it being undecided and undecidable how he became thus.

**Tra'gopan**, a name given to the birds of the genus *Certhia*, members of the family Phasianidae and quite nearly related to the genus *Gallus*. The males, however, instead of a comb, have a crest of soft feathers and a pair of soft horn-like appendages, protractile and retractile at will, above the eyes, as well as wattles in front on the throat; the tail is large, depressed, and rounded at its posterior margin; the tarsi are armed, in the male, with short conic spurs. The generally recognized species are 5 in number, and are mostly confined to the pine forests of the Himalaya Mts. and confluent and neighboring chains of Asia. They are generally solitary in their habits, dwell in the inmost recesses of their native forests, and are difficult of approach. They average about the size of the domestic poultry, or perhaps are a little larger. They feed upon grains, insects, worms, etc. The prin. feature is the remarkable development of the livery of the male at the pairing season.

**Tragul'idee**, a family of placental mammals of the order Ungulata and sub-order Artiodactyla, and containing the smallest living representatives of the order. In external appearance they are somewhat intermediate between a deer and a hog, but are peculiar in the arching of the back behind and the projection of the buttocks backward; the neck is rather short; the head slender and with a pointed snout; the ears moderate; no horns are developed in either sex; the tail is moderately short; the legs are slender; the feet provided with lateral hooflets. The family is now peculiar to Asia and Afr. It is specially interesting as exhibiting an intermediate condition in the development of the stomach and some other parts between the typical ruminant ungulates and the omnivorous or hog-like forms.

**Train of Thought.** See ASSOCIATION OF IDEAS.

**Trajan's Column**, the masterpiece of the arch. Apollodorus, erected in honor of the emp. Trajan A. D. 114, stands among the remains of Trajan's Forum at Rome. It is a column of white marble 132 ft. in height, around and up which runs a scroll of bas-relief sculptures presenting a continuous history of Trajan's achievements. No less than 2500 human figures are delineated, beside horses, fortresses, etc.

**Trajan's Wall**, in the Dobruksa, European Tur., extends E. from the Danube at Chernavodi to Kustendji on the Black Sea. It is a double, in some places a triple, earthwork, on the S. side of a natural fosse consisting of a narrow marshy valley.

**Trajanus** (MARCUS ULPIS), Rom. emp. A. D. 98-117, b. at Italica, near Seville, Sp., Sept. 18, A. D. 52; distinguished himself in the Parthian and Ger. wars; was adopted by Nerva in 97; in Jan. of the following yr. he succeeded him on the throne. His reign is considered, next to that of Augustus, the most brilliant period of the hist. of imperial Rome. The Rom. arms were eminently successful. By two campaigns Dacia was conquered and made a Rom. prov. By another campaign (114-116) Armenia and Parthia were conquered, and Trajan was the first and the only Rom. emp. who navigated the Per. Gulf. No less successful was his internal gov. In his return from the Parthian campaign, Trajan d. at Selinus, in Cilicia, Aug. 11, 117.

**Trail** (RUSSELL THACHER), M. D., b. at Vernon, Ct., Aug. 5, 1812, became a phys. in New York 1840; abandoned soon afterward the use of drugs; substituted the water-cure treatment, opening an establishment for that purpose, and founded in 1853 the "New York Hygieo-Therapeutic Coll.," a med. school for both sexes, subsequently removed to Florence, N. J. Ed. of periodicals, and author of numerous treatises. D. Sept. 23, 1877.

**Tramway.** See RAILROADS.

**Trance** (Lat. *transitus*, "a dying state"), a state of abeyance of most of the vital functions, resembling in some cases a profound sleep, in others closely simulating actual death. Some cases of so called T. are clearly cataleptic, and all are associated with abnormal nervous conditions or perverted nerve-functions.

**Transcauca'sia**, the name generally given to that part of Asiatic Rus. which lies S. of the Caucasian Mts., between the Black Sea and the Caspian. The name has no political significance, however.

**Transcendental.** Kant called "transcendental" all those cognitions or elements of cognitions which are not derived *a posteriori* by experience, but underlie all experience as its necessary *a priori* conditions, and which consequently transcend the whole sphere of experience. Transcendental are all those primary, original, and *a priori* principles of knowledge which, as necessary and universal truths, underlie all contingent and particular truths derived from experience; and in this sense of the word "transcendental" is the opposite of "empirical."

**Trans'it** [Lat. *transire*, to "go across"], the passage of a planet over the disk of the sun, or, in a broader sense, the passage of any celestial body over an arbitrary point of reference.

**Transit Instrument.**—An astronomical instrument used to determine the time of a star's passage over a fixed great circle of the heavens, usually the meridian or the prime vertical. In the latter case the instrument is called a prime vertical T.

**Transit Circle.**—It has been usual until recently to consider the mural circle as a companion to the T. instrument in a fixed observatory; but by attaching a large circle to the horizontal axis of the T. instrument the results formerly obtained by 2 instruments and 2 observers are now more accurately obtained by this single instrument, called the T. or meridian circle; the declination of a star being obtained from the circle reading, while its right ascension is obtained at the same time by observing its T. [From orig. art. in *J.'s Univ. Cyc.*, by L. WALDO.]

**Transits of Venus and Mercury.** The word "transit" is from the Lat. *transitus*, a "way," or "passage over." In accordance with this etymology, the term *transit* is applied to denote the apparent passage of a planet across the sun's disk. In order that this should take place, the



planet must be between us and the sun, and its orbit, consequently, must be within that of the earth; of all the known planets, Mercury and Venus are alone those to be found in this category. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. S. ALEXANDER, LL.D.]

**Transmigration** [Lat. *trans*, "across," and *migrare*, to "migrate"], the doctrine of the repeated existence of the soul in different forms of matter, its form in each successive existence being determined by its merits and demerits in the preceding ones. The most striking fact in connection with this doctrine is its wide prevalence, its profound and permanent hold on certain great nations, its constant re-appearance in more or less pronounced forms in all parts of the world. The anc. civilization of Egypt seems largely to have grown out of this faith. The swarming millions of India also, through the chief periods of their hist., have lain under its spell. It played an important part in the speculations of the early Fathers of the Chr. Ch., and has often cropped out in works of later theologians. Men of the profoundest metaphysical genius, like Scotus Erigena and Leibnitz, have affirmed it and sought to give it a logical or scientific basis.

Another striking fact connected with this subject is that it seems to be a native and ineradicable growth of the Oriental world, but appears in the W. world in scattered instances, and, rather as an exotic form of thought. The pantheistic tendency which possessed and overwhelmed the Brahmanic mind, made the idea of T. natural. Furthermore, the Brahmanic thinkers are a distinct class of men whose whole lives are absorbed in introspective reveries and metaphysical broodings, furnishing the most favorable conditions for exactly such a belief as that of T. And the vast swarms of the common people in the E. are the passive followers of this high caste of thinkers. On the contrary, in the W. world the characteristic tendencies are all different. Pantheistic theories are rarely held. An impassable barrier is imagined separating humanity from every other form of being. Speculative reason, imagination, and affection are chiefly employed in scientific studies and social pursuits. This absorption in material things and evanescent affairs engenders in the spirit an arid atmosphere of doubt and denial, in which no efforescence of poetic and mystic faiths can flourish. [From orig. art. in *J.'s Univ. Cyc.*, by REV. WILLIAM R. ALGER.]

**Transmutation of Force or Energy.** See CORRELATION OF FORCES.

**Transportation** [Lat. *transportare*] differs from banishment by being simply a transfer of a person from one part of the dominion to another, while one banished is driven out altogether from the dominion. T. was adopted as a means of punishment in Eng. in the middle of the 17th century, and the criminals were sent to the plantations of Amer., where they were treated as slaves. After the Amer. war of independence, Australia was selected by Eng. as the place of T., and the first criminals arrived at Sydney in 1787. In 1840 the whole system of T. was abandoned by Eng. It is still in use in Fr. and Rus., which latter tries by this means to settle the vast steppes of Siberia.

**Transubstantiation** [from *trans* and *substantia*, "a change of one substance into another"] is a scholastic term introduced by Paschasius Radbertus (831) to signify the change of the substance of the natural elements of bread and wine into the very body and blood of Christ in the Eucharist, while the visible form and the appearance of bread and wine remain. This miracle is supposed to take place in the mass whenever the priest pronounces the words of institution: "This is my body," "This is my blood." The doctrine was rejected by all the Reformers and Prot. chs. because it contradicts the testimony of our senses (sight, touch, taste) and the very nature of the sacrament. It is based on a literal interpretation of the words of Christ: "This is my body." PHILIP SCHAFF.

**Transvaal** ["across the Vaal"] Republic, The, in S. Afr., between lat. 22° and 28° S., and lon. 25° and 31½° E., and comprising an area of 115,000 sq. m., is bounded E. by the Port. possessions, the Zwazi and Zulu countries, S. by Natal and the Orange Republic, and W. and N. by Hart and Limpopo rivers, which separate it from the country of the Kafirs. The country is mostly very thinly peopled, and chiefly used by the inhabs. for hunting and cattle-breeding; it stands at a low stage of culture. The soil is very fertile, and the surface presents almost everywhere the aspect of hills and valleys covered with rich vegetation and watered by limpid streams. Two mt.-ranges traverse the country from S. W. to N. E.; other minor elevations are scattered in different directions. The prin. rivers are the Vaal and the Limpopo, with their affluents. The country is perhaps richer in minerals than any other country in the world—iron, tin, lead, copper, silver, gold, porcelain-clay, alum, marble, saltpetre, coal, and diamonds. Coffee, sugar, cotton, tobacco, and all kinds of cereals, apples, pears, figs, grapes, peaches, almonds, nuts, oranges, bananas, guavas, etc. are produced. Nevertheless, the inhabs., comprising about 770,000 natives and 40,000 white, prefer to live by hunting. The whites, the so called Boers, live on widely scattered farms, where they cultivate a small piece of field and keep large herds, but their favorite occupation is *trekken*—that is, they range around for months hunting, with huge wagons, drawn by 16 or 20 buffaloes. Some towns have been built, however, such as Potchefstroom, Pretoria, the seat of govt.; Rustenburg, of the same size; and Nylstroom, a minor settlement. Ostrich-feathers, wool, ivory, cattle, cereals, leather, fruit, tobacco, butter, brandy, etc. are exported; all kinds of manufactured goods are imported, and are sold by strolling peddlers. For the yr. 1882 the finances showed—receipts, £263,523; expenses, £253,069. The prin. items of income are direct taxes on real estate, a capitation tax on those who have no real estate, custom-house duties, etc. The public debt amounts to £563,068. The Boers were mostly born in Cape Colony or Natal. In order to escape from the control of Eng. law, they retreated into the rich N.

wilderness, and here they formed a state in 1858, and gave themselves a const. After a time the commonwealth was recognized, but in 1877 the Cape govt. took possession of and annexed the terr. This proceeding was violently resented by a large number of the Boers, who took up arms and were successful in their encounter with small bodies of Brit. troops, and after a truce the govt. determined to give up the country to the Boers, subject to certain regulations recognizing the suzerainty of the Brit. Crown. [From orig. art. in *J.'s Univ. Cyc.*, by AUGUST NIEMANN.]

**Transylvania, Grand Duchy of**, a crown-land of the Austro-Hungarian monarchy, comprising an area of 21,216 sq. m., with 2,084,048 inhabs., is mostly mountainous, formed by a plateau which rises to an average height of 1500 ft., and is surrounded on all sides by mts.—S. and E. by the Transylvanian Alps, W. and N. by the Transylvanian Ore Mts., and S. W. by the mts. of the Banate. On account of the mountainous character and great elevation of the country, its climate and vegetation resemble those of more N. countries. The vine, however, is still cultivated. In the S. part rainstorms and inundations are of frequent occurrence. Mineral products abound; gold is found, also silver, copper, quicksilver, iron, lead, sulphur, precious stones, valuable pebbles, chalk, graphite, and porcelain-clay. The extensive deposits of peat and coal are not utilized, on account of the country's immense wealth in wood. The salt production is important. The animal kingdom presents a great variation. Cattle-breeding is carried on with energy. Buffaloes are used for draught. Horses of a powerful breed are reared and exported. Sheep are very numerous. Of wild animals, bears, wolves, foxes, and wild-boars abound; also eagles, vultures, quails, prairie-hens, various kinds of wild-geese, ducks, etc. Bees are extensively reared, and much honey and wax are exported.

The country has always retained a certain independence, and was in the oldest time inhabited by the Dacians, the Getæ, but subsequently, between the 3d and 10th centuries, numerous tribes drew through it, first the Visigoths in 272, then the Huns, and, after the dissolution of the Hunnic empire in 453, the Ostrogoths, Avars, Slavs, Gers., and finally the Magyars. By these race-inundations of the Carpathian countries the Slavs became settled in the N. and S. parts, and the Magyars in the central plain, while the descendants of the anc. Dacians, the Wallachs, continued to occupy the S. E. dists. Beside the Wallachs, Gers., the so called Saxons, live in the country, in the N. E. and S. parts, and Magyars and Czechs in the E. The prin. occupations are agriculture and cattle-breeding. The cultivation is poor, and the production of grain is insufficient for the home demand; the largest profit is yielded by the cultivation of the vine, tobacco, hemp, flax, and fruit. Cattle-breeding is important, and the breed of horses is celebrated. Manufacturing industry is very low, though numerous tanneries and breweries are in operation. Coarse linen is everywhere produced, but only for home use; finer fabrics are imported. Much common pottery is produced, also some glass; in Hermannstadt and Kronstadt soap and hats are manufactured, but in many dists. even masons, carpenters, and smiths are wanting. The commerce is mostly in the hands of the Gers. and Armenians, who carry on the exportation of the cattle and animal products, and the importation of textile fabrics, colonial ware, and articles of luxury. The interior traffic consists chiefly in the exchange of animal products and wooden-ware, and takes place at annual and weekly fairs. In political respects the *Diploma Leopoldinum* forms the basis of the const. It guarantees the maintenance of the 3 nations, the Magyars, Czechs, and Saxons, and accordingly the country is divided into 3 parts—the country of the Magyars, with the cities of Klausenburg and Carlsburg; the country of the Czechs, with the cities of Maros Vasarhely and Udvarhely; and the country of the Saxons, with the cap. of Hermannstadt and the towns of Schässburg, Kronstadt, and Bistritz. The country belongs to the Hungarian crown, and sends its representatives to the Hungarian Parl. [From orig. art. in *J.'s Univ. Cyc.*, by AUGUST NIEMANN.]

**Trap**, in geology and lithology, a term applied formerly in a vague way to a large variety of rocks which are now often distinguished by other names more or less significant of their mineralogical composition; the word "trap" being now most generally applied to designate little more than a mode of occurrence, in the form of so called "dikes" intersecting, or of beds intercalated between beds of, other rocks, and held by most of our geologists and lithologists to be intrusive in origin. The word *trap* is Swe. or Dan. in derivation, *trappa* in the former and *trappe* in the latter lang., meaning a "stair," and was applied first, it is thought, to the columnar basaltic traps, which at times occur in ranges of columns rising above each other, like rude stairs; such contour being, however, due in all cases to different kinds of erosive action, chiefly glacial.

**Trap-pists, The**, a monastic order of the R. Cath. Ch., received their name from La Trappe, an abbey of the Cistercian order, situated in the dept. of Orne, Fr., and founded in the middle of the 12th century. Here Armand Jean le Bouthillier de Ranée introduced those severe reforms which made the T. one of the most austere orders of the R. Cath. Ch. Twelve hours of the day were given to religious exercises, and several hours to hard labor. Vegetables and water formed the fare; meat, wine, etc. were forbidden, and conversation between the monks themselves or with outsiders was avoided. The whole life tended to concentrate the mind on the sole idea of death.

**Trap-Rock.** See TRAP.

**Travancore**, with Trivandrum on the Malabar coast as cap., one of the best administered feudatory states of the British-Indian empire, on the S. W. end of the Indian peninsula, with an area of 6653 sq. m., and a pop. of 1,308,847, chiefly Hindoos. A most turbulent sect are the Mappilas, Mohammedans who inhabit the N. of the state. The ruling family of the maharajah is famous for its particular interest



In astronomical observations and its promotion of the efforts of philanthropists. Coffee and pepper show considerable increase; cardamoms, areca, and cocoanuts were with other articles a monopoly of the rajah, but can now be obtained in open market, being only subjected to a light export duty.

**Traverse City**, cap. of Grand Traverse co., Mich., on R. R. and at the head of the W. arm of Grand Traverse Bay. Pop. 1880, 1897.

**Traverse-Table**, in surveying, a table from which the lat. and departure of any course can be found by inspection. It is a rough table of the sines and the cosines of arcs, computed to each quarter of a degree from 0° to 90°, and for every radius from 1 to 100. In the ordinary tables the computation is only carried out to 2 places of decimals. The table is used in a manner entirely similar to that of using a table of natural sines and cosines. When greater accuracy is required than can be attained by the use of the T.-T., the lat. and departure may be computed in each case from suitable formulas.

**Trawling**, in the fisheries, sometimes is fishing by means of a trawl, or small bag-shaped net, dragged along the bottom of the sea behind a boat. The name *trawling* is also given to a system of fishing for cod, halibut, and other large fish, by means of a great number of hooks set at intervals along a stout line which lies upon the sea-bottom. From time to time this trawl or ground-line is underrun by men in a boat, and the fish are removed.

**Treadmill**, a machine sometimes employed in prison discipline, was introduced into Brit. prisons in 1817. It is an appliance by which the prisoner's weight gives a revolving motion to a cylinder, somewhat as a horse's weight gives motion to an ordinary horse-power machine.

**Treadwell** (DANIEL), b. at Ipswich, Mass., in 1791, displayed in childhood his mechanical ingenuity by inventing a machine for making wood-screws; brought out in 1818 a new printing-press; visited Eng. 1819; invented the "power-press" 1822, in 1826 the system of turn-outs on single-track R. Rs., in 1829 a machine for spinning hemp, and in 1835 described in a memoir before the Amer. Acad. important improvements in the material and method of construction of cannon, resembling the subsequent Armstrong processes; secured a patent and a govt. contract, and filled from 1834 to 1845 the Rumford professorship of technology in Harvard Coll. D. Feb. 27, 1872.

**Treadwell** (JOHN), LL.D., b. at Farmington, Conn., Nov. 23, 1745, grad. at Yale 1767; studied law; was a member of the legislature 1776-85, of the Continental Cong. 1785-86, co. judge 1786-89, member of the council 1785-98; was judge of probate and of the supreme court of errors 1789-1808; was chosen lieut.-gov. 1798, and was gov. 1809-11. He was pres. of the A. B. C. F. M. from its foundation to his death, Aug. 19, 1823.

**Treason** [Fr. *trahir*, *trahison*, from Lat. *trado*, *traditio*] is a crime of indefinite and variable limits, committed against the sovereignty of the people or the supreme ruler's person. The Eng. definition includes in the crime of T. or high T., compassing the death of the king or of his eldest son and heir; violation of the queen or the king's eldest daughter if unmarried; levying war in the realm by a subject; counterfeiting the privy seal; beside other offences, some of which were legally made such in a time of excitement. Our const. defines T. as "levying war against the U. S., adhering to their enemies, or giving them aid and comfort." T. against a State is in the criminal laws of some States, but it may be called an unnecessary crime. T. D. WOOLSEY.

**Treasurer of the U. S.**, an officer of the U. S. treas. dept. who receives and pays out money on the warrant of the sec. of the treas., countersigned by the first comptroller and certified by the register, taking receipts for all moneys paid out. Moneys paid to the treas. are charged to the T. on covering warrants, upon which he signs his receipt.

**Treasury of the United States**, a dept. of the executive govt. of the U. S., having control over the collection, management, and disbursement of the public revenue, and presided over by a sec., who is, next to the sec. of state, the most important officer of the cabinet. The subordinate officers consist of 2 assistant secs., a treas., 3 comptrollers, 6 auditors, a registrar, coms. of customs and of internal revenue, a solicitor, and about 16,000 employés.

**Treat** (ROBERT), b. in Eng. in 1622, was one of the first settlers of Wethersfield, Conn.; afterward settled at Milford, where he was soon chosen a judge; was a magistrate 1661-65; became a major of Conn. troops 1670; marched to Springfield (1673) to the relief of that place against the Indians; drove them from before the town, subsequently routed them at Hadley; participated in the great Indian battle at the Narragansett Fort in Dec. of that yr.; was chosen lieut.-gov. 1676, and gov. 1686-1701. D. July 12, 1710.

**Treaty**. See INTERNATIONAL LAW.

**Trebizond**, or **Tarabozan**, town of Asiatic Tur., on S. E. coast of the Black Sea, beautifully situated on a slope facing the sea, and surrounded with walls and defended by a citadel on a neighboring hill and forts at the entrance of the harbor. It is well built, especially the suburb which is inhabited by the Chrs., and which contains the bazaars. Cotton manufactures, colonial produce, spices, ironware, glass, wine, salt, and corn to the value of about \$20,000,000 are annually brought to it from Europe, and exchanged for silk, wool, tobacco, wax, gall-nuts, opium, shawls, carpets, and saffron, which are brought from Per. on camels. Pop. 32,000.

**Tree** [A.-S. *treow*], a woody plant with a single trunk rising to more than the height of a man. There are all gradations between shrubs and trees. Some woody-stemmed plants are properly called trees, although of dwarf stature, the branches being elevated upon a single trunk; some, which branch from the ground or near it into a cluster of trunks, reach such a height and magnitude that they must be called trees rather than shrubs. *Exogenous trees* spring

from an embryo having a pair of cotyledons or seed-leaves, and develop lateral buds as well as the terminal or primary one, and therefore branch freely. The name *exogenous* denotes that it is an outside-grower—i. e. the trunks, and equally the branches, increase in thickness by new wood formed outside the old. The character of a tree depends much upon its mode of branching, and this primarily upon the arrangement of leaves upon the twigs. When the leaves are opposite, so will be the branches of the spray, while alternate leaves originate alternate branchlets; but this symmetry is usually obscured in the larger branches by the non-development of some of the buds and the destruction of many branchlets. When the main trunk persists and leads throughout, the tree is said to have an excurrent trunk; while the main trunk is lost in or replaced by the main branches, it is said to be deliquescent. Completely excurrent trunks are most common in

*Coniferous trees*—including cypresses, junipers, yews, pines, spruces, and firs—a kind of exogenous tree in structure, but with wood composed of homogeneous cells having peculiar markings. Their flowers are also greatly simplified, their ovules naked and fertilized by direct application of the pollen, so that they are distinguished by some as a sub-class of exogens, by others as a class, under the name of *gymnosperms*, or naked-seeded plants. They are mostly stately trees, with peculiar narrow, commonly needle-shaped leaves, of very simple nervation, mainly evergreen, and they are developed more commonly from an embryo with the 2 cotyledons so completely divided, each into 2 or 3 or more leaflets, that they were naturally supposed to have a whorl instead of a pair of cotyledons, and therefore called polycotyledonous.

*Cycadeous trees*, represented by the *Cycas*, commonly but improperly known as sago-palm, are of a peculiar type, exogenous in structure, but with the mode of growth of

*Endogenous Trees*.—Palm trees are the more common representatives of this type. They rise by a simple columnar trunk, not tapering as it ascends, terminated with a crown of large and long-stalked leaves. This simple and mainly cylindrical trunk comes from their whole vegetation being the development of a single terminal bud. Such axillary buds as they develop form the inflorescence, and therefore do not result in permanent branches. In contrast with the wood of exogenous trees, that of endogenous trees in general has no concentric layers surrounding a central pith, and no proper bark. The wood is made up of separate bundles or threads of fibro-vascular material, longitudinally traversing and separately imbedded in cellular and softer fundamental tissue. As the wood is thus more largely formed toward the circumference, and gradually fills up within, the name of endogenous growth—i. e. "growth within"—is sufficiently appropriate. Exogenous trunks increase indefinitely in diameter; endogenous trunks in general soon become incapable of further enlargement, except in height. They are accordingly cylindrical up to the crown of leaves. In place of a bark, distinct, separable, and of different layers, endogenous trunks are invested by an inseparable, more homogeneous, and permanent rind, which, along with the more solidified wood of the circumference, restricts and limits distension. Some endogenous trunks, however, continue to increase in diameter. They also branch when old, usually only after blossoming, which takes place from a terminal bud, thus arresting the vegetative growth, which is resumed from axillary buds. Such stems therefore fork at each flowering or other arrest of the terminal bud, and so in time form a branched head.

*Fern-trees*, or *tree-ferns*, mainly represent arboreal vegetation among *cryptogamous* plants in the present age, although in former periods other vascular cryptogams were largely arborecent. Tree-ferns are restricted to tropical regions of moist climate, or at least to those regions or habitats in which both winter and dryness are unknown. Their port is similar to that of palms, the structure of the wood peculiar, answering neither to the endogenous nor the exogenous type.

*Evergreen and deciduous trees* differ in that the latter cast off or lose all their leaves at the coming of a cold or of a dry season, while the former hold their old leaves alive, at least until after new ones are produced. Deciduous trees are mainly if not wholly of the exogenous type.

*Duration of Trees*.—An exogenous tree, renewing annually its twigs and foliage above, its growth of roots beneath, and zone of new wood and bark connecting the two, has really no definite limits to its existence. Its actual duration depends upon external circumstances, and upon some inherent liabilities which may practically result in a certain average of life in any particular species. Increase of size, height, or spread of branches, and other inevitable consequences of age, however, bring increasing, and at length inevitable, disadvantages and liabilities, so that practically, although most trees, like most men, die an accidental death, the longest survivors may be said to die of old age in the sense in which the oldest of the human race do. Various collections have been made of the data respecting the actual longevity of trees. Suffice it to say, however, that exogenous trees are known, by the actual counting of their layers, throughout or in great part, to have attained the age of from 1200 to fully 3000 yrs. The tallest trees known rise little less than 500 ft. (*Eucalyptus*, in Australia). The largest in girth are trees of *Eucalyptus*, up to 81 ft.; giant redwoods in Cal., up to 91, and possibly 100 ft.; baobab trees of Senegal, some of which have reached the latter circumference, but they are low trees of rapid growth even when old, and probably of no extreme age; and, finally, there is a Mex. *Taxodium* or bald cypress, a slow-growing tree, which measures 112 ft. in circumference. If this does not consist of 2 or more original trunks which have grown into one, it is probably the oldest existing tree known.

Endogenous trees like palms, which do not continue to increase in girth, are more strictly limited in their dura-



tion; perhaps they never live more than 200 or 300 yrs.; and the same may be said of tree-ferns. When an endogenous trunk has a soft living rind, capable of unlimited expansion, and also produces branches, perhaps it may live as long as an exogenous tree. Dragon trees (*Dracena*) are examples of this. The celebrated great dragon tree of Orotava, Tenerife, was probably as old as any of the existing redwoods of Cal.

ASA GRAY.

**Tree-Ferns.** See TREE.

**Tree-Frog, or Tree-Toad**, a term employed for those species of anurous amphibians (order Salientia) which are adapted for life among the trees, and which are therefore provided with terminally dilated toes. This character of dilatation of the tips of the toes is of mere teleological significance, and with no true morphological characteristics.

**Treitschke** (H. G. VON). See APPENDIX.

**Tremain'** (LYMAN), b. at Durham, N. Y., June 14, 1819, studied law; admitted to practice in the supreme court of N. Y. in 1840; joined the Dem. party; was supervisor of Durham, N. Y., in 1842, co. dist. atty. in 1846, and co. judge and surrogate of Greene co., N. Y., 1847; in 1853 practiced law in Albany, N. Y.; was atty.-gen. of N. Y. State in 1857. From the commencement of the c. war he identified himself with the Rep. party; was member of N. Y. Assembly from Albany co. 1865, and speaker in 1866; Congressman at large for N. Y. State 1873-75. D. Nov. 30, 1878.

**Trench** (RICHARD CHENEVIX), D. D., b. at Dublin, Ire., Sept. 9, 1807, grad. at Trinity Coll., Cambridge, 1829; spent some yrs. in travel; took orders in the Ch. of Eng. 1833; was curate at Hadleigh, Suffolk, 1833-35, incumbent of Curdridge 1835-40, curate to Archdeacon Wilberforce at Alverstoke 1840-44, rector of Itchenstone 1844-45; was appointed examining chaplain to the bp. of Ox. (Dr. Wilberforce) 1845; was Hulsean lecturer 1845-46, and select preacher at Cambridge 1843 and 1856; prof. of theol. at King's Coll., Lond., 1846-58, dean of Westminster 1856-63, and was ordained abp. of Dublin, as successor to Dr. Whately, Jan. 1, 1864. Author of poems, *The Story of Justin Martyr, Sabbath, Honor Neale, Poems from Eastern Sources*, etc.

**Trendelenburg** (FRIEDRICH ADOLF), b. in Entin, principality of Lubeck, Nov. 30, 1802, ed. at the gymnasium in his native town and at the univs. of Kiel, Leipzig, and Berlin; was appointed in 1833 a prof. *extraordinarius* of philos. at the Univ. of Berlin; was promoted to a full (or "ordinary") professorship in the same univ. in 1837, and retained this position until his death, Jan. 24, 1872. In 1846 he was elected a regular member of the Berlin Acad., and from the following yr. until his death he was sec. of the section for the hist. of philos. During nearly the whole of his life as prof. at Berlin, T. was a member of the governmental commission for the examination of candidates for positions as teachers in the public schools of Prus. In this position he wielded a great and salutary influence. From 1849 to 1851 T. was a member of the popular house of the Prus. Diet, where he sided with the moderate or patriotic party. As a univ. prof., T. lectured to large classes on psychology, logic, the hist. of philos., ethics, the philos. of law, and the theory of teaching. He was particularly eminent for his wide knowledge and understanding of the hist. of philos., and also as a philosophical critic. His own system was in a measure eclectic in its basis.

**Trent** (Ger. *Trient*), town of Aus., in the S. part of Tyrol, on the Adige, is beautifully situated and well built, surrounded with walls and traversed by canals. Its cathedral, built of white marble in 1212, is a magnificent edifice. It manufactures leather, glass, sugar, tobacco, bells, cards, and silks, and carries on an important transit-trade between It. and Ger. Pop. 17,073.

**Trent, Council of**, was called forth by the Ref. of the 16th century, and demanded by both parties in the contest, but was again and again postponed by the policy of the papal court. Finally, it was convened as an exclusively Roman council by order of Pope Paul III. in the Aus. city of Trent (*Tridentum*), in the It. part of Tyrol (at that time a free city of the empire under a prince-bishop), on Dec. 13, 1545, and lasted, with several interruptions, till Dec. 4, 1563. It closed with "Anathema" to all heretics, anathema, anathema."

The decrees and canons of the council were confirmed by a bull of Pope Pius IV. Jan. 26, 1564. This bull enjoins strict obedience upon all Catholics, and forbids, under pain of excommunication, all unauthorized interpretation, reserving this to the pope alone, and threatening the disobedient with "the indignation of Almighty God and of his blessed apostles, Peter and Paul." The number of attending members varied considerably; it increased toward the close, but never reached the number of the first oecumenical council at Nicea (which had 318 members) nor of the last of the Vatican (which numbered 764). The decrees were signed by 253 members, including 4 papal legates, 2 cardinals, 3 patriarchs, 25 abps., 168 bps.,  $\frac{5}{8}$  Its. Lists of the signers are added to the best editions of the Decrees.

The object of the council was twofold: (1) To condemn the principles and doctrines of Protestantism, and to define the doctrines of the R. Cath. Ch. on all the disputed points. (2) To effect a reformation of discipline, which was admitted by all honest and earnest Catholics to have fallen into such deplorable decay as to explain, if not to justify, the Ref. Twenty-five public sessions were held, but about half of them were spent in solemn formalities. The chief work was done in committees or congregations. The entire management was in the hands of the papal delegates. The court of Rome, by diplomacy and intrigue, outwitted all the liberal elements. The council abolished some crying abuses, and introduced or recommended disciplinary reforms as regards the sale of indulgences, the morals of convents, the education of the clergy. But in regard to the dept. of doctrine, although liberal evangelical sentiments were uttered by some of the ablest members in favor of the supreme authority of the Scriptures, and justification by faith, no concession whatever was made to Protestantism. The doctrinal

decisions of the council are divided into *Decrees* (*decreta*), which contain the positive statement of the Roman dogmas, and into short *Canons* (*canones*), which condemn the dissenting Prot. views with the concluding "anathema sit." They are stated with great clearness and precision.

The *Canons* and *Decrees* of the council were first pub. by Paul Manutius (Rome, 1564), and often since in different langs. Best Lat. ed. by Le Plat (1779) and by Schulte and Richter (Lips., 1853); best Eng. ed. by Rev. J. Waterworth (with a hist. of the council, Lond., 1848).

The history of the council was written chiefly by 2 able and learned Catholics of very different spirit—the liberal, almost semi-Prot. monk Fra Paolo Sarpi, of Venice (*Istoria del Concilio Tridentino*, first, Lond., 1619); and in the interest of the papacy by Cardinal Sforza Pallavicini, who had access to all the archives of Rome (*Istoria del Concilio di Trento*, Rome, 1656-57, 3 vols. fol.). Both accounts must be compared to get a full view. On the Tridentine standards, see the author's *Credo of Christendom*, third ed. 1881, vol. 1. pp. 90 seq.; II. 77 seq.

PHILIP SCHAFF.

**Trenton**, R. R. junc., cap. of Grundy co., Mo., on Grand River. Pop. 1870, 930; 1880, 3312.

**Trenton**, city, an important R. R. and commercial centre, cap. of Mercer co. and of the State of N. J., is at the head of tide-water and steamboat navigation on Del. River, and is intersected by Del. and Raritan Canal. T. has a line of steamboats to Phila. on the Del., and is 27 m. from Phila. and 56 from New York. It is connected with Pa. by 2 fine bridges over the Del.

*Streets, Buildings, Etc.*—Its streets are wide and well shaded. Several picturesque elevations in the suburbs, including a fine eminence along the river, are occupied by handsome mansions with beautiful grounds. It has a public library (in addition to the State library in the capitol), an opera-house, and a system of public graded schools, with a high-school and several private schools. The public buildings in T. comprise the State capitol, the State normal and



State Capitol (Trenton, N. J.).

model schools, the Soldiers' Children's Home, the State prison, State lunatic and deaf and dumb asylums, State reform school for girls, and a large U. S. P. O. and court-house.

*Manufactures.*—These are the prin. source of the growth of T. It has very large crockery manufactures, also extensive iron and steel works, woollen mills, fire-brick and terracotta works, rubber-works, zinc-works, locomotive and ordnance works, etc. Hundreds of thousands of tons of coal are annually shipped by water from T. to E. ports. It has a water-power = 1000 horse-power from the Del. Pop. 1870, 22,874; 1880, 29,910. On the night of Dec. 25, 1776, Washington, with about 2400 men, crossed the Del. above T., which city he surprised and captured, together with the garrison of about 1300 Hessians, with their arms and 6 field-pieces. The enemy being in superior force in the vicinity, Washington recrossed the Del. on the 26th. A few days later, however, he returned to N. J. and took possession of T., where he concentrated his forces, and whence he moved to Princeton early in Jan. 1777. WILLIAM CLOKE.

**Trenton**, Tenn. See APPENDIX.

**Trenton Falls**, a waterfall of W. Canada Creek in the tp. of Trenton, Ononda Co., N. Y. The falls are a favorite place of summer resort, chiefly on account of the remarkable wildness of the surrounding scenery. The stream flows through a ravine or chasm in the Trenton limestone from 70 to 200 ft. deep, and the water descends 312 ft. in 2 m. by half a dozen cataracts and cascades.

**Trescot** (WILLIAM HENRY), b. at Charleston, S. C., in 1822, was sec. of legation in Eng. 1852-53, and under-sec. of the U. S. 1857-60. Wrote *The Diplomacy of the Revolution, An Historical Study, The Diplomatic Hist. of the Administrations of Washington and Adams*, etc. In Dec. 1881 he became special envoy extraordinary and minister plenipotentiary of U. S. to Chili, Peru, and Bolivia.

**Trespass** [O. Fr. *trespasser*], in law, is a species of tort, consisting in an unlawful act done to the person or property of another by means of direct violence, actual or constructive. T. are separated into 3 kinds—to person, to personal property, and to real property. The term "trespass" is also the name of the common-law form of action which must be used to recover damages from the wrong-doer when the delict complained of is a trespass.

**Trevelyan** (SIR CHARLES EDWARD), BART., K. C. B., b. in Eng. in 1807, entered the civil service of the E. I. Co.; made to the vice-regal govt. at Calcutta elaborate reports on various subjects, one of which led to the abolition of some oppressive imposts; secured the aid of the govt. to some opposition of European lit. and science among the natives of India; in 1840 assistant sec. to the treas.; knighted in 1848 for services in connection with the Irish famine;



appointed gov. of Madras Jan. 1859, but recalled in May 1860, in consequence of having protested against the new taxes proposed by the gov.; finance minister in India 1862-65; created a baronet 1874. Wrote *Education of the People of Ire.*, *The Irish Crisis*, *The Purchase System in the Brit. Army*, etc.

**Trevelyan** (GEORGE OTTO), son of Sir Charles Edward, b. at Rothley Temple, Leicestershire, Eng., July 20, 1838, ed. at Harrow School and at Trinity Coll., Cambridge; was distinguished in the E. I. civil service; returned from India, and was M. P. from Tynemouth as a liberal 1865; became civil lord of the admiralty under Mr. Gladstone's second administration Dec. 1868; resigned July 1870. Wrote *The Life of Lord Macaulay*, *Early Years of Charles James Fox*, etc. Became chief sec. for Ire. 1882.

**Treves** (Ger. *Trier*), town of Rhenish Prus., on the right bank of the Moselle, beautifully situated among the vine-clad hills of that river. It is the most anc. city of Ger. The emp. Augustus established here a Rom. colony under the name of *Augusta Treverorum*. Almost annihilated during the barbarian invasions, it arose under the abps. of T. to nearly its earlier splendor. It is now a decayed town, but one of high antiquarian interest from its numerous Rom. remains. Pop. 24,200.

**Tre'vor** (Sir JOHN), b. at Brynkinalt, Denbighshire, Wales, about 1637, was called to the bar at the Inner Temple May 1661, knighted Jan. 1671; became K. C. 1678, was elected to Parl. 1679, chosen speaker of the new House of Commons May 1685; became master of the rolls Oct. 20, 1685; sworn of the privy council July 6, 1688; was dismissed from office by William and Mary; was an energetic opponent of the gov. in the Convention Parl. 1689, but soon made his peace with the court, with the consent of which he was unanimously elected speaker Mar. 20, 1690; was made first com. of the great seal May 14, 1690; was restored to the office of master of the rolls Jan. 1693; was reported by a parliamentary committee guilty of bribery Mar. 12, 1695, and by vote of the House was declared guilty of a high crime; resigned the speakership, and was a few days later formally expelled. He retained the high position of master of the rolls for the rest of his life. D. May 20, 1717.

**Tri'ade**, in chem., those elements or radicals which are trivalent or equivalent in their combinations to 3 atoms of hydrogen.

**Tri'ads, The Welsh**, a collection of rhythmical triplets containing historical facts and fancies, traditions, legal, rhetorical, and moral tales, and the like. They exist in the Welsh lang. The oldest extant T. are referred to Edward I.'s time. Most of the T. are of much more recent origin.

**Triangulation**. See GEODESY AND SURVEYING.

**Trias**. See GEOLOGY.

**Tribe** (*gens, phratry, tribe, and confederacy* among the Amer. aborigines). A gens is a body of persons descended from the same ancestor, and as such it represents the most primitive social organization, and contains the first germ of gov't. The *gentes* of the Iroquois will be taken as the standard exemplification.

I. THE *GENS* AS AN INDIVIDUAL ORGANISM.—The Senecas, Cayugas, and Onondagas were each composed of 8 *gentes*, arranged and named as follows:

- First, 1, Wolf; 2, Bear; 3, Beaver; 4, Turtle.  
Second, 5, Deer; 6, Snipe; 7, Heron; 8, Hawk.

The Mohawks and Oneidas, the 2 remaining Iroquois tribes, had but 3 *gentes*, the Wolf, Bear, and Turtle, and have but 3 at the present time. When the confederacy of the Iroquois was formed (about A. D. 1450), 7 of the 8 *gentes* were in existence.

1. *The Right of Electing its Sachems and Chiefs*.—Nearly all the Amer. Indian tribes had 2 grades of chiefs, sachems and common chiefs, the office of the former being hereditary, the other non-hereditary. The office of sachem was made perpetual in the gens by filling the vacancy as often as it occurred, while that of chief was bestowed as a reward of merit, and died with the individual. The duties of a sachem were confined, theoretically, to the affairs of peace. On the other hand, the chiefs were the superior class in ability, but not in authority over the gens. The relations of the chiefs were primarily to the tribe, composed of several *gentes*, as that of the sachem was primarily to the gens, of which he was the father and official head. Upon the death of a sachem, among the Iroquois, a council of the gens was convened to fill the vacancy. After the choice was made it still required the acceptance of the candidate by the other *gentes* before the election was complete. When the person was accepted, it was still necessary that the new sachem should be installed by a council of the confederacy before he could assume the duties of the office.

2. *The Power of Deposing its Chiefs*.—As the members of the gens had the right to elect, so they possessed the equal power to depose their chiefs. When a sachem or chief had been deposed in due form by a council of his gens, he ceased to be regarded as an official character.

3. *The Right of bestowing Personal Names upon the Gentiles*.—After the birth of a child a name was selected by its mother from those not in use belonging to the gens, with the concurrence of the chief and nearest relatives. It should be announced at the next ensuing council of the tribe. There were 2 classes of names in use—one adapted to childhood, and the other to adult life—which were exchanged at the age of 15 or 16 in the same formal manner. In some tribes the youth was required to go out upon the war-path and earn his new name. If a person was elected a sachem or chief, his name was "taken away" and a new one bestowed in its place.

4. *Mutual Rights of Inheritance of the Property of a Deceased Member of the Gens*.—In savage, and also in barbarous tribes below the Middle Status, the amount of property was inconsiderable. The most valuable personal articles were interred with the body of the deceased owner. Nevertheless, the question of inheritance was certain to arise with

the growth of property. Accordingly, we find, as a substantially universal custom, that the property remained in the gens of the decedent and was distributed among his gentiles (pron. *gen'-ti-les*) as the nearest of kin. The language of savage tribes, and of tribes in the Lower Status of barbarism, is perfectly simple. Lands are universally owned in common by the tribe. After tillage had commenced, among the Amer. aborigines occupation of land gave a possessory right to so much as was brought under cultivation, and it passed by inheritance, the same as personal effects.

5. *The Obligation not to Marry in the Gens*.—The intermarriage of brothers and sisters was practised in anc. times. In the midst of the conjugal system which then prevailed, the gens was instituted. The main object at which it aimed was fully accomplished by the prohibition of intermarriage in the gens. Brothers still shared their wives in common, and sisters their husbands the same.

6. *Reciprocal Obligations of Help, Defence, and Redress of Injuries*.—Among the Iroquois, and other Indian tribes generally, the obligation to avenge the murder of a kinsman was recognized. It was the duty of the gens of the slayer and of the slain to attempt the adjustment of the crime if possible before proceeding to extremities. A council of each was held separately, and propositions were made for the condonation of the offence, usually in the nature of expressions of regret and of presents of considerable value. If the relations of the slain person were implacable, one or more avengers were appointed by the gens from among its members, who were charged with the duty of pursuing the criminal and of slaying him wherever he might be found.

7. *The Right to Adopt other Persons into the Gens*.—Another distinctive attribute of the gens was the right of adoption. Captives taken in war were either put to death or adopted by the different gentes. Women and children usually experienced clemency in this form. Adoption not only conferred gentle rights, but also the nationality of the tribe.

8. *The Council of the Gens*.—The simplest and lowest form of the council was that of the gens, which was a democratic assembly, because upon the most important questions every member had a voice. It elected and deposed chiefs, avenged or condoned the crime of murder, elected "keepers of the faith," performed the ceremony of adoption, and distributed the property of a deceased member. It was the germ of the higher council of the tribe, and of that still higher of the confederacy, each composed exclusively of chiefs.

II. THE INDIAN PHATRATY.—The phratry (*φρατρία*) is a brotherhood, as the term imports, and a natural growth from the organization into gentes. It is an organic union or association of two or more gentes of the same tribe for certain common objects. The gentes united in a phratry were usually such as had been formed by the segmentation of an original gens. Each phratry is a brotherhood. The gentes in the same phratry are brother gentes to each other, and cousin gentes to those of the other phratry, but the two are equal in privileges and functions. The phratry concerned themselves with the public games, in which the people divided by phratry, with cases of murder, with the funerals of distinguished men, and with the confirmation of the nomination of sachems and chiefs made by the gentes.

III. THE INDIAN TRIBE.—The T. was the ultimate stage of organization of the great body of the Amer. aborigines. Their striking characteristic was the large number of independent T. into which they had fallen by the process of segmentation. Each T. was individualized by a name, by an independent dialect, by a supreme gov't., and by the possession of a territorial area which it claimed and defended as its own. It was composed of several gentes gradually developed from two or more, all the members of which were intermingled by marriage and spoke the same dialect. As the gens was founded upon consanguinity, so the T., as an assemblage of gentes of the same lineage, was founded upon dialect. The following are the prin. attributes of the Indian T.: (1) The possession of a tribal terr. and a tribal name; (2) the possession of an independent dialect; (3) the right of investing chiefs elected by the gentes; (4) the possession of a religious faith and worship; (5) a supreme gov't. through a council of chiefs; (6) in some cases a head-chief of the T.

IV. THE INDIAN CONFEDERACY.—A tendency to confederate for mutual defence would spring up very naturally among kindred T. To such a union of T. speaking dialects of the same stock-lang. the individual gens, and the individual T. composed of gentes, were eminently adapted. The chronic state of warfare in which they lived and the severe straits to which they were frequently reduced would quicken this tendency into action among such T. as were sufficiently advanced in intelligence and in the arts of life to perceive its benefits. It would be simply a growth from a lower into a higher organization by an extension of the principle which united the gentes in a T. Several confederacies, as might have been expected, were found in different parts of N. Amer. when discovered, some of which were quite remarkable in plan and structure. Among the number may be mentioned the Iroquois confederacy of 5 independent T., the Creek confederacy 6, and the Dakota league of "the 7 council fires."

The Iroquois T. furnish an illustration of the manner in which a confederacy was formed. When discovered (A. D. 1608) they occupied the whole area between the Hudson and the Genesee river, and southward down the Susquehanna into Pa. In numbers they never at any time exceeded 20,000 persons. The general features of this confederacy may be indicated by the following propositions: (1) A union of T. composed of the same gentes, and on the basis of equality, each T. remaining independent in all matters pertaining to local self-government within its own terrs. (2) A general council of sachems, limited in number, equal in rank, and holding the supreme authority over all matters pertaining to the confederacy. (3) Sachemships were cre-



ated in perpetuity in certain gentes of the several T., with power in the latter to fill vacancies as often as they occurred; but the right to invest the sachems with office was reserved to the general council. (4) The sachems of the confederacy were also sachems of their respective T., and the council of the T. was left supreme over all matters pertaining to it exclusively. (5) In the general councils of the confederacy unanimity was made essential to every public act. (6) The council of each T. had power to convene the general council, but the latter had no power to convene itself. (7) The general council was open to the orators of the people for the purpose of discussing public questions, but the council alone decided. (8) The confederacy recognized no official head; in the administration of its affairs one sachem possessed as much authority as another. (9) They had reached the idea of general military commanders, but they created 2 principal war-chiefs of the confederacy, instead of one, and made their powers equal. This was probably the office held by Montezuma among the Aztecs, that of a general commander. [From orig. art. in *J.'s Univ. Cyc.*, by HON. LEWIS H. MORGAN, LL.D.]

**Tribune** [Lat. *tribunus*, from *tribus*, a "tribe"], designated originally, in the primitive constitution of anc. Rome, an officer who for some purposes represented one of the tribes of which the Rom. people consisted; but the term became, in course of time, a frequently used title for officers of very different character and very unequal power. The two most important offices bearing this title were those of the *tribuni militum* and the *tribuni plebis*. The number of the *tribuni militum* was 24, six to each legion, and each commanding the legion for 2 months. The *tribuni plebis* were instituted in 494 B. C., after the secession of the plebs to the Mons Sacer. Their office was to defend the plebeians against the arbitrariness and violence of the patricians. Their persons and houses were sacred and inviolable. Their doors were always open, and any one who sought refuge within their precincts was entitled to protection. But their authority was originally merely prohibitory. They could by personal intervention or by the interposition of their veto stop any action of any magistrate, without giving any reason for so doing or without incurring any responsibility, but they had no power of arraignment or punishment, and no share in the administration or legislation. Nevertheless, the hist. of Rome shows how this merely negative authority by degrees developed into a most formidable positive power.

**Trichina** (tri-k'na) **Spiralis**, a parasitic nematoid worm infesting the muscular tissue of the pig, the rat, and some other animals, and liable to occur also in man. As commonly found, this worm is a quiescent encysted parasite, occupying, often in great numbers, the tissue of the voluntary muscles. The cyst is about  $\frac{1}{50}$  of an inch long and  $\frac{1}{100}$  of an inch wide. When stretched out the worm is of a tapering, cylindrical form,  $\frac{1}{250}$  of an inch long, and is  $\frac{1}{450}$  of an inch thick in its widest portion. When a portion of trichinous flesh is devoured in the raw state by man or certain kinds of inferior animals, the muscular tissue and the encysting capsules are liquefied by digestion, and the worms are set free in the cavity of the intestine. They immediately begin to penetrate the walls of the intestine and disperse themselves over the body. They have been found under these circumstances in the substance of the intestinal walls, in the mesentery, the diaphragm, the peritoneal and pleural cavities, and thence outwardly in all the voluntary muscles of the trunk and limbs. They soon afterward become enveloped in a closed capsule or cyst, and there grow larger. As they increase in length within the confined space of the cyst, they become gradually coiled up, thus assuming the spiral form characteristic of the encysted worm.

This process of the development of adult T. in the intestine and the dispersion of their young throughout the system produces in man and animals a severe and often fatal illness, known as *trichinosis*. Its earliest symptoms are those of intestinal irritation, caused by the growth and activity of the ingested worms—namely, abdominal pains, nausea, vomiting, and diarrhoea. There is also fever and loss of appetite. Then follows an oedematous swelling of the face, body, and limbs, with muscular pains and tenderness, especially on motion; so that the patient lies helpless, with the arms and legs in a semiflexed position, and any attempt at either active or passive movement causes suffering. This corresponds with the period of dispersion of the embryonic worms and their establishment in the muscular tissue. There is also marked difficulty of chewing and swallowing, owing to the invasion of trichinae into the corresponding muscles; hoarseness or loss of voice, due to their presence in the laryngeal muscles; and even in some cases serious disturbance of respiration, from a similar affection of the diaphragm and the intercostals. In man, after death from trichinosis, there have been found in the same subject in the gastrocnemius muscle of the leg 30,000 young trichinae to the cubic inch, and in the deltoid muscle at the shoulder, over 90,000 in the same space. In severe cases death may take place within the first 2 days, from the intensity of the diarrhoea and febrile disturbance. More commonly, the fatal termination occurs in the fourth or fifth week. If the patient survive this period, the chances of recovery are much increased, as the parasites have then become encapsuled and are passing into a state of quiescence.

The danger of infection by trichinosis consists in taking as food pork which is imperfectly cooked. The T. are killed by a temperature of 160° F., and meat which has been subjected for a short time to this temperature is harmless. The methods which are most likely to reduce its frequency, and, if possible, to exterminate it altogether, are—first, the maintenance in slaughter-houses of extreme order and cleanliness, no waste material being permitted to remain over night to serve as an attraction for rats, nor allowed to mingle with the food of the remaining pigs; and secondly, swine should never be fed with the flesh of one of their own species

which has died from injury or disease. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. J. C. DALTON, M. D.]

**Trichiniasis**, or **Trichinosis**, a disease from eating trichinous swine-flesh. (See *TRICHINA SPIRALIS*.)

**Tricolor**, the Fr. national flag, colored blue, white, and red in vertical divisions. It was first adopted during the First Revolution, and it is said that the colors of Philippe Egalité's livery were chosen for the national flag.

**Tridentine Profession of Faith**, or the **Creed of Pius IV.**, is a clear and concise summary of the doctrines of the Council of Trent, suggested by that council, prepared by a college of cardinals under the supervision of Pope Pius IV., and issued by him Nov. 13, 1564. It consists of 12 articles, including the Nicene Creed, and is put in the form of an individual profession and solemn oath. It is binding upon all R. Cath. priests and public teachers in sems., colls., and univs. It is also used for converts to the R. Cath. Ch., and hence called the "Profession of Converts." The tenth article reads: "I acknowledge the holy Catholic Apostolic Roman Church as the mother and mistress of all churches; and I promise and swear true obedience to the bishop of Rome as the successor of St. Peter, prince of the apostles, and vicar of Jesus Christ."

**Tridymite** [Gr. *τρίδυμος*, "triplets," or "trines," from the crystals being compounds of three], an allotropic modification of silica, discovered in 1868 as occurring in a volcanic porphyry from Cerro San Cristoval in Mex. It has been identified elsewhere, and is possibly a common mineral in eruptive rocks, having been mistaken for quartz.

**Triest**, or **Trieste**, tre-est', city of the Aus. empire, on the Gulf of Triest, at the N. E. extremity of the Adriatic Sea. The old town, which is surrounded with walls and mostly consists of narrow and tortuous streets, is built on a steep acclivity, at the foot of which the new town extends along the harbor; between the 2 parts of the town runs the Corso, a broad, elegant thoroughfare, opening into large squares lined with magnificent edifices and ornamented with fountains and monuments. Its manufactures are numerous, and some of them very important. It is from its commerce, however, that T. principally derives its importance. Its harbor is safe, spacious, and deep, admitting vessels of 300 tons burden close to its quays. It has a naval and a mercantile acad. and a school of navigation, and it is the head-quarters of the Aus. Lloyd's Steam-packet Co., with magnificent docks and arsenals. Pop. 74,544.

**Trigonometry** [Gr. *τρίγωνον*, a "triangle," and *μετρον*, a "measure"], a branch of math. whose primary object is to explain the method of solving triangles; it also treats of the general relations of circular functions. It is divided into 3 great branches—*plane*, *spherical*, and *analytical*. *Plane T.* treats of the relations between the sides and angles of plane triangles; *spherical T.* treats of the relations between the sides and angles of spherical triangles; and *analytical T.* treats of the general relations between circular functions. For a complete article on this subject see *J.'s Univ. Cyc.* W. G. PEARCE.

**Trillium** [Lat. *trilliz*, "triple," so called from the division of its parts], a genus of perennial herbaceous N. Amer. plants, now placed in a sub-order of the lily family, embraces a dozen species, all of which grow wild in marshy grounds from Me. to Fla., consist of a naked stem a foot high, surmounted by 3 ovate netted-veined leaves, a large flower, and a purple 3-celled berry. They are cultivated in gardens, highly valued for their beauty, and commonly known as 3-leaved nightshade, wake-robin, birth-root, or Indian balm. They have astrigent, expectorant, and tonic qualities, and yield resin, tannic acid, and a volatile oil.

**Tri'lobite** [Gr. *τρεῖς*, "three," and *λοβός*, a "lobe"], the common name of a group of fossil crustaceans, among the oldest of the Articulata, and were so called from the triple division of the body. They were once among the most abundant forms of animal life.

**Trimble** (ALLEN), b. in Augusta co., Va., Nov. 24, 1783, removed to Lexington, Ky., in infancy; settled in Highland co., O., in 1804; was clerk of the courts and recorder 1809-16; commanded a mounted regiment under Gen. Harrison 1812-13; was a member of the State assembly 1816, of the State senate 1817-26, speaker 1819-20, acting gov. 1821-22, gov. 1826-30, and pres. of the first State board of agriculture 1846-48. D. Feb. 2, 1870.

**Trimble** (ROBERT), b. in Berkeley co., Va., in 1777, removed to Ky. when 3 yrs. old; was admitted to the bar 1803; settled at Paris, where he was chosen to the legislature; became judge of the court of appeals 1808, chief-justice of Ky. 1810, U. S. dist. atty. 1813; was dist. judge of Ky. 1816-26, and justice of the U. S. supreme court from 1826 to his death, Aug. 25, 1858.

**Trimble** (WILLIAM A.), brother of Col. Allen, b. in Woodford co., Ky., Apr. 4, 1786, studied law; commenced legal practice at Highland, O., 1811; served in the war of 1812-15, attaining the rank of lieut.-col. of U. S. Inf., which he held until 1819; was U. S. Senator 1819-21, and com. with Gen. Cass to treat with the Indians at Green Bay, Wis., 1821. D. Dec. 13, 1821.

**Trimūrdi** [Sans. from *tri*, "three," and *mūrti*, "form"], the Hindoo triad, an expression implying the unity of the creative, preservative, and destructive principles of the primal deity of the Hindoos. The 3 gods, Brahma, Vishnu, and Siva, together constitute the T.

**Trinidad**, the southernmost island of the W. I., opposite the mouth of the Orinoco, belongs to G. Brit. Area, 1754 sq. m. Pop. 153,128. A chain of mts. covered with red cedar, palms, and different kinds of trees yielding excellent timber and ornamental woods, extends along the N. shore, and sends out branches toward the S., between which beautiful valleys open into large plains which terminate in swamps along the coast. The island is of volcanic formation. The soil is exceedingly fertile, and sugar, molasses, rum, cocoa, cotton, and coffee are largely produced. Cap. Port of Spain.



**Trinidad**, on R. R., cap. of Las Animas co., Col. It is a great wool and hide market for S. Col. and N. M. Rich deposits of bituminous coal abound. Prin. business, farming and grazing. Pop. 1870, 562; 1880, 2,226.

**Trinitarians**. See REDEMPTIONISTS.

**Trinitrocarbollic Acid, Trinitrophenol, Trinitrophenic Acid, Carbazotic Acid, Picric Acid**, is produced by the action of hot nitric acid on phenol, salicine, salicylic acid, indigo, aloes, benzoin, silk, etc. It is usually prepared from pure crystallized phenol. It crystallizes in beautiful pale-yellow, scaly crystals or needles. It dissolves in 86 parts of water at 60° F., and in much less at 212° F. It is soluble in alcohol, ether, and benzol, and in sulphuric and nitric acids. When heated it melts, and on cooling solidifies to a crystalline mass; at a higher temperature it sublimes; when quickly heated, it explodes. Its taste is very bitter. Its solution in water is yellow, and it imparts a yellow color to the skin and to silk and wool; hence it is used as a yellow dye. By reducing agents, sulphide of ammonium, etc., it is converted into picramic acid, which has been used as a dye for silk, producing a series of colors like those of catechu. Treated with a hot concentrated solution of cyanide of potassium, it yields a blood-red solution of isopurpurate of potassium. This compound has been used to dye wool maroon tints; it is very explosive, and to avoid accident it is generally supplied in the form of a paste containing glycerine. Picric acid is used as a dye for silk and wool. A beautiful green dye is made by mixing the picric acid with indigo carmine. Leather is dyed with picric acid, particularly alum-tanned leather for belt lacings. It precipitates brucine, strychnine, veratrine, quinine, quinidine, cinchonine, and most of the opium alkaloids, but does not precipitate morphine, atropine, pseudomorphine, caffeine, nor the glucosides. Picric acid is monobasic, and forms bitter crystalline salts, many of which are very explosive. A mixture of 54 parts of picrate of ammonia and 46 of nitrate of potassa has been used as a substitute for gunpowder. C. F. CHANDLER.

**Trinitrocellulose**, a name given to gun-cotton, indicating its process from and relation to cellulose.

**Trinity**. See God.

**Trinity College**, an inst. of learning at Hartford, Conn., known until 1845 as Washington Coll., was opened in 1824 under the direction of the P. E. Ch. In 1872 the coll. grounds within the city were sold as a site for the new State Capitol. A new structure, a vast quadrangle 1050 ft. by 376, inclosing 3 courtyards and having an aggregate area of 4 acres, is now erected on the new grounds purchased for the coll. 1 m. S. of the old location. The alumni number above 1000, a large proportion having been Epls. clergymen. The coll. owns property valued at above \$1,000,000, has a library of 18,000 vols., and a valuable cabinet. The curriculum is thorough, and there is a special scientific course. There are numerous scholarships available for needy students for the ministry.

**Trinity River**, in Tex., rises by several forks in the N. part of the State. The W. fork, rising in Archer co., seems to be the largest. Next in importance is the Elm fork. T. R. is a noble stream, flowing through a fertile, well-timbered country. At its lowest stage it is navigable to Liberty, 90 m. from its mouth in Galveston Bay, and at high water small boats have ascended 500 m. The whole length of the main stream is 550 m.

**Trinity Sunday**, in the R. Cath., Anglican, and other chs. (but not the Greek Ch.), the Sunday next after Pentecost. It was established as a ch. festival, in Honor of the Holy Trinity, by Pope John XXII. in 1320.

**Tripe de Roche** [Fr. for "rock-tripe"], a name applied by Fr. Canadian voyageurs and hunters to several species of *Umbilicaria* and *Gyrophora*, tough and bitter lichens of the barren grounds of Brit. N. Amer. T. de R. is often used as food when other provisions are exhausted, and, though cathartic and unpalatable, it will sustain life. The genera have representatives growing upon rocks in many high arctic and alpine regions.

**Triple Alliance**. (1) The league between Eng., Swe., and the States-General (1668) for the protection of the Sp. Netherlands against Louis XIV. (2) The league of G. Brit., Fr., and the Netherlands against Sp. and the Pretender in 1717. (3) The league of Aus., G. Brit., and Russ., in 1795.

**Tripoli** [from *Tripoli* in Barbary, whence it was once imported], a polishing powder consisting of the aggregate fossil frustules of great numbers of diatomaceous plants. T. is brought from Bohemia, Corfu, and other points.

**Tripoli**, the easternmost of the Barbary states, N. Afr., dependent of the Tur. empire, is bounded W. by Tunis, N. by the Mediterranean, and E. and S. by Barca, the Libyan desert, and Fezzan. With the exception of the dists. around the metropolises, which are very fertile, and produce all kinds of fruits, vegetables, and cereals belonging to the Mediterranean terrs., the coast-land is an arid and desolate plain. In the interior, between the desert coast-land and the desert of Sahara, stretch two chains of low mts., issuing from the Atlas and inclosing valleys and plateaus of considerable fertility. Of rivers there are none, and rain falls only between Oct. and Mar. Dates, senna, millet, and barley are the common crops; cotton, tobacco, saffron, and wheat are cultivated, and in many places olive-groves, vineyards, orchards, and gardens yield fruit, wine, and vegetables in abundance and of superior quality. Cattle, sheep, horses, mules, and poultry are abundant; mats, carpets, and earthenware are manufactured. The area of the country is estimated at 598,873 sq. m.; the pop. at 1,010,000, consisting of Berbers, Moors, and Jews. The govt. is a complete despotism.

**Tripoli**, cap. of the state of Tripoli, on a rocky promontory in the Mediterranean, has an excellent harbor, the only one along this coast for several hundred m. The town is most miserably built, but it is strongly fortified, and it contains some magnificent though now somewhat decayed

edifices. Leather, carpets, mantels, and tobacco are manufactured, and a great trade with Timbuctoo, Bornu, and other places S. of Sahara is carried on. Pop. 30,000.

**Tripoli** [Arab. *Tarābulūs*], seaport-town of Syria, some 40 m. N. N. E. of Beyroot, and about the same distance N. W. of Baalbec. The anc. town consisted of 3 distinct quarters, not quite  $\frac{1}{4}$  m. apart, settled by colonists from Aradus, Sidon, and Tyre, and was therefore called *Tripolis* ("the triple city") by the Grs. The modern town, solidly built, stands nearly 2 m. from the sea, embosomed in orchards of orange, lemon, apricot, and apple trees. El-Kadisha ("the sacred river"), which starts near the famous grove of cedars on Mt. Lebanon, runs through the town. Just S. of the Kadisha, on a hill some 500 or 600 ft. above the sea, stands an old castle, built by the crusaders about 1109, and now garrisoned by Tur. troops. As Beyroot advances, the commerce of T. is declining more and more, its harbor being shallow and unsafe. Pop. nearly 20,000, more than half of whom are Mohammedans. R. D. HITCHCOCK.

**Trismegistus**. See HERMES TRISMEGISTUS.

**Tristan da Cunha**, the largest of a group of 3 islets in the S. Atlantic, in lat. 37° 3' S., lon. 13° 19' W., comprises an area of about 40 sq. m. It is mountainous, its centre rising into a volcanic peak 8326 ft. high, but fertile, well provided with water, and healthy. It was discovered in 1506 by the Port. navigator Tristan da Cunha.

**Triton** (Gr. *Τρίτων*), in Gr. and Rom. mythology, a marine deity. He is sometimes the son of Poseidon and Amphitrite, sometimes a subordinate sea-god, and sometimes even localized as the god of the Libyan Sea.

**Triton**, a common name for the aquatic salamanders (water-newts). The T. are strictly aquatic, have a compressed tail, and breathe by lungs, frequently coming to the surface of the water for fresh air.—*Triton* is also the name of a genus of gasteropod mollusks of family Murielidae. The T. afford many of the shells called conchs.

**Triumph** [Lat. *triumphus*], in anc. Rome, a state pageant in which a victorious gen. or naval commander, preceded by the senate and by the spoils and prisoners, was drawn by 4 horses along the Sacred Way and followed by his army to the temple of Capitoline Jove, where solemn sacrifice was offered. As a rule, no one who had not held the office of dictator, consul, or prætor could triumph. The war, too, must be one against foreign foes, and one which absolutely extended the power of the state.

**Triumviri, or Tresviri**, [Lat. *tres*, "three," and *viri*, "men"], in anc. Rome, a board of 3 men appointed for some special public duty. In a. c. 60, Julius Cæsar, Pompey, and Crassus formed a coalition for the conduct of public affairs; this is called the "first triumvirate." The "second triumvirate," that of Octavian, Mark Antony, and Lepidus, was officially recognized by the senate, and the 3 magistrates bore the name of *Triumviri reipublicæ constituende* ("triumvirs for arranging public affairs").

**Trochu**, tro-shu' (LOUIS JULÉS), b. at Le Palais, dept. of Morbihan, Fr., May 19, 1815, made his military career chiefly as aide-de-camp and in the ministry of war; distinguished himself at the storming of the Malakoff as commander of the 1st brigade of the 1st Fr. corps; by his pamphlet *L'Armée française* in 1867, which revealed the weaknesses of the Fr. army, he lost the favor of the emp. Nap., but when in 1870 the Fr. army broke down, he was called to the imperial council and appointed gov. of Paris Aug. 17. When the revolution broke out in Paris after the disaster of Sedan, he was made commander-in-chief of all the forces defending the capital. Publ. *L'Armée Française* en 1879.

**Troezen, or Troæze**, one of the oldest cities of anc. Gr., in a fertile plain which occupied the S. E. part of Argolis. It was founded by Ionian settlers, but by the conquest of Peloponessus by the Dorians it became a Doric city, still maintaining its Ionian sympathies and traditions. After the battle of Thermopylæ its harbor was appointed the place of rendezvous for the Gr. fleet. It fought with 5 ships and 1000 men in the battles of Artemisium, Salamis, Platea, and Mycale. Up to the Peloponnesian war it was a firm ally of Athens, but after that time it sided with Lacedæmon, and subsequently it became a Macedonian possession. In the 2d century it was still a splendid city.

**Trogodytes** (Gr. *τρογολοῦνται*, from *τρογών*, a "cave," and *δύνειν*, to "enter"), with the anc. writers, the name of races found N. of the Caucasus in Mauritania, but especially along the coasts of the Red Sea. They lived in caves and depended on herds of cattle for their livelihood. The name is now applied in nat. hist. to a genus including the chimpanzee and the gorilla.

**Trogus Pompeius**, a Lat. author, of whose life little is known; wrote, in the time of Augustus, *Libri Historiarum Philippicarum* (abdg. by Justin, q. v.), of which there are a few brief fragments, quoted by Vopiscus and others.

**Troja**. See TROY.

**Trollope** (ANTHONY), b. in 1815, was ed. at Winchester and Harrow schools, and from 1834 to 1867 was connected with the Brit. postal service, for which he made many voyages, and subsequently travelled extensively in the U. S., the W. I., and Australia. In 1869 he was an unsuccessful candidate, in the Liberal interest, for Beverly. Wrote several books of travel and many novels—e. g. *Barsetshire Towers*, *Doctor Thorne*, *The W. I.* and *The Sp. Main*, *Tales of All Countries*, *North America*, *Australia* and *New Zealand*, *The Prime Minister*, etc. D. Dec. 6, 1882.

**Trollope** (FRANCES MILTON), b. probably in 1790, was the daughter of a clergyman; in 1809 contracted marriage with Thomas Anthony Trollope, a barrister. In 1829 she went to Amer., and attempted to establish herself in some kind of business at Cin.; failing in this, she returned to Eng., where she pub. her *Domestic Manners of the Amers.*, a broad and rather offensive caricature, which met with great favor in Eng. She followed up this success by writing a novel, *The Refugee in Amer.*; subsequently travelled on the continent of Europe, publishing narratives of her adventures



and observations, and entered upon a career of literary activity which lasted more than 20 yrs. Wrote *Tremordyn (Cliff, Life and Adventures of Jonathan Jefferson Whitelaw, Fashionable Life, or Paris and London*, etc. D. Oct. 6, 1863.

**Trollope** (THOMAS ADOLPHUS), b. Apr. 29, 1810, was ed. at Winchester and Ox.; travelled on the Continent; pub. *A Summer in Brittany* (1840). *A Summer in W. Fr.* (1841), and took up his residence in Florence, which has since been his home. He has been a constant contributor to Eng. literary periodicals, and the It. correspondent of the *New York Tribune*. Most of his writings relate directly to It. hist., life, and manners. Among these are *The Girlhood of Catharine de Medici*, *Tuscany* in 1849 and 1850, *Marietta*, *History of the Commonwealth of Florence*, etc.

**Trolls**, in the Norse and Teutonic mythologies, and in the folk-lore of the more recent times, a class of powerful spirits, hostile to man, and very often circumvented and defeated by men, since their strength was associated with extreme supineness of understanding. There is a theory that holds that the T. represent the Lapps and Finns who were gradually repelled by the Scandinavian race.

**Tromp, van** (MAARTEN HARPERTZON), b. at Briel in 1597, received his education in the Dutch navy. In 1639 he was made an admiral, and gained a European fame by his 2 great victories in the same yr. over the Sp. fleet off Grave-lines and in the Downs. He was less successful in the war between Eng. and Hol., and having been defeated by Blake, he even lost his command for some time in 1652. He was soon reinstated, however, and defeated Blake completely in the Downs, Nov. 29, 1652. On Aug. 6, 1653, he attacked the Eng. fleet between Scheveningen and the Maas. The battle lasted 2 days, but was finally lost by the Dutch; Tromp himself was killed Aug. 10.—His son, CORNELIS VAN TROMP, b. at Rotterdam Sept. 9, 1629, achieved almost an equal fame, held the highest positions in the Dutch navy, and served with great distinction in Den. D. May 29, 1691.

**Trondhjem**, trond'yem, the anc. *Nidaros*, the oldest town of Nor., is beautifully situated on the S. shore of Trondhjemsfjord. Of its cathedral, which once was the largest ch.-building in Scandinavia, only the choir remains, in which the kings are crowned. Its breweries and distilleries are extensive and celebrated. Much copper, salt and dried fish, and timber is exported. Pop. 22,544.

**Troost** (GERARD), M. D., b. at Bois-le-Duc, Hol., Mar. 15, 1776, ed. at Amsterdam and Leyden; studied med. and natural science; served in the army, both as a private soldier and afterward as a med. officer; proceeded to the U. S. 1810; settled at Phila., where he was one of the founders and the first pres. of the Acad. of Nat. Hist. (1812-17); established at Cape Sable, Md., the first alum-factory in the U. S. 1814; was appointed prof. of mineralogy in the Phila. Museum 1821; settled at New Harmony, Ind., with Owen and McClure 1825; became prof. of chem. and mineralogy in the Univ. of Nashville 1827, and was State geologist of Tenn. 1830-49. D. Aug. 14, 1850.

**Trophy**, trô'fē [Gr. *τρόπαιον*, from *τρέφειν*, to "turn"], among the anc. Grs. a memorial erected on the battle-field by the victors, on the spot where the enemy turned to flight or retreat. Originally T. were of wood or of simple armor affixed to a tree.

**Tropics**. See SOLSTICE, CAPRICORN, CANCER.

**Troubadours**. See TROUVÈRES.

**Troup**, troop (GEORGE MCINTOSH), b. in Ala. Sept. 8, 1780, grad. at Princeton 1797; became a lawyer in Ga.; was chosen to the legislature 1800; M. C. 1807-15; was U. S. Senator 1816-18 and 1829-34, and gov. of Ga. 1823-27; was an eloquent speaker and an ardent advocate of the doctrines of State rights and State sovereignty. D. May 3, 1856.

**Troup** (ROBERT), LL.D., b. in New York in 1757, grad. at Columbia Coll. 1774; studied law under John Jay; entered the Revolutionary army as lieutenant 1776; became an aide to Gen. Woodhull; was taken prisoner at the battle of L. L.; confined in the Jersey prison-ship and the provost prison, New York; exchanged in 1777; became aide to Gen. Gates at Saratoga; was sec. to the board of war 1778-79; studied law at Princeton under Judge Patterson; was for several yrs. U. S. dist. judge in New York and member of the legislature. D. Jan. 21, 1832.

**TROUT** (derived through the Fr. *truite* from the mediæval Lat. *trutta*), a name variously applied in different countries. (1) Primarily, and by right, however, the name belongs alone to the well-known fish so called of G. Brit. and related species of N. countries. These species belong to the family Salmonidae, and, as generally understood, to the genus *Salmo*, and form a group distinguished by their habits as well as structure. They are in the main confined to fresh waters, and there reside during the whole of the yr. feeding therein and propagating near their habitual abiding-place. The pre-eminent species are the *Salmo fario* of Europe and the *S. fontinalis* of N. Amer.

(2) The name "trout" is also applied in the U. S. to the species of *Micropterus* (black bass) and *Cynoscion* (weak-fish), and elsewhere to many other fishes, but always quite erroneously.

THEODORE GILL.

**Trouvères**, troo-vairz'. The earliest example of verse in any of the dialects of Romance is the N. Fr. *Cantilène de Ste. Eulalie*, which is attributed to the 9th century. Lyric poetry, however, seems to have reached its bloom first in the South, and especially in Provence. The word *trouvère* (of which *troubadour* is the Southern form) means simply a finder or inventor. The T. was the composer of poems which were sung at public festivals or at the courts of great barons and princes. Sometimes he also composed the accompanying music. If he lacked skill or voice, he employed a *jongleur* (*joculator*) to sing his verses for him. The *chanson de geste* (epical) seems to have been a product of the N. of Fr. To the *chanson de geste* succeeded the *Roman d'aventures*, which occupied itself more exclusively with the adventures of a single hero, and whose later prose form (as in *Mélusine*) was the first step toward the modern romance. The *fabliau*

(*fabula*) was a short tale in verse, often humorous. The *lai* was narrative also, but serious. In the epical poetry an imperfect assonance preceded rhyme, and verses of 10 syllables those of 12, the Alexandrine of modern Fr. poetry.

The T. left behind them a vast mass of verse, both epical and lyrical. Their productions cover a space of 3 centuries, though by the middle of the 13th a decline is evident in their epical poetry. The greater part of what remains to us of Provencal poetry is lyrical. The best, as also the earliest, of the *chansons de geste* is that of Roland. The Provencal poem of Girart de Roussillon surpasses it as a picture of manners. The Provencal *Chronicle of the Crusade* against the Albigensian heretics is also interesting. Of the other *chansons*, perhaps the best are *Guillaume d'Orange*, *Agier*, and *Fierabras*. *Partonopeus de Blois* has more fancy and literary merit than any other *Roman d'aventures*, unless it be *Amadous et Ydoine*. Among shorter narrative poems, *Amis et Amiles* and *Jourdain de Blaivies* may be mentioned as particularly good. The best lyrics among the troubadours are Arnaut Daniel, Bernard de Ventadour, Girard de Bornell, Bertran de Born, and Pierre Cardinal. Among the T. Rutebeuf is the most distinguished as a lyrical and Chrestien de Troyes as an epic poet. As a writer of *lais*, Marie de France is pre-eminent. Of the rhyming chroniclers, Benoit de St. Maur, Wace, and Philippe Mousket are the most noted. Beside subjects from mediæval hist. or legend, the T. versified classic themes, notably the tale of Troy and the adventures of Æneas. Didactic poems, like the *Dolopathos* and the *Sept Sages*, drawn from E. sources, were also popular, and the *Roman de Renart*, in which beasts are the actors, had a spirit which has kept it alive to our own day. The T. had great gayety and inventiveness, especially in the *fabliau*. The modern drama begins with their miracle-plays. [From orig. art. in J.'s Univ. Cyc., by PROF. J. R. LOWELL, LL.D., C. C. L.]

**Trowbridge** (EDMUND), b. at Newton, Mass., in 1709, grad. at Harvard 1728; was appointed atty.-gen. of Mass. 1749; was for several yrs. a member of the council, but lost favor with the popular party in 1766 on account of lukewarmness in resisting Brit. aggressions; became chief-justice of the supreme court 1767; presided with great fairness at the trial of the Brit. soldiers charged with the "Boston massacre" 1770, and resigned his office 1772 on account of the impending conflict with Eng., and remained in seclusion during the Revolution. D. Apr. 2, 1793.

**Trowbridge** (JOHN TOWNSEND), b. at Ogden, N. Y., Sept. 18, 1827, settled in New York 1846 as a writer for periodicals; removed in 1847 to Boston; became ed. of the *Yankee Nation* 1850; wrote many popular tales over the signature "Paul Cretyon;" contributed to the *Atlantic* and other magazines, and has been for several yrs. ed. of *Our Young Folks*. Author of *Father Brightkops*, *Neighbor Jackwood*, *Cutty's Case*, etc.

**Trowbridge** (WILLIAM PETIT), Ph. D., LL.D., b. in Oakland co., Mich., May 25, 1828; received an appointment as cadet in the U. S. Military Acad. at W. Pt.; grad. in 1848; was ordered back to the Acad. as assistant in the astronomical observatory, where he fully prepared himself for duty on the Coast Survey. In this survey he was engaged in the primary triangulation of the coast of Me.; but previous to entering upon this duty he executed surveys of Appomattox River, in Va., with a view to the improvement of its navigation, and after his return from Me. he made similar surveys of James River near Richmond. In 1853 he was ordered to the Pacific coast to conduct a series of magnetic and tidal observations extending from San Diego to Puget Sound, a work which occupied 3 yrs.; resigned his commission in the U. S. engineers to accept an appointment as prof. in the Univ. of Mich., but in the following yr. he accepted a permanent situation as assistant in the Coast Survey, and was for some time specially engaged in preparing for publication the results of the Gulf Stream explorations, and in 1860 was sent to Key West to superintend the erection of a permanent self-registering magnetic observatory. Upon the breaking out of the c. war he was assigned to the duty of preparing minute descriptions of the harbors, inlets, and rivers of the S. coast for the use of the navy. He was subsequently transferred to the war dept., and was during the remainder of the war in charge of the branch office of the engineer dept. in New York. After the close of the war he became v.-p. of the Novelty Iron-Works in New York, having direction of their working operations—a position which he occupied for 4 yrs. In 1870 he was appointed prof. of mechanical or dynamic engineering in the Sheffield Scientific School of Yale Coll. He has written a book on *Steam Generators*, and is now prof. of engineering in Columbia Coll., New York. He was one of the associate eds. of J.'s Univ. Cyc.

**Troy, Troja, or Ilium**, the scene of the Homeric poem, was the metropolis of the Troad, the coast-region extending from Cape Lectum on the Ægean to Dardanus and Abydos on the Hellespont, and comprising a broad, undulating plain sloping from the foot of Mt. Ida to the sea, and traversed by the rivers Scamander and Simois. This plain was densely peopled by a mixed race of Pelasgians and Phrygians, and contained many cities, of which however, T. was by far the most splendid and powerful. It was founded by Ilus, the son of Tros, the grandson of Dardanus, and developed rapidly and magnificently. It had a fortified acropolis, called Perium, which overlooked the town proper, and contained the temples of Laomedon, the royal palaces. Under Priam, the son of Laomedon, it reached its highest splendor and experienced its downfall.

**Troy**, city, on R. R., cap. of Pike co., Ala., 35 m. from Columbus, Ga., contains a female coll. and 2 acads. Prin. business, cotton-planting. Pop. 1870, 1058; 1880, 2294.

**Troy**, Mo. See APPENDIX.

**Troy**, city, important R. R. and commercial centre, and cap. of Rensselaer co., N. Y., at the head of navigation on Hudson River, at its confluence with Mohawk River,



6 m. above Albany. It has extensive manufactures of iron, cotton goods, stoves, railroad cars, car-wheels, shirts, etc. The first Bessemer steel-works in Amer. were established here. It has a splendid Masonic temple, the Rensselaer Polytechnic Institute, a R. Cath. sem. for the education of priests, acads., and a female sem. A new music-hall, costing \$500,000, and the provincial sem. are among the prin. buildings. A new iron bridge, costing \$250,000, connects T. with W. T. T. is practically the terminus of the Erie and Champlain canals. A daily line of steamers and various lines of barges ply to New York, and lines of propellers to Phila. and other points. Oakwood Cemetery is famous for its natural attractions and artificial adornments. Pop. 1870, 46,465; 1880, 56,747; 1883, 60,000.

**Troy**, R. R. junc., cap. of Miami co., O., on Miami River Canal. Pop. 1870, 9005; 1880, 3803.

**Troy**, on R. R. Bradford co., Pa., 25 m. S. of Elmira, N. Y. Pop. 1870, 1081; 1880, 1241.

**Troyes**, trawh, town of Fr., cap. of the dept. of Aube, on the Seine, has many splendid buildings, but is in general an old-fashioned place, partly in a state of decay, partly rebuilding. The ch. of St. Urban and the cathedral are remarkable. Cotton fabrics, cloths, bombazines, calicoes, prints, lace, and hosiery are extensively manufactured. Its general trade is very active. Pop. 41,275.

**Troy Weight** (from *Troy Novant*, a monkish name for London), a system of weight, employed in Eng. and the U. S. for gold, silver, jewels, and drugs. The T. lb. has 12 ounces. One lb. T. is to 1 lb. avoirdupois as 144 to 175. The T. ounce is to the ounce avoirdupois as 192 to 175.

**Truce**. See INTERNATIONAL LAW, SUMMARY OF.

**Truce of God**, in the Middle Ages, an inst. which sprang up in Fr. and Ger. for the repression of private feuds and of the wrongs committed by the strong against the weak, by which nobles and princes bound themselves to keep the peace, to abstain from unlawful wars, and to protect clergymen, women, merchants, pilgrims, peasants, and other non-combatants. The final triumph of legal over feudal govt. did away alike with this inst. and with the necessity for it.

**Truckee**, Nevada co., Cal., on R. R. and Truckee River, 120 m. E. N. E. of Sacramento, is in the midst of a timbered region. Pop. 1880, 1147.

**True** (CHARLES KITTREDGE), D. D., b. at Portland, Me., Aug. 14, 1809, studied at the Boston High School and Wilbraham Acad., and grad. at Harvard in 1832; became pastor of Meth. chs. in Mass., R. L. Conn., and N. Y.; was prin. of the Amenia Sem., and in 1849-60 prof. of moral and intellectual philos. in the Wesleyan Univ. at Middletown, Conn. He pub. *Shavemut, or the Settlement at Boston*, and *Elements of Logic*. D. June 30, 1878.

**True Cross**, or **Holy Rood**, **The**. After his conversion to Christianity, the emp. Constantine the Great determined to build a ch. on Golgotha, on the very spot where the cross of Christ had stood. The task presented peculiar difficulties, however. Two centuries before, the place had been utterly disturbed by the emp. Hadrian. The Holy Sepulchre had been filled up, a temple erected to Jupiter and Venus, and pagan altars and statues scattered all over the place. But Helena, the mother of Constantine the Great, happened to stay in Jerusalem at this time (326), and by her order the whole place was cleared and extensive excavations were undertaken. The Holy Sepulchre was discovered; the 3 crosses were also found, the nails, and the tablet of inscription.

**True Friends**. See SINCERE BRETHREN.

**True Inspiration Community**. See INSPIRED, THE.

**Trufé** (O. Fr. *trufle*), a common name for fungi of the genus *Tuber* and other closely allied genera. They are subterranean in growth, and are from an inch to 6 inches in diameter. The T. is one of the choicest of the edible fungi. T. are found to some extent in the U. S.

**Trullan Synods**, the name of 2 ecclesiastical councils, the first convened in 680 by the emp. Constantine Pogonatus for the purpose of reconciling the Monothelites with the orthodox Ch.; the second in 682 by the emp. Justinian II. In order to confirm and enforce the statutes of the 5th and 6th œcumenical councils, whence it is also called Quinisextum. The epithet *Trullan* is derived, like that of Lateran, from the place in which the assembly sat.

**Trumansburg**, on R. R. Tompkins co., N. Y., 2 m. W. of Cayuga Lake, has an acad. Pop. 1870, 1246; 1880, 1376.

**Trumbull** (BENJAMIN), D. D., b. at Hebron, Conn., Dec. 19, 1735, grad. at Yale 1759, was pastor of N. Haven ch. from 1760 to his death; served as a volunteer soldier, and also as chaplain, in war of the Revolution; wrote *A Plea in Vindication of the Conn. Title to the Contested (Western) Lands*, *A Complete Hist. of Conn.* 1630-1764, and began a *Gen. Hist. of the U. S. of Amer.*, left incomplete by his death, Feb. 2, 1820.

**Trumbull** (HENRY CLAY), S. T. D., b. at Stonington, Conn., June 8, 1830, ed. at Williston Sem., E. Hampton, Mass.; settled at Hartford, Conn., in 1851; was appointed State missionary of the Amer. Sunday School Union for Conn. in 1858, and ordained as a Congl. clergyman in 1861; served during the war as chaplain of the 10th Conn. Volunteers, and was taken prisoner before Ft. Wagner in 1863; was appointed missionary sec. for N. Eng. in 1865, and normal sec. in 1871, and removed in 1875 to Phila., where he became the ed. of the *Sunday School Times*. He has pub. *The Sabbath School Concert*, *The Knightly Soldier*, *Falling in Harness*, *Childhood Conversion*, *Kadesh Barnea*, etc.

**Trumbull** (JAMES HAMMOND), LL.D., b. at Stonington, Conn., Dec. 20, 1821, ed. at Yale in the class of 1842; aided Rev. J. H. Linsey in compiling catalogues of the mammalia, reptiles, fishes, and shells of Conn. 1842-43; was assistant sec. of state of Conn. 1847-52 and 1858-61; sec. 1861-65; corresponding sec. of the Conn. Historical Society 1849-63; has been its pres., and also librarian of the Watkinson Free Library since 1863; was one of the founders of the Amer. Philological Association 1869, and its pres. 1874-75, and was

appointed in 1873 lecturer in Yale on the Indian langs. of N. Amer., a subject to which he has devoted much time since 1858. Ed. of *The Colonial Records of Conn.* 1836-39; Roger Williams's *Key into the Lang. of Amer.*, Lechford's *Plain Dealing*, etc.; author of *The Origin of McFingal*, *The Composition of Indian Geographical Names*, *The Best Method of Studying the Indian Langs.*, etc.

**Trumbull** (JOHN), LL.D., b. at Westbury (now Water-town), Conn., Apr. 24, 1750, was admitted to Yale, graduating 1767; wrote with Timothy Dwight a series of essays in the style of the *Spectator*; was tutor there 1771-73, during which time he pub. *The Progress of Dulness*, a satire on the methods of education; studied law; was admitted to the Conn. bar Nov. 1773; wrote for the political periodicals; settled as a lawyer at New Haven Nov. 1774; pub. anonymously his poetical *Elegy on the Times*, and in the following yr. pub. in Phila. the first canto of his *McFingal*, a Revolutionary satire, in Hudibrastic verse. He settled at Hartford June 1781; was associated with Humphreys, Barlow, and Hopkins in the production of *The Anarchiad*; was State atty. for Hartford 1789-95, member of legislature 1792 and 1800, judge of superior court 1801-19, and also judge of court of errors 1808-19; was several yrs. treas. of Yale College, and in 1825 removed to Detroit, Mich. D. May 10, 1881.

**Trumbull** (JOHN), son of Jonathan, colonial gov. of Conn., b. in Lebanon, Conn., June 6, 1756, was grad. from Harvard in 1773; chose art as his profession; joined the army in 1775 as adjutant; turned his skill as draughtsman to account in drawing plans of the enemy's works; was promoted to aide-de-camp of Washington; accompanied the army to New York, and went as adjutant-gen. with Gates, who was appointed to the command of the N. army; left the service, discontented, in 1777, and returned to his painting; in 1780 went to Paris, thence to Lond., and studied with West; was suspected as a spy during the excitement caused by the execution of André, and imprisoned 8 months; released through West's intercession, he returned to Amer. in 1782, and remained till peace was concluded, then went back to Eng. In 1789 he returned to Amer. with the purpose to commemorate on canvas the chief persons and events of the Revolution; among the likenesses taken were several of Washington. He returned to Eng. as sec. to John Jay, and passed nearly 10 yrs., from 1794 to 1804, in diplomatic service; painted 4 grand pictures for the rotunda of the capitol at Washington, and passed the last 27 yrs. of his life mainly in New York; was pres. of the Amer. Acad. till 1825. D. Nov. 10, 1843.

**Trumbull** (JONATHAN), LL.D., b. at Lebanon, Conn., June 10, 1710, grad. at Harvard 1727; studied theol., and was licensed to preach, but soon devoted himself to mercantile business, and ultimately to the law; was elected to the assembly 1733; was its speaker 1739; became an assistant 1740, to which office he was re-elected 22 times; was made judge of the co. court and assistant judge of the superior court; was chosen lieut.-gov. 1766, thereby becoming *ex-officio* chief-justice of the superior court; became gov. 1769; held that office throughout the Revolution, resigning in 1783; was an energetic supporter of the popular cause; was a leader of the "Whigs" of N. Eng. D. Aug. 17, 1785.

**Trumbull** (JONATHAN), son of Gov. Jonathan, b. at Lebanon, Conn., Mar. 26, 1740, grad. at Harvard 1759; was for several yrs. before the Revolution a member of the legislature and speaker of the house; was paymaster in the army 1775-78; became in 1780 sec. and first aide-de-camp to Gen. Washington; was M. C. 1789-95, speaker of the House of Reps. 1791-95, U. S. Senator 1795-96, lieut.-gov. of Conn. 1796-98, and gov. from 1798 until his death, Aug. 7, 1809.

**Trumbull** (JOSEPH), son of gov. Jonathan, b. at Lebanon, Conn., Mar. 11, 1737, grad. at Harvard 1756, was a member of the Continental Cong. 1774-75; was commissary-gen. of the Revolutionary army from July 19, 1775, to Aug. 2, 1777, and a com. for the board of war from Nov. 27, 1777, to Apr. 18, 1778. D. July 23, 1778.

**Trumbull** (JOSEPH), LL.D., grandson of Gov. Jonathan, b. at Lebanon, Conn., Dec. 7, 1782, grad. at Yale 1801; was admitted to the bar in Windham co., 1803; practised for some time in O.; afterward settled at Hartford, where for 11 yrs. he was pres. of the Hartford Bank (1828-39); was several times chosen to the legislature; M. C. 1834-35 and 1839-43; was pres. of a R. R. co., and was gov. of Conn. 1849-50. D. Aug. 4, 1861.

**Trumbull** (LYMAN), b. at Colchester, Conn., Oct. 19, 1813, ed. at Colchester Acad.; taught an acad. at Greenville, Ga., 1833-36; studied law; was admitted to the bar 1837; settled at Belleville, Ill.; was elected to the legislature 1840; was sec. of state 1841-42, justice of the supreme court 1848-53, M. C. 1853-55, and U. S. Senator 1855-73; was prominent as a Rep. during the war, and became chairman of the judiciary committee 1861; was a delegate to the Phila. "Loyalists' convention" 1866, and voted against the impeachment of Pres. Johnson in 1867.

**Trum-pet-Fish**, a name applied on the N. Amer. Atlantic coast to the *Fistularia tabacaria* (family Fistulariidae), and on European coasts to *Centricus scolopax* (family Centricidae), closely allied families of the order Hemibranchii. The first mentioned is without scales, and has a greatly elongated snout, with the mouth at the end of a bony tube. The forked tail has one or two long central filaments. The European T.-F. has a large and very sharp dorsal spine, and a snout very much like that of the foregoing.

**Trum-pet-Flower**, a popular name for various species of *Bignonia* and *Tecoma*, mostly shrubs and woody vines, though in tropical regions some of the species are large trees. They belong to the order Bignoniaceæ. The native species of the U. S. are *Bignonia capreolata*, *Tecoma radicans*, and *T. stans*. *T. capensis* from S. Afr., *T. grandiflora* from Japan, and other fine species are often cultivated.

**Trunk-Fish**, a name applied to various fishes of the order Plectognathi and the sub-order Ostracodermi, forming the family Ostracodontidae. They are so called on ac-



count of being encased in an angular case-like development of the integuments, recalling to mind the idea of a trunk.

**Truro** (THOMAS WILDE), BARON, b. in Lond., Eng., July 7, 1782, was called to the bar at the Inner Temple 1817; soon became a leader upon his circuit; was a junior counsel in defense of Queen Caroline 1820; became sergeant-at-law 1824, king's solicitor 1827; entered Parl. as a Whig 1831; became solicitor-gen., and was knighted Feb. 9, 1840; was atty.-gen. June to Aug. 1841; became chief-justice of the common pleas July 7, 1846; was created lord chancellor and Baron Truro by Lord John Russell's administration July 15, 1850, and resigned Feb. 1852. D. Nov. 11, 1855.

**Trustee**, in the strict and technical meaning originally given to the word, is one who holds the legal estate or property in lands or things personal for the use and benefit of another. In a more comprehensive sense the term is applied to all persons who stand in a fiduciary relation toward others in respect to the possession, use, management, or disposition of property. The office and function of T. are in the highest degree fiduciary; they must act in perfect good faith, and with the discretion and care at least of ordinary business-men under the same circumstances. Courts of equity have full power to enforce these duties.

**Truxton** (THOMAS), b. on L. I., N. Y., Feb. 17, 1755, went to sea at 12; was impressed into the Brit. navy; became in 1776 lieut. of the Amer. privateer Congress; equipped and commanded in 1777 the Independence, with which he made valuable prizes; afterward commanded the St. James (30 guns), with which he disabled a Brit. ship of superior force; was engaged in the E. I. trade for several yrs. after the war; became capt. of the U. S. frigate Constellation (June 1794), with which he captured the Fr. frigate L'Insurgente Feb. 9, 1799; obtained a victory over the Vengeance Feb. 1, 1800; was made commander of the W. I. Squadron of 10 vessels 1801; was dismissed from the service by Pres. Jefferson, and was in 1816-19 high sheriff of Phila. D. May 5, 1822.

**Tryon** (WILLIAM), LL.D., b. in Ire. about 1725, received a good education; became a distinguished officer in the Brit. army; married Miss Wake, a relative of the earl of Hillsborough, sec. of state for the colonies, through whose influence he was appointed lieut.-gov. of N. C. 1764; became gov. by the death of Gov. Dobbs July 20, 1765; suppressed the revolt of the "Regulators," treating the prisoners with cruelty; erected at the cost of the prov. a magnificent residence at Newberne; was advanced to the governorship of N. Y. July 3, 1771; became col. 1772 and maj.-gen. 1777; resigned his post Mar. 21, 1778, and returned to Eng., where he became a lieut.-gen. 1782. D. Feb. 27, 1788.

**Tse-tse**, the *Glossinia morsitans* of Westwood, a dipterous insect a little larger than the common fly. It abounds in some parts of S. Afr., but is absent from large districts. Its bite is dangerous. Its venom is secreted by a little gland, smaller than a mustard-seed.

**Tuareks** (Tawarek), a race of Mohammedan nomads inhabiting a great part of the Sahara from Fezzan W. to the Atlantic. Their hair is straight, their features are Caucasian rather than African, and their physical development is fine. They have a written alphabet, but no lit. The T. are divided into large tribes, and greatly oppress the Tibboos (Tebu), their neighbors. Their number is about 200,000.

**Tuber** (Lat.), in plants, a thickened subterranean portion of the stem, bearing latent buds or "eyes," and usually composed of cellular substance richly stored with starch or some equivalent principle. Hence, many T., like that of the common potato, are of great value for human food.

**Tube-rose**, the *Polyanthus tuberosa*, an *amaralidaceous* plant, a native of Ceylon, much cultivated in greenhouses for its beautiful and highly fragrant white flowers, which are extensively employed by perfumers.

**Tübingen**, an old but interesting town of Ger., Würtemberg, is beautifully situated on the Neckar. Its univ., founded in 1477, is a celebrated inst. Reuchlin and Melancthon were among its first profs., and in the beginning of this century it developed a new school of theol. of great influence. The general trade of T. is very lively. Pop. 11,708.

**Tübingen School**, the title of a group of theological and exegetical writers connected with the Univ. of Tübingen in Ger., who opposed both the old or evangelical and the so-called rationalist interpretation of the Bible. The founder of the school is Dr. Baur, and its principal pupils are Strauss and Zeller.

**Tuckahoe**, the Indian name of a singular vegetable substance found under ground in the S. States of the U. S., sometimes attaining the size, and having somewhat the appearance of a loaf of bread, whence it is often called "Indian loaf" or "Indian bread." Its methods of growth and reproduction are unknown. It was eaten by the Indians, and is still sometimes used, when boiled in milk, as a substitute for arrow-root.

**Tuck'er** (GEORGE), b. in Bermuda 1775, emigrated about 1787 to Va.; grad. at William and Mary Coll. 1797; became a lawyer; was a member of the Va. legislature; M. C. 1819-25, taking a high position as a debater and constitutional lawyer; was prof. of moral philos. and political economy in the Univ. of Va. 1825-45. D. Apr. 10, 1861.

**Tucker** (HENRY ST. GEORGE), LL.D., son of judge St. George, b. in Va. Jan. 5, 1781, became a distinguished lawyer; was M. C. 1815-19; prof. of law in the Univ. of Va. 1824; chancellor of the fourth judicial dist.; pres. of the Va. court of appeals and of the Va. Historical and Philological Society. D. Aug. 28, 1848. Wrote *Commentaries on the Laws of Va.*, *Lectures on Constitutional Law*, and *Lectures on Natural Law and Govt.*—His son, DAVID HUNTER, b. at Winchester, Va., June 18, 1815, ed. at the Univ. of Va., and in med. at Phila. and Paris, became prof. in Jefferson Med. Coll. and in Med. Coll. of Va., and was author of some med. works. D. Mar. 17, 1871.

**Tucker** (JOSIAH), D. D., b. at Langharne, Wales, in 1711, ed. at St. John's Coll., Ox., took orders in the Ch. of Eng.; was successively curate, minor canon, rector, and preben-

dary at Bristol; became dean of Gloucester 1758; was distinguished from nearly all his contemporaries by his clear perception of the state of political affairs in the Amer. colonies, and advocated in several pamphlets their peaceable separation. D. Nov. 4, 1799.

**Tucker** (LUTHER), b. at Brandon, Vt., in 1802, became a printer; established in 1826 the Rochester *Daily Advertiser*, the first daily paper in N. Y. W. of Albany; founded in 1831 the *Genesee Farmer*, the pioneer agricultural paper of N. Y., afterward consolidated with the *Albany Cultivator*, and in 1852 established the *Country Gentleman*.

**Tucker** (ST. GEORGE), LL.D., b. at Port Royal, Bermuda, June 29, 1752, grad. at William and Mary Coll. 1772; studied law; was concerned in an expedition against Bermuda, where he aided in the capture of a fortification and a large amount of stores 1776; commanded a regiment at Yorktown, where he was severely wounded in the knee and rendered lame for life; married Mrs. Frances Bland Randolph, mother of John Randolph, 1778; became a member of the Va. legislature, prof. at William and Mary Coll., com. to revise and digest the laws of Va., and a delegate to the convention at Annapolis, Md. (1786); was a judge in the State courts of Va. nearly 50 yrs., judge of the court of appeals 1808-11, and of the U. S. dist. court of E. Va. 1813-27. Wrote *A Dissertation on Slavery, with a Proposal for its Gradual Abolition in Va.*, *Letter on the Alien and Sedition Laws*, and a vol. of poems. D. Nov. 1827.

**Tucker** (WILLIAM JEWETT). See APPENDIX.

**Tucker** (HENRY THEODORE), b. in Boston Apr. 30, 1813, studied in the public schools of that city; travelled in Europe, and devoted himself to lit., criticism, and the study of art, and was a frequent contributor to periodicals, many of his papers having been collected in different vols.: *The Italian Sketch-Book*, *Artist Life*, *Characteristics of Literature*, etc. D. Dec. 17, 1871.

**Tuckerman** (JOSEPH), D. D., b. at Boston, Mass., Jan. 18, 1778, grad. at Harvard 1798, was pastor of the Unit. ch. at Chelsea, Mass., from Nov. 4, 1801, to Nov. 4, 1826; organized the "Benevolent Fraternity of Churches" for the support of a city mission called the "Ministry at Large," to which he devoted himself; was the organizer of the first Seamen's Friend Society in the U. S. 1812, and visited Eng. for the organization of charitable insts. D. Apr. 30, 1840.

**Tucson**, city, on R. R., cap. of Pima co., and formerly of Ari. Terr., in Santa Cruz Valley, 70 m. N. of the Sonora line. Prin. business, stock-raising, mining, and farming. Pop. 1880, 7007.

**Tudor**, the family name of an Eng. dynasty which occupied the throne from 1485 to 1603, when it became extinct upon the death of Queen Elizabeth. The family was descended from Owen ap Tudor, an obscure Welsh gentleman who about 1423 married Catharine of France, widow of Henry V. of Eng. The sovereigns of the T. line were HENRY VII. (1485-1509), HENRY VIII. (1509-47), EDWARD VI. (1547-53), MARY (1553-58), and ELIZABETH (1558-1603).

**Tudor** (WILLIAM), b. at Boston, Mass., Mar. 28, 1750, grad. at Harvard 1769, studied law with John Adams; was admitted to the Suffolk bar July 27, 1773; was a col. and judge-advocate-gen. on the staff of Gen. Washington 1775-78; afterward a member of both houses of the legislature, sec. of state 1809-10; v.-p. of Mass. Cincinnati 1816; was one of the founders of Mass. Historical Society. D. July 8, 1819.

**Tudor** (WILLIAM), son of Judge William, b. at Boston, Mass., Jan. 28, 1779, grad. at Harvard 1796; spent some time in literary pursuits at Paris, and travelled in It.; went on a mercantile agency for the exportation of ice to the W. I. 1805; was one of the founders of the Boston Athenaeum; was a leading member of the Anthology Club, and editor of the *Monthly Anthology*; delivered the Fourth of July oration at Boston 1809, and the Phi Beta Kappa address at Harvard 1810 and 1815; founded the *N. Amer. Review* May 1815; conducted it as a bi-monthly, and wrote  $\frac{1}{4}$  of its contents, until Dec. 1818, when it was changed to a quarterly and passed into other hands; pub. *Letters on the E. States*, a vol. of *Miscellanies*, and a *Life of James Otis* (1823); was the originator of the Bunker Hill Monument (1823); was U. S. consul at Lima, Peru, 1829-37; became U. S. chargé d'affaires at Rio Janeiro, Brazil, 1827, and wrote while there his last work, *Gebel Teir*. D. at Rio Janeiro Mar. 9, 1830.

**Tues'day** (Ger. *Dienstag*; Fr. *Mardi*), the third day of the week, named in honor of *Tiu*, the Ger. Tyr, god of war. It is from the *Dies Martis* of the later Rom. pagans.

**Tuesday**, *Shrove*. See SHROVE-TUESDAY.

**Tufts College**, an inst. of learning at Medford, Mass., under the control of the Unit. denomination, founded in 1853 on lands given by Mr. Charles Tufts, possesses a fine 3-story edifice, a large natural history museum and a fine chapel, beside 3 large dormitories; has an endowment fund of above \$1,000,000. A divinity school was opened in 1867.

**Tulleries** (Fr.), a famous palace of Paris, on the right bank of the Seine, between the river and the Rue Rivoli, and between the Place du Carrousel and the Place de la Concorde. The ground was originally occupied by tile-works, whence the name of the palace, and was bought by Francis I. in 1518. In 1564 Catharine de' Medici commenced the erection of the buildings after the plans of Philibert Delorme. The palace has been the scene of some of the most stirring spectacles of the hist. of Fr. Nap. I., Louis XVIII., Charles X., Louis Philippe, and Nap. III. resided here, and the palace was stormed and ransacked by the people Aug. 10, 1792, July 28, 1830, and Feb. 26, 1848. In May 1871 it was destroyed by fire by the Communists.

**Tuke** (HENRY), son of William, b. at York, Eng., about 1755, was for 35 yrs., from 1780, a minister and distinguished writer of the Society of Friends. Author of *The Faith of the People called Quakers in our Lord and Saviour Jesus Christ*, set forth in various Extracts from their Writings; *The Principles of Religion as professed by the Society of Christians usually called Quakers*, written for the instruction of their Youth and for Information of Strangers, etc. D. in 1814.



**Tula're**, Cal. See APPENDIX.

**Tulare** (or **Tule**) **Lake**, a shallow lake in Tulare co., Cal., is 30 m. long and 20 m. wide. Area, 500 sq. m.

**Tule** [Sp.], the *Scirpus calidus*, a large club-rush or sedge (order Cyperaceae) which grows to a great height and covers large areas of marshy ground in some parts of Cal. The "tule-lands" are very fertile when once drained.

**Tu'lip** [Per. *dulband*, a "turban," alluding to the form of the flower], the *Tulipa Gesneriana*, and other species, liliaceous bulbiferous herbs, all of the Old World, now everywhere cultivated. Nearly 1000 varieties are catalogued.

**Tulipoma'nia**, a violent passion for the possession and cultivation of rare varieties of the tulip. The most famous T. was that which raged in Hol. 1634-37. The enormous prices then paid for tulip-bulbs of choice varieties led to inordinate speculation in the article. Tulips were bought and sold on speculation like stocks. The excitement led finally to severe commercial disasters.

**Tulip-Tree**, the *Liriodendron tulipiferum*, a beautiful and noble forest tree of the U. S., belonging to the order Magnoliaceae. Its wood is valued in house-carpentry and carriage and furniture making. It is often incorrectly called poplar, and sometimes whitewood.

**Tull** (JETHRO), b. in Oxfordshire, Eng., about 1680, studied law; was admitted as a barrister and made the tour of Europe, after which he settled first on his paternal estate, and afterward on Prosperous Farm in Berkshire, near Hungerford, and gave his attention to scientific agriculture; invented the drill-plough, and pub. a famous work entitled *New Horse-Hoeing Husbandry* (1733). The essence of his system consisted in planting in rows and in pulverizing the soil around the plants, but he made the mistake of thinking manure unnecessary. D. Jan. 8, 1740.

**Tullahoma**, Tenn. See APPENDIX.

**Tullius** (SERVIUS). See SERVIUS TULLIUS.

**Tullius Hostili'us**, according to Rom. legends, the third king of Rome (673-641 B. C.). During his reign the combat between the Horatii and Curiatii took place. But subsequently the Albans meditated treason, and when T. discovered their foul plans he razed the city and transferred the inhabs. to Rome.

**Tully**. See CICERO.

**Tully** (WILLIAM), M. D., b. at Saybrook, Conn., Nov. 18, 1785, grad. at Yale Coll. 1806, at Phila. in med. 1808, and practised in Conn. 1815-27; held professorships of materia medica at Castleton, Vt., 1827-29, and Yale Coll., New Haven, 1830-41; in 1851-59 was a prominent collaborator on Webster's *Dictionary*, and wrote *Materia Medica*, or *Pharmacology*. His studies of materia medica were the result of experimental exhibitions of meds. upon himself and many enthusiastic and admiring students. He gave special attention to indigenous Amer. plants, especially veratrum and conium. His works involved a new nomenclature, rigidly classical, and etymological in its formation; they are not calculated to attract the med. student or general reader of med., but are a storehouse of valuable facts and suggestive thought for the special student. Dr. T. also issued with Dr. Miner, in 1822, a celebrated *Essay on Fever*. He was instrumental in founding the Retreat for the Insane at Hartford, Conn. D. Feb. 28, 1859.

**Tun**. See Ton.

**Tung'sten** [Swe. *tung sten*, "heavy stone," alluding to the high specific gravity of wolframite], a metal forming quadrivalent and sexvalent compounds, and apparently also quinquivalent. The chief sources are—*wolframite*, a tungstate of iron and manganese, which frequently accompanies native oxide of tin; and *scheelite*, tungstate of lime, also a somewhat abundant source of T. T. is found also in the following rarer minerals: tungstate of lead, or *stolzite*; of copper and lime, or *cuproscheelite*; of manganese, or *huebnerite*; and of manganese and iron, or *megabasite*; as well as in the native oxide, *tungstic ochre*, and in small quantities in samarskite, ytrotantalite, tantalite, and columbite.

**Tungus'es**, a Mongolian tribe, inhabiting the regions of Siberia between the rivers Yenisei and Lena, and mingling W. with the Ostlaks, N. with the Samoyeds, E. with the Lamuts; the Mantchoos to the N. are of Tungusian stock. The T. have flat faces, olive complexion, no beards, straight black hair, and oblique eyes. They are nomads. The S. are Booddhists, the N. Shamanists. Number, about 70,000.

**Tunis**, one of the Barbary states, N. Afr., dependent on Tur., is bounded E. by Tripoli, W. by Algeria, N. by the Mediterranean, and S. by the Sahara, and comprises an area of 45,716 sq. m., with 2,100,000 inhabs. The coast to the E. of the Bay of Tunis is low and sandy; to the W. it is rocky and bald, forming lofty promontories, among which Cape Bon is the northernmost point of Afr. The interior is traversed by the Atlas Mts., whose average height is between 4000 and 5000 ft. The climate is dry and hot, but healthy, and the soil is, in general, exceedingly fertile, and produces wheat, maize, dhurra, and barley; cotton, indigo, saffron, and tobacco are also cultivated. Olive and date plantations are very numerous and very remunerative, and all S. European fruits grow abundantly. Oxen, sheep, mules, and camels are the common domestic animals. Salt and lead are produced. Some branches of manufactures, such as woollen fabrics, especially the well-known red caps, dyed skins, morocco leather, and coral, are extensively developed. There are about 45,000 Jews among the inhabs., who else are Mohammedan Berbers and Arabs. T. occupies nearly the terr. of anc. Carthage. From the 13th to the 16th century it became the terror of all the nations around the Mediterranean on account of its piracy, which did not cease until near the middle of the 16th century. The Fr. campaign against T. was commenced Apr. 30, 1881. On May 12, 1881, the city of T. was surrendered, the Bey giving virtually to Fr. the suzerainty of the country.

**Tunis**, cap. of the state of Tunis, on the shore of a shallow lake or lagoon which communicates with the Bay of Tunis through a narrow channel, called the Goletta. It is

surrounded with a double wall and defended by a citadel. Its streets are narrow, unpaved, and filthy, but its houses, though only one story high, and presenting no windows to the streets, are substantially built, and generally the interior is splendidly fitted up in Oriental style. The palace of the bey and several of the mosques are fine edifices, and the bazars are large and well stocked. Silk and woollen manufactures are extensively carried on: caps, shawls, burnouses, turbans, and mantles, soap, wax, olive oil, and leather are also manufactured and exported, and the transit-trade between Europe and the interior of Afr. is important. Pop. 120,000.

**Tunkers**. See DUNKERS.

**Tunkhan'nock**, R. R. junc., cap. of Wyoming co., Pa., on Pa. and N. Y. Canal, 32 m. N. of Wilkesbarre. Pop. 1870, 953; 1880, 1116.

**Tunnel**. See FRÉJUS (COL DE), FUCINO, SAINT GOTHARD, HOOSAC TUNNEL, TUNNEL, CHICAGO; TUNNELLING, the Cleveland tunnel in WATER-WORKS, the Thames tunnel in LONDON, the Hudson River tunnel in New York.

**Tunnel, Chicago**. The city of Chicago, Ill., which obtained its supply of water from the shore of Lake Mich., about  $\frac{1}{2}$  m. N. of the mouth of Chicago River, by means of works constructed in 1852, found about 10 yrs. after that the lake at the point of supply was so affected by the sewage of the city as to render the water pumped into the mains wholly unfit for domestic use. It was decided by the city authorities to construct a tunnel under the bottom of the lake to a point 2 m. out. The T. consists of a land-shaft at the W. and a lake-shaft at the E. extremity. The T. proper is 2 m. in length from the pumping-works, in a N. E. direction. The lake-shaft is protected by a crib, or hollow pentagonal breakwater, from storms, vessels, and ice. The horizontal diameter of the T. is 5 ft., and the vertical 2 inches greater.

The work was commenced at the land-shaft on Mar. 17, 1864. The first 90 ft., passing through wet running sand, was curbed with 3 sections of a cast-iron cylinder of 9 ft. internal diameter and  $1\frac{1}{2}$  inches thick. From the bottom of the iron cylinder the clay was very good, and the shaft was bricked up with a curb 8 ft. in diameter and 1 ft. thick. The main T. proper was lined with 2 shells of brick-work, in all about 9 inches thick, including cement joints. The upper arch was built on a ribbed centre of boiler iron, which diminished the open space inside of the T. only  $\frac{1}{2}$  inches, and thus allowed the cars which conveyed away the earth to go up to the face of the excavation, usually kept from 10 to 20 ft. ahead of the masonry. The iron centre was 30 inches long in the direction of the T. The crib is 58 ft. horizontal measurement on each of the 5 external sides, and 40 ft. high. The inner portion, or well, has sides parallel with the outer ones, 22 ft. long each, leaving the thickness of the breakwater 25 ft. Flooring of 12-inch white pine timber was laid close together. The outer and inner vertical faces and the middle wall are of solid 12-inch white pine timber, except the upper 10 ft. of the outside, which was of white oak, to withstand better the action of the ice. Across the angles of the outer and middle walls were placed brace-walls about 10 ft. long of solid 12-inch timber. All of the wall-timbers were fastened to each other by  $1\frac{1}{2}$ -inch square bolts 34 inches long, pointed and driven somewhat slanting into  $1\frac{1}{4}$ -inch auger-holes about 5 ft. apart. The slant was given in opposite directions to the bolts nearest each other, to avoid the possibility of their being drawn out by the buoyancy of the timber. Three rectangular openings, each 4 ft. wide and 5 ft. high, were made through the breakwater at different depths below the surface of the lake, so that water could be drawn from near the bottom, middle, or top as future experience might show to be best. The whole of the outside surfaces of the outer and inner walls was sheathed with 2-inch pine plank carefully jointed, placed vertically, and spiked on. Instead of pine, 3-inch white oak was used for the upper portion of the outside, to resist ice. The cast-iron cylinder for the lake-shaft at the E. end of the T. consists of 7 sections, each 9 ft. in length, 9 ft. internal diameter,  $2\frac{1}{4}$  inches thick, and in all other respects like the one for the land-shaft, except that the lowest section was turned on the outside to make it penetrate the clay more easily, and the upper end was provided with 2 gates for the introduction or exclusion of the lake water, each 54 inches high by 32 inches wide, and placed with their tops below the lowest known level of the lake.

The original estimate of the probable cost of the work was \$307,552; the actual cost, including all preliminary and other expenses of whatever nature chargeable to the lake T. up to Apr. 1867, was \$457,844.95. The completion of the T. has brought about a most gratifying change in the quality of the water supplied. The extraordinary growth of the city, and the increased rate of consumption of water per capita above what was originally estimated, have caused the construction of another and larger T. from the same crib, parallel with the first, to the lake shore, and thence in a S. W. direction about 4 m. farther to a point where new pumping-engines are in operation. Both T. have an estimated capacity of 150,000,000 U. S. gals. per diem. [From orig. art. in *J.'s Univ. Cyc.*, by E. S. CHESBROUGH, C. E.]

**Tun'nelling**. *Tunnels* are subterranean passages through hills and mts. or under lakes and rivers. A tunnel through a hill becomes advisable when it will cost less to remove only as much of the material as will permit a safe passage than to make an excavation open at the top. The cost per cubic yard or other unit of measure is usually not less than 5 or 6 times as great in a tunnel as in an open cutting, and sometimes the disproportion is vastly greater. The tunnel, however, is generally the only work practicable in the case, and the only question is at what point to end the open cut or "approach" and begin the tunnel. This depends on many circumstances, but the "portals" of the tunnel are usually placed where the depth of cutting is from 50 to 60 ft. Progress within the confined area of the tunnel being comparatively slow, access to it at the earliest moment is



sought through shafts sunk from the surface overhead. The tunnel being reached through the approaches or shafts, or both, the process of "drifting" is begun; and this operation is twofold—"heading and bottoming"—the former being a preliminary work intended to open the way in advance and facilitate the removal of the rest of the material in enlarging the tunnel to its full dimensions. This advanced excavation is carried forward either at the upper or lower part of the sectional area, according to circumstances. If the material is solid rock, undivided by seams or fissures, the tunnel is excavated to its proper shape for permanence without artificial support. If the rock be deficient in hardness and cohesion, temporary props of timber are used as the work proceeds, and walls and arches of masonry are subsequently built to sustain it. Ventilation and drainage must be amply provided for during the progress of the work, the former by blowing-machines which drive fresh air to the headings and expel the smoke of blasts; the latter by pumps which raise the water, often found in copious quantity, through the shafts, except where it can pass by natural flow through the approaches. In blasting rock within the tunnel, gunpowder has been superseded almost wholly by the more recently discovered and much more powerful explosive nitro-glycerine, combined with inert substances which render it safer in handling without materially impairing its effects. The charges are simultaneously fired by electricity, and with much greater effect than if exploded separately, as was the former method. The drilling of the blast-holes has latterly been greatly hastened by the use of tools driven by machinery worked by compressed air, which assists in ventilating the tunnel in its escape after doing its work.

Tunnels in earth do not require the drill or the explosive, but need support at each step, with sometimes more delay and expense than where blasting is required. Very few tunnels in America, although many in Europe, have been driven through such material.

**Subaqueous tunnels** under the beds of rivers and lakes are executed in the same manner with the preceding, only with special precautions against influx of water. [From orig. art. in *J's Univ. Cyc.*, by BENJ. H. LATROBE, C. E.]

**Tunny** (Gr. *θύνας*), the *Oreogmus thynnus*, a large fish of the mackerel family, caught abundantly in the Mediterranean and Black seas, and sometimes in the Atlantic. It sometimes, though rarely, measures 20 ft. in length, and exceeds half a ton in weight. It moves in vast shoals. Its flesh is highly esteemed, both fresh and salted.

**Tunstall, or Tonstall** (CUTHBERT), D. D., LL.D., b. at Hathersfield, Yorkshire, about 1475, entered Balliol Coll., Ox., about 1491; studied at Padua, where he took the degree of LL.D.; became vicar-gen. to Abp. Warham and rector of Harrow-on-the-Hill 1511, prebendary of Lincoln 1514, archdeacon of Chester 1515, and master of the rolls 1516; was sent 1516-17 to Brussels with Sir Thomas More as joint ambassador to Charles I. of Sp., with whom they concluded 2 treaties; became prebendary of York 1519, prebendary and dean of Salisbury 1521, bp. of London Oct. 1522, lord privy seal May 1523, ambassador to Sp. 1525; accompanied Wolsey to Fr. July 1527; was a plenipotentiary to negotiate the Peace of Cambrai 1529; bought up Tyndale's N. T. at Antwerp and burned them in Cheapside 1529; became bp. of Durham by papal bull Feb. 21, 1530; concurred in most of the ecclesiastical reforms of Henry VIII. and those of the first yrs. of Edward VI., but was deprived of his bishopric and sent to the Tower on a charge of treason Oct. 1532; was restored by Mary; was again deprived by order of Queen Elizabeth July 1559, in consequence of having refused to take the oath of supremacy, and was committed to the custody of Dr. Parker, abp. of Canterbury. Author of *In Laudem Matrimonii*, *De Arte Supplicandi*, *De Veritate Corporis et Sanguinis Domini Nostri Jesu Christi in Eucharistia*, *Libri II.*, etc. D. Nov. 18, 1559.

See GUM TREE.

**Tupelo**. See GUM TREE.

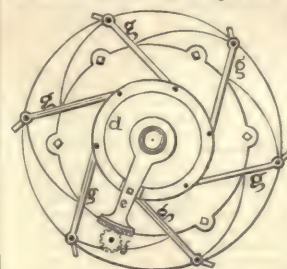
**Tupper** (BENJAMIN), b. at Stoughton, Mass., in 1738, was a soldier in the Fr. war 1756-63; became col. of the 11th Mass. Inf. early in 1776; served under Gates at Saratoga; was at the battle of Monmouth 1778; was brevetted gen. before the close of the war; was associated with Gen. Rufus Putnam in forming the O. Land Co.; was surveyor of O. lands 1785; served against the Shays rebellion 1786; settled at Marietta, O., 1787; became judge there 1788. D. in June 1792.—His son, EDWARD W., was brig.-gen. of O. volunteers under Gen. Harrison in 1812, and d. in 1823.

**Tupper** (MARTIN FARQUHAR), D. C. L., F. R. S., b. in Lond., Eng., July 17, 1810, ed. at Charterhouse School and at Christ Ch., Ox., where he grad. 1831; was called to the bar at Lincoln's Inn, but never practised; wrote *Proverbial Philosophy*, etc. In 1851 and 1876 he visited the U. S., and in 1875 wrote a drama in honor of the centenary of Amer. independence.

**Turbine** [Lat. *turbo*]. This term is usually applied to a water-wheel revolving upon a vertical axis, as distinguished from those turning on horizontal axes, which are known as vertical water-wheels, or simply, as water-wheels. There are 2 radically different modes of applying water-power. One consists in receiving the water in buckets formed on the periphery of the wheel, in such a manner that the weight of the water causes the wheel to rotate, and overcomes whatever resistance opposes its rotation. In such a wheel the water does not move with its velocity approaching that of the head. In the second the weight or pressure of the head is employed in giving a rapid motion to the water, which by its impulse or reaction communicates motion to the wheel. Wheels with horizontal axes are suited to the first method; those with vertical axes to the second.

A T. water-wheel consists of the following parts: (1) a series of fixed vanes, called guides, for giving a suitable direction to the water; (2) a series of vanes attached to a revolving rim to receive the action of the water; (3) a shaft for transmitting the movement; (4) a gate for regulating the

quantity of water admitted, and consequently the velocity of the wheel. It also requires an iron or wooden flume or pen-stock for conveying the water to the wheel under the pressure due to the entire head or fall, and a tail-race for the escape of the water.



in the W. States. It is of the second class, discharging inwardly. The gates are moved by an arrangement shown in the cut. The wheel is covered by a casing terminating in a pipe within which the shaft revolves. This pipe passes through a circular disk *d*, carrying an arm *e*, and resting upon the casing. The pipe may rise to the surface of the water or terminate in a stuffing-box. A pinion *f* gears with an arch-head on the arm *e*, and gives a rotary movement to the disk, opening and closing the gates by means of jointed bars *g g*. This wheel is stated to have shown an efficiency of 83 per cent. with the gates fully open, and 70 per cent. with the gates half open. [From orig. art. in *J's Univ. Cyc.*, by PROF. J. P. FRIZELL.]

**Turbot**, a fish belonging to the family Pleuronectidae, order Seleceophall, sub-order Heterosomata. The body is always strongly compressed, more or less oval, and with one of its sides colored, the other generally colorless; the scales are variously developed; the lateral line is continuous behind; the head compressed, more or less rhomboid, and with the snout pointed; both eyes are on the same side, one being on or near the forehead, the other comparatively low down; mouth terminal, and with an oblique lateral cleft. The species are numerous, and found distributed in every sea, and some of them ascend rivers. They live chiefly on sandy bottoms, and rest with their white side below, and the dark one upturned. Although almost all have the eyesless side white or colorless, a few have dull spots on that side, and in one species it is colored like the eyed side. Over 100 species are known, of which 15 inhabit the waters of the Atlantic, and 16 those of the Pacific U. S. The most common species in the markets of the E. States are the flounder and the halibut.

**Turenne, de** (HENRI DE LA TOUR D'AUVERGNE), VICOMTE, b. at Sedan, dept. of Ardennes, Fr., Sept. 11, 1611, a son of Henry, duke of Bouillon, and Elizabeth, a sister of William I. of Nassau-Orange, was ed. by his uncle, Maurice of Nassau, and entered the Fr. army in 1630. During the Thirty Years' war he distinguished himself; was created a marshal of Fr. in 1643, and contributed much to the conclusion of the Peace of Westphalia in 1648. In the wars of the Fronde he first sided with Condé, but became reconciled with the court, was appointed commander-in-chief of the royal troops, defeated Condé at Bleneau 1652, the Spaniards at Arras 1654, and in the Dunes 1658. In the war with Sp. (1667) he conquered Flanders, and in the war with Hol. (1672) his fame reached its culmination in the two Aus. armies at Mülhausen (1674) and Türkheim (1675). He was killed by a cannon-ball near Sarbach, July 27, 1675. He is considered the greatest gen. Fr. has produced, next to Nap.

**Turgenev** (IVAN), b. at Orei, Nov. 1818, studied at Moscow, St. Petersburg, and Berlin; was appointed to the ministry of the interior; was for several years banished on account of his liberal ideas, but allowed to return to the capital, and lived subsequently mostly in Paris and Ger. In 1843 his poem *Parascha* attracted much attention, and still more his sketches of rural life in Rus., *Memoirs of a Sportsman* (1852). His works comprise several highly appreciated novels, *Smoke*, *Liza*, etc. D. Sept. 3, 1888.

**Turgot** (ANNE ROBERT JACQUES), BARON DE L'AULNE, b. at Paris May 10, 1727, was ed. for the Ch., but gave up the ecclesiastical career; studied law and national economy; became noted by his essays in the *Encyclopédie*, and was appointed intendant—that is, gov.—of the prov. of Limosin in 1761. In 1774 Louis XVI. appointed him minister of finance, and he immediately went to work to save, if possible, the state from bankruptcy. In 1775 a scarcity of grain occurred, which almost grew into a famine. The artificial barriers between the various provs. of the realm, which trammelled the free trade in grain in the interior, T. abolished by a *lit du justice*; he compelled the Pari. to acknowledge the measure, and the riots of the mob, excited by secret emissaries of the courtiers, were speedily suppressed by military power. The king suddenly dismissed him in May 1776. His *Œuvres complètes* contain his essay on usury, on the best method of taxation, and *Réflexions sur la Formation et la Distribution des Richesses*. D. Mar. 20, 1781.

**Turin** [It. *Torino*; Lat. *Augusta Taurinorum*], city of N. Italy, on the banks of the Po, in N. lat. 45° 4' E. lon. 7° 42'. 755 ft. above the sea. In the 11th century it was the capital of a small independent state, but passed by marriage into the family of the dukes of Savoy. It was the political capital of the dukedom of Savoy, and afterward of the kingdom of dom of Sardinia, until 1861, and then of the kingdom of Italy until 1865, when the seat of govt. was transferred to Florence. The removal of the seat of govt. was a severe shock to T., but the enterprise of its people has restored its old prosperity, and its pop. has risen to 352,832.

The chs. of T. contain few good works of art, but the cathedral has a *Virgin and Saints* ascribed to Dürer, and San



Domenico contains a *Madonna* by Guercino. The royal palace, though large, is not of extraordinary magnificence. The Univ. of T., now in a very flourishing condition, occupies a building of plain arch. in the Via Po. The Pinacoteca contains remarkable works by Gaudenzio Ferrari, Fra Angelico, Pollajuolo, Guido, Guercino, Paul Veronese, Domenichino, Albani, Vandyke, Paul Potter, Holbein, and other eminent masters, among which a priceless *Memling*, the *Passion of Our Lord*, deserves special mention. The museum of antiquities, including the Egyptian collection of Drovetti, is of great interest and value.

**Turkestan**, or **Toorkistan** [properly, *Turkistan*, "land of the Turks"], formerly by geographers called **Bucharia, Great and Little**, the name of the broad, longitudinal depression between the Karakorum (Mustagh) and Hindoo-Koosh to the S., and the Thian Shan to the N., occupied by the river-systems of the Amoo Darya (Oxus) to the W., and the Tarim (Yarkand) to the E., is bounded N. by Mongolia and the Kirgheez steppes, W. by the Caspian Sea, S. by Persia, Afghanistan, and High Asia, or the mountainous region forming the N. boundary of India, and E. by China proper. Its area is 1,576,402 sq. m.

Western or Russian *Turkestan* comprises the govt.-general of T., the Trans-Caspian dist., the feudatories of Bokhara and Khiva, all Rus. dominions, and the Toorkoman steppes and the unexplored hilly tracts of Karategin on the upper course of the Oxus, which are still independent. As regards its physical conformation, the N. part is chiefly a plain extending from the Thian Shan hills to the shores of the Caspian. With the exception of a few table-lands and some bits of hard clay or loam, the soil consists chiefly of black or yellow sands, and the only land really fit for cultivation is that lying on the slopes of the hills or on the banks of rivers and canals. Two water-lines of anc. renown traverse the country at wide intervals. The largest of these rivers is the Amoo Darya, which, rising N. of the Hindoo-Koosh in the Pamir steppes, flows along the terr. of Afghanistan and Bokhara, and traverses then in a N. W. direction the plains and deserts of Khiva, until it empties into the Sea of Aral. The other great river, the Sir Darya of modern times, descends from the distant highlands of Ferghana (Khokand), at first to water lands of plenty; but as it tends northward it passes through what is now for the most part a vast desert, until it loses itself in the Sea of Aral in a wild delta of swamps and thickets. The river is navigable for a considerable distance. The main river of Bokhara is the Zeravshan, which has its source at an elevation of 7000 ft. above the sea, divides N. E. of Samarcand into many branches, and flows S. W. to the steppe country. As regards the climate, spring begins in the middle of Feb. The annual mean temperature of Tashkend, in lat. 41° 8' N., is 55° F. The winter is not so severe as in Rus.; the spring brings abundant rain; the summer is dry and hot, even unpleasantly so, at least to Europeans; terrible sandstorms (*uvragan*) occur in the steppes. Mining is still in its infancy. The iron, copper, and lead ores of the Karatan Mts. along the N. frontier of Bokhara have not yet given rise to any vigorous production of metals. Gold is found in the Ili district. The extensive coal-deposits in the Karatan have not yet been utilized, and are said to be of poor quality; layers of rock-salt have been discovered here. Forests are scarce. Peat is used as fuel in the towns. The high temperature of the summer has a good influence on the cultivation of the soil, which is everywhere sandy, light, and porous. Irrigation is indispensable, and plays a prominent part in agriculture. Only wheat and clover are winter crops; all other cereals, such as millet, barley, maize, pease, and rice (S. of Tashkend), are sown in Apr. and harvested in Aug. Cotton succeeds in lat. 42½° N., and ripens in Oct. Grapes are cheaper than potatoes. The vine is chiefly cultivated S. of Tashkend, and the grape yields a good wine. Tobacco is also raised S. of Tashkend. Rearing of silkworms is a favorite occupation. The domestic animals comprise the horse, ass, cow, camel, sheep, goat; also swine, poultry, dogs, and cats. The horses are small, but light and swift. The camel is the Bactrian double-humped. The cattle are small and poorly cared for. Sheep, brown-colored and with pendent ears, are reared for their flesh. ¾ of the inhabs. are nomads. The whole pop. has a strong commercial spirit. Merchants from Samarcand and Tashkend have for many centuries visited the trade-centres of E. Rus., China, and Per., and in the interior the towns swarm on all market-days with nomads who are eager to buy.

On the basis of a census of the families, the pop. is estimated at 4,000,000 Rus. subjects, and 3,600,000 in the states of Bokhara, Khiva, Karategin, and the Toorkoman steppes. T. blood prevails, and the Oozbeks predominate. The Oozbeks have no social organization. Most of them are nomads; those who have fixed homes are called Sartes, and are Mohammedans. But they are waning; they plunder caravans in connection with the Toorkomans—Turks with a sprinkling of Iranian blood, and still more inveterate robbers. The Toorkomans, however, are brave and revengeful, while the Oozbeks are cowardly. Only people of the higher classes can read and write. On a still lower stage stand the Kirgheez. On the left bank of the Oxus they have no fixed habitations, but make all passes and fords unsafe. The bravest of these mt.-nomads are the Kipchaks, on the S. W. slope of the Thian Shan Mts. Tadshik has been, since the 13th century, the name of those who speak Per., comprising the Iranian part of the pop., the productive class, with fixed habitations. They live mostly in the towns, and are often considered as Sartes. The lang. is Tartarian, a branch of the Tur. or Oozbek, interspersed with Per. and Arabic words; Tur., however (Osmanlee), and Per. are generally understood. The letters are Arabic. The lit. represents a one-sided civilization, built up by dogmas of Mohammedan theol., legends, and some poetry. Original works have not yet been discovered; what have become known are merely translations from the Per. and Arabian.

*History.*—W. T. is the home of the anc. Scythians. They were followed by the Sakae, a Tur. tribe from E. T., who in the 2d century B. C. began to threaten them. In the 4th century B. C. Alexander the Great founded Khokand on the Sir Darya. In the 1st century B. C. the Chi. pushed onward to Khokand (Ferghana). The anc. worship of fire and other natural phenomena was suppressed by the Mohammedan conquerors and supplanted by Islam. An Iranian noble converted to Mohammedanism laid in 874 the foundation of a monarchy ruled by the Samanides till 907, with Bokhara as cap., and extending from the sources of the Oxus and Jaxartes to the shores of the Caspian Sea and the Per. Gulf. This most glorious era was followed by centuries of confusion; and up to the arrival of the Rus. the hist. of the country was one uninterrupted series of wars and feuds. In 1847 the Rus. took possession of the region between the lakes of Balkash and Isskul, established a military station at the mouth of the Sir Darya, and began to ply the first steamer on the Aral Sea. In 1860 it was determined to connect the forts on the Sir Darya with those in the E., and the conquest of the cities of T. and Cherkend in 1864 was the immediate result of the operation. To the E. the fertile valley of the Ili was conquered in 1870 from the Dunganese. To the W. the right bank of the Oxus was ceded in 1873 by Khiva, and the immediate result of the humiliation of Khiva was the establishment of a Trans-Caspian govt. comprising the terr. on the E. shore of the Caspian Sea, with Krasnovodsk as cap. A winter campaign, rich in scenes of brilliant valor, increased in 1876 the Rus. empire with the exceedingly fertile kingdom of Khokand, which now bears the name of Ferghana. By an ukase of July 11, 1887, the new conquests were organized into the govt.-general of T., with Tashkend for its cap.

*Eastern Turkestan*, called *Nan-ty* by the Chinese, *Altishar* ("six towns") by the neighboring Mohammedans, and *Jitishar* ("seven towns") by its actual ruler, stretches about 250 m. from N. to S. as a gently undulating plain, shut in to the S. by the great range of mts., comprising the Künlün and Karakorum, the watershed range between India and Central Asia; bounded W. by the Pamir steppes, and N. by the Thian Shan range, the outward culminating ridge of the mt.-system in which the great rivers of Siberia take their rise. To the E. lies the Gobi desert. It comprises an area of about 420,000 sq. m., and forms the transition from W. to E. Asia, consisting of a plateau of an average elevation of 6400 ft., with a depression in the centre to which all the waters of the plain flow. The climate is distinguished by great dryness; summer rains are rare. The winter is not severe. Snow seldom falls in the plains; the tanks are frozen and the ice stored for summer. In Aug. and Sept. the maximum of heat during the day is respectively 92° and 65° F. The most remarkable of the minerals is jade or nephrite. Agriculture is possible only by means of irrigation; accordingly, all towns and settlements are situated along the rivers or in their neighborhood, and numerous canals and ditches are dug in the fields. Rice, wheat, barley, millet, Indian corn, and sometimes a few peas and beans are raised in the neighborhood of the towns. Linseed is grown only for the seed, and hemp for the intoxicating extract, *charras* or *bang*, the use of the fibre not being known. The lower classes are all supplied with cotton clothing from their own fields, but the better classes wear garments made of silk or of Eng. or Rus. cotton fabrics. Tobacco is raised in considerable quantities. Carrots, turnips, radishes, onions, cabbages, melons, cucumbers, red pepper, tomatoes, and coriander are raised in every garden; grapes, apricots, peaches, apples, pears, and figs are successfully cultivated. Mulberry and apricot trees of unusual size grow at the very foot of the mts. Forests are wanting; most of the timber for building is either willow or poplar. Stamping-mills for crushing rice are driven by water-power, but horses and donkeys are used for treading out the corn. Excellent breeds of horses come from Aksu and Khokand. The Bactrian double-humped camel is reared in large herds; its sure step makes it very useful in crossing the mt.-passes. Of the domesticated animals the broad-tailed sheep is of the greatest importance; the Turfani wool has a world-wide celebrity and forms one of the most important articles of commerce. The manufactures are almost entirely confined to articles required for home consumption; carpets and felts form almost the only exceptions to this rule.

E. T. was most probably originally peopled by an Aryan race, mentioned in the old Indian epics as Saka and Tukhara, remnants of which are still found in the mts. and recognizable by their features. In the 2d century B. C. it came under Chi. authority. In the 1st century B. C. it was overrun by the Huns, and afterward by other Tur. tribes. At the end of the 7th century A. D. the Tibetans invaded Kashgar, and in 713 the Arabs arrived hither. In 1218 Ghengis Khan, the great Mongol conqueror, overran the country; afterward the Mantchoos came as rulers and governors; and in the last decades Tadshiks and Sartes immigrated from Khokand. Thus, the pop. of the towns is very much mixed; in the mt.-valleys, however, the various tribes have maintained themselves more pure, but a primitive type is wanting. The total number of inhabs. is estimated at 580,000. A large part of the pop. is still nomadic.

*History.*—In antiquity and during the Middle Ages, E. T. was constantly the apple of contention between chiefs of Tur. descent and the Chi. emps., who got a foothold here in the 2d century B. C. In the 8th century A. D. the people were converted from Buddhism to Islam. Saints claiming descent from Mohammed, and known as Khwajas, acquired great influence, and the sectaries attached to these chiefs divided the people into rival factions. Later in the 17th century, Khwaja or Hoja Appak, the leader of one of these parties called the White Mountain, having been expelled by the ruler of Kashgar, a Turk chief called Ismael Khan, who was a zealous supporter of the opposite party or Black Mountain, sought the aid of the Calmucks of Zungaria, who



established the Khwajas of the White Mountain once more in the country, though with an authority subordinate to their own. Great disorders ensued, but the Khans of Zungaria continued to exercise their supremacy till 1757. In the next yr. the Chi. succeeded in bringing also the states of T. under their rule. The Khwajas of the White Mountain took refuge in Khokand, and made more than one attempt to recover what they considered their rights. In 1827 Jehangir Khan Khwaja conquered Kashgar and Yarkand; subsequently he was surrendered by the khan of Khokand, and was executed in Peking in 1838. An expedition headed by seven Khwajas in 1852 met with even less success than the former. Nevertheless, the attempt was repeated in 1857, and Wali Khan, although repulsed again in 1858, left in Kashgar a name for ferocity and bloodthirstiness which will long remain. The Chi. ruled E. T. through the gov. gen. at Ill. In 1863 the Dungan Mussulmans overthrew the Chi. authority, and the Kashgarians recalled the Khwajas; in 1864 the gates of Kashgar were opened for Busurg Khan of the White Mountain. He was accompanied by Mohammed Yakooobi, who in Sept. 1865 compelled the Chi. garrison of the citadel of Kashgar to surrender. This success gathered numerous partisans around him; he threw Busurg Khan in prison and assumed himself the supreme authority. Wars and conquests filled the first yrs. of his reign. He subjugated Khotan, Aksu, Turfan—yea, even the Calmucks N. of the Thian Shan consented to pay a tribute. Having thus reunited all the old Altishar, he conquered in 1870 the dist. of Sizikol, and gave his kingdom the prouder name of Jitishar. The frontier toward China is not yet regulated, and in 1871 a Chi. army of 130,000 men was sent to reconquer Kashgar. It remained near the Great Wall till 1875, made then an advance, but is said to have been thoroughly defeated in May 1875. [From orig. art. in *J.'s Univ. Cyc.*, by EMIL SCHLAGINTWEIT.]

**Turkey.** See MELEGRIDIDE.  
**Turkey.** The Turkish empire extends over parts of Europe, Asia, and Africa. But its suzerainty, for instance, over Egypt, is merely nominal, and over all not immediate possessions very loose. By the treaty which ended the war with Russia, 1877-78, the area and population of the empire were very much reduced. The semi-independent states of Bulgaria and Eastern Roumelia were created, Bosnia and Herzegovina were virtually given to Austria, large additions were made to Greece, Roumania, Servia, and Montenegro, and Russia, too, a territory of 5670 sq. m., with a population of 600,644, including 417,602 Mahometans. The area and population of the empire are not known as the results of exact measurement and a general census, but only by estimates. The latest estimates are as follows:

		Sq. M.	Pop.
Europe:	Immediate Possessions.....	69,850	4,490,000
	Eastern Roumelia.....	13,500	815,946
	Bosnia, Herzegovina, and Novi-Bazar.....	28,570	1,326,440
	Bulgaria.....	24,369	1,998,983
	Total Europe.....	115,289	8,631,369
Asia:	Immediate Possessions.....	729,170	16,132,892
	Tributary Samos.....	180	40,000
	Total Asia.....	729,350	16,172,892
Africa:	Tripoli.....	398,873	1,010,000
	Egypt.....	1,132,980	16,400,000
	Total Africa.....	1,531,853	17,410,000
	Total Turkish Empire.....	2,396,092	42,214,350

**European Turkey** comprises a part of the peninsula of the Balkan. The W. boundary is formed by the Adriatic and Ionian seas, with the gulfs of Drino, Durazzo, and Avlona; the S. is formed by Greece, and then by the Ægean and Marmora seas, with the bays of Salonica, Monte Santo, Istiklar, Orphano, Saros, etc. The peninsula of Gallipoli forms, with the coast of Asia Minor, the Dardanelles, Hellespont, and the Thracian Bosphorus leads into the Black Sea, which forms the eastern boundary. N. and N. W. the country is bounded by Bulgaria, Servia, Bosnia, and Montenegro. To the E. rise the Balkan Mts., the anc. *Hæmus*, first as a single range whose westernmost peaks rise more than 5000 ft., then separating, farther to the E., into 2 parallel ranges, the Little and Great Balkan. The Balkan forms an important climatic boundary-line; to the N. reigns the climate of Central Europe, to the S. that of S. Europe. The pop. is composed of Greeks, Slavs, Osmanlis, Armenians, Jews, Tcherkassians, etc. Agriculture is carried on very primitively. Maize, wheat, and buckwheat are the prin. cereals. Beans, peas, and lentils are raised; of vegetables, onions, cabbages, beets, and cucumbers, of fruits, especially plums. Almond, lemon, orange, and olive trees are cultivated. Cattle-breeding is a very important branch of the national industry. The horses in the mt.-regions are small and clumsy, but strong and useful. The breeds of mules and asses are good. The buffalo plays a considerable part in agriculture. Sheep-breeding is extensively carried on, and the rearing of bees and silkworms is flourishing, silk being one of the most important articles of export. Wild animals, such as bears, wolves, etc., and game, such as the wild-boar, the stag, the deer, etc., abound. Fishing and the gathering of sponges are extensively carried on along the coasts. Mining is much neglected. The circumstance that all trades are still carried on in the old traditional fashion is very characteristic of the state of manufacturing industry. Nevertheless, all the prin. manufactures, such as carpets, leather goods, arms, etc., are distinguished both for their excellence of workmanship and their fine taste in form and color. But these good qualities are now rapidly vanishing. The traffic in the interior suffers much from bad administration and from the want of sufficient means of

communication. Good roads are very scarce. In the more important manufacturing cities annual fairs take place, by which the exchange of goods is greatly facilitated. The foreign commerce is exclusively carried on by foreigners. **Asiatic Turkey** comprises Asia Minor and vast adjacent parts. The W. frontier is formed by the Mediterranean; to the S. the Tur. dominion stretches as far as the Isthmus of Suez, extending thence along the Arabian Gulf to the Strait of Bab-el-Mandeb, occupying the narrow coast-belt, bounded S. E. and E. by Ar. and Per., N. by Rus. (Caucasus) and the Black Sea. For a distance of 100 m. the Mediterranean washes the shores of Syria. Beyroot is here the most important harbor. From the Bay of Iskanderoon the coast turns suddenly to the W., and for a distance of 150 m. it is rocky, but has numerous small harbors. The W. coast of Asia Minor, about 50 m. long in a straight line, is most cut up and fringed with numerous islands. Only Smyrna is here of any importance. The Hellespont and Dardanelles lead to the Sea of Marmora, the Thracian Bosphorus to the Black Sea, whose S. coast, about 180 m. long, has many good harbors, of which Sinop and Trebizond are the most important. The mts. of Koordistan form the W. border of the plateau of Iran. The highlands of Armenia and Asia Minor are bounded S. by a range which branches off from the mts. of Koordistan, and terminates W. at the Bay of Iskanderoon. To the N. the border range of the plateau continues to the vicinity of Tiflis, and runs along the coast of the Black Sea to Scutari. In the interior of Asia Minor the ranges of Taurus and Anti-Taurus reach a height of 11,000 ft., and form the boundary toward Syria. Armenia is covered with high mts., of which Ararat, 16,915 ft. high, is the most remarkable. Asia Minor is to some extent steppe-land, in many places exceedingly fertile. To the S. of Asia Minor and Armenia the Lebanon system, consisting of various ranges, runs from N. to S., losing itself to the E. in the Syrian desert. Of the highland desert which forms the peninsula of Ar., T. owns only the narrow coast-belt, called Hedshas. The lowland of Mesopotamia is a desert W. of the Euphrates, and between the Euphrates and Tigris a steppe-land broken up by some ranges of hills; but from the point where the 2 streams unite to their mouth in the Per. Gulf, a distance of about 100 m., stretches a flat alluvial plain. These two rivers are the largest in Asiatic T. The plateau of Syria is split by a deep furrow between the Lebanon and Anti-Lebanon ranges, in which the Orontes flows. The Leontes, Jordan, and Kishon water Syria and Pal.; the Kisil-Irmak (Halye), Mæander, and Hermus water Asia Minor. Politically, Asiatic T. is divided into—(1) Armenia, (2) Koordistan, (3) Irak Arabi, (4) El Deshesreh, (5) Asia Minor or Anatolia, (6) Syria and Pal., and, finally, the Arabian possessions.

T. in Europe is divided administratively into 4 vilayets or provinces, but which do not include the dist. of Constantinople, which forms a separate govt. The division of T. in Asia was into 14 vilayets previous to the war of 1877-78, but two of these were ceded to Russia. The government of the empire is despotic; the sultan is absolute ruler. At the head of the administration of the empire is the vizier. The ministers are subordinate to him as secs. of state. Beside him, the sheik ul Islam is the most important person. He is the chief of the Ulema, a body at once judicial and ecclesiastical, whose office it is to explain and apply the law. The ministers preside over depts. organized in the same manner as those of the other European govts.—namely, for foreign affairs, war, finances, commerce, public education, public buildings and quarantine, justice, and police. The slaves are now the only legally subordinate class of the pop. Else, all subjects are equal before the law. There is no aristocracy. The career of a man depends entirely on his personal ability, and manumitted slaves and the poorest people can reach the highest positions. Although Islam is the religion of the state, there exists general freedom of worship. Of Chr. denominations, the Orthodox Gr. and the Armenians are most largely represented. The R. Cath. Ch., inclusive of the United Oriental Chrs., has 28 patriarchs and abps. Education is very low, both among Chrs. and Mohammedans. Of late, however, the govt. has commenced to establish, beside the elementary schools which have existed since 1847, middle schools and special schools in the larger cities, and higher schools for the training of teachers and officials. The financial affairs of the Ottoman empire are in a state of thorough disorganization. Previous to the Rus. invasion of 1877 there existed a virtual state of bankruptcy, which became almost irremediable by the separation of some of the richest provs. of European T. from the empire, with consequent diminution of the public revenue. According to the most trustworthy estimates the actual expenditure of the govt. exceeded the actual revenue in recent yrs. in amounts varying from 10,000,000 to 36,000,000 francs. On May 10, 1875, when the borrowing power came to an end, the total debt was estimated at 5,023,840,300 francs, or £202,554,430. According to the law of June 22, 1869, the recruiting of the army is effected by volunteers and by levies of lot. Military service is compulsory for all Mohammedans; men of other confessions free themselves by the payment of a stipulated sum. The term of service is 30 yrs.—4 in the active army, *nizam*; 2 in the first reserve, *idadiyal*; 6 in the second reserve, *redif*; and 8 in the landsturm, *hiyal*. The actual strength of the Tur. army is but imperfectly known. According to official estimates, referring to the period just following the declaration of war by Rus. in 1877, the regular army on the war-footing amounted to 487,000 men. It is estimated that after the Treaty of Berlin the strength of the regular army, under the existing organization, was reduced to 350,000 men. The fleet consisted at the end of 1878 of 15 large armor-clad ships, 18 smaller iron-clads, including 11 monitors and gunboats on the Danube, and 45 other steamers. The term of service in the navy is 7 yrs., beside 5 yrs. in the reserve. The total force numbers about 50,000 men. Industry and commerce are very little developed.



The mts. are richer in metals than the other mts. of Europe. Immense coal-deposits are found in Asia Minor. But these sources of wealth remain undeveloped. Excellent copper, however, lead, bitumen, soda, and meerschaum are exported. Asia Minor possesses immense forests, from which all the countries of the Mediterranean could be provided with timber. The plains S. of the Balkan, the islands, and the coast-regions of Asia produce a great abundance of fruit, on which might be based a large trade in preserved fruits, olive oil, olive-oil soap, figs, raisins, and wine. Tobacco succeeds nearly everywhere. The mulberry tree is extensively cultivated, and the export of raw silk, especially from Beyroot and Brusa, is of importance to the silk-market of the whole world. The lowlands of the peninsula of Balkan, the plateaus of Asia Minor and Armenia, the plains of Syria and Mesopotamia, produce wheat, barley, hemp, sesame, and cotton, and grain and cotton form important items of export. Madder, oil of rose, opium, mastic, saiep, etc. are also largely produced. The animal kingdom yields excellent fur of the marten, otter, beaver, itlis, and wild-cat; hides, tallow, cheese, bones, horn, etc., which play a considerable part in trade. There are no commercial statistics even approximately exact. At the close of 1882 the Turkish empire had 1076 miles of railway, namely, 904 in Europe and 172 in Asia (from Smyrna to Aidin, 145 miles, and from Scutari to Ismid, 27 miles), and 17,950 miles of telegraph line, with 31,782 miles of wires. The number of telegraph offices in 1883 was 464. But the whole empire has only 480 post-offices.

**History.**—The Ottoman tribe which now rules the Tur. empire came originally from the Altai Mts. Orkhan, who resided in Brusa, and conquered Nicomedia and Nicaea about 1330, is considered as the founder of the Ottoman power. He called himself *padishah*, and the gate of his palace the *Sublime Porte*. In 1355 Sultan Murath I. made Adrianople his European residence; in 1389 he conquered the whole of Bulgaria, and his son, Bajazet I., called Ilderim, compelled the Gr. emp. to pay a tribute. Amurath II. compelled the Gr. emp. to conclude an humiliating peace in 1453, and conquered Salonica. Under Mohammed II. the Ottomans took Constantinople (May 29, 1453), and made it the cap. of their empire under the name of Stambul. Mohammed II. subjugated Gr. in 1460, took several harbors in the Black Sea from the Genoese, conquered Sinoob, destroyed the empire of Trebizond in 1461, made the larger part of Bosnia an Ottoman province, waged war for 16 yrs. against the Venetians, took Kroja and Scutari from them, conquered the Crimea, and took Moldavia from the Poles. Selim I. (1512-19) conquered Armenia as far as the Tigris, Syria, Egypt, and a large part of Ar., with the sacred cities of Mecca and Medina. His son, Solyman II. the Magnificent (1519-66), brought the empire to the culmination of its power. In Asia he conquered Mesopotamia and Georgia, in Europe Rhodes in 1522, and half of Hungary in 1526, besieged Vienna, though without effect, in 1527, made a new campaign against the Ger. emp. in 1532, and entertained the plan of subjugating the whole Occident; which plan was baffled, however. After a number of strong and powerful sultans, Selim II. (1566-74) was the first of a series of weak and voluptuous rulers. He had an able vizier, however, Sokollu, and good and bad luck alternated with each other during his reign and those of his successors. The reign of Mohammed IV. (1648-87) was eventful and important by the undertakings of the able viziers (Mohammed Köprili, Achmed Köprili, Kara Mustapha) who governed the realm. In 1687 Mohammed IV. was deposed, and succeeded by Solyman III. His vizier, Mustapha Köprili, conquered Belgrade and several other cities, and invaded Hungary, but was defeated there and killed. Mustapha II. defeated the Venetians and the Rus. czar, Peter the Great, but was completely routed himself at Zenta in 1697 by the Aus. gen. Prince Eugene of Savoy. By the Peace of Carlowitz (1699) the empire lost Transylvania and Hungary to Aus., Azof to Rus., Podolia and the Ukraine to Poland, and the Morea to Venice. In 1703 the Janizaries raised Achmed III. to the throne. He concluded an alliance with Charles XII. of Swe., and surrounded Peter the Great on the banks of the Pruth in 1711, but concluded peace on the surrender of Azof. The Morea was reconquered, but the victories of Prince Eugene at Peterwardein and Belgrade cost the empire the most important parts of Serbia and Wallachia, which were ceded by the Peace of Passarowitz (1718). Mustapha III. and his successor, Abd-ul-Hamid I. (1773-89) failed signally in their policy toward Rus., and by the Peace of Kutschuk-Kainardski (July 21, 1774) Rus. obtained a kind of protectorate over Moldavia and Wallachia, the important cities of Azof, Taganrog, Yenikale, Kertsch, etc., the right of navigation in all Tur. seas, etc. After the accession of Selim III. (in 1789) the Turks received a severe defeat from the Rus. gen. Suwarow, and Bessarabia, Wallachia, Belgrade, and Ismail were occupied by the allies. Meanwhile Prus. and Eng., afraid of the growing power of Rus., exercised their influence in favor of T., and by the peace with Aus. at Sistowa (Apr. 4, 1791), with Rus. at Jassy (Jan. 9, 1792), the allied powers surrendered nearly all their conquests. From this time dates the singular position of the Tur. power in Europe, depending more on the jealousy of the other powers than on its own strength, and supported by the W. powers simply from fear lest the Rus. should take possession of Constantinople and assume a dominating position in the Black Sea and the Mediterranean. The position became still more complicated by the enmity between Eng. and Fr., both of which powers were interested in the maintenance of T. The position of the empire became dangerous. Between 1812 and 1826 Mahmood II. had to fight against insurrections in Serbia, in various places of Asia, in Gr., and finally the Janizaries revolted, but were completely destroyed. By their annihilation T. became almost defenceless, and this condition Rus. used to compel her to conclude the treaty of Akjerman (in 1826), by which Serbia, Moldavia, and Wallachia obtained a certain political

autonomy under Rus. guaranty. In 1828 a new and dangerous war broke out, and by the Peace of Adrianople (Sept. 14, 1829), T. recognized the independence of Gr. New insurrections followed in various places, of which that in Egypt under Mehemet Ali was the most dangerous. Mahmood died, and Abd-ul-Medshid, 17 yrs. old, ascended the throne July 31, 1830. Rus. formed the quadruple alliance between Rus., Eng., Prus., and Aus., and compelled Mehemet Ali to give up Syria, Cilicia, and Crete, which he had conquered, and content himself with Egypt as an hereditary fief. Redshid Pasha, the minister of the young sultan, tried to strengthen the empire internally, especially by concessions to the non-Mohammedan pop. In his foreign policy he leaned upon Eng., and used the revolutionary movements in Europe (1847-50) to form connections with the liberal powers and strengthen his position against Russia. This caused the czar Nicholas to take up once more his plans of driving the Ottomans out of Europe. He demanded the protectorate over the Chrs. living in T., and when this was refused he occupied (in 1853) the principalities of the Danube. The Porte now declared war against Rus., and when the Rus. army proved superior to the Tur., Fr. and Eng. formed an alliance with the Porte in the spring of 1854, and attacked Rus. in the Baltic and in the Crimea. The war ended by the Peace of Paris (Mar. 30, 1856), according to which the Black Sea was to be open to merchant vessels, but closed to vessels of war; the Danubian principalities were to pay tribute to the Porte and to be under the protectorate of the great powers of Europe; the lower course of the Danube to be again placed under the authority of the Porte, etc. In spite of the protests of the Porte, Moldavia and Wallachia united in 1857 into one state, Romania, which since 1866 has been governed by a prince of Hohenzollern. The revolution in Crete beginning in 1866 lasted several yrs. With Egypt T. has had a continual series of conflicts. June 25, 1861, Abd-ul-Medshid was succeeded by Abd-ul-Aziz, who was as incapable a ruler as the former. The differences with Gr., caused by the revolution in Crete, were adjusted by the Conference of Paris in 1869, but the khedive of Egypt obtained in 1872 the right of increasing his army and fleet and of making independent loans, and in 1873 he was made perfectly independent with respect to the whole internal administration. During the Franco-Ger. war (on Oct. 31, 1870) Rus. threw off the treaty of 1856, and the insurrection which broke out in the N. provs., Bosnia and Herzegovina, in 1874, was evidently encouraged by her. On May 20, 1876, a revolution took place at Constantinople. Abd-ul-Aziz was deposed, and Murad V. proclaimed sultan. Aug. 31, 1876, Murad V. was also deposed, and Abd-ul-Hamid II. was proclaimed the ruler of T. By the treaty of San Stefano T. ceded to Rus. the Dobruja, which was to be given to Romania in exchange for Bessarabia, and a tract of Asiatic terr. ranging from Makrialos on the Black Sea to a point S. of Bayazid on the Per. frontier, comprising about 10,000 sq. m., and including the port of Batoum and the fortresses of Kars and Ardahan. Large tracts of Tur. terr. were ceded also to Servia, Montenegro, and Romania, but the heaviest blow to the Tur. empire was dealt by the establishment of an independent Bulgaria, extending from the Danube on the N. to the Egean on the S., and from Servia on the W. to the Black Sea on the E. In the arrangements, however, the treaty of Berlin (July 13, 1878) made considerable modifications. Batoum was declared a free port, and the dist. of Bayazid was restored to T. The new state of Bulgaria was much curtailed, that part of its terr. which is situated S. of the Balkan range being formed into a separate semi-independent state, E. Roumella, under a Chr. prince chosen and confirmed by the Sultan. But at the same time Bosnia and Herzegovina were placed under Aus. occupation, and a regulation of the frontier between T. and Gr. was promised. This regulation was finally settled, under pressure of the great powers, June 14, 1881, and a large addition of terr., detached from the Tur. prov. of Albania, was given to Gr. The area of this terr. is about 5160 sq. m., and the pop. 293,000. [From orig. art. in *J.'s Univ. Cyc.*, by AUGUST NIEMANN.]

**Turkey-Buzzard** (*Cathartes aura*), a vulture so called from its close resemblance to the common turkey. It mostly inhabits N. Amer., but is sometimes found in Jamaica, where it is called the John crow. It is about 2½ ft. long, and 6 ft. between the tips of the wings. The general color of the plumage is black mingled with brown. T.-B. as scavengers are of much service to man, devouring all refuse substances that are injurious to health. Another species, *Cathartes atratus*, commonly known as the carrion crow or black vulture, is smaller than the above, and is found in the S. States.

**Turkey Stone.** See HONE.

**Turkish Language and Literature.** The T. lang. belongs to the Ural-Altai or Scythian or Turanian group, and is allied to the Finno-Hungarian, Samojedic, Tungusian, and Mongolian langs. It is spoken in various dialects over a vast tract of land stretching from the Lena across Central Asia, Asia Minor, and the Balkan peninsula to the Adriatic. Several of these dialects, or rather branches, of the primitive stock-lang. have obtained a literary development, such as the Uigur, the Jagatali, and the Osmanli. Best known is the Osmanli, spoken at present throughout the whole T. empire in Europe, Asia, and Afr., and much used both in lit. and in political and commercial business. It is much mixed with respect to its materials, half of its words being either Per. or Arabian. Its gram., however, is strictly T. It is generally written with Arabic letters; sometimes, however, Armenian characters are used.

The T. lit. is rich, but not very original. Much of what it contains is translation or imitation. Lyrical poetry flourished among the Turks even before the establishment of their empire in Europe, and the most prominent poet of that period is Mohammed Tschelebi, whose romantic epics and mystical lyrics are still highly appreciated. The golden age









MEDITERRANEAN SEA

TRIPOLI

EGYPT

CAIRO

LIBYAN DESERT





# TURKEY AND GREECE

Drawn and Engraved on Copper-Plate  
EXPRESSLY  
FOR  
JOHNSON'S UNIVERSAL CYCLOPEDIA

Scale of Miles  
0 50 100 150 200







of T. poetry was the times of Solymán the Magnificent, when Faslî (d. 1563) and Bâkî (d. 1600) wrote. The former is the author of the celebrated poem, *Gül ü Bulbul* ("The Rose and the Nightingale"). Of great importance among the numerous historical productions are the annals of the empire from its establishment to the end of the 18th century, commenced by Saad-ed-din, and continued by Naima (1591-1659), Reschid (1660-1721), Tschelbisade (1721-37), Sami (1730-43), Issi (1744-52), and Wasîf (1752-73). Particularly interesting are the so called *Fetwas*, judicial decisions of entangled juridical cases, of which there are several collections, giving a vivid picture of the life of the people and of the peculiar connection between their religion and its legislation. (See *Geschichte der Osmanische Dichtkunst*, by Hammer.)

**Turkistan.** See TURKESTAN.

**Turkomsans, or Toorkomans.** See TURKESTAN.

**Turks** is the name of the prin. branch of the Turanian family, allied to the Magyars and Finns in Europe, to the Samoyeds in N. Asia, and to the Mongols and Mantchoos in China. As a continuous people they inhabit the central part of Asia, from the N. frontier of Persia and Thibet to about lat. 59° N. in Siberia, and from Lake Baikal to the Caspian Sea; as a scattered pop. they are found in India, China, Siberia, S. Russia, Egypt, Asia Minor, and European Tur. They consist of many different tribes.

**Turk's and Calicos Islands,** a former Brit. colony, annexed in Jan. 1874 to Jamaica. These islands constitute the S. E. portion of the Bahama chain. They lie between 21° and 25° N. lat. and 71° and 73° 30' W. lon. Until 1848 they were included in the Bahama colony, and from that time till 1874 had a separate govt., though attached to Jamaica. The Calicos Islands, the most north-westerly, are the largest, but the least important. The only export is salt, which is largely sent to the U. S. The quality of the salt is very good, but all W. I. and Yucatan salt is known in the market as T. I. salt. Pop. 423.

**Turmeric** (*Curcuma*), the root of *Amomum curcuma*, a native of the E. I. and Cochinchina. It contains a volatile oil, a yellow coloring-matter (*curcumin*), starch, cellulose, gum, and a brownish dye. T. is used in the dyeing of silk and wool, and is extensively employed in pharmacy for coloring ointments, etc.

**Turnbull** (ROBERT), D. D., b. at Whiteburn, Scot., Sept. 10, 1809, grad. at Glasgow Univ.; was for some yrs. a Bap. preacher in Eng. and Scot.; settled in Danbury, Conn., 1833, at Detroit, Mich., 1835, at Hartford, Conn., 1837, at Boston, Mass., 1839, and was from 1845 pastor of the First Bap. ch. at Hartford. Author of *Theophany, or the Manifestation of God in Christ; Christ in Hist., or the Central Power, and Life Pictures*. D. Nov. 20, 1877.

**Turnbull** (ROBERT JAMES), b. at N. Smyrna, Fla., in Jan. 1775, was ed. in Eng., studied law in Charleston and Phila., and practised at Charleston until 1810, when he devoted himself to the care of his residence on his large plantation; became a leader of the nullification party; was prominent in the free-trade conventions at Columbia and Charleston 1831, and at the S. C. nullification convention of Nov. 1832, which adopted from his pen an address to the people. A collection of his articles called *The Crisis* became the textbook of the nullification party. D. June 15, 1833.

**Turnbull** (WILLIAM), b. in Md. 1800, grad. at the U. S. Military Acad. July 1819, served on topographical duty until 1831, in which yr. he was transferred to the corps of topographical engineers with rank of capt.; major 1838; was chief topographical engineer in construction of the Potomac aqueduct 1832-43. He was in charge of improvement of lake harbors 1843-46. In the war with Mex. he served as chief topographical engineer of Gen. Scott's army, from Vera Cruz to the City of Mex. In 1848-49 he superintended the construction of the New Orleans custom-house; engaged in the study of the question of bridging the Susquehanna at Havre de Grace, and expediency of an additional canal around the Falls of the Ohio 1852; on light-house duty and in charge of the improvement of Cape Fear River, N. C., at the time of his death, Dec. 9, 1857.

**Turner** (JOSEPH MALLORD WILLIAM), R. A., b. at Covent Garden, Lond., Eng., Apr. 23, 1775. When only 12 yrs. of age he exhibited 2 drawings at the Royal Acad.; was an assiduous student there for 10 yrs. from 1789, exhibiting no less than 59 pictures, all in water-colors; acquired wonderful skill in marine scenery; was in 1799 chosen an associate of the Royal Acad.; exhibited during the 2 following yrs. 14 pictures; was chosen an academician 1802, being already recognized as the first landscape-painter of his time; gave his attention thenceforth to oil-painting; was chosen in 1807 prof. of perspective at the Royal Acad.; pub. in 1808 his famous *Liber Studiorum*, a series of plates from original designs, many of which were engraved by his own hand, and which avowedly challenged comparison with the *Liber Veritatis* of Claude Lorraine, the artist whom he most admired and imitated; began about 1815 to strike out a style of his own, chiefly marked by wonderful accuracy in reproducing the phenomena of nature and by great skill as a colorist; exhibited at the Academy no fewer than 250 pictures, most of which he refused to sell at any price, and maintained nearly equal celebrity in another branch of his art by the exquisite finish of the drawings and the engraved designs which he furnished to such works as Dr. Whitaker's *History of Richmondshire*, to illustrated editions of the *Poems* of Rogers, Byron, and Scott, or pub. in several series *The Scenery of the S. Coast, Eng. and Wales, The Rivers of Eng., The Rivers of Fr., etc.* and resided for several yrs. at Chelsea, where he d. Dec. 19, 1851.

**Turner** (SAMUEL HULBEART), D. D., b. at Phila. Jan. 23, 1790, grad. at the Univ. of Pa. 1807; was ordained deacon in the P. E. Ch. 1811, and priest in 1814; was pastor of a ch. at Chestertown, Md., 1812-17; was elected prof. of historic theol. in the Gen. Epis. Sem., New York, Oct. 8, 1818; removed with that inst. to New Haven, Conn., 1820, and returned with it in 1821 to New York, where it was com-

bined with the New York Diocesan Sem. under the title of the Gen. Theological Sem., in which he was prof. of biblical learning and interpretation of Script. from Dec. 19, 1821, to his death, and also prof. of Heb. in Columbia Coll. from 1831. Author of *Biographical Notices of Distinguished Jewish Rabbis, Thoughts on the Origin, Character, and Interpretation of Scripture Prophecy, Teachings of the Master, etc.*; edited in Gr. and Eng., with analytical and exegetical commentaries, the Epistles to the Hebrews, to the Romans, and to the Ephesians. D. Dec. 21, 1861.

**Turner** (WILLIAM WADDEEN), b. in Lond. in 1810, came to the U. S. 1818; became distinguished for his attainments in modern and Oriental langs.; was successively librarian to the Univ. of New York and instructor in Heb. in Union Theological Sem. 1842-52; assisted Dr. Isaac Nordheimer in the preparation of his Heb. manuals; contributed to Bartlett's *Dict. of Americanisms*; superintended the publication of Dr. S. R. Riggs's *Dakota Gram. and Dict.* and other linguistic works issued by the Smithsonian Inst.; contributed to Ludewig's *Lit. of Amer. Aboriginal Langs.*, to the *Transactions* of the Amer. Ethnological and Oriental societies, etc.; was for several yrs. recording sec. of the National Institute for the Promotion of Science, and librarian of the U. S. patent office from 1852 to his death, Nov. 29, 1859.

**Turner's Falls,** R. R. junc., Franklin co., Mass., on Conn. River, has extensive manufactures of paper, cutlery, etc. Pop. not given in census of 1880.

**Turnip** [*O. Gen. turnep*], a biennial plant, abundantly cultivated throughout the N. temperate zone, having a swollen fleshy root of great value as food for man, and more especially for cattle. It is of the same genus (*Brassica*) as MUSTARD and of the same species (*B. campestris*) as RAPE (which see), is found growing wild as a weed in Europe and N. Asia, and is largely cultivated both as a field and as a garden crop, sometimes reaching 20 or 25 lbs. The most valuable kinds are the Swe. or Rus. T., usually called ruta-bagas, of which there are numerous varieties. T., when grown in gardens, must be sown early in spongy soil; when raised in the field, they are sown much later, and thrive best in moist cloudy weather. The leading varieties are, in Eng., the white Dutch, white Fr., sweet Ger., and Teltow; in the U. S., the improved Amer. and Carter's and Laing's ruta-bagas.

**Turnip-Fly**, a name common to several insects destructive to turnips. The most common is the small chrysomelid beetle called also turnip-flea (*Altica* or *Haltica nemorum*), from its prodigious leaping powers, a species having an oval body and wide head, long and strong hind legs, large black wings with 2 yellowish stripes, and claws notched and hooked to enable it to keep firm hold of the cruciferous vegetables which constitute its food. It eats the leaves of the turnip as soon as they appear above ground in the spring, and lays its eggs on the under side of the leaves later in the season.

**Turn'spit**, a dog employed for turning the spit upon which meat is roasted. The T. is a very intelligent dog, with a long body, short and often crooked legs, long and pendulous ears, and a very large head. It has a dash of greyhound blood. The dog stands in a kind of tread-mill, his weight giving motion to the spit.

**Turn'stone** [so called from its habit of overturning stones in search of food], the *Streptopelia interpres*, a wading bird allied to the plovers, and common on the shores of the U. S. and in nearly all parts of the world.

**Turpentine**, a term applied to certain vegetable oleoresins which exude from coniferous trees, also to the resin obtained from the *Pistacia terebinthus*. They are obtained by making an excavation, having a capacity of about 3 pints, in the trunk of the tree, in which the exuded juice accumulates; which is collected, washed with warm water, and purified by straining through straw filters. The several varieties of T. are viscid solutions of resin in a volatile oil.

*Oil of turpentine* (*spirits of turpentine*) is obtained by the distillation of crude T., each variety of the crude product furnishing a distinct volatile oil. They all form colorless, mobile liquids of a peculiar disagreeable odor, are insoluble in water, but dissolve in alcohol, ether, and in bisulphide of carbon. The oils of T. are solvents of many resins and oils, of caoutchouc, and of iodine, sulphur, and phosphorus. The chief differences exhibited by the various varieties are in specific gravity, boiling-point, and optical rotatory power. A numerous variety of seeds and fruits yield by distillation oils isomeric or polymeric with those of T.; these have received the generic name of *camphenes* or *terebenes*. T. is sometimes applied externally in med. in the shape of salves and plasters; it is also taken internally in the form of pills. The oils of T. are extensively used in the preparation of varnishes, and to some extent in med. as stimulants, diuretics, and anthelmintics.

**Turpin**, or **Tylinus**, abp. of Rheims (d. Sept. 2, 800), was the reputed author of a Lat. chronicle relating the campaigns of Charlemagne against the Saracens in Sp. The book was declared authentic by Pope Calixtus II. in 1122. Many interior features indicate that the work was produced in the 12th century, perhaps by Pope Calixtus II. himself.

**Turquoise.** See PRECIOS STONES.

**Turtle.** See CHELONIANS.

**Turtle, or Turtle-Dove**, a name applied to several small pigeons, especially those of the genus *Turtur*. The *T. auratus*, or common European T., is a migratory bird, famed for its gentleness, its strong conjugal affection, and its loud but soft cooing note. The T. or mourning dove of the U. S. is the *Zenaidura carolinensis*, whose gentle and mournful note is well known. It is 13 inches in length, and has a remarkably long tail.

**Tuscaloosa**, city, on R. R. cap. of Tuscaloosa co., Ala., at the head of navigation on Warrior River, contains Ala. Univ., Tuscaloosa Female Coll., Ala. Central Female Coll., Ursuline convent, and the State insane asylum. Pop. 1870, 1689; 1880, 2418.



**Tuscan Order of Architecture** is generally regarded as a Rom. simplification of the Doric style, having unfluted columns and no triglyphs. It seems, however, to have been Etruscan rather than Rom. The general effect is low and heavy.

**Tuscany**, formerly an independent grand duchy of It., was between duchies of Parma and Modena, Papal States, and Tyrrhenian Sea, and had an area of 8886 sq. m. Its terr. corresponded nearly to that of the anc. Etruria.

**Tuscara'ra**, Elko co., Nev. Pop. 1880, 1364.

**Tuscola**, city and R. R. junc., cap. of Douglas co., Ill. Pop. pt. 1870, 2863; 1880, 2806, including 1457 in city.

**Tuscumbia**, Ala. See APPENDIX.

**Tuttle** (CHARLES WESLEY), b. at Newfield, Me., Nov. 1, 1829, was assistant observer at the Cambridge Observatory 1850-54; discovered a telescopic comet 1853; was a member of U. S. expedition to determine difference of lon. between Greenwich and Cambridge 1854-55; studied law at Cambridge law school, and was admitted to Suffolk bar 1856; has contributed to the *Astronomical Journal* and to the *Annals of Harvard Observatory*, etc.

**Tuttle** (DANIEL SILVESTER), D. D., b. at Windham, Greene co., N. Y., Jan. 26, 1837, grad. at Columbia Coll. in 1857; studied theol. in the Gen. Theological Sem. in New York; entered holy orders, and in 1866 was elected bp. of Mont., having jurisdiction in Id. and Ut.; was consecrated in 1867.

**Tutuila**, one of the Samoan or Navigators' Islands, affords several excellent harbors, of which that of Pangopango, on the S. side, is the best. By an arrangement between the native chiefs and Com. Meade this harbor was offered to the U. S. as a coaling-station in 1872, and in the following yr. a special agent was sent by the Amer. govt. to negotiate the extension of the protectorate over all the islands; but in 1875 a native king was elected, and the special Amer. agent was made prime minister.

**Tweed** (WILLIAM MARCY), b. in New York Apr. 3, 1823; in 1850 was elected alderman from the Seventh ward; in 1853 was elected to Cong.; was school com. of the Seventh ward 1857-59; became a member of the board of supervisors of New York co. 1859, and 4 times its pres.; in 1863 deputy street com.; in 1867 State senator, re-elected in 1869; was for many yrs. a member of the Tammany Society, of which he was grand sachem 1869-71. His appointment as deputy street com. in 1863 may be said to date the foundation of the famous Tammany Ring, of which he was the chief spirit; he became the virtual head of the dept. of public works, and by extending enormously the expenditures for public improvements acquired vast political influence and began to accumulate a fortune. The Ring gradually grew in power and influence till 1868, and at the opening of 1869 was master of nearly every department of the State government; T.'s positions gave him unsurpassed political influence; he openly boasted that he was worth \$20,000,000. In 1868 the Ring's greatest scheme of robbery, the building of a new c.-h., was planned. In 1870 a new charter was passed by the legislature placing the power of auditing in a board of audit composed of the mayor, the controller, the com. of parks, and the com. of public works. Schemes of plunder were now organized on a grand scale. Several contractors for work on the new c.-h. were directed to make out claims against the co. for all manner of imaginary services; these fraudulent bills, amounting to \$6,000,000, were passed by the board of audit at its first and only meeting; of this amount, over \$1,000,000 were traced to T.'s private pocket. Instead of meeting again, the board illegally delegated the power of auditing to Auditor Watson, and signed the bills separately, without meeting as a board. Of the whole amount of money paid in this way, the Ring received 65 per cent.; T.'s share was usually 25 per cent. A secret account of the money thus paid was kept in the auditor's office under the title "County Liabilities." During the winter of 1870-71 a clerk employed in the auditor's office copied by stealth the items in this account and gave them to his patron, James O'Brien, who pub. them in the N. Y. *Times* in July 1871. The excitement created thereby started a popular uprising which resulted in the complete overthrow of the Ring in the elections of Nov. 1871. On Feb. 10, 1872, T. was indicted by the grand jury for forgery and grand larceny; he was sentenced on Nov. 22 to 12 yrs.' imprisonment in the penitentiary and to pay a fine of \$12,300.18, one yr. for each of 12 counts in the indictment, and a fine of \$250 each for 39 other counts; he remained in the penitentiary on Blackwell's Island till June 16, 1875, when he was released by a decision of the court of appeals. A new warrant was immediately issued against him, and on Mar. 8 \$6,537.117.38. D. in a verdict for damages amounting to \$6,537.117.38. D. in Ludlow st. Jail, N. Y., Apr. 12, 1878.

**Tweeddale** (GEORGE HAY), MARQUIS OF, b. Feb. 1, 1787, succeeded his father, the eighth marquis, in the peerage in 1804. During the peninsular war he served as assistant quartermaster-gen. on the staff of the duke of Wellington, and was wounded at Vittoria and at Busaco. He also served in the war of 1812-15 between G. Brit. and Amer., when again wounded. Was gov. and commander-in-chief of Madras 1842-46. In 1867 he was made a field-marshal in the Brit. army. In 1867 he was made a knight grand cross of the order of the Bath. D. Oct. 10, 1876.

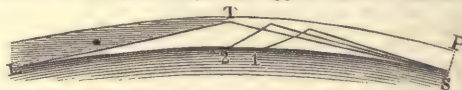
**Twelfth Day and Twelfth Night**. See EPIPHANY.

**Twes'ten** (AUGUST DEVLEY CHRISTIAN), D. D., b. in Glückstadt Apr. 11, 1789, studied at Kiel and Berlin; prof. of philos. and theol. at Kiel from 1814; called to Berlin in 1835 to fill the theological chair of the great Schleiermacher, which position he occupied till his death, Jan. 8, 1876. He was a pupil and admirer of Schleiermacher, but more positive an orthodox. He wrote *Lectures on Chr. Dogmatics*, *Logik*, *Matthias Flacius*, etc.

**Twiggs** (DAVID EMANUEL), b. in Richmond co., Ga., 1790, was appointed capt. in the 8th Inf. in 1812, major 28th Inf. Sept. 21, 1814, and served throughout the war with G. Brit.; was retained in the peace organization of the

army in 1815 as capt. 7th Inf., 1st Inf. 1822, major May 14, 1823, lieutenant-col. 4th Inf. 1831, col. 2d Dragoons June 1836. In the war with Mex. he served in command of the right wing of the army under Gen. Taylor at Palo Alto and Resaca de la Palma; was promoted to brig.-gen. June 30, 1846. Transferred to Gen. Scott's army, he commanded a brigade before Vera Cruz, and during subsequent operations resulting in the capture of the city of Mex. was in command of the 2d division of regulars; military gov. of Vera Cruz 1848. In Feb. 1861, being in command of the dept. of Texas, he surrendered his army to Gen. McCulloch of the Confed. service, for which he was dismissed from the service of the U. S. Mar. 1; he was soon afterward appointed a maj.-gen. in the Confed. army, and commanded for a while at New Orleans, D. Sept. 15, 1862.

**Twilight** (Sax. *twecleht*; Ger. *Zwielicht*), the light which by its increasing brightness foretokens the rising of the sun in the morning, and which lingers after sunset, becoming fainter and fainter until it disappears as veritable night comes on. The morning T. in the Lat. is distinguished by the term *aurora*, while the evening T. is called *crepusculum*—terms which, with the usual modification, are retained in the Fr. But the cause is in both cases the same, and the explanation is perfect which refers T. to the reflection and refraction of the sun's light by that portion of the atmosphere which is still illuminated by the sun's rays after he has set to us, or a similar portion on which he shines before he rises to us in the morning. Thus, let S T P (in figure) represent the upper portion of a nearly lenticular section of the atmosphere which is illuminated by the sun's rays in the evening after he has set to an observer at 1 or 2, etc., or L. Then the direction of the rays from S toward T will be somewhat bent from the perpendicular S T as the light passes from the low and dense to the upper and rarer portions of the atmosphere. This light is moreover reflected wherever notable variety of density is found among the various atmospheric strata. And thus (bent a little downward by refraction) the reflected light reaches the observers stationed respectively at 1, 2, etc., until at last it is only the light from the mere edge of the lenticular illuminated portion S P T, and that in the high region at T, that reaches the observer at L. Vapor in solution or partially condensed may sometimes aid the reflection of the light. All this will require that T. immediately after sunset should be comparatively very bright and broadly extensive along the horizon, as the light then, on the hypothesis here discussed,



will come from the broad and dense part of the lenticular segment S T P. Afterward the T. ought rapidly to fade and appear narrower, until at length a mere faint line of light be left visible along the horizon. Before sunrise the same varieties must occur, but in inverse order. All this is precisely consonant with fact. The explanation, therefore, as heretofore intimated, is perfect.

The theoretical explanation of T. is then consistent in its circumstances with fact: one of these circumstances should, however, be more completely exhibited. As, on the one side, the angle of incidence with the plumb-line extended to T is equal to the angle of reflection on the other side, and the reflected ray from these proceeding downward through the atmosphere becomes thus the inversion of the incident ray in its whole course upward, the symmetry thus introduced will require that the reflected ray when it reaches the surface at L, should be a tangent to the surface there, and so at right angles to the plumb-line there, the earth being supposed to be a perfect sphere—a supposition quite sufficiently near to accuracy for our purpose. All this, moreover, will indicate that we shall have two equal right-angled triangles extending to the centre of the earth, with their right angles at S and L respectively. And so the plumb-line extended from the centre to T will bisect the arc S L. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. S. ALEXANDER, LL.D.]

**Twilight Bow**. This is a phenomenon in some measure resembling a widely expanded rainbow; the conspicuous colors, however, are only the red and the blue; and it is often the most conspicuous when the weather is uncommonly clear and serene. The middle of the T. B., like that of the rainbow when complete, is directly opposite to the sun, and the whole phenomenon is most conspicuous in the evening at the very time of sunset, and in the morning just at sunrise.

**Twining** (ALEXANDER CATLIN), LL.D., b. at New Haven, Conn., July 5, 1801, grad. at Yale Coll. in 1820; was tutor at Yale 1824-26; prof. of math. and natural philos. at Middlebury Coll. 1828-49; has been C. E. on various canals and R. Rs., and invented the first practical method of producing ice by artificial means in commercial quantities.

**Twiss** (HORACE), K. C., b. in Eng. in 1786, was called to the bar at the Inner Temple; sat in Parl. 1820-32 and 1835-37; favored R. Cath. emancipation and law reform, but opposed the parliamentary reform bill; K. C. 1827, council for the admiralty, judge-advocate under Lord Liverpool, and under-sec. for the colonies 1828; wrote leaders and parliamentary summaries for the *Times*, and contributed to other periodicals; vice-chancellor of the duchy of Lancaster 1844. D. May 4, 1849.

**Twiss** (SIR TRAVERS), D. C. L., F. R. S., b. in Westminster, Lond., about 1810, grad. at Univ. Coll., Ox., 1830; prof. of political economy in the Univ. of Ox. 1842-47, of international law in King's Coll., Lond., 1852-55, and regius prof. of civil law at Ox. 1855-70; admitted an advocate in Doctors' Commons 1840; commissary-gen. of city and diocese of Canterbury 1849, vicar-gen. of abb. of Canterbury 1852, chancellor of diocese of Lond. 1858, advocate-gen. Aug. 1867; knighted



Nov. 1867. In 1872 resigned all his appointments. Wrote *Progress of Political Economy in Europe since the Sixteenth Century*. Letters Apostolic of Pope Pius IX., with reference to the Law of Eng. and the Law of Europe, etc.

**Tybee Island**, in Chatham co., Ga., lies off the entrance to Savannah River. The island is 6 m. long and 3 wide, and is separated from the other coast-lands by Lazaretto Creek. At its N. E. end stands Tybee light-house. T. I. has become historic as the site of the batteries by which Gen. Gillmore breached Ft. Pulaski on Cockspur Island, Apr. 11, 1862.

**Tyche**. See FORTUNA.

**Tycho Brahe**. See BRAHE.

**Tycoon**, the title of the hereditary military ruler of Japan, once considered as emp. The office has been abolished since the revolution in favor of the mikado or "spiritual ruler." The T. held their court at Yedo (now Tokio), and were the highest authorities known to foreigners. The treaties which opened Japan to foreign commerce and residence were negotiated with the T.

**Tyler**, R. R. junc., cap. of Smith co., Tex., 270 m. N. of Galveston, has 2 acads. The U. S. dist. and circuit courts and State supreme court hold sessions here twice each yr. Pop. not given in census of 1880.

**Tyler** (BENNETT), D. D., b. at Middlebury, Conn., July 10, 1783, grad. at Yale Coll. 1804; studied theol.; was pastor of the Congl. ch. at S. Britain, Conn., 1808-22, pres. of Dartmouth Coll. 1822-28, and pastor of the Second Congl. ch. at Portland, Me., 1828-33; was the leader of the opposition to the theological views taught at Yale Theological Sem. known as the "New Divinity," and in 1834 became pres. and prof. of Chr. theol. at the new sem. founded at E. Windsor, Conn., by the "Pastoral Union" of chs. in Conn.—a post he retained until his death, May 14, 1858. Author of *A History of the New Haven Theol.*, in Letters to a Clergyman; *The Sufferings of Christ confined to his Human Nature*, *The Doctrine of Perseverance of the Saints*, *The N. Eng. Revivals*, etc.

**Tyler** (DANIEL), b. in Brooklyn, Conn., Feb. 22, 1799, grad. at W. Pt. July 1819, when commissioned second lieut. light artil.; retained in the 5th Inf. June 1, 1821; transferred to 1st Artil. June 12, 1821; served at the artil. school of practice 1824-27, on ordnance duty 1830-34; resigned from the army May 31, 1834, and became a C. E., being pres. and constructing engineer of various R. Rs. until the c. war, when appointed (Apr. 23, 1861) col. 1st Conn. Volunteers, which regiment he led to Wash., and the next month was appointed brig.-gen. of Conn. Volunteers, and in command of division at the action of Blackburn's Ford July 18, and battle of Bull Run July 21. Mustered out Aug. 11, 1861. Re-appointed brig.-gen. U. S. volunteers Mar. 13, 1862. Resigned Apr. 6, 1864. D. Nov. 30, 1882.

**Tyler** (JOHN), 10th Pres. of the U. S., b. in Charles City co., Va., Mar. 29, 1790, son of Judge John (1748-1819), who was gov. of Va. 1808-11, grad. at William and Mary Coll. 1806; studied law; was admitted to the bar 1809; was a member of the State legislature 1811-16 and 1825-28, and a C. E. 1816-21; was gov. of Va. 1825-27, U. S. Senator 1827-36; opposed the administration of Adams and the tariff bill of 1832; made a 3-days' speech against a protective and in favor of a revenue tariff 1832; sympathized with the nullification measures of S. C. in that yr.; voted for Clay's Compromise bill; resigned his seat in the Senate Feb. 1836; took up his residence at Williamsburg; was regarded as a martyr to the Whig cause, and was in consequence supported in the campaign of 1836 for the Vice-Presidency by many Whigs; sat in the Va. legislature as a Whig 1839-40; was a member of the national Whig convention which met at Harrisburg, Pa., Dec. 4, 1839, by which he was nominated for the Vice-Presidency on the ticket headed by Gen. Harrison; was elected V.-P. Nov. 1840, inaugurated Mar. 4, 1841; succeeded to the Presidency on the death of his predecessor Apr. 4; retained in office a large number of Dems., filling their places with Whigs; convoked Cong. to an extra session May 31, 1841; expressed in a message his approval of the establishment of a national bank; instructed his sec. of the treas., Hon. Thomas Ewing, to submit to Cong., in response to a joint resolution, a bill for the incorporation of a "fiscal bank of the U. S.," which was passed Aug. 6; returned that bill without his approval on account of an amendment concerning branch banks, which in his veto message he pronounced to be unconstitutional; incurred thereby the resentment of the Whigs throughout the country, who accused him of desertion of their principles; was abandoned by the members of his cabinet (with the exception of Daniel Webster); filled their places with reputed Whigs, but did not satisfy the Whig members of Cong., who pub. a manifesto Sept. 13 breaking off political relations; was abandoned by Mr. Webster in the following yr. as soon as the delicate negotiations with G. Brit. concerning the N. E. boundary were terminated by the Ashburton Treaty (Aug. 9, 1842); reorganized his cabinet by the admission of 3 Dems. (July 12, 1844), which was rejected by the Senate, but effected his object in the closing days of his administration by the passage of the joint resolutions of Mar. 1, 1845; was nominated for the Presidency by an informal Dem. convention held at Baltimore in May 1844, but soon withdrew from the canvass; was succeeded Mar. 4, 1845, by James K. Polk, and lived in almost complete retirement from politics until Feb. 1861, when he was a member of the abortive "peace convention" held at Wash., and was chosen its pres.; renounced soon afterward his allegiance to the U. S., and was elected to the Confed. Cong. D. Jan. 17, 1862.

PORTER C. BLISS.

**Tyler** (MOSES CORN), b. at Griswold, Conn., Aug. 2, 1835, grad. at Yale 1857, at Andover Theological Sem. 1860; was pastor of a Congl. ch. at Poughkeepsie, N. Y., 1860-62; in Eng. 1863-67; was afterward prof. of the Eng. lang. in the Univ. of Mich.; is a popular lecturer and writer, and became prof. of hist. in Cornell Univ. 1881.

**Tyler** (ROBERT OGDEN), b. in Greene co., N. Y., Dec. 22, 1831, grad. at the U. S. Military Acad. July 1, 1853, when commissioned brevet second lieut. of artil.; joined Col. Steptoe's command, which marched from St. Louis to Wash. Terr. 1854-55, T. taking post at San Francisco; engaged in the Yakima (1856) and the Spokane (1858) expeditions. Transferred to Fort Ridgely, Minn., 1859, and New York harbor 1860. Engaged in the c. war on the expedition for relief of Ft. Sumter Apr. 1861; in reopening communications with Washington *via* Baltimore May 1861; as depot quartermaster at Alexandria May-Sept.; as col. of the 4th Conn. Volunteers in the defenses of Wash. until the spring of 1862; in the Va. Peninsular campaign in command of siege batteries before Yorktown; in battles of Hanover C.-H., Gaines's Mill, and Malvern Hill. Promoted to brig.-gen. of volunteers Nov. 29, 1862, and engaged in the battle of Fredericksburg, Dec. 13; at Chancellorsville, Gettysburg, and subsequent operations, until Jan. 1864; covered Wash. and lines of communications of the Army of the Potomac, Jan.-May 1864; took part in the Richmond campaign of 1864, from the Wilderness battles to Cold Harbor, where severely wounded June 1, and disabled for further duty in the field. Commanded various depts. Dec. 1864-June 1866, when resumed quartermaster duty, in which dept. he became lieut.-col. and deputy quartermaster-gen. July 1866. D. Dec. 1, 1874.

**Tyler** (ROYALL), b. at Boston, Mass., July 18, 1757, grad. at Harvard 1776; studied law under John Adams; was for a short time during the war of the Revolution aide to Gen. Lincoln, which post he also filled during the Shays rebellion 1786; settled at Guilford, Vt., 1790; was judge of the Vt. supreme court 1794-1800, and chief-justice 1800-06; pub. *Reports of Cases in the Supreme Court of Vt.* He was one of the earliest Amer. dramatists, had a high reputation as a wit, and was quite successful in the introduction in comedy of Yankee dialect and of humorous stories. D. Aug. 16, 1826.

**Tyler** (SAMUEL), LL.D., b. in Prince George's co., Md., Oct. 22, 1806, acquired an unusually extensive acquaintance with Gr.; grad. at Middlebury Coll., Vt., 1827; studied law; admitted in 1831 to the bar at Frederick City; in 1850 appointed a com. to simplify the pleadings and practice in all the courts of the State, and prepared a highly esteemed *Report*; resided for some yrs. in Wash., D. C.; was connected as prof. with the law dept. of the Columbian Univ.; wrote chiefly on metaphysics. Wrote *A Discourse on the Baconian Philos.*, *Burns as a Poet and as a Man*, *The Progress of Philos. in the Past and in the Future*. D. Dec. 15, 1877.

**Tyler** (WILLIAM SEYMOUR), D. D., b. at Hartford, Pa., Sept. 2, 1810, grad. at Amherst Coll. 1830; taught classics in Amherst Acad. 1830-31; was tutor in Amherst Coll. 1832-34; studied theology for 2 years at Andover Seminary; was in 1836 licensed to preach by the third presbytery of New York, but not ordained until many yrs. later (1858), in consequence of his acceptance of the professorship of Gr. and Lat. at Amherst Coll.; became Graves prof. of Gr. (1847) on the division of the professorial chair. He has pub. *Memoir of Rev. Henry Lobdell, M. D., Missionary at Mosul, Plato's Apology and Crito, The Theol. of the Gr. Poets, The Hist. of Amherst Coll.*, etc.

**Tyler** (EDWARD BURNETT), LL.D., F. R. S., b. at Camberwell, Lond., Eng., Oct. 2, 1832, ed. at the Quaker school at Grove House, Tottenham; devoted himself to ethnological and antiquarian researches, in furtherance of which he visited Mex. in 1860, and has been one of the founders of the new science sometimes called "comparative ethnology" (Gr. *ethos*, "a custom"). Author of *Anahuac, or Mexico and the Mexicans, Ancient and Modern*; *Researches into the Early Hist. of Mankind and Development of Civilization*, *Primitive Culture, Researches into the Development of Mythology, Philosophy, Religion, Art, and Customs*, etc.

**Tyndale**, or **Tindale** (WILLIAM), b. at Hunt's Court, N. Nibley, Gloucestershire, Eng., about 1484, studied at Magdalen Hall, and afterward at Christ Church, Ox.; took orders in the Ch. of Eng.; was cited before the chancellor of the diocese of Worcester 1522, on account of his advocacy of the doctrines of Luther; translated into Eng. the *Enchiridion Militis, or Soldier's Manual*, of Erasmus; went to Lond. 1523, to Hamburg Jan. 1524; resided there nearly a yr., and translated the N. T. into Eng., of which the latter part of the edition was bought up by Tunstall, bp. of Lond., who burned them at Cheapside 1529; removed to Marburg, and pub. there his *Obedience of a Christian Man* (1528); had an interview with Coverdale at Hamburg; pub. his translation of the Pentateuch, "emprinted at Marlbrow [Marburg] in the Land of Hesse," 1530; had a bitter controversy with Sir Thomas More, who in a witty and abusive pamphlet denounced the translation and its author 1530-31; brought out a revised and corrected edition, the first to which he put his name, 1534; wrote several doctrinal treatises and introductions, expositions, and notes to various books of the Bible; resided during his later yrs. at Antwerp; was arrested 1535 on a charge of heresy through the agency of an emissary of Henry VIII. acting in concert with the clergy and magistrates of Brussels; imprisoned in a castle at Vilvoorden, Brabant; tried by virtue of a decree of Charles V., issued 1530, and the Univ. of Louvain having urged his condemnation, with the eager approval of Henry VIII., he was convicted, and after 18 months' imprisonment was strangled and burned at the stake at Vilvoorden Oct. 6, 1536.

**Tyndall** (JOHN), D. C. L., LL.D., F. R. S., b. at Leighlin Bridge, near Carlow, Ireland, Aug. 21, 1820, became in 1829 "civil assistant" to a division of the Irish ordnance survey; devoted 5 hours a day for 12 yrs. to systematic private studies, chiefly in the direction of natural science; was transferred to the Eng. branch of the ordnance survey, with which he remained until 1844, and received a position as railway engineer, which he filled for 3 yrs.; was teacher of physics 1847-48 in Queenwood Coll., Hampshire; went to Ger., where he attended at Marburg the celebrated lectures on chem. by Bunsen, on physics by Gerling and Knoblauch, and on math. by Stegmann; worked hard in the laboratory



in conjunction with Knoblauch, making discoveries in magnetism and diamagnetism, which he embodied in a paper *On the Magneto-Optic Properties of Crystals, and the Relation of Magnetism and Diamagnetism to Molecular Arrangement*; grad. in 1851, presenting for his degree an inaugural dissertation *On Screw Surfaces* (in Ger.); became a F. R. S., and in 1852 a member of the Brit. Association for the Advancement of Science, and was chosen one of the secs. of its section of physics; was invited in Feb. 1853 to give one of the Friday evening lectures at the Royal Inst.; was elected June 1853 prof. of natural philos. in that inst. and in the govt. school of mines; visited Switz. for the first time 1849; made a second visit, along with Huxley, in 1856, and has since made annual excursions to the Alps, where he distinguished himself by his investigations of the rate of motion of glaciers (1859) by planting thermometric stations on the sides and summit of Mont Blanc, and by scaling for the first time the Weisshorn (1861) and Matterhorn (1868); pub. the result of his observations in the *Philosophical Transactions* (1860), and in 3 vols., *Glaciers of the Alps, Mountaineering in 1861, and Hours of Exercise in the Alps*; communicated from time to time memoirs on the *Influence of Crystalline and Organic Structure upon Magnetism*, and on the *Polarity of the Diamagnetic Forces*, as well as upon radiant heat—a subject which has been the field of the brilliant discoveries described in his lectures at the Royal Inst. in 1862; became the successor of Faraday at the Trinity House 1866, and supt. of the Royal Institution 1867; accompanied to Algeria the expedition sent to observe the solar eclipse of Dec. 1870; visited the U. S. in 1872 on a successful lecturing-tour; has been honored with the Rumford medal of the Royal Society for his discoveries in thermodynamics, and with the doctorate of laws from the univs. of Cambridge (1855), Edinburgh (1866), and Ox. (June 18, 1873), and was pres. of the Brit. Association in its session at Belfast Aug. 1874, when his Address was the occasion of a sharp theological controversy from its enunciation of the last results of the evolution theory. He had already attracted attention some yrs. before by his proposition to submit the question of the efficacy of prayer to a scientific test. His later researches have been chiefly upon acoustics in connection with the Trinity House. He also wrote *Sound, a Course of Eight Lectures*; *Nine Lectures on Light, Essays on the Use and Limit of the Imagination in Science*, etc.

**Tyner** (JAMES N.), b. at Brookville, Ind., Jan. 17, 1826, received an academic education; studied law, which he practised at Peru, Ind.; was sec. of the Ind. senate 1857-61; was chosen a Presidential elector in 1860; was a special agent of the P. O. dept. 1861-66; was a Rep. M. C. 1869-75; was appointed gov. of Col. in 1875, but before taking possession of that post was made second assistant P. M.-gen., and on the resignation of Gov. Jewell in July 1876 succeeded him as P. M.-gen. till Mar. 1877.

**Tyng** (STEPHEN HIGGINSON), D. D., b. at Newburyport, Mass., Mar. 1, 1800, grad. at Harvard 1817; studied theol.; was ordained in the P. E. Ch. 1821; was minister of St. George's, Georgetown, D. C., 1821-23, of a ch. in St. Anne's parish, Md., 1823-29; rector of St. Paul's, Phila., 1829-33, of the ch. of the Epiphany, Phila., 1833-45, and from 1845 to May 1878 of St. George's, New York; edited successively the *Epis. Recorder*, the *Theological Repository*, and the *Prot. Churchman*; is author of *Lectures on the Law and Gospel*, *Forty Years' Experience in Sunday Schools*, *The Prayer-Book Illustrated by Scripture*, etc.—His son, DUDLEY ATKINS, b. in Prince George's co., Md., in 1825, grad. at the Univ. of Pa. 1845; studied theol. at Alexandria Sem.; took orders in the P. E. Ch. 1846; had charge of parishes at Columbus, O., Charleston, Va., and Cin., O., and was rector of the ch. of the Epiphany, Phila., from 1854 until shortly before his death, Apr. 19, 1858. The touching ballad *Stand up for Jesus!* commemorates an incident of his death-bed. Author of *Vital Truth and Deadly Error, Children of the Kingdom, or Lectures on Family Worship*.

**Tyng** (STEPHEN HIGGINSON), Jr., D. D., son of Stephen H., b. at Phila. June 29, 1839, grad. at Williams Coll. 1859; studied theol. at the Va. Epis. Sem.; was ordained deacon May 8, 1861, and priest Sept. 11, 1863; became rector of the church of the Mediator, New York, 1863; went into the army as chaplain of the 12th N. Y. Volunteers 1864; organized the parish of the Holy Trinity, New York, 1865, building on 42d st. a ch. which in 1873-74 was replaced by a large and commodious edifice; was tried in 1867 for a violation of the canon law of his Ch.; edited for some years a weekly religious journal, *The Working Church*; took a prominent part in the revival movement of 1875 directed by Messrs. Moody and Sankey, and in the summer of 1876, with other clergymen, commenced out-door Sunday services for the people in a "gospel tent" erected near his ch. Resigned his rectorship 1881.

**Type-Writers.** See WRITING-MACHINES.

**Typha.** See CAT TAIL.

**Typhoid Fever.** See TYPHUS AND TYPHOID FEVERS.

**Typhon**, the Gr. name of an Egyptian deity called Set, son of Seb or Cronos and Nut or Hannut or Rhea, b. on the third of the intercalary days of the yr., brother of Osiris, Isis, Nephthys, Haroeris, and Anubis. According to the Gr. legend, he was the rival and opponent of his brother Osiris, whom he destroyed. Set afterward represented the principle of evil, as Osiris that of good, in the religion. His worship was of the most remote period, and he is mentioned as early as the 6th dynasty, and in chapters of the ritual possibly older. Set—or Sutech, another name of the god—was also the god of the Aramæan and other nations, such as the Khita, the neighbors and enemies of Egypt, as well as the Shasu or Shepherds, foreigners who invaded the Delta before the 18th dynasty. In the ritual, Set is said to be the god who swallows souls and devours hearts, or Baba, another of his names, who feasts off the wicked; and elsewhere he is said to change into a crocodile to devour Osiris, who changes into an ape, and throughout he is con-

sidered the evil and hostile principle of nature. Human sacrifices are said to have been offered to him at Heliopolis, and were abolished by Amasis I., but men were burned in his honor at Elleithya, for which a red cow is said to have been afterward substituted. In Gr. mythology, Typhon, called Typhæus, was one of the giants, son of Tartarus and Gaia, or a son of Hera, with a hundred serpents' heads vomiting fire, or had a gigantic human shape, with wings at the belly, and like the giants his legs terminated in snakes. He was the father of the dog Orthros, the companion of Geryon, of Cerberus, the Chimera, and even Sphinx according to some legends. He attacked the gods, who flew to Egypt, and when Zeus endeavored to annihilate him with a thunderbolt and *harpe* or falchion, T. hacked him to pieces and hid the sinews of the god. These were restored to Zeus by Hermes or Mercury, and after a fierce contest and pursuit as far as Sicily, Zeus overcame T. and placed him under Mt. Ætna, or, according to other versions, under the earth in Cilicia.

**Typhoons.** See STORMS, by PROF. A. GUYOT.

**Typhus and Typhoid Fevers** (*typhus*, from Gr. τυφος, "stupor"; *typhoid*, from Gr. τυφος, "stupor," and εἶδος, "form"). Typhus is a highly contagious, continued fever, accompanied by marked cerebral derangement. The symptoms are a chill, a congestive febrile movement, delirium, suffused and dusky countenance, heavily coated, dark, and cracked tongue, quick and full pulse at first, afterward becoming feeble. About the fourth day a petechial eruption appears on the chest and abdomen, soon becoming general. It either terminates favorably by a crisis, or death occurs from blood-poisoning or exhaustion. Typhus is engendered by filth and overcrowding, and is transmitted by direct contagion.

*Typhoid* is a mild infectious, continued fever, accompanied by marked abdominal derangement. The symptoms are "general malaise," chill, followed by a persistent diarrhoea of characteristic ochre-colored stools, attended with abdominal pain and tympanitis; a febrile movement, which increases by regular morning and evening fluctuations, reaching its height during the second week. About this time a papular eruption appears in successive crops upon the abdomen and chest. These symptoms are invariably associated with an enlargement and ulceration of "Peyer's patches." The predominance of pulmonary or cerebral symptoms often completely obscures the intestinal lesion. The disease terminates either in a protracted convalescence, or death ensues from exhaustion, intestinal hemorrhage, or perforation of the bowel. It is usually caused by the use of drinking water that has been infected by typhoid fever-germs. It may also result from defective drainage or sewerage, and in some instances it seems to have arisen de novo.

Some authorities consider the 2 diseases identical, but their points of difference are quite distinct. Typhus is more severe in its onset than typhoid; its eruption appears earlier and differs considerably from the typhoid roseola; and the entire absence in typhus of the abdominal lesions that are so essential to typhoid proves that the 2 diseases are not identical. JOHN R. HOBBS.

**Typhography.** See PRINTING.

**Tyr**, in Scandinavian mythology, the god of war, had only one natural hand; the other was made of iron. In order to persuade the wolf Fenris to suffer himself to be bound with Gleipnir, Tyr placed his right hand in the wolf's mouth as a pledge that he would be loosened again; and when the gods refused to remove Gleipnir, the wolf bit off Tyr's hand. The third day in the week is called after him: Icel. *Tyrsdagur*; Dan. *Tirsdag*; Eng. *Tuesday*, after his A.-S. name, *Tiw*.

**Tyrant** [Gr. τύραννος], in anc. Gr. did not necessarily designate, as at present, a despotic and cruel ruler. The Gr. T. were citizens who by force or stratagem assumed the rulership of a state or city without lawful warrant.

**Tyre**, the *Tyros* of the anc., the *Tzor* of Script., was a daughter-colony of Sidon and the mother-city of Carthage. It was the wealthiest and most magnificent of all Phœnician cities, and flourished for 3000 yrs.

**Tyrian Purple**, a celebrated dye used by the anc., and prepared extensively at Tyre from the shell-fish murex, from each of which only a minute quantity was obtained at an enormous cost, and hence this color became the symbol of imperial power. Purple is now obtained from vegetable and mineral sources.

**Tyrol**, tîr'ol; Ger. te-rol', prov. of the Aus. empire, the anc. *Rætia*, is bounded N. by Bavaria, W. by Switz., and S. by It., and comprises an area of 11,324 sq. m., with 805,176 inhabs. The country is mountainous throughout, traversed from W. to E. by 3 lofty chains of the Alps—the Tyrolese Alps in the N., the Trent Alps in the S., and in the middle the Rætian Alps. The valley between the Tyrolese and Rætian Alps is drained by the Inn, which flows through Bavaria to the Danube; the valley between the Rætian and Trent Alps is drained partly by the Adige, an affluent of the Po, partly by the Drave, which flows through Styria to the Danube. One third of the surface is covered with perpetual snow. Another third is covered with forests. Only a small part of the country is suitable for tillage. Wheat, rye, oats, and barley are grown; in the gardens, vineyards, and orchards excellent wine, numerous mulberry trees for the rearing of silkworms, and fine fruits, olives, and figs are raised. But the chief industry of the people is the rearing of cattle, especially sheep and goats. Cap. Innsbruck.

**Tyronë**, R. R. June, Blair co., Pa., 131 m. E. of Pittsburg. Pop. 1870, 1840: 1880, 2678.

**Tyrone** (HUGH O'NEILL), EARL OF, b. in Ire. about 1550, commanded a troop of horse in the service of Queen Elizabeth in the war against the rebel earl of Desmond 1579-83; maintained a correspondence with the Eng. govt. while conspiring against it; formed an alliance with Red Hugh,



the chief of the O'Donnells, 1590; assumed the title of "The O'Neill;" offered the sovereignty of Ire. to Philip II. of Sp.; defeated Sir John Norris, and was proclaimed a traitor 1597; defeated and killed Marshal Bagnal at Blackwater Aug. 14, 1598; concluded a truce with the Earl of Essex Sept. 8, 1599; retreated from Munster before Lord Deputy Mountjoy 1600; successfully invoked the aid of Sp., but was defeated with his Sp. allies in an attack upon Kinsale Dec. 1601; surrendered to Mountjoy; received a pardon 1602; presented himself to King James, and was confirmed in his earldom and estates 1603; was suspected in 1607 of being engaged in a new conspiracy; proceeded to Brussels to invoke the protection of the Sp. govt., and spent the remainder of his life in obscurity, poverty, and blindness, a pensioner of the king of Sp. and of the pope. D. in 1616.

**Tyrosine**, a nitrogenous substance formed by the decomposition of albuminoid bodies by acids, alkalies, and putrefaction, was first obtained by decomposing caseine with fusing potash. It can also be prepared by heating water with sulphuric acid.

**Tyrrhenia**. See **ETRURIA**.

**Tyrrhenian Sea**, **The**, the anc. *Mare Tyrrhenum*, is that part of the Mediterranean which lies between the It. mainland and the islands of Sardinia, Corsica, and Sic.

**Tyrtæus**, according to an old tradition, a lame school-master of Attica and of mean extraction. When, in the second Messenian war, the Lacedæmonians sent to Athens for a leader in obedience to an oracle, the Athenians, moved by fear and jealousy, are said to have sent them T. as the most unfit person they could find for the position. T. however, was possessed of eminent lyrical power, and by his songs so aroused the Lacedæmonians that they finally came victorious out of the war (688 B. C.).

**Tyson** (JOHN ROBERTS), LL.D., b. at Phila. Feb. 12, 1804, became a lawyer in his native city; served in the city councils and in the State legislature; was M. C. 1855-56; possessed literary and artistic accomplishments; was instrumental in procuring the publication of the archives of Pa., and projected a hist. of the Amer. colonies, which he was prevented from prosecuting by his death, June 27, 1858. Author of *An Essay on the Penal Laws of Pa.*, *A Discourse on the Integrity of the Legal Character*, *On the Colonial Hist. of the E.*, and *some of the S. States*, etc.

**Tzar**. See **CEAR**.

## U.

**U**, a letter long used interchangeably with V, but at present *u* always represents a vowel, and *v* a consonant. The vowel *u* has 4 principal sounds in Eng.: (1) the sound of *u* in *tube*; (2) the sound as heard in *rule*; (3) the sound heard in *bull*; (4) that heard in *burn* or in *tub*, but in the latter word it has a shorter sound than in the former. U in chem. is the symbol of uranium.

**Ubi**, the name of a Germanic people settled in the time of Cæsar, on the right bank of the Rhine, from the Sieg to the Lahn, between the Sigambri to the N. and the Suevi to the S. Cæsar describes them as being quite familiar with Gallic manners and civilization. When they were too hard pressed by their wild neighbors, the Suevi, Agrippa removed them, in the time of Augustus, to the left bank of the Rhine. In the insurrection of Civilis (70 A. D.) they participated only for a short time, and because they were compelled by force. Soon after they became merged into the Franks.

**Ucayale**, oo-ki-ah'la, or **Ucayali**, river of S. Amer., is formed in Peru by the junction of 2 smaller streams rising in the Andes and passing near Cuzco. It runs N., and after a course of about 1100 m. joins the Amazon, of which it is the most distant source.

**Udall**, or **Woodall** (NICHOLAS), b. in Hampshire, Eng., in 1504, grad. at Corpus Christi Coll., Ox., 1524, where he became a fellow; wrote verses for the City of London pageant at the coronation of Queen Anne Boleyn, May 1533; took orders in the Ch. of Eng.; was a zealous advocate of the Ref.; was master of Eton School 1534-43; pub. *Flores for Latin Spekyng*, *Selected and Gathered out of Terence*, and the same translated into English; wrote *Ralph Roister Doister*, memorable as the earliest Eng. comedy known to be extant. U. was dismissed from the mastership of Eton in 1543 in consequence of having removed from the chapel some silver images; was vicar of Brintree, Essex, 1537-44; entered the service of Queen Catharine Parr; obtained on the accession of Edward VI. the rectory of Calborne; edited *The First Tome or Volume of the Paraphrase of Erasmus upon the N. T.*; became canon of Windsor 1551-56, and head-master of Westminster School 1555, and wrote for the queen's entertainment various *Dialogues and Interludes*. D. Dec. 1556.

**Ugrians**, **The**, a Finnish tribe, inhabiting parts of the govt. of Tobolsk, Siberia, speak a primitive Finnic dialect, mixed with Tartaric elements, and occupy a very low stage of civilization. They are nominally Chrs., but their religion is really a mixture of Christianity, Mohammedanism, and Shamanism. They are nomads, and hunting and fishing are their chief occupations.

**Uhlán**, or **Hulan** [Tartar for "brave" or "youthful"], a soldier of certain corps of light cav. U. are employed in the Rus., Austro-Hungarian, and Ger. armies.

**Uhland**, oo'lahnt (JOHANN LUDWIG), b. at Tübingen Apr. 26, 1787, studied law at the univ. of his native city; practised in Stuttgart 1812-14; became a member of the Würtemberg assembly in 1819; was appointed prof. of the Ger. lang. and lit. at Tübingen in 1830; sat in the national assembly of Frankfurt in 1848. His ballads and lyrical poems made him the head of the Swabian school. His scientific researches are of great value: *Ueber das altfranzösische Epos*, *Ueber Walther von der Vogelweide*, etc., and his collection of *Alle hoch- und niederdeutsche Volkslieder*. D. Nov. 13, 1862.

**Uhrichsville**, R. R. junc., Tuscarawas co., O. Pop. 1870, 1541; 1880, 2790.

**Ukiah**, city, cap. of Mendocino co., Cal., 100 m. N. W. of Sacramento, has an acad. Pop. tp. 1870, 966; 1880, 2076, including 933 in city.

**Ukraine** (the "frontier-land"), the name commonly given to that easternmost portion of Poland which, extending on both sides of the Dnieper along its middle course, and conquered by the Poles in 1320, formed the frontier of the Polish empire against the Tartars. It soon became an apple of contention between Rus. and Poland, and after the second division of Poland it was taken by Russia.

**Ulcer and Ulceration** [Gr. *ἔλκος*; Lat. *ulcus*], the process of molecular death or disintegration occurring on the surfaces of the body at points where nutrition is low in consequence of local irritation or injury or defective circulation and bad states of the blood. U. are classed as— (1) Simple or healthy U., if the term is not a misnomer—that is, U. having a healthful tendency to heal. (2) Weak U., lacking the florid color and healing tendency of the first class; they often result from the debilitated health of the subject. (3) Indolent U.; often all recuperative power is lost; usually the border is thickened and elevated, and may be indurated. (4) Irritable U. are painful, and may bleed upon touch. (5) Inflamed U. U. are liable to become inflamed upon slight local irritation or derangement of the blood, use of alcohol, and exposure to cold. (6) Sloughing U., conditions often following the inflamed U. or very low states of health. (7) Serpiginous U., when some specific vice of the blood gives it a tendency to spread, and it pursues a tortuous, serpentine course. (8) Specific U., with undermined edges, due to primary deposits beneath the skin, which soften and discharge upon the surface.

The simple U. needs simply to be kept clean and protected by any bland cooling lotion or ointment; the weak and indolent requires stimulating applications; the indurated often requires the incision of its thickened borders or removal by strapping with plaster; the elastic bandage will effect a speedy cure in many cases; the inflamed U. calls for cold and evaporating lotions; the sloughing, for antiseptics. In all forms the diet must be rich, the appetite maintained by tonics, and the blood enriched by iron and often alteratives.

E. D. HUDSON.

**Ulema** [Arab., "wise"], in Mohammedan countries, a judge of the law and of religion. Strictly, the name is plural, including, as a class term, all muftis, mollahs, cadis, and indeed all who are learned in religion and the law. These are designated, in a body, the ulema.

**Ufila**, or **Wulfila** [that is, "Little Wolf;" grecized, *Ulphilas*], b. in 318 among the pagan Visigoths, at that time settled on the N. bank of the Danube in the Dacian terrs., and descended from a Chr. family. Thus he was ed. in Christianity, and learned both the Gothic and the Gr. langs. In 348 he was consecrated bp. among the Goths, and so great was his success in converting them to Christianity that he is generally designated the Apostle of the Goths. U. was a prolific writer, but his prin. work is his translation of the Bible into Gothic. For the O. T. he used the Septuagint, for the N. some Gr. MS. not known now; and for the transcribing of his work he had to invent a new alphabet, which he ingeniously composed of Gothic runes and Gr. letters. This translation accompanied the Goths in all their wanderings, but in the 9th century it disappeared, together with the lang. and national existence of the people; and it remained unknown and forgotten till the latter part of the 16th century, when Arnold Mercator discovered, in the abbey of Werden, a fragment of it containing the 4 gospels. It was the so called *Codex Argenteus*, written with silver letters on purple parchment. It was transferred from Werden to Prague, and thence the Swedes carried it as spoil in 1648 to Upsal, where it is still preserved. D. 388.

**Ullasutal**, or **Uljassutal**, an important commercial station of Mongolia, in lat. 48° 22' N., lon. 97° E., on the line between the Rus. frontier and Si-Ngan-Foo, cap. of the Chl. prov. of Shen See, and prin. depot for all goods destined for the markets of Central Asia. It consists of a civil and a military quarter.

**Ullmann** (KARL). See **APPENDIX**.

**Ulloa**, de (ANTONIO), F. R. S., b. at Seville, Sp. Jan. 12, 1716, ed. in the naval service; was sent to S. Amer. with Don Jorge Juan and a commission of the Fr. Acad. to measure a degree of the meridian in Peru (1735); spent 10 yrs. in S. Amer., being employed to fortify the Pacific coast against an anticipated attack by Lord Anson's expedition; was elected a F. R. S., and communicated to S. Amer.; pub. *A Voyage to S. Amer.*; was instrumental in establishing the royal woollen manufactories and in the reform of the colls. of hist. and surgery, and superintended the completion of the basins of Ferrol and Cartagena; became the first Sp. gov. of La. 1766, but was unable to establish his govt., and was soon driven away by the riots of the Fr. pop. of New Orleans; pub. *Entretentimientos Físico-históricos sobre la América Meridional*, and a vol. of *Observations of a Solar Eclipse made at Sea*; rose to be lieut.-gen. in the naval service; was intrusted in 1779 with the command of a squadron destined to capture an Eng. merchant fleet and to rendezvous at Havana for an attack upon the Brit. settlements in Fla., but, being absorbed in astronomical investigations, forgot to open his sealed orders, and returned after 2 months without having effected anything; was court-martialled in 1780 and acquitted, but was never again employed in active naval service. D. July 3, 1795.

**Ulloa**, de (FRANCISCO), b. in Sp. about the beginning of the 16th century, went to New Sp. shortly after its conquest; was a lieut. of Cortez in his explorations of the Pacific coast, and commanded the expedition which in 1539-40 explored the Gulf of Cal., to which he gave the name of "Sea of Cortez."

On his return he was assassinated in Jalisco.

**Ulm**, a town of Ger. kingdom of Würtemberg, at the influx of the Danube into the Danube. Its cathedral, begun in 1377, but never completed, is a magnificent edifice in Gothic



style, 485 ft. long, 200 ft. broad, and 141 ft. high. Ulm is fortified, and contains a great variety of manufactures. On Oct. 17, 1805, Gen. Mack, at the head of an Aus. army of 30,000 men, here capitulated to Napoleon. Pop. 32,699.

**Ulpianus** (Domitius), distinguished as a jurist, held various judicial offices under Septimius Severus and Caracalla. Alexander Severus made him *magister scriniorum*, *praefectus annonae*, and *praefectus praetorio*, but he was murdered by the soldiers in 228 before the eyes of the emp. Of his writings only fragments exist, but about  $\frac{1}{4}$  of the *Digest* of Justinian consists of excerpts from his books.

**Ultramarine** [Fr. *outre mer*, "beyond the sea"—i. e. from Asia], a blue pigment formerly obtained from lapis lazuli, a mineral containing silica, alumina, soda, lime, sulphuric acid, a little sulphur and iron, with a very little chlorine and water. It is found in Siberia, Transylvania, Per., Chi., Tibet, Tartary, and the E. I., and furnishes a beautiful and very durable pigment.

**Ultramon'tanism**, a tendency within the R. Cath. Ch. to place an absolute authority in matters of faith and discipline in the hands of the pope at Rome—*ultra montes*, "on the other side of the Alps"—in opposition to the tendency, original in Christianity, of placing the national chs. in partial independence of the Rom. curia, and making the pope subordinate to the statutes of an oecumenical council.

**Ultramontanists**. See ULTRAMONTANISM.

**Uly'sses, or Odysseus**, a son of Laërtes, the husband of Penelope, the father of Telemachus, king of Ithaca; participated in the expedition against Troy; wandered for many yrs. after the capture of the city, and did not reach home until 20 yrs after his departure. He plays a very conspicuous part in the *Iliad*, and is the hero of the *Odyssey*.

**Uma**, one of the names of the most important goddess of the modern Hindoo pantheon, the wife of Shiva, otherwise called Durga, Devi, Bhavani, Kali, or Parvati.

**Um'ber** [Lat. *terra umbrina*, *umbrina*; Fr. *argile ochreuse brune*, *terre fine de Turquie umbrée*], a mineral pigment formerly obtained from Umbria in It., but at present chiefly imported from the island of Cyprus. Its composition is—silica, 18 per cent.; alumina, 5 per cent.; oxide of iron, 48 per cent.; oxide of manganese, 20 per cent.; water, 14 per cent.; being essentially a siliceous brown hæmatite.

**Umbrel'la-Bird**, one of the most singular birds known, is the *Cephalopterus ornatus* of S. Amer., one of the Corvidæ of the group called raven-crows. On its head is a curious crest of blue hair-like feathers, and beneath its throat hangs a large wattle covered also with blue feathers. It is of a deep-black color, and of the size of the crow.

**Umbrel'la-Shell** (*Umbrella*), a genus of gasteropod mollusks of the family Pleurobranchidae. The small, umbrella-shaped shell only covers the more important organs, and the shell itself is often concealed by the mantle.

**Umbrella Tree**, a small tree of the genus *Magnolia* (*M. umbrellata*), found in the U. S. along the Allegheny Mts. from Pa. to Ky.; has obovate-lanceolate leaves, pointed at both ends, and a rose-colored fruit. It takes its name from the fact of the leaves being crowded on the summit of the flowering branches in an umbrella-like circle.

**Umbria**, an anc. division of It., between Etruria and the Ager Gallicus, which stretched along the Adriatic from Esis to Rubicon, and was inhabited by a Gallic tribe.

**Uncedilla, N. Y.** See APPENDIX.

**Uncial Letters** [Lat. *unciales literæ*, from *uncia*, "inch"], a term used in diplomatics and palæography to indicate characters of a large and round form used in some anc. MSS. The earliest Gr. and Lat. MSS. are written in uncial letters, which were used until about the middle of the 5th century, when the necessity for more rapid writing brought into general use characters of a smaller form composed of rounded and not straight lines, termed uncial, many of the letters resembling the majuscule, or capital, and others the minuscule, or small, letters.

**Uncion, Extreme**. See EXTREME UNCTION.

**Underwood** (JOSEPH ROGERS), b. in Goochland co., Va., Oct. 24, 1791, went to Ky.; grad. at the Univ. of Lexington 1811; studied law, and was admitted to the bar. At Dudley's defeat in 1813 he was severely wounded. In 1813 he entered upon the practice of law, at Glasgow, Ky.; was a member of the legislature in 1816-19; in 1823 removed to Bowling Green; was member of the assembly 1825-26, judge of the court of appeals 1828-35, M. C. 1835-43, member and speaker of the house in the Ky. legislature 1846, U. S. Senator 1847-53, Presidential elector in 1824 and 1844, and delegate to the national Dem. convention at Chicago in 1864. D. Aug. 23, 1876.

**Undine** [Lat. *unda*, "wave"], in mediæval superstition, a water-spirit, corresponding nearly to the nymphs of classical mythology.

**Undulatory Theory of Light**, the theory which regards light as a mode of motion generated by molecular vibrations in the luminous source, and propagated by undulations in a subtle medium, sensibly imponderable, presumed to pervade all space, including the intervals which separate the molecules or atoms of ponderable bodies. Only one other theory can be opposed to this, the theory which supposes light to consist of material particles emitted from the source, and projected in straight lines in all directions with a velocity which continues uniform at all distances, and is the same for all intensities. The phenomena of light are satisfactorily accounted for by the undulatory theory.

The laws of vibration, and also of the composition of vibrations, must first be presumed to be understood. The manner in which a vibrating solid generates undulations in a surrounding elastic medium is explained at length in the article Acoustics, to which the reader is referred. In that explanation, however, mention is only made of undulatory movements excited in a single determinate direction. It is impossible, nevertheless, to disturb the equilibrium of an elastic fluid at any point, in any direction whatever, without disturbing that of the adjacent molecules, and so giving

rise to tremors in all directions. Accordingly, if the original disturbance is confined to a mere point, the generated wave will be spherical; and such also will be sensibly its form, whatever be the dimensions of the vibrating body, when the distance from the body is considerable compared with those dimensions. The curvature of a spherical surface is less in proportion as the radius is greater. Hence, at a very great distance from the centre of disturbance the wave-front is sensibly plane. It should further be kept in mind that inasmuch as the movements of the molecules in undulations may be derived from any of the possible modes of vibration, those movements may be circular or elliptical as well as linear, and instead of being confined to the direction of the radius of the wave, may be transverse to it, or may take place in the tangent plane to the wave-surface. In the case of circular movements performed around the radius as an axis, an undulation will therefore consist of a chain of molecules occupying positions less and less advanced, in the direction of progress, in their respective circles, until the last differs from the first by 360°. Accordingly, at any instant, the molecules in such undulations, or series of undulations, will present the exact counterpart, direct or reversed, of the thread of a screw.

Now, suppose that, in the way of an advancing plane wave-surface, and parallel to it, there be interposed a plane obstructing solid, having in it a small aperture through which a minute elementary portion of the movement may be propagated, while all the remaining part is arrested, then this aperture will become the centre of a new spherical wave on the other side of the obstruction. If the solid be perforated by a great number of apertures, each of these will generate its own independent wave; and all these waves, as in their progress they encounter each other and become blended, will ultimately reproduce anew the plane wave from which they originated. By supposing the number of these apertures infinitely great, and the spaces between them infinitely small, we shall arrive at the conclusion that a plane wave is equivalent to an infinite number of spherical waves, whose centres are infinitely near to each other in that plane, and of which the plane wave is the resultant; so that if, at any time, we intercept any number of these component waves, either such as are contiguous to each other, or such as are separated by determinate intervals, the consequences of the proceeding may be calculated *a priori* by finding the resultant of those which remain unobstructed. This principle, which is of the highest importance to the physical theory of undulation as applied to optics, was first laid down by Huyghens. By the proper application of this principle, all the phenomena of reflection, refraction, single and double, diffraction, and polarization may be satisfactorily explained. The subject is very fully treated in *J's Univ. Cyc.* F. A. P. BARNARD.

**Unfermented Bread**. See BREAD.

**Unicorn** [Lat. *unum*, "one," and *cornu*, a "horn"], described by various writers, from Ctesias and Pliny down, as a horse-like creature with a straight horn in the middle of the forehead. Its figure occurs as a heraldic charge.

**Union**, yün'yün, R. R. junc., cap. of Union co., S. C. Pop. pt. 1870, 2845; 1880, 3637, including 1267 in v.

**Union, American**. See SOVEREIGNTY.

**Union, American**. The United States of America constitute a federal republic of a novel, peculiar and extraordinary character. There has never been anything like it in the annals of history. It is true there have been many federal or confederated unions; but, in speaking of the American Union and its rare and peculiar features, Lord Brougham, in his *Political Philosophy*, vol. iii. p. 336, says: "It is not at all a refinement that a federal union should be formed. This is the natural result of men's joint operations in a very rude state of society, but the regulation of such a union upon pre-established principles; the formation of a system of govt. and legislation of which the different subjects shall be not only individuals but states; the application of legislative principles to such a body of states, and the devising of means for keeping its integrity as a federation, while the rights and powers of the individual states are maintained entire, is the very greatest refinement in social policy to which any state or circumstances has ever given rise, or to which any age has ever given birth." The A. U. of the separate States is not what the Germans style a *Bundesstaat*, or an incorporated union or consolidated state or nation; nor is such a union as is characterized by the Germans as *Staatenbund*, or states-union. Under the Amer. system, while the States collectively constitute an international unit as regards third parties, yet they do not cease to be international units as regards each other. (See decisions of U. S. supreme court, 13 Peters, 550, and STEPHENS'S *Constitutional View of the Late War*, vol. i. p. 393.) ALEX. H. STEPHENS.

**Union (British)**. The present Brit. empire is composed of the 3 kingdoms of Eng., Scot., and Ire., which long preserved their independence under the same crown, Ire. having been an appendage of the English royal domain since the Middle Ages, and Scot. having been governed by the kings of Eng. since the accession of James I. to that throne (1603). The legislative union with Scot. was consummated by a treaty signed by 20 coms., ratified by the Eng. and Scotch Parls., and finally proclaimed May 1, 1707. The legislative union with Ire. was not consummated until 1801.

**Union, Christian**. See EVANGELICAL ALLIANCE.

**Union Christian College**, at Merom, Sullivan co., Ind., on Wabash River, and under the direction of the Christian Connection, was incorporated in 1859, has an endowment of \$100,000, and occupies several buildings. There are academic, business, classical, musical, and scientific depts., to which both sexes are admitted. It also gives disabled soldiers free instruction.

**Union City, R. R. junc.**, Randolph co., Ind., 84 m. N. E. of Indianapolis. Forests of walnut, oak, ash, hickory, and other valuable woods abound in the vicinity. Pop. 1870, 1439; 1880, 2478.



**Union City**, Branch co., Mich., on R. R. and St. Joseph River, at the head of navigation. Pop. tp. 1870, 2121; 1880, 2672, including 1280 in city.

**Union City**, R. R. junc., Erie co., Pa., 23 m. S. E. of Erie. Pop. 1870, 1500; 1880, 2171.

**Union City**, R. R. junc., Obion co., Tenn. Pop. of dist. 1870, 2479; 1880, 3734, including 1879 in city.

**Union College**, or **Union University**, Schenectady, N. Y., incorporated in 1795 under the name of Union College, indicative of the union of the various evangelical sects engaged in its foundation. About 4000 alumni have left its halls. The faculty consists of 12 members, in addition to 2 tutors, and there are 2 courses of study in the coll. proper—the classical and the scientific. There is a flourishing engineering school, and the chemical and nat. hist. depts. are provided with ample means for practical study in the laboratory and the field. An academical dept. for preparatory collegiate instruction has been established. Soon after the accession of Dr. Potter to the presidency (1871), measures were instituted to bring the coll. into connection with the Albany Med. and Law Schools of the Albany Univ. and the Dudley Observatory, and an act was passed to that effect which embodies all these schools into one univ. bond under the title of the "Union University," in which, however, each body was to maintain its corporate rights and privileges and pursue its respective aims.

**Union, Evangelical, or Evangelische Kirche**, Lutheran and Reformed. See EVANGELICAL CHS.

**Union Springs**, R. R. junc., cap. of Bullock co., Ala., 55 m. from Columbus. Pop. 1870, 1455; 1880, 1862.

**Union Springs**, Cayuga co., N. Y., on R. R. and the E. shore of Cayuga Lake, 10 m. from Auburn, the co.-seat. Pop. 1870, 1150; 1880, 1210.

**Unions, Trades**. See TRADES-UNIONS.

**Un'iontown**, on R. R., Perry co., Ala., 30 m. W. of Selma. Pop. 1870, 1444; 1880, 810.

**Un'iontown**, R. R. junc., cap. of Fayette co., Pa. (originally Beesontown), 40 m. S. E. of Pittsburg, laid out by J. Beeson 1783, incorporated 1796. Pop. 1870, 2503; 1880, 3265.

**Un'ionville**, on R. R., Hartford co., Conn., 34 m. N. of New Haven. Pop. not given in census of 1880.

**Unitarianism** [Lat. *unitas*]. Ever since thinking man has been in the world there have been speculations about the Cause of all things. These speculations have always held to one being supreme, while they have been put into various forms—polytheism, trinity, or simple and indivisible unity. Judaism was undoubtedly unitarian, and it is held that Christianity was at the start. The earliest chs. of which we have any definite knowledge consisted in great numbers of Unitarians. Believers in Christ at the beginning were simply denominated Christians; but the oldest body of Chrs. holding a distinctive faith upon the point in question—i. e. the Ebionites—were undoubtedly Unitarians; and the earliest Fathers, Justin Martyr, Tertullian, and Origen, while advocating their "Economy," the initial form of Trinity, evidently wrote in an apologetic strain, as if they felt that there was a great body of opinion against them. Gradually, however, the early Fathers, falling in with Platonic speculations, were tending to ideas of a Trinity, but it was not till the 4th or 5th century that the doctrine of the Trinity was completely formulated and established. And this continued for several centuries to be the settled orthodoxy of the Ch., till in the 16th century U. was revived by the Socini.

Lælius and Faustus Socinus, uncle and nephew, were its. of a noble family. It is the more remarkable that they should have been learned men and studious in the Scriptures, and that both should have broken off from the religion of their education and social position to embrace new and unpopular opinions—so unpopular and dangerous to them that they both found it expedient to leave their country. Lælius went to Switz., where he d. in Zurich in 1562. Faustus resided in Bâle, and spent some time in collecting and arranging the papers which Lælius had left to him, and then went to Transylvania, where a number of Unitarian chs. were formed and established. Thence he removed to Poland. His speculations gave offence to the lower classes; they rose against him: a mob broke into his house, ransacked his dwelling, and destroyed his MSS.; and he died near Cracow in 1604, a martyr to his faith. There is still left, however, in Hungary and Transylvania, a considerable body of Unitarians who inherit his faith.

In Ger., Eng., and Amer., U. has found a more favorable soil, and many chs. in the 2 latter countries, about 900 in each, bear the name; beside 1000 or 2000 congregations of Univits., and more than as many of a body which refuses every name but that of *Christians*. In Ger. the speculations of many of her eminent theologians and critics have taken the same direction without any formal separation from the Lutheran Ch.; while in Fr. only the honored names of the Comenels, father and son, have been distinctly known in connection with it. In Eng. its earliest confessors were Thomas Firmin, a merchant of Lond., and John Biddle, who set up in Lond. the first Unit. public worship known in Eng. He was pursued and hounded through 5 imprisonments, till on the 6th he d. in a dungeon on Sept. 22, 1662, at the age of 47. Indeed, it is by a lineage of remarkable men that Eng. U. has been most distinguished—in which are the names of Milton, Locke, and Sir Isaac Newton. William Penn and Sir Wm. Jones; and of authors such as William Roscoe, Samuel Rogers, Charles Lamb, Priestley, and Lardner, beside those of the present day, as Joseph Blanco White and his biographer, J. H. Thom. and James Martineau. Also to be mentioned among Eng. Units. are Dr. Samuel Clarke of a former day, Ricardo, the political economist, Sir John Bowring; and not the least to be honored, John Pounds of Portsmouth, the founder of the ragged schools, and of noted women, Joanna Baillie and Florence Nightingale. Boston, with its vicinity, may be called the birthplace of

U. in Amer. The controversy which brought matters to that result in a good many chs. there and in N. Eng., carried on by Dr. Worcester of Salem and Prof. Stuart of Andover on one side, and Channing and Prof. Henry Ware, Sr., and Norton on the other, broke out in 1812. Just before, in 1810, Noah Worcester had pub. his *Bible News*. Nearly 30 yrs. before, Dr. James Freeman of King's chapel in Boston had taken the same ground, and his congregation altered the Liturgy in accordance with his views. It was the first ch. in Amer. that decidedly espoused the Unit. faith, though many yrs. before Jonathan Mayhew, pastor of the West ch. in Boston, was known as an Arian. The Amer. Unit. Association was formed in Boston in 1825, chiefly for the publication and distribution of tracts and books. It has used its funds also to build chs. and assist feeble ones, and to send out preachers in this country; and it has for a number of yrs. supported a missionary in India, Mr. Dall. But the first general convocation of the Unit. clergy of Amer. was held in New York in 1865, consisting of ministers and delegates from the chs.; and on this occasion arose and was keenly debated the question about a *creed*. But the word met with no favor in the conference. The affirmations of the conference were—that every man has a perfect right to judge for himself, unbound by any set of articles; that while professing itself to be a Chr. body, it left every one to decide for himself what Christianity itself is—4. e. without forfeiting his place in the body, to choose among the conflicting views of Chr. doctrine and statement that which seemed to him to be true and right.

In fact, U. is characterized not so much as being a system of thought as a way of thinking; and *that* may be called, whether for praise or blame, the rational way. Religion it regards as addressing itself to reason and conscience alike, requiring of men to believe nothing which contradicts reason, and to do nothing which they have not ability to do. Human nature, in its view, is not a mass of helpless depravity, but is endowed with moral qualities which are capable of good, and which are to be educated to virtue and religion, just as truly as the mental powers are to be educated to knowledge and the highest intelligence. Human life is appointed to be the sphere of this culture, with all its toils, cares, trials, and sufferings—its natural affections and enjoyments also not to be crushed down, but intended to minister to the same end. [From *orig. art. in J.'s Univ. Cyc.*, by ORVILLE DEWEY, D. D., LL.D.]

**Unitarians**. See UNITARIANISM.

**United Armenians**, a name applied to those Armenian Chrs. who acknowledge the pope, the orthodox Armenians being called Gregorians. The Armenian Rite in the R. Cath. Ch. has 1 patriarch and primate (in Cilicia), 4 abps. (at Constantinople, Aleppo, Seleucia (or Diarbekir), and Lemberg), beside 2 in *partibus*, and 16 bps. Their union took place 1316-44.

**United Brethren, or Unitas Fratrum**. See MORAVIAN CHURCH.

**United Brethren in Christ** (often confounded with the United Brethren, see MORAVIAN CHURCH), a denomination of Prot. Chrs. which arose in the U. S. about 1755, under the leadership of the Rev. Philip William Otterbein (1726-1813), a Ger. missionary of the Reformed Ch., and Martin Böhm. Their polity is a mixture of Methodism, Congregationalism, and Presbyterianism. They oppose Freemasonry and the manufacture, sale, and use of alcohol. Since 1820 they have held services in both Ger. and Eng.

**United Christians of St. Thomas**, a body of E. I. R. Caths., chiefly found in Travancore, at S. end of India.

**United Copts**, since 1732 the designation of a body of R. Cath. Copts of the E. rite. They number (in Egypt) 12,000, and are under a vicar apostolic and bp. in *partibus*, who is of their own rite.

**United Evangelical Church**. See EVANGELICAL CHURCHES.

**United Greek Church**, since the Ref., a body of R. Caths. of the E. rite, who acknowledge the pope and accept the doctrines of the Lat. Ch., but use the Gr. liturgies and follow the Gr. rule as to the marriage of secular priests and the use of both kinds in the Eucharist. They are *La Gerarchia Cattolica*, 1872 of 4 rites—the Rumanian, Ruthenian, Bulgarian, and Melchite—and number about 4,000,000.

**United Kingdom of Great Britain and Ireland**. See ENGLAND, GREAT BRITAIN, IRELAND, SCOTLAND, WALES, and UNION (BRITISH).

**United Methodist Free Churches**, a denomination of G. Brit. and Ire., dating from 1857.

**United Nestorians**, a body of R. Caths. of the Syrian rite, more often called Chaldean Chrs., dating from 1553.

**United Original Seceders**, a Presb. sect of Scot., dating from 1820, when several ministers of General Associate Synod refused to reunite with the Associate Synod.

**United Presbyterian Church in England, Scotland, and Ireland** dates in its present form from 1847, when the United Secession Ch. was made one with the Relief Ch. The United Presbs. differ from the Established and the Free Ch. in taking the ground that the civil govt. should have nothing whatever to do with the Ch., either by contributing to its support or meddling with its affairs.

**United Presbyterian Church of North America** dates from 1858, when the Associate Presb. Ch. (originated in 1754) joined in one organization with the greater part of the Associate Reformed Ch. (dating from 1782). Its greatest strength is in the W. and Central States. It has theological sems. in Newburg, N. Y., Allegheny, Pa., Xenia, O., Monmouth, Ill., and at Osioot and Ramleh in Egypt, where there is a successful mission among the Copts.

**United Provinces**. See NETHERLANDS.

**United Secession Church** was formed in Scot. in 1820 by a reunion of the Associate and General Associate Synods. In 1847 it was united to the United Presb. Ch.

**United Society of Believers in Christ's Second Appearing**. See SHAKERS.



**United States, The.** *Geographical Position.*—Between lat. 24° 30' and 49° N., and lon. 66° 48' and 124° 32' W. from Greenwich, or 10° 14' E. and 47° 30' W. from Wash. In addition to this contiguous territory, there is Alaska, recently purchased from the Rus. govt. This vast territory, formerly known as Rus. America or Russian Possessions, is bounded as follows: Commencing at the S. point of Prince of Wales Island, on the parallel of 54° 40' N. lat., and between the 131st and 133d degree W. lon. from Greenwich, the line ascends to the N. along Portland Channel as far as the point of the continent where it strikes the 56th degree of N. lat.; thence the line follows the summit of the mts. parallel to the coast as far as the point of intersection of the 141st degree of W. lon., and from the said point along the 141st degree to the Frozen Ocean. The W. limit passes through a point in Bering Strait on the parallel of 65° 30' N. lat., at its intersection by the meridian which passes midway between the islands of Kruzenstern and the island of Ratmanoff, or Noonarook, and proceeds due N. without limitation into the same Frozen Ocean. The same W. limit, beginning at the same initial point, proceeds in a course nearly S. W. through Bering Strait and Bering Sea, so as to pass midway between the N. W. point of the island of St. Lawrence and the S. W. point of Cape Choukatski to the meridian of 172° W. lon.; thence from the intersection of that meridian, in a S. W. direction, so as to include the island of Atton and the Copper Island of the Korandorski Couplet or group in the N. Pacific Ocean, to the meridian of 193° W. lon., so as to include the whole of the Aleutian Islands E. of that meridian.

*Boundary.—Ocean Shore Line.*

Coasts.		Including bays, islands, etc.	Excluding islands, etc.	Excluding bays, etc.
Maine.....		2,486 m.	784 m.	278 m.
N. Atlantic.	New Hampshire.....	49	41	18
	Massachusetts.....	886	622	266
	Rhode Island.....	320	245	45
	Connecticut.....	262	240	104
	New York.....	980	50	none
	New Jersey.....	540	300	120
	Delaware.....	118	106	23
	Maryland.....	509	411	33
	Virginia.....	654	348	116
	North Carolina.....	1,641	1,069	320
S. Atlantic Mex. Gulf. Pacific.	South Carolina.....	756	267	220
	Georgia.....	684	480	128
	Florida { E. coast.....	2,474	1,034	472
	W. coast.....	1,562	883	674
	Alabama.....	315	247	58
	Mississippi.....	287	225	88
	Louisiana.....	2,250	1,256	552
	Texas.....	1,330	940	392
	California.....	1,477	1,063	713
	Oregon.....	442	442	392
Wash. Terr.....		1,332	1,028	238
Total.....		21,354 m.	12,101 m.	5,270 m.

Land, Lake, and River Boundary.		Length, miles.
Along the 49th parallel to Lake of the Woods.....		1,275
Lake of the Woods to Lake Superior.....		340
Lake Superior to River St. Mary.....		300
River St. Mary to Lake Huron.....		60
Lake Huron to River St. Clair.....		220
River and Lake St. Clair and River Detroit to Lake Erie.....		80
Lake Erie to Niagara River.....		200
Niagara River to Lake Ontario.....		35
Lake Ontario to St. Lawrence River.....		160
St. Lawrence River to New York State line (lat. 45°).....		120
Along lat. 45° to Hall's Stream.....		160
Hall's Stream and highlands to Maine State line.....		40
West line of Maine to St. Francis River.....		220
St. Francis River to St. John River.....		40
St. John River to New Brunswick line.....		80
W. line of New Brunswick to head of St. Croix River.....		90
St. Croix River to Passamaquoddy Bay.....		220
Boundary toward British America.....		3,480
Rio Grande del Norte to lat. 31° 47'.....		1,420
Along lat. 31° 47'.....		100
South line to lat. 31° 20'.....		30
Along lat. 31° 20' to lon. 111°.....		160
From lat. 31° 20' and lon. 111° to Colorado River.....		220
Colorado River.....		20
Colorado River to the Pacific.....		145
Boundary toward Mexico.....		2,105
Total ocean, land, lake, and river boundary.....		10,855

*Dimensions and Area.*—Greatest extent (excepting Alaska) E. and W., 3100 m.; N. and S., 1780 m. Area (including Alaska, which is 577,390 m.), 3,602,990 square miles.

*Reverse.*



Great Seal of the United States.

10,850 miles, without including that of Alaska.

*Population, Census 1880.*—Whites, 43,402,970; colored, 6,580,793; Chinese, 105,445; Indians, 66,407; Japanese, 148—total, 50,155,783; native-born, 43,475,840; foreign-born, 6,679,943. Total pop. 1790, 3,989,214; 1800, 5,308,483; 1810, 7,239,881; 1820, 9,633,822; 1830, 12,866,020; 1840, 17,069,453; 1850, 23,191,876; 1860, 31,443,321; 1870, 38,558,371; 1880, 50,155,783.

*Cities.*—In 1790 the U. S. had only 6 cities of 8000 or more pop. In 1880 there were 35 of over 50,000 pop. Among them are New York, 1,206,299; Philadelphia, 847,170; Brooklyn, 566,663; Chicago, 503,185; Boston, 362,839; St. Louis, 350,518.

*Government.*—The U. S. of Amer. is a federal republic, composed of 38 sovereign States, 8 organized Terrs., the District of Columbia, Ind. Terr., and Alaska. The govt. is based on the const. of Sept. 17, 1787, and amendments made thereto in 1791, 1798, 1804, 1865, 1868, and 1870. The electors of the most numerous branch of the several State legislatures are qualified voters in the States respectively for all elective officers of the federal govt. All legislative powers are vested in a Cong., which consists of a Senate of 2 members from each State, elected by the legislatures thereof for 6 yrs., and a House of Representatives, the members of which are apportioned according to pop., and elected by the people in dists., for 2 yrs. Each State is entitled to at least 1 Representative. The const. provided for a specific number of Representatives to the first Cong., but afterward the number was designated by a vote of Cong. itself after each decennial census. Beside its ordinary legislative capacity, the Senate is vested with certain judicial functions, and its members constitute a high court of impeachment. No persons can be convicted by this court unless on the concurrence of 2/3 of the Senators present, nor does judgment extend further than to removal from office and disqualification to hold a federal office thereafter. Representatives have the sole power of impeachment. The executive power is vested in a President, who is elected by an electoral college, chosen by popular vote, or by the legislatures of the States, the number of electors voted for being equal to the number of Senators and Representatives from the States in Cong. His term of office is 4 yrs., but he is eligible for re-election indefinitely. The electors forming the college are themselves chosen in the manner prescribed by the laws of the several States; but an act of Cong. provides that the Presidential electors shall be all chosen upon the same day—viz. on Tuesday after the first Monday in Nov. A majority of the aggregate number of votes given is necessary to the election of Pres. and V.-P., and if none of the candidates has such a majority, then the election of Pres. is determined by the House of Reps., and that of the V.-P. by the Senate, from among the 3 candidates having the highest number of electoral votes, and in doing so the vote is taken by States, the Representatives of each State having only 1 vote, and the result must, of course, be determined by a majority of the States, so it would be possible to elect a Pres. by less than a majority of the Representatives in the House. No person can be President or V.-P. who is not a native-born citizen. The Pres. is commander-in-chief of the army and navy, and of the militia when in the service of the Union. With the concurrence of 2/3 of the Senate, he has the power to make treaties, appoint civil and military officers, levy war, conclude peace, and do all that rightly belongs to the executive power. He has a veto on all laws passed by Cong., but so qualified that, notwithstanding his disapproval, any bill becomes a law on its being afterward approved of by 2/3 of both houses of Cong. The Pres. has a salary of \$50,000 per annum, and the "White House" at Wash. for a residence during his official term. The V.-P. is *ex-officio* pres. of the Senate; and in case of the death, resignation, or other disability of the Pres., the powers and duties of that office devolve upon him for the remainder of the term for which the Pres. had been elected. This provision of the const., for the first time since the foundation of the govt., came into operation in 1841, on the demise of the lamented William H. Harrison, who died Apr. 4, just 1 month after his inauguration, when John Tyler, the V.-P., succeeded to the Presidency. V.-P. Fillmore also succeeded Pres. Taylor under this provision, V.-P. Johnson succeeded Pres. Lincoln in 1865, and V.-P. Arthur succeeded Pres. Garfield in 1881. In case of the disability of the V.-P., the pres. of the Senate *pro tempore* takes his place.

*Periphery.*—Coast line: Atlantic, 2163 m.; Gulf, 1764; Pacific, (excepting Alaska), 1943; total, 5270 m. (or, including shore line, bays, islands, inlets, etc., 21,354 miles). North line: land, 1785 m.; water, 1690; total, 3,475 m.; and line toward Mexico: land, 665; water, 1440; total, 2105 m. The total length of the ocean, land, lake, and river periphery is



## Presidents and Vice-Presidents.

Term.	Presidents.	Vice-Presidents.	Held office.
1.	Geo. Washington, Va.	John Adams, Mass.	April 30, 1789 to March 4, 1793
2.	Geo. Washington, Va.	John Adams, Mass.	March 4, 1793 to " 1797
3.	John Adams, Mass.	Thomas Jefferson, Va.	" 1797 to " 1801
4.	Thomas Jefferson, Va.	Aaron Burr, N. Y.	" 1801 to " 1805
5.	Thomas Jefferson, Va.	George Clinton, N. Y.	" 1805 to " 1809
6.	James Madison, Va.	George Clinton, N. Y.	" 1809 to " 1817
7.	James Madison, Va.	Elbridge Gerry, Mass.	" 1817 to " 1821
8.	James Monroe, Va.	D. D. Tompkins, N. Y.	" 1821 to " 1825
9.	James Monroe, Va.	D. D. Tompkins, N. Y.	" 1825 to " 1829
10.	J. Q. Adams, Mass.	John C. Calhoun, S. C.	" 1829 to " 1837
11.	A. Jackson, Tenn.	John C. Calhoun, S. C.	" 1837 to " 1845
12.	A. Jackson, Tenn.	M. Van Buren, N. Y.	" 1845 to " 1849
13.	Van Buren, N. Y.	Rich. M. Johnson, Ky.	" 1849 to " 1853
14.	W. H. Harrison, O.	John Tyler, Va.	" 1841 to April 4, 1845
15.	John Tyler, Va.	"	April 6, 1841 to March 4, 1845
16.	Jas. K. Polk, Tenn.	George M. Dallas, Pa.	" 1845 to " 1849
17.	Zach. Taylor, La.	Millard Fillmore, N. Y.	" 1849 to July 9, 1850
18.	M. Fillmore, N. Y.	"	July 9, 1850 to March 4, 1853
19.	Frank Pierce, N. H.	W. R. King, Ala.	" 1853 to " 1857
20.	James Buchanan, Pa.	J. C. Breckinridge, Ky.	" 1857 to " 1861
21.	Abraham Lincoln, Ill.	Hannibal Hamlin, Me.	" 1861 to " 1865
22.	A. A. Lincoln, Ill.	Andrew Johnson, Tenn.	" 1865 to April 14, 1869
23.	A. Johnson, Tenn.	"	April 15, 1869 to " 1873
24.	Ulysses S. Grant, Ill.	Schuyler Colfax, Ind.	" 1873 to " 1877
25.	Ulysses S. Grant, Ill.	Henry Wilson, Mass.	" 1877 to " 1881
26.	R. B. Hayes, O.	W. A. Wheeler, N. Y.	" 1877 to " 1881
27.	C. A. Arthur, O.	C. A. Arthur, N. Y.	" 1881 to Sept. 19, 1881
28.	C. A. Arthur, O.	"	Sept. 20, 1881 to March 4, 1885
29.	G. Cleveland, N. Y.	T. A. Hendricks, Ind.	" 1885 to " 1893

The administrative business of the nation is conducted by several high officers with the title of secretaries, etc., who form what is termed the cabinet or advisory council of the Pres. These are the sec. of state, the sec. of the interior, the sec. of the treas., the sec. of war, the sec. of the navy, the P. M.-gen., and the atty.-gen.—the last named being the official law authority for advisement in administrative affairs. The several depts. of the govt. are under the direct control and supervision of these officers. The following gives the names and dates of appointment of those who have held the several offices since the adoption of the const.:

## Secretaries of State.

Edm. Jefferson, Va.	Sept. 26, 1789	James Buchanan, Pa.	Mar. 6, 1845
Thos. Randolph, Va.	Jan. 2, 1794	John M. Clayton, Del.	Mar. 7, 1849
T. Pickens, Mass.	Dec. 10, 1795	Daniel Webster, Mass.	July 22, 1850
John Marshall, Va.	May 13, 1800	Wm. Everet, Mass.	Nov. 6, 1852
James Madison, Va.	Mar. 6, 1801	Wm. L. Marcy, N. Y.	Mar. 7, 1853
Robert Smith, Md.	Mar. 6, 1809	Lewis Cass, Mich.	Mar. 6, 1857
James Monroe, Va.	Apr. 2, 1811	Jere. S. Black, Pa.	Dec. 17, 1860
John Q. Adams, Mass.	Mar. 5, 1817	Wm. H. Seward, N. Y.	Mar. 6, 1861
Henry Clay, Ky.	Mar. 7, 1825	E. Washburne, Ill.	Mar. 5, 1869
M. Van Buren, N. Y.	Mar. 6, 1829	Hamilton Fish, N. Y.	Mar. 11, 1869
Ed. Livingston, La.	May 24, 1831	Wm. M. Evans, N. Y.	Mar. 12, 1877
Albert Gallatin, Pa.	May 29, 1833	James G. Blaine, Me.	Mar. 5, 1881
John Forsyth, Ga.	June 27, 1834	T. F. Frelinghuysen, N. J.	Dec. 12, 1881
Daniel Webster, Mass.	Mar. 5, 1841	F. B. Bayard, Del.	Mar. 5, 1885
Hugh S. Legaré, S. C.	May 9, 1843		
A. P. Upshur, Va.	July 24, 1843		
John C. Calhoun, S. C.	Mar. 6, 1844		

## Secretaries of the Treasury.

A. Hamilton, N. Y.	Sept. 11, 1789	Thomas Corwin, O.	July 23, 1860
Oliver Wolcott, Conn.	Feb. 2, 1793	James Guthrie, Ky.	Mar. 7, 1863
Samuel Dexter, Mass.	Jan. 1, 1801	Howell Cobb, Ga.	Mar. 6, 1867
Albert Gallatin, Pa.	May 16, 1801	Philip F. Thomas, Md.	Dec. 12, 1869
G. W. Campbell, Tenn.	Feb. 9, 1814	John A. Dix, N. Y.	Jan. 11, 1861
Alex. J. Dallas, Pa.	Oct. 22, 1816	Salmon P. Chase, O.	Mar. 7, 1861
W. H. Crawford, Ga.	Oct. 2, 1816	W. P. Fessenden, Me.	July 1, 1864
Richard Rush, Pa.	Mar. 7, 1829	H. McCulloch, Ind.	Mar. 7, 1865
Sam. D. Ingham, Pa.	Mar. 6, 1829	G. S. Boutwell, Mass.	Mar. 11, 1869
Louis Manly, N. Y.	Aug. 2, 1831	W. A. Richardson, Mass.	Mar. 17, 1873
Wm. B. Duane, Pa.	Mar. 1, 1833	Ben. H. Brewster, Ky.	June 4, 1874
Roger B. Taney, Md.	Sept. 23, 1833	Lot M. Morrill, Me.	July 7, 1876
Levi Woodbury, N. H.	June 27, 1834	John Sherman, O.	Mar. 8, 1877
Thomas Ewing, O.	Mar. 5, 1841	Wm. Windom, Minn.	Mar. 5, 1881
Walter Forward, Pa.	Sept. 13, 1841	Chas. J. Folger, N. Y.	Oct. 27, 1881
J. C. Spencer, N. Y.	Mar. 3, 1843	W. Q. Gresham, Ind.	Sept. 24, 1884
George M. Bibb, Ky.	June 15, 1844	Hugh McCulloch, Ind.	Oct. 28, 1884
R. M. Walker, Me.	Mar. 6, 1845	D. Manning, N. Y.	Mar. 6, 1885
Wm. M. Meredith, Pa.	Mar. 8, 1849		

## Secretaries of War.

Henry Knox, Mass.	Sept. 12, 1789	Geo. W. Crawford, Ga.	Mar. 8, 1849
Timothy Pickens, Mass.	Jan. 2, 1795	Chas. M. Conrad, La.	Aug. 15, 1860
James McHenry, Md.	Jan. 27, 1796	Jefferson Davis, Miss.	Mar. 6, 1863
Samuel Dexter, Mass.	May 13, 1800	John B. Floyd, Va.	Mar. 6, 1867
Roger Griswold, Conn.	Feb. 3, 1801	Joseph Holt, Ky.	Jan. 18, 1861
H. Dearborn, Mass.	Mar. 5, 1801	Simon Cameron, Pa.	Mar. 5, 1861
William Eustis, Mass.	Mar. 7, 1809	E. M. Stanton, Pa.	Jan. 16, 1862
John Armstrong, N. Y.	Jan. 13, 1813	U. S. Grant, Ill.	Aug. 12, 1867
James Monroe, Va.	Sept. 27, 1814	L. Thomas, Del.	Feb. 21, 1868
W. H. Crawford, Ga.	Aug. 1, 1815	J. M. Schofield, Ill.	May 28, 1868
G. Graham, Va.	Apr. 8, 1817	John A. Rawlins, Ill.	Mar. 11, 1869
John C. Calhoun, S. C.	Oct. 7, 1817	W. W. Belknap, Iowa.	Oct. 25, 1869
James Barbour, Va.	Mar. 7, 1825	Alphonso Taft, O.	Mar. 8, 1876
Peter B. Porter, N. Y.	Mar. 26, 1828	Jas. D. Cameron, Pa.	Mar. 22, 1876
John H. Eaton, Tenn.	Mar. 9, 1829	W. W. McCrary, Iowa.	Mar. 12, 1877
Lewis Cass, Mich.	Aug. 1, 1831	Alex. Ramsey, Minn.	Dec. 10, 1879
Joel R. Poinsett, S. C.	Mar. 7, 1837	Robt. T. Lincoln, Ill.	Mar. 5, 1881
John Bell, Tenn.	Mar. 5, 1841	W. C. Endicott, Mass.	Mar. 5, 1885
John C. Spencer, N. Y.	Oct. 12, 1841		
James W. Porter, Pa.	Mar. 8, 1843		
Wm. Wilkins, Pa.	Mar. 16, 1844		
Wm. L. Marcy, N. Y.	Mar. 6, 1845		

## Secretaries of the Navy.

Benj. Stoddard, Mass.	Mar. 21, 1790	Geo. Bancroft, Mass.	Mar. 10, 1845
Robert Smith, Md.	July 15, 1801	John Y. Mason, Va.	Sept. 9, 1846
J. Crowninshield, Mass.	Mar. 3, 1805	Wm. B. Preston, Va.	Mar. 8, 1849
Paul Hamilton, S. C.	Mar. 7, 1809	W. A. Graham, N. C.	July 22, 1860
William Jones, Pa.	Jan. 12, 1813	J. P. Kennedy, Md.	July 22, 1862
B. W. Crowninshield, Mass.	Dec. 19, 1814	Jas. C. Dobbin, N. C.	Mar. 7, 1863
Smith Thompson, N. Y.	Nov. 9, 1815	Isaac Toucey, Conn.	Mar. 6, 1867
S. L. Southard, N. J.	Sept. 16, 1823	Adolph E. Borie, Pa.	Mar. 5, 1869
John Branch, N. C.	Mar. 9, 1829	G. M. Robeson, N. J.	June 25, 1869
L. Woodbury, N. H.	May 23, 1831	R. W. Thompson, Ind.	Mar. 12, 1877
M. Dickerson, N. J.	June 30, 1834	N. Goff, Jr., Va.	Jan. 6, 1881
K. F. Paulding, N. Y.	June 25, 1838	William H. Hunt, La.	Mar. 2, 1881
Geo. E. Badger, N. C.	Mar. 6, 1841	W. E. Chandler, N. H.	Apr. 12, 1882
Abel P. Upshur, N. C.	Sept. 13, 1841	W. C. Whitney, N. Y.	Mar. 5, 1885
D. Henshaw, Mass.	July 24, 1843		
T. W. Gilmer, Va.	Feb. 15, 1844		
John Y. Mason, Va.	Mar. 14, 1844		

## Secretaries of the Interior.

Thomas Ewing, O.	Mar. 3, 1849	Col. John P. Ives, O.	Nov. 1, 1870
A. H. H. Stuart, Va.	Sept. 12, 1850	Zach. Chandler, Mich.	Oct. 13, 1875
R. McCalland, Mich.	Mar. 7, 1856	Carl Schurz, Mo.	Mar. 12, 1877
J. Thompson, Miss.	Mar. 6, 1857	S. J. Kirkwood, Iowa.	Mar. 6, 1881
Caleb B. Smith, Ind.	Mar. 5, 1861	H. M. Teller, Col.	Mar. 5, 1882
John P. Usher, Ind.	Jan. 8, 1863	L. Q. C. Lamar, Miss.	Mar. 5, 1885
James Harlan, Iowa.	May 15, 1865		
O. H. Browning, Ill.	July 27, 1866		
Jacob D. Cox, O.	Mar. 6, 1869		

## Postmasters-General.

Sam. Osgood, Mass.	Sept. 26, 1789	Joseph Holt, Ky.	Mar. 14, 1859
T. Pickens, Mass.	Aug. 12, 1791	Horatio King, Me.	Feb. 12, 1861
Jos. Habersham, Ga.	Feb. 25, 1795	Montgomery Blair, Md.	Mar. 5, 1861
G. Granger, Conn.	Nov. 24, 1801	Wm. Dennison, O.	Sept. 24, 1864
Return J. Meigs, O.	Mar. 17, 1814	A. W. Randall, Wis.	July 25, 1866
John McLean, O.	June 22, 1823	J. A. Creswell, Md.	Mar. 5, 1869
Wm. J. Barry, Ky.	Mar. 9, 1829	M. Jewell, Conn.	Aug. 24, 1874
Amos Kendall, Ky.	May 1, 1835	Jas. N. Tyner, Ind.	July 12, 1875
John M. Niles, Conn.	May 25, 1840	David M. Key, Tenn.	Mar. 12, 1877
Francis Granger, N. Y.	Mar. 6, 1841	H. Maynard, Tenn.	June 2, 1880
C. A. Wickliffe, Ky.	Sept. 13, 1841	Thos. L. James, N. Y.	Mar. 5, 1881
Timothy Phelps, Tenn.	Mar. 6, 1845	Tim. O. Howe, Wis.	Dec. 30, 1883
N. C. Hall, N. Y.	July 23, 1849	W. Q. Gresham, Ind.	Sept. 24, 1884
Jacob Colman, S. C.	Aug. 1, 1850	Frank Hutton, Pa.	Oct. 14, 1884
S. D. Hubbard, Conn.	Aug. 31, 1852	W. F. Vilas, Wis.	Mar. 3, 1885
James Campbell, Pa.	Mar. 5, 1853		
A. V. Brown, Tenn.	Mar. 6, 1857		

## Attorneys-General.

Edm. Randolph, Va.	Sept. 26, 1789	J. Crittenden, Ky.	July 22, 1850
Wm. Bradford, Pa.	Jan. 27, 1794	Caleb Cushing, Mass.	Mar. 7, 1853
Charles Lee, Va.	Dec. 10, 1795	Jeremiah S. Black, Pa.	Mar. 6, 1857
Edwin M. Stanton, Pa.	Dec. 30, 1860	Edwin M. Stanton, Pa.	Dec. 30, 1860
Levi Lincoln, Mass.	Mar. 5, 1861	Edward Bates, Mo.	Mar. 6, 1861
Robert Smith, Md.	Mar. 3, 1865	Titan J. Coffey, Pa.	(ad int.)
J. Breckinridge, Ky.	Aug. 7, 1865		June 22, 1863
C. A. Rodney, Del.	Jan. 28, 1867	James Speed, Ky.	Dec. 2, 1866
Wm. Pinkney, Md.	Dec. 11, 1861	Henry Stanbery, O.	July 23, 1864
Richard Rush, Pa.	Feb. 10, 1814	Wm. M. Evans, N. Y.	July 23, 1868
William Wirt, Md.	Nov. 15, 1817	E. R. Hoar, Mass.	Mar. 5, 1869
J. McP. Berrien, Ga.	Mar. 9, 1829	Amos T. Akerman, Ga.	June 23, 1870
Roger B. Taney, Md.	July 30, 1831	Geo. H. Williams, Or.	Dec. 14, 1871
B. F. Butler, N. Y.	Nov. 15, 1833	E. Pierpont, N. Y.	Apr. 26, 1875
Felix Grundy, Tenn.	July 5, 1838	Alphonso Taft, O.	May 22, 1875
Henry J. Gilpin, Pa.	Jan. 11, 1840	Charles Devens, Mass.	Mar. 12, 1877
J. C. Crittenden, Ky.	Mar. 3, 1841	Wayne MacVeach, Pa.	Mar. 5, 1881
Hugh S. Legaré, S. C.	Sept. 13, 1841	Benj. H. Brewster, Pa.	Dec. 19, 1881
John Nelson, Md.	July 1, 1843	A. H. Garland, Ark.	Mar. 5, 1885
John Y. Mason, Va.	Mar. 6, 1845		
Nathan Clifford, Me.	Oct. 17, 1846		
Isaac Toucey, Conn.	June 21, 1848		
Reverdy Johnson, Md.	Mar. 8, 1848		

**Courts.**—The judicial powers of the U. S. are vested in a supreme court and such other inferior courts as Cong. may from time to time establish. The present judicial establishments consist of a supreme court, circuit courts, and dist. courts. The supreme court, the highest judicial tribunal of the Union, is composed of a chief-justice and 8 associate justices. One session is held annually at the cap., commencing on the first Monday in Oct., and closing generally early in May.

## Chief-Justices, and Dates of Appointment.

John Jay, N. Y.	Sept. 23, 1789	Roger B. Taney, Md.	Dec. 23, 1835
John Rutledge, S. C.	July 1, 1790	Samuel P. Chase, O.	Dec. 4, 1864
O. Ellsworth, Conn.	Mar. 4, 1796	Morrison B. Waite, O.	Jan. 21, 1874
John Marshall, Va.	Jan. 27, 1801		

The circuit courts are held by a justice of the supreme court and the judge of the dist. in which the court sits, conjointly. The U. S. is divided into 9 judicial circuits, in each of which a session is held twice a year.

## Circuits.

I. Me., N. H., Mass., R. I.	VI. O., Mich., Ky., and Tenn.
II. Vt., Conn., N. J., and Pa.	VII. Ill., Ind. and Wis.
III. Del., N. J., and Pa.	VIII. Minn., Ia., Mo., Kan., Ark., Tex., and Cal.
IV. Md., Va., W. Va., N. C., S. C., and Fla.	IX. Cal., Or., and Nev.

The district courts are held by the district judges alone. Each State forms one or more dists. There are, beside these, Territorial courts, which are temporary and lose that character whenever a Terr. becomes a State. Each court has a clerk, an atty., and a marshal. All judges of the U. S. courts are appointed by the Pres. by and with the advice and consent of the Senate, and hold their offices during good behavior.

**Political History, Etc.**—The States composing the Amer. Union on the ratification of its independence were in number 13—viz. Mass., N. H., Conn., R. I., N. Y., N. J., Del., Pa., Md., Va., N. C., S. C., and Ga. These States, so far as inhabited, and with the exception of a few small settlements, occupied the terr. between the Atlantic and the Allegheny Mts., but their actual limits extended back to the Miss., with an area of 815,615 sq. m. The first accession of terr. to the old Union was La., which extended from the Brit. possessions in the N. to the Gulf of Mexico (Tex. excepted) on the S., and from the Miss. to the Rocky Mts. The area within these limits is 930,928 sq. m. La. was purchased from the Fr. in 1803, and by the terms of the cession the U. S. also acquired the Fr. claim to the terr. W. of the mts. Fla. was purchased from Sp. in 1819. It contains 58,680 sq. m. The treaty of cession included also the Sp. claim to all the terr. from the mts. to the Pacific N. of the 42d parallel. That portion of Fla. now comprised in the States of Ala. and Miss. was taken possession of by the U. S. as early as 1811. Texas, originally a prov. of Mex., and from 1836 an independent State, was admitted into the Union in 1845, and added to the Federal limits 265,780 sq. m. The line of demarcation between the Brit. and Amer. terr. W. of the Rocky Mts. was settled in 1846, and a contested title to 280,425 sq. m. of land converted into a frontier possession. Cal. and N. M. (649,762 sq. m.) became parts of the Union by the treaty of Guadalupe Hidalgo in 1848, and the terr. from Northern Mex. called Arizona (113,030 sq. m.) was acquired by the treaty of 1854. Russ. Amer. or Alaska, having an area of 577,390 sq. m., was purchased from Russ. in 1867. For details of history see the several States of the Union, the Presidents, Declaration of Independence, Confederate States, etc.



## General View of existing States and Territories.

States and Territories.	Settlement. By whom.	Date.	Territory.	State.	Time of holding general election.	LEGISLATURES.		Time of meeting of Legislature.	Gov.'s term.	State capital.
						Senators.	Reps.			
Alabama.	Fr.	1713.	Mar. 3, 1817.	Dec. 14, 1819.	1st M. Aug.	33.	4 yrs.	2 M. Nov.	bi. 2 yrs.	Montgomery.
Arkansas.	Fr.	1820.	Mar. 3, 1819.	June 15, 1836.	1 M. Sept.	33.	4 yrs.	2 M. Jan.	bi. 2 yrs.	Little Rock.
California.	Sp.	1790.	Sept. 9, 1850.	Sept. 9, 1850.	Tu. after 1 M. Nov.	bi. 40.	4 yrs.	1 M. Jan.	bi. 4 yrs.	Sacramento.
Colorado.	Amer.	1860.	Feb. 28, 1861.	Mar. 3, 1875.	"	bi. 36.	4 yrs.	1 Wed. Jan.	bi. 2 yrs.	Denver.
Connecticut.	Eng.	1633.	One of the original States.	"	"	an. 24.	2 yrs.	1 W. after 1 Jan.	an. 4 yrs.	Hartford.
Delaware.	Swedes.	1677.	"	"	"	bi. 32.	4 yrs.	2 M. Jan.	bi. 4 yrs.	Dover.
Florida.	Sp.	1564.	Mar. 3, 1822.	Mar. 3, 1845.	"	32.	4 yrs.	1 T. after 1 M. Jan.	bi. 4 yrs.	Tallahassee.
Georgia.	Fr.	1733.	One of the original States.	"	1 W. Oct.	bi. 44.	2 yrs.	1 W. Nov.	bi. 2 yrs.	Atlanta.
Illinois.	Fr.	1749.	Feb. 3, 1809.	Dec. 3, 1818.	Tu. after 1 M. Nov.	bi. 51.	4 yrs.	1 W. after 1 M. Jan.	bi. 4 yrs.	Springfield.
Indiana.	Fr.	1730.	May 7, 1800.	Dec. 11, 1816.	"	bi. 50.	4 yrs.	1 W. after 1 M. Jan.	bi. 4 yrs.	Indianapolis.
Iowa.	Amer.	1835.	June 12, 1838.	Mar. 3, 1845.	"	bi. 40.	4 yrs.	2 M. Jan.	bi. 2 yrs.	Des Moines.
Kansas.	Amer.	1859.	May 30, 1860.	Jan. 29, 1861.	Tu. after 1 M. Nov.	bi. 40.	4 yrs.	2 M. Jan.	bi. 2 yrs.	Topeka.
Kentucky.	Va.	1775.	From Virginia.	June 1, 1793.	1 M. Aug.	bi. 38.	4 yrs.	1 M. Dec.	bi. 4 yrs.	Frankfort.
Louisiana.	Fr.	1699.	Mar. 3, 1805.	Apr. 8, 1812.	Tu. after 3 M. Apr.	bi. 36.	4 yrs.	2 M. May.	bi. 4 yrs.	Baton Rouge.
Maine.	Eng.	1620.	From Mass.	Mar. 3, 1820.	2 M. Sept.	bi. 31.	2 yrs.	1 W. Jan.	bi. 2 yrs.	Augusta.
Maryland.	Eng.	1634.	One of the original States.	"	Tu. after 1 M. Nov.	bi. 26.	4 yrs.	1 W. Jan.	bi. 4 yrs.	Annapolis.
Massachusetts.	Eng.	1630.	"	"	"	an. 40.	1 yr.	240.	1 yr.	Boston.
Michigan.	Fr.	1670.	Jan. 11, 1805.	Jan. 26, 1837.	1 M. Apr.	bi. 32.	2 yrs.	1 W. Jan.	bi. 2 yrs.	Lansing.
Minnesota.	Amer.	1847.	Mar. 3, 1849.	May 4, 1858.	Tu. after 1 M. Nov.	bi. 47.	4 yrs.	1 W. after 1 M. Jan.	bi. 3 yrs.	St. Paul.
Mississippi.	Fr.	1716.	Apr. 7, 1798.	Dec. 10, 1817.	"	bi. 40.	4 yrs.	1 T. Jan.	bi. 4 yrs.	Jackson.
Missouri.	Fr.	1763.	Jan. 3, 1812.	Feb. 9, 1867.	"	bi. 34.	2 yrs.	1 W. after Jan. 1.	bi. 4 yrs.	Jefferson City.
Nebraska.	Amer.	1859.	May 30, 1864.	Feb. 9, 1867.	"	bi. 33.	2 yrs.	1 T. Jan.	bi. 2 yrs.	Lincoln.
Nevada.	Amer.	1850.	Mar. 2, 1861.	Mar. 21, 1864.	"	bi. 20.	4 yrs.	1 M. Jan.	bi. 4 yrs.	Carson City.
N. Hampshire.	Eng.	1623.	One of the original States.	"	"	bi. 34.	2 yrs.	1 W. June.	bi. 2 yrs.	Concord.
New Jersey.	Swedes.	1627.	"	"	"	an. 31.	1 yr.	2 T. Jan.	an. 4 yrs.	Trenton.
New York.	Dut.	1613.	"	"	"	bi. 32.	2 yrs.	1 W. after 1 M. Jan.	bi. 4 yrs.	Albany.
N. Carolina.	Eng.	1653.	"	"	"	bi. 50.	2 yrs.	1 W. after 1 M. Jan.	bi. 4 yrs.	Raleigh.
Ohio.	Va. & N. Eng.	1788.	July 13, 1787.	Apr. 30, 1802.	2 T. Oct.	bi. 33.	2 yrs.	1 M. Jan.	bi. 2 yrs.	Columbus.
Oregon.	Eng.	1796.	Aug. 14, 1859.	Feb. 14, 1859.	1 M. June.	bi. 30.	4 yrs.	2 M. Jan.	bi. 4 yrs.	Salem.
Pennsylvania.	Eng.	1682.	One of the original States.	"	Tu. after 1 M. Nov.	an. 30.	4 yrs.	1 T. Jan.	an. 4 yrs.	Harrisburg.
Rhode Island.	Eng.	1639.	"	"	Tu. after 1 M. Nov.	bi. 35.	4 yrs.	1 T. Jan.	bi. 4 yrs.	Providence.
S. Carolina.	Eng.	1670.	"	"	"	bi. 33.	2 yrs.	1 M. Jan.	bi. 2 yrs.	Columbia.
Tennessee.	N. C. & Va.	1765.	May 26, 1790.	June 1, 1796.	"	bi. 33.	2 yrs.	1 M. Jan.	bi. 2 yrs.	Nashville.
Texas.	Sp.	1690.	Mar. 1, 1845.	"	"	bi. 31.	4 yrs.	2 T. Jan.	bi. 2 yrs.	Austin.
Vermont.	Eng.	1763.	From N. H. & N. Y.	Feb. 18, 1791.	1 T. Sept.	bi. 30.	2 yrs.	1 W. Oct.	bi. 2 yrs.	Montpelier.
Virginia.	Eng.	1607.	One of the original States.	"	Tu. after 1 M. Nov.	bi. 40.	4 yrs.	2 M. Jan.	bi. 4 yrs.	Richmond.
W. Virginia.	Amer.	1867.	From Virginia.	Dec. 31, 1867.	"	bi. 26.	4 yrs.	2 W. Jan.	bi. 4 yrs.	Charleston.
Wisconsin.	Amer.	1831.	Apr. 30, 1836.	Mar. 3, 1847.	"	an. 33.	4 yrs.	1 M. Jan.	bi. 2 yrs.	Madison.
Alaska Terr.	Rus.	1805.	Dist. govt. organized May 17, 1884.	"	"	"	"	"	"	Sitka.
Arizona Terr.	Sp.	1598.	Feb. 24, 1863.	"	Tu. after 1 M. Nov.	bi. 12.	2 yrs.	24.	2 yrs.	Prescott.
D. C.	U. S.	1790.	Mar. 3, 1791.	"	"	"	"	"	"	Washington.
Dakota Terr.	Amer.	1860.	Mar. 2, 1861.	"	Tu. after 1 M. Nov.	bi. 12.	2 yrs.	24.	2 yrs.	Bismarck.
Idaho Terr.	Amer.	1852.	Mar. 3, 1863.	"	"	bi. 12.	2 yrs.	24.	2 yrs.	Boise City.
Montana Terr.	Amer.	1858.	May 26, 1864.	"	"	bi. 12.	2 yrs.	24.	2 yrs.	Helena.
N. Mex. Terr.	Sp.	1598.	Sept. 9, 1850.	"	"	bi. 12.	2 yrs.	24.	2 yrs.	Santa Fe.
Utah Terr.	Amer.	1847.	Sept. 9, 1850.	"	"	an. 12.	2 yrs.	24.	2 yrs.	Salt Lake City.
Wash. Terr.	Amer.	1848.	Mar. 2, 1853.	"	"	bi. 12.	2 yrs.	24.	2 yrs.	Olympia.
Wyoming Terr.	Amer.	1864.	July 25, 1868.	"	"	bi. 12.	2 yrs.	24.	2 yrs.	Cheyenne.

**Revenue.**—The receipts of the U. S. during the year ending June 30, 1884, were as follows: Customs, \$195,067,489.76; internal revenue, \$121,586,072.51; direct tax, \$70,720.75; public lands, \$9,810,705.01; miscellaneous receipts, \$21,984,881.89; total net ordinary receipts, excluding loans, \$348,519,869.92. The expenditures during the same year have been: Civil and miscellaneous, \$70,920,433.70; war, \$39,429,603.36; navy, \$17,292,601.44; Indians, \$6,475,999.29; pensions, \$55,429,328.06; interest, \$54,578,378.48; total net ordinary expenditures, excluding interest, \$244,126,244.33.

**Commerce and Navigation.**—The imports and exports of merchandise and specie into and from the U. S. in the fiscal year ending June 30, 1884, amounted to—merchandise, imports, \$667,697,063; exports, \$740,513,609; excess of exports, \$72,815,916; specie, imports, \$37,436,262; exports, \$67,133,383; excess of exports, \$29,707,121. The number of sailing vessels for the same year was 16,658, of 2,414,008 tons; steam vessels, 5401, of 1,465,000 tons.

**Postal Service.**—Number of foreign letters (estimated) mailed during the year 1884, 33,328,019. Number of P. O. in the U. S., 50,017; length of public mail routes, 359,530 m.; cost of mail service, \$25,359,516; postage on newspapers and periodicals, \$1,880,592; amount received for postage stamps, envelopes, and cards, sold, \$4,515,877; number of registered letters and packages mailed, 11,246,545; amount of fees on registered matter, \$957,059 (in addition to postage); number of dead letters and parcels received, 4,751,872; number of money-orders issued, 8,314,951; amount of money-orders purchased, \$129,810,038; cost of U. S. ocean mail service, \$332,221.

**Army.**—The aggregate strength of the line of the army in 1884 was 2147 officers and 24,236 enlisted men—viz.:

	Officers.	Enlisted men.
10 cavalry regiments.	430	7,115
5 artillery regiments.	279	2,596
25 infantry regiments.	856	11,035
Engineer battalion, recruiting parties, ordnance dept., hospital service, Indian scouts, W. Pt. signal detachment, and gen. service.	582	3,470

The country is divided into 3 military divisions, as follows: 1. Military division of the Missouri, commanded by Maj.-Gen. John M. Schofield, head-quarters Chicago—depts. of the Mo., Tex., Dak., and the Platte; 2. Military division of the Atlantic, commanded by Maj.-Gen. Winfield S. Hancock, head-quarters New York—depts. of the E. of the S. and of W. Pt.; 3. Military division of the Pacific, commanded by Maj.-Gen. John Pope, head-quarters San Francisco—depts. of Cal., the Columbia, and Ari.

**Navy.**—There were in the service in 1884, 44 naval steam vessels, all screw propellers except 4, beside 13 wooden sailing vessels, 19 iron-clad vessels, 2 torpedo rams, and 15 tugs; total, 93, of which but few were in efficient service. The number of guns is 550. The active list is composed of 1064 officers of the line, 591 officers of the staff, and 204 warrant officers; total, 1859 officers of all grades. There were in service, July 1884, provided for by the navy appropriation act for fiscal year 1885, 7500 men and 750 boys. The marine corps consists of 85 officers and 1500 enlisted men.

**Indians.**—Indians "not taxed"—i. e. in tribal relations—are excluded by the const. from the basis of political representation. The several tribes are regarded as "domestic, dependent nations," governed by their own laws, yet subject to the sovereignty of the U. S.; having a right of occupancy in their lands, yet without the power to cede those lands except to the U. S. alone. The policy of removing the

Indians to the W. of the Miss. was inaugurated about 1825, and largely carried out in the 20 yrs. following, especially in respect to the Southern or Appalachian Indians—the Creeks, Choctaws, Chickasaws, Cherokees, and Seminoles. Beside the Ind. Terr. other large reservations have been set apart for Indian occupation, especially in Mont. and Dak. Formerly, under the treaty system, a U. S. Indian agent was a sort of minister resident, while the tribes were governed according to their own traditions and customs by their own chiefs. By the act of 1871 the authority of the chief is practically destroyed, yet no agencies for administering justice and preserving the peace among the tribes have been instituted to take the place of the system thus abrogated. In consequence, the administration of the internal affairs of the Indian tribes has been thrown into much confusion.

**Census.**—The census of the U. S. is taken, under an express provision of the const., every 10 yrs. The U. S. judicial dists. are made census dists., and the marshal of each dist. directs and supervises its enumeration. The marshals appoint assistants, who perform the actual enumeration. The lists of names, ages, occupations, etc. are sent to the supt. of the census at Wash., who conducts the compilation and publication of the statistical results.

**Public Lands.**—Apart from special grants the public lands of the U. S. may be acquired by individuals in the following ways: First, under the Homestead act, by which a tract of 80 acres, at \$2.50 an acre (called double minimum land), or 160 acres at \$1.25, may be obtained through the payment of certain fees and commissions, ranging from \$7 to \$34, on condition that the applicant resides upon and cultivates the land for 5 yrs. Second, under the Pre-emption act, through which any person may, by "entering" at the appropriate land-office a tract of 80 or 160 acres, secure a right to take the land at govt. rates whenever it shall be offered for sale. Third, by auction, whenever offered by proclamation of the Pres. or public notice from the general land-office at Wash. Fourth, after failure to sell by auction, the lands remain subject to purchase by what is called private entry at any subsequent period. Fifth, by timber culture, or planting trees upon 160 acres one may obtain a patent for 160 acres, free, at the end of 3 yrs.

In its patent system the U. S. is far in advance of any other country. During the yr. 1883, 22,216 patents were issued.

**The Public Debt.**—See DEBT, NATIONAL.

**Railroads.**—The following table exhibits mileage of railways and capital account in each group of States, 1884:

Group of States.	Length of Line.	Length Operated.	Capital Stock.	Funded Debt.	Total Investment.	Cost of R. R. and Equipment.
N. England	6,323	6,203	198,544,058	144,346,982	\$60,317,081	337,953,809
Middle	17,332	16,334	1,012,157,191	899,914,618	2,012,536,974	1,596,937,643
Western	18,866	15,263	404,794,911	497,360,083	888,303,873	793,126,049
Southern	70,308	66,288	1,794,908,299	1,756,985,194	3,881,033,666	3,441,141,046
Pacific	7,436	6,739	307,638,131	196,935,506	553,290,717	515,537,513
Total	120,562	110,414	3,706,060,583	3,455,040,383	7,495,471,311	6,684,756,045

For Agriculture, Manufactures and Mining, Education, Religion, etc., see under the respective States.

See CENTRE OF U. S. POP. in APPENDIX.

**Literary and Scientific Institutions.**—The only important institutions of a national character controlled by the U. S. are the Military Acad. at W. Pt., the Naval Acad. at Annapolis, the Smithsonian Institution, and the National Acad. of Sciences.

A. R. SPOFFORD.









# MAP OF UNITED STATES

Drawn and Engraved on Copper-Plate

EXPRESSLY

FOR

JOHNSON'S UNIVERSAL CYCLOPEDIA

SCALE OF MILES 0 100 200 300











**United States Bank.** See BANK.  
**United States Christian Commission.** See CHRISTIAN COMMIS-  
**United States, Literature of.** See ENGLISH LAN-  
 GUAGE AND LITERATURE.  
**United States Lutheran Church.** See LUTHERAN  
 CHURCH IN THE U. S.

**United States Military Acad.** See WEST POINT.  
**United States Naval Academy, The,** was opened Oct. 10, 1845. The course of instruction, designed to train mdpn. for the navy, at first occupied 5 yrs., of which 3 were passed at sea. Various changes have been made in the course of instruction, which was made 7 yrs. in 1850, 4 yrs. in 1851, and 6 yrs. (the 2 last of which are spent at sea) Mar. 3, 1873, where it now remains. The Naval Academy, first located at Annapolis, Md., was removed to Newport, R. I., in May 1861, but re-established at Annapolis in Sept. 1865, where it now is, occupying lands formerly known as Ft. Severn. The Acad. is under the direct care and supervision of the navy dept. There are to be allowed in the Acad. 1 cadet-mdpn. for every member or delegate in the House of Reps., appointed at his nomination, 1 for D. C., and 10 appointed at large by the Pres. The number of appointments which can be made is limited by law to 25 each yr., named by the sec. of the navy after competitive examinations, the cadets being from 14 to 18 yrs. of age. The successful candidates become students of the Acad., and receive the pay of cadet-mdpn., \$500 per annum. Beside the cadet-mdpn., 35 cadet-engineers may be appointed each yr., from 16 to 20 yrs. of age, on competitive examination involving a higher standard of knowledge. The course for cadet-engineers is 4 yrs. at the Acad. and 2 additional yrs. at sea. All cadets who graduate are appointed assistant engineers in the navy as fast as vacancies occur. The course of instruction is thorough, involving a close pursuit of math., steam-engineering, physics, mechanics, seamanship, ordnance, hist., law, etc.

**United States of Colombia.** See COLOMBIA.  
**United Synod of the Presbyterian Church,** a former organization in the S. U. S.; seceded in 1857 from the New School Presbs., and in 1864 joined the General Assembly of the Confed. States.

**United Syrians.** In the E. rite of the R. Cath. Ch. the Syrian rite comprises the Chaldeans, the Maronites, the United St. Thomas Chrs., and the United Syrians proper. The latter have a patriarch at Aleppo, styled patriarch of Antioch, and abps. of Aleppo, Babylon, Damascus, and Seleucia, beside 11 bps. They number about 30,000.

**Universalism.** This term indicates the belief of those who hold the doctrine of the final holiness and happiness of all intelligent beings. They conceive it to be utterly inconsistent to affirm that a Being of infinite benevolence will doom any of his children to irremediable woe. They argue that none but a malignant Being, having the power to reclaim those of his subjects that have wandered from him, will permit them to go on in sin, and suffer its consequent miseries forever. Univts. believe in the infinite and immutable love of the Heavenly Father, who will not permit the sinner to elude his all-conquering grace, but will follow the lost soul to the deepest hell it may make for itself, and will find it and bring it back to his presence and to the joy of the celestial state. Such are the meaning and purpose, they conceive, of the Chr. religion.

**Universalists.** See UNIVERSALISM.  
**Universals** are either metaphysical, *universalia ante rem*, denoting the archetypal forms of things as far as they existed in the Divine Mind before the real things were created; or physical, *universalia in rem*, denoting the archetypal forms as far as they actually exist in things created; and finally logical, *universalia post rem*, denoting the archetypal forms as far as they are abstracted by the human intellect from the things.

**Universe, The** [Lat. *universum*], a term employed to signify the grand and total aggregate of created things. The knowledge we have acquired of the all but boundless creation, of which the globe we inhabit is a humble and inconspicuous member, may be succinctly summed up in the following propositions:

1. The stars are suns as truly as our own, and like ours are endowed with self-luminosity. Some of them are furnished with one or more luminous satellites; others with satellites of which, though obscure, the existence is sufficiently proved by the phenomena presented by the phases of their brightness and by their movements.

2. These systems, which we may call systems of the first order, and which resemble our planetary system, are governed by the force of gravity residing in a principal star, and are subject to the same Keplerian laws which reign among the planets revolving around our sun.

3. In many cases these simple systems are replaced by systems extremely complex, forming groups and globular aggregations of which the laws of movement and of equilibrium are still unknown.

4. Innumerable other aggregations are of a character more or less resolvable, but of greater complication; in which yet, in consequence of the distance of the bodies and the slowness of their movements, there appears no trace of a centre of motion nor any law of regular concentration.

5. The Milky Way is a zone constituted of an enormous agglomeration of complicated masses of stars, which may each be regarded as composed of innumerable systems of a superior order.

6. The stars which are apparently the largest are also the nearest, and greater distance is the principal cause of the smaller apparent magnitude of the others.

7. Beside the stars, there are in the heavens very numerous masses of matter luminous *per se*, not yet condensed into well-defined bodies, but simply gaseous, which form the nebulae. Some of these are of enormous extent and of extremely irregular density; others have a uniform density;

others, still, a condensation increasing toward the centre, as if they were stars just forming; some are annular, and appear destined to form systems of a more complicated character.

8. The largest part of these nebulous masses of gradual condensation present themselves in regions independent of the Milky Way, and seem to form systems by themselves.

9. The absolute dimensions of the stars and the nebulae, and their respective distances, are entirely unknown in consequence of the absence of parallax; and hence we can know nothing at all positive as to their real distribution in space. Yet we can be certain that the stars are not uniformly distributed, but are most numerous and most dense—not only apparently but also really—in the plane of the Milky Way. The nebulae, on the other hand, are in greater density and number in a plane perpendicular to this.

10. Estimating by indirect means the stellar distances, and expressing them only in relative measures, we infer that, placing the nearest stars at the smallest distance possible—that is to say, the distance corresponding to an annual parallax of an entire second—they would be remote from us by 206,265 semi-diameters of the great orbit of the earth, and their light would occupy 3¼ yrs. in coming to us from them. These numbers must be increased at least tenfold in order to include all the stars in our neighborhood; because it is certain that only very few have more than the tenth of a second of parallax; and hence the magnitude of the orbit which the earth describes around the sun, though 276,000,000 kilometres in diameter, would not appear from one of these more than an imperceptible point.

11. Calculating with this proportion, according to the most probable elements of photometry and of proper motion, the distance of the other objects which the most powerful Herschel instruments can reach, we find it such that, for these, light should occupy in coming to us, a time 312 times longer than for the stars of the first magnitude having a tenth of a second of parallax; that is to say, more than 10,000 years!

12. Immense as this space may seem, it does not constitute the real limit of the creation, since our most powerful instruments fail to penetrate even all the galactic strata in all their profundity; hence, the firmament is for us unfathomable. It cannot, nevertheless, be called infinite; nothing composed of distinct and separate entities can be infinite. But, though not absolutely infinite, the universe is for us as if it were so. It is said that the world ought to be infinite in order that the work may be worthy of its Infinite Creator. But if it were infinite and peopled to infinity with stars, the celestial vault ought to appear, in all its extent, as brilliant as the sun. Such is not the fact; and hence the stars are not infinite in number.

13. The matter which composes this incomprehensible mass is yet always the same. The elements which the chemist studies in his laboratory are the very same elements which the spectroscopist reveals in the stellar atmospheres and in the ultimate nebulae.

14. But the creation which the astronomer contemplates is not a simple aggregation of incandescent matter; it is a prodigious organism, in which, where the incandescence of matter ceases, life begins. Though this life may not be discoverable by our telescopes, still, from the analogy of our globe, we can argue to its general existence in others.

15. In the immense variety of objects of creation which have been or which still are in existence on our planet, we can argue the diversity which must exist yonder.

16. But it would be a very narrow view to model the entire universe upon the pattern of our little globe, while in this relatively microscopic system there is presented so great a variety; nor is it philosophical to pretend that every star is inhabited like ours, and that in every system life is limited to dark satellites alone. It is true that with our life limited to dark satellites alone. It is true that with our life could not exist except between confines of temperature narrowly limited—that is, between zero and 40° to 45° C. (104° to 113° F.)—but who can tell that these are not limits for our organisms only?

17. Life fills the universe, and with life is associated intelligence; and as beings inferior to ourselves abound, so may there in different conditions exist others of capacities infinitely greater than our own.

18. But this is a sphere over which the astron. may not extend his reign. His proper province is to study the material and mechanical development of the world—to trace it out in space, and aid the geologist who studies it in time.

19. Inasmuch as no new and conspicuous body has come to occupy a permanent place in the starry sphere, if any such body has at any time appeared instantaneously, we now know that this was not a new creation, but one of those great momentary conflagrations which are not rare even in our day, but are only difficult to demonstrate on account of the apparent minuteness of the bodies which are their seat. Are these conflagrations born of collisions from without, or from new transformations in the interior of the star? We know not; but we still see in them the evidence that in those depths of space, where eternal silence seems to reign, there exists a prodigious activity.

20. The comets, which have been the subject of so many speculations during the past century, are now recognized to be only visitors, strangers to our system, and parts of a great nebula of a special nature, containing gases very familiar to chemistry—not in elementary condition, as in the sidereal nebulae, but combined with proteiform carbon, an element detected only in a portion of the stars. Their light is not wholly due to reflection from the sun, but is also in some degree their own.

21. Heat is the prime force animating the universe; its action is transmitted from one body to another by the instrumentality of a continuous medium which we call ether; and we are in contact with the remotest regions through this mysterious medium, whose vibrations constitute radiant heat, light, and vital chemical activity.



22. Gravity is the force which directly rules the entire creation, from the pebble falling upon the earth to the nebula gradually condensing in the profundity of space; but it is not the sole force which rules in the universe; perhaps even it is itself only a consequence of disturbed equilibrium in the ether. But the comets have given indications of some other force not yet well defined operating in space. The rapid development of the tails of these bodies is not explained by the action of heat alone, nor by that of gravity.

23. The decennial vicissitudes of the sun, showing themselves in the variations of its spots and in the force of its eruptions, are reflected in the variations of terrestrial magnetism and in the electric displays of the aurora borealis.

24. We are not yet at the end of marvels; we shall be so only when we cease to study. There was a time when the solar system was limited to a central luminous body surrounded by a few of the larger non-self-luminous celestial objects. Not long after there were added to this, numerous systems of the second order (the satellites), and discovery was believed to be at an end. Now, on the other hand, the very idea of the system is itself radically changed.

25. It is not so very long since it was believed that the stellar spaces were peopled only by well-defined and compact bodies; now there have been discovered those enormous masses of gas which are perhaps destined to constitute other solid bodies, if even already there are not some of them solidified, of which light has not yet brought us the announcement.

26. How many other marvels ought we not to find in the immensity of that space which we are yet unable to sound? Who would have imagined, 10 yrs. ago, the wonders which the spectroscope was on the point of revealing? Every new improvement in art brings a new improvement also to science; and the astron., profiting by both art and science, is finding new revelations of the greatness of God, and giving new cause to exclaim with the royal prophet, "O Lord, how manifold are thy works! In wisdom hast thou made them all;" and thus, as the heavens declare his glory, and the firmament sheweth forth his handiwork, so if the day astounds us with its wonders, the night opens to us the very treasury of science. (For a more complete account, see article by P. A. SECCHI, *Director of Rome Observatory*, in *J.'s Univ. Cyc.*) F. A. P. BARNARD.

**University of Colorado, The**, at Boulder, was opened in 1876, and is supported by the State; the tuition is free. The first commencement occurred June 8, 1882. It is designed to be to Col. what Mich. Univ. is to Mich., and has a preparatory school connected with it. Its intrinsic merits are pushing it to the front rank among educational insts.

**University of Virginia**. See VIRGINIA, UNIVERSITY OF.

**Uncleavened Bread**. See BREAD.

**Uncleavened Bread, Feast of**. See PASSOVER.

**Upas Tree** [*Antiaris toxicaria*, from the native word *antiar*]. This tree grows in the forests of Java, where it is called *Bokun upas*. The viscid juice of the plant dries into a resinous mass termed by the Javanese *antiar*. This exudation is extremely poisonous, and when introduced into the circulation of an animal, death speedily ensues. The stories of the early travellers respecting the pernicious character of exhalations from the foliage of this tree were gross exaggerations. The plant belongs to the bread-fruit family.

**Updegraff** (J. T.), b. in Jefferson co., O., 1822, studied med. at Univ. of Pa., from which he grad.; studied in med. schools in Edinburgh and Paris; served as surgeon in the army during the c. war, and afterward practised med.; was member of C. senate 1872-73; chairman of Rep. State central committee 1875, and elected to the 46th, 47th, and 48th Congs. D. Nov. 30, 1882.

**Upfold** (GEORGE), M. D., D. D., LL.D., b. at Shemley Green, near Guilford, Eng., May 7, 1796, came to the U. S. 1802; settled at Albany, N. Y.; grad. at Union Coll. 1814, and in med. in New York 1816; entered upon the study of theol.; was ordained in the P. E. ch. 1818; was minister at Lansingburg, N. Y., 1818-20, rector of St. Luke's, New York, 1820-28, assistant minister of Trinity ch. 1821-25, rector of St. Thomas's ch., New York, 1828-31, of Trinity ch., Pittsburg, Pa., 1832-50, and was consecrated bp. of Ind. Dec. 1849. D. Aug. 26, 1872.

**Upham** (CHARLES WENTWORTH), b. at St. John, N. B., May 4, 1802, son of a loyalist refugee, judge of the supreme court of the prov.; grad. at Harvard 1821, at Cambridge Divinity School 1824; colleague of Dr. Prince, pastor of the First ch. in Salem, 1824-44; left the profession on account of bronchial weakness; edited the *Christian Register*; travelled and lectured as agent of the Mass. board of education; was elected mayor of Salem; was member of the Mass. house of reps. in 1849, of the State senate 1850-51, of the national Cong. from the 6th dist. 1854-55; State senator 1858, rep. 1859-60. Wrote *Letters on the Logos, Prophecy as an Evidence of Christianity*, and *Lectures on Witchcraft, comprising a Hist. of the Salem Delusion of 1692*. D. June 15, 1875.

**Upham** (NATHANIEL GOOKIN), LL.D., b. at Rochester, N. H., in 1801, grad. at Dartmouth Coll. in 1820; was judge of the supreme court of the State 1833-43, and connected with the Concord R. R. 1843-63. In 1853 he was appointed by Pres. Pierce one of the coms. at Lond. to adjust claims between citizens of the U. S. and Brit. subjects; was a member of the State legislature 1855-66. D. Dec. 11, 1869.

**Upham** (THOMAS COGSWELL), D. D., b. at Deerfield, N. H., Jan. 20, 1799, grad. at Dartmouth Coll. 1818, and at Andover Theological Sem. 1821; became assistant teacher of Heb. in the sem., and translated Jahn's *Biblical Archaeology*; in 1823 was ordained pastor of the Congl. ch. in Rochester, N. H.; in 1825 was chosen prof. of mental and moral philos. in Bowdoin Coll. Wrote *Manual of Peace, Elements of Mental Philosophy*, etc. D. Apr. 2, 1872.

**Upper Sandusky**, city and R. R. junc., cap. of Wyandot co., O., on the W. bank of Sandusky River, 64 m. N. W. of Columbus. Pop. 1870, 2564; 1880, 3540.

**Upsala**, town of Swe., 45 m. N. W. of Stockholm, has a

beautiful cathedral and a flourishing univ. The univ. is attended by over 1200 students. Pop. 15,515.

**Upshur** (ABEL PARKER), b. in Northampton co., Va., June 17, 1790, studied law under William Wirt at Richmond, where he practised 1810-24; was rep. in the legislature, and in 1826 was appointed a judge of the general court; in 1829 was a member of the State constitutional convention, and in 1843 was appointed sec. of the navy; was killed by the bursting of a gun on board the U. S. steamer Princeton Feb. 28, 1844. Wrote *Inquiry into the Nature and Character of our Federal Govt.*, etc.

**Upton** (EMORY), b. at New York 1840, grad. at the U. S. Military Acad. May 1861. In the Peninsular campaign of 1862 he commanded a battery at Yorktown, Gaines's Mill and Glendale; in command of artil. brigade at South Mountain and Antietam; appointed col. 121st N. Y. Volunteers Oct. 1862, and engaged at Fredericksburg, Salem Heights, Gettysburg, and in command of a brigade during subsequent Rapidan campaign. In the Richmond campaign of 1864 he led his brigade (6th corps) through the Wilderness battles to the front of Petersburg; transferred with his corps to the Shenandoah July 1864, he was wounded at Opequan Sept. 19. Returning to duty, was engaged in the expedition into Ala. and Ga. in the spring of 1865 resulting in the capture of Selma, Columbus, etc. Mustered out of the volunteer service Apr. 1866, he was in July transferred to the 25th Inf. with rank of lieutenant-col., and engaged in perfecting a *System of Infantry Tactics*, which was adopted in Aug. 1867, for the use of the army and militia of the U. S.; transferred to the 18th Inf. in 1869, and to the 1st Artil. 1870. Was commandant of cadets at W. Pt. 1870-75. For gallantry in the field during the war he was brevetted from major to maj.-gen. D. Mar. 15, 1881.

**Ural**, river of Rus., rises in the Ural Mts., flows S., forming the boundary between Europe and Asia, and enters the Caspian Sea after a course of 1040 m. It is not navigable on account of sand-banks, but abounds in the finest fish.

**Ural Mountains**, *The*, a range of plateaus rather than a chain of mts., rising from 3000 to 5000 ft., and with a breadth of from 16 to 66 m. They begin at the Arctic Ocean, in lat. 70° N., and stretch southward to lat. 50° N., forming the natural boundary between Europe and Asia. They are exceedingly rich in metals.

**Urania**, in Gr. mythology, one of the 9 Muses, the goddess of astron., and a daughter of Zeus and Mnemosyne.

**Uranium**. Klaproth in 1789 gave this name to a metal whose oxide he discovered in the mineral called *pitchblende*, which contains sometimes as much as 85 per cent. of urano-uranic oxide. It was not until as late as 1840, however, that metallic U. was first discovered by Peligot, what had previously passed for the metal having been ascertained by him to be only the monoxide. There are quite a large number of mineral species that contain U., but the only one occurring in sufficient quantity to be available for the extraction of uranic compounds is pitchblende, which is found at Joachimsthal in Bohemia in sufficient quantity to furnish it to commerce, in which it is in demand chiefly for coloring porcelain and glass. One Amer. locality only is as yet known, from the N. side of Lake Superior, of a variety called *coracite*.

**Uranos** (Gr. for "heaven"), in the Gr. mythology, the son of Gæa, the earth, and by her the father of the Titans, Cyclopes, Hecatoncheirians, etc. (See TITANS.)

**Uranus**, the 7th planet in order of distance from the sun, and, with the exception of Neptune alone, the outermost member of the planetary family. It was discovered by Sir W. Herschel Mar. 13, 1781.

**Urbana**, city and R. R. junc., cap. of Champaign co., Ill. Pop. 1870, 2277; 1880, 2942.

**Urbana**, city and R. R. centre, cap. of Champaign co., O., 100 m. N. of Cin. and 46 m. W. of Columbus, in a rich agricultural dist., and has various manufactures. The Urbana Univ., the only Swedenborgian school in the U. S., is located here. Pop. 1870, 4276; 1880, 6252.

**Urchin-Fish**. See DIDONOTIDEÆ.

**Urchin**, *Sea*. See ECHINIDEÆ.

**Ure** (ANDREW), M. D., F. R. S., b. at Glasgow, Scot., May 17, 1778, ed. at the univs. of Glasgow and Edinburgh, where he also grad. in med.; became prof. of chem. at the Andersonian Inst. at Glasgow 1804, and director of the Glasgow Observatory 1809; removed to Lond. 1830; was appointed analytical chemist to the board of customs 1834; acquired a high reputation by his original scientific researches, and especially by his successful application of chemical discoveries to the arts and to manufactures. Wrote *A New Systematic Table of the Materia Medica*, *A Dict. of Chem.*, *A New System of Geol.*, etc. D. Jan. 2, 1857.

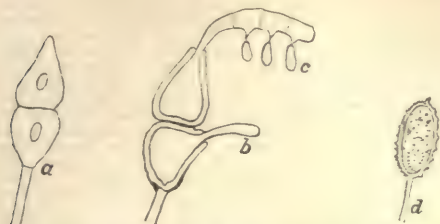
**Urea** [Fr. *urée*; Ger. *Harnstoff*; *Ureoxyl* *Ammoniak*], an isomere of ammonium cyanate. It is an essential constituent of the urine of mammiferous animals. U. also occurs, to some extent, in human blood and perspiration, in the vitreous humor of the eye, and in the lymph and chyle of various animals. It is the chief outlet for the oxidized nitrogen of the tissues of the system, a healthy adult excreting more than an ounce daily. It is not formed in the kidneys, which appear merely to separate it from the blood in which it is pre-existent.

**Uredineæ** [Lat. *ureo*, to "burn"], an order of Fungi to which belong the rusts and many of the mildews which attack living plants. The black spots known as mildew are found late in summer and in autumn in streaks on the leaves and stems, and occasionally on the glumes, of grasses. The black color is caused by the spores of a fungus to which the name *Puccinia graminis* has been given. The mycelium or vegetative threads of this species extend throughout the stem and leaves, and sometimes even into the roots, of the grass. They burst finally through the epidermis, and bear dark-colored spores, consisting of two cells, as shown in Fig. 1, a. In the following spring, or during the winter if kept sufficiently moist and warm, each of these cells ger-



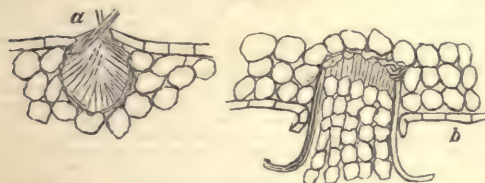
minates and pushes out a tube, as in Fig. 1, *b*, which tube quickly divides into 3 or 4 parts by cross-partitions, and bears the bodies represented in Fig. 1, *c*. The latter, if

Fig. 1.



placed on moistened leaves of grass, grow by pushing out a tube for a short time, but soon perish. If, however, they are placed on leaves of the common barberry, and kept in a sufficiently moist position, the tubes may be seen to penetrate into the interior of the barberry leaf, on which, at the end of a few days, a red spot appears, and the tissue of the leaf becomes thickened. In this red spot there appears on the upper surface of the leaf a number of dark-colored bodies, which, when examined by the microscope, exhibit the structure shown in Fig. 2, *a*. Shortly afterward there grow out from the under surface of the leaf a number of cup-shaped bodies (Fig. 2, *b*), containing orange-colored

Fig. 2.



spores, at first arranged in rows, but soon breaking up into powder. These cup-shaped bodies are commonly called cluster-cups, and are found on the barberry in spring and early summer. The spores contained in the cluster-cup germinate at once by pushing out a tube; but if sown on barberry leaves, the germinating tubes soon perish without entering the leaves. When, however, the spores produced in the cluster-cups on the barberry are sown on moistened leaves of grass, the germinating threads which they give out penetrate into the leaves, and in a few weeks burst through the epidermis and bear a number of spores, as in Fig. 1, *a*. The spores are oval, of an orange color, slightly granulated, and borne singly on a short stalk. The spots caused by the orange-colored spores are known as rust. The rust spots are later in the season succeeded by the black spots already described as mildew. The mildew spots are produced either by the growth onward of the same mycelial filaments which have produced the rust spots, or by the germination of the rust spores. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. W. G. FARLOW, M. D.]

**Urfah.** See ORFA.  
**Urga** ["palace"]. The Russian name of the Mongolian **Bogdo-Kuron or Da-Kuren** ("holy camp"), the cap. of N. Mongolia, has 30,000 inhabs., and is on the Tola, on the line between Kiachta and Peking which forms the principal caravan-route between Rus. and China. U. consists, like all Mongolian towns, of a Mongolian and a Chi. quarter. Both places are disgustingly dirty. Bogdo-Kuren contains large Buddhist monasteries and temples, and is the seat of the supreme Mongolian Kutukhtu, who is considered the terrestrial representative of Booddha, and ranks in holiness next to the Dalai-Lama of Lhasa and the Panchoss Rinpoche of Shigartse, both in Tibet. The monasteries are extensive structures of stone. The other houses are miserable huts or tents of felt, incredibly dirty, and swarming with clouds of parasitic insects. The custom is to not bury the dead, but to leave them, in accordance with Booddhistic doctrines, to be devoured by the dogs and birds of prey. The Mongols settled here belong to the Khaika tribe. During summer, numerous pilgrims from all parts of Mongolia gather to the city, and a brisk trade springs up. The unit of value is the tea-brick. Tea, mixed with cows' blood, is moulded into the form of bricks, and from 12 to 15 such bricks are paid for a sheep, from 120 to 150 for a camel. The surrounding country has a S. Siberian character. A Rus. consul is stationed here.

**Uric Acid, or Lithic Acid,** occurs in a small proportion in human urine, but is much more abundantly contained in the excretions of insects, land-reptiles, and birds, usually as the ammoniac salt. It is extensively found in the guano-beds of the Pacific islands, also in the form of ammoniac urate, and is said to be contained in the human spleen, liver, and lungs; also in the blood, which latter, in certain diseases, as gout and albuminuria, contains a very considerable amount; indeed, in persons suffering from the former affection it often accumulates around the joints, forming what are commonly but incorrectly termed "chalk-stones," which consist chiefly of sodic urate. When secreted in excess, it is discharged by the kidneys, and is deposited from the urine as *red gravel*, or it accumulates in the bladder and forms a constituent of urinary calculus.

**Urim and Thum'mim** [Heb. plu. abstracts, signifying "enlightenment and fulfilment" or "completion"], the name of that sacred symbol of the high priest of Israel

which was given at Sinai, but lost forever at the destruction of the first temple. It was placed either upon the *choohen* or breastplate of the high priest, thus being the 4 rows of precious stones (*Kaishet*), or else within its pocket.

**Urinary Calculi and Deposits.** *Deposits.*—Urine in disease often deposits on standing various kinds of sediments, such as blood, pus, and mucus corpuscles, epithelial scales, spermatozoa, urates, uric acid, phosphates, calcic oxalates and carbonates, hippuric acid, cystine, leucine, xanthine, tyrosine, etc. These deposits form light flocculent powders or compact grains (*gravel*), or they collect in larger concretions, forming calculi. The most common sediments contain uric acid. This often separates in a free state, forming *red gravel*. A crystalline or amorphous deposit, consisting of ammonio-magnesian phosphate, forms what is known as *white gravel*.

*Calculi in the Bladder.*—These vary greatly in size and composition, and are frequently composed of concentric layers of different composition, arranged around a clot of blood or a foreign substance as a nucleus; the exterior layer is often phosphatic, but never uric, in character. As a rule, the oxalic calculi are the hardest, the phosphatic being the softest. Calculi are removed from the bladder by crushing instruments or by extraction through a perineal incision. Acid gravel calls for constant use of alkalies and corrected diet; alkaline gravel indicates the use of dilute mineral acids.

#### Urine, Retention of. (See RETENTION OF URINE.)

**Urquiza**, oor-kee'sah, de (Justo José), b. in the prov. of Entre Rios, viceroyalty of Buenos Ayres, in 1800, of mixed Sp. and Indian blood; became gov. of his native prov. 1842; commanded the Argentine forces in Uruguay 1843-45, and gained over Rivera, at India Muerta, Mar. 28, 1845, an important victory; found himself an object of suspicion to Rosas, against whom he revolted; defeated Rosas at the decisive battle of Monte Caseros, forcing him to flee to Europe; was recognized at Buenos Ayres as provisional dictator; called a cong. at Santa Fé to form a const.; was forced to retire from Buenos Ayres by the revolution of Sept. 11, which established the independence of that prov. from the confederation; was chosen pres. for 6 yrs. 1854-60; established his cap. at Bajada del Paraná; carried on alternate warfare and diplomatic negotiations with the semi-independent prov. of Buenos Ayres, which he ultimately added to the confederation by the treaty of Nov. 11, 1859; was appointed commander-in-chief on the expiration of his presidential term 1860, and shortly after elected gov. of Entre Rios; was defeated by Mitre, the gov. of Buenos Ayres, at the battle of Pavon, Sept. 17, 1861; retired from the governorship of Entre Rios 1864, and took little subsequent part in political affairs. He was assassinated at his country-seat of San José, Entre Rios, in May 1870.

**Ursa Major** [Lat. "Greater Bear"], the first of Ptolemy's N. constellations, including the fine group of seven stars known as "Charles's Wain," "The Dipper," or the "Butcher's Cleaver," near the N. pole, formerly called also *Septentriones* (likewise *Septemtriones*) and the "Plough."

**Ursa Minor** [Lat. "Lesser Bear"], one of Ptolemy's N. constellations, containing the N. Star (*Polaris*) and the group anciently known as Cynosura, the "Dog's Tail." *Polaris* is a double star of the third magnitude.

**Ursidae**, a family of placental mammals of the order *Ferae*, embracing all the species of bears. These have the body heavy, the hair abundant, the head conic, and with the snout short, but more or less pointed, the feet plantigrade (i. e. with the palms and soles applied to the ground in walking or resting), and each with 5 digits fully developed and armed with sharp non-retractile claws; the teeth in adult 36 to 42. The family is widely distributed, and has representatives in the extreme arctic regions as well as in the temperate and torrid zones—in Amer., Europe, and Asia, and in the N. of Africa. About 15 species are known.

**Ursula**, SAINT. See *URSULINES*.

**Ursulines**, an order of celibate women in the R. Cath. Ch., named in honor of St. Ursula, who, according to legend, suffered martyrdom in the 3d, 4th, or 5th century, being massacred, together with her army of virgins, by the Huns near Cologne. The order was founded by St. Angela Merici of Brescia, who in 1587 became its first superior.

**Urticaceae** [from *Urtica*, one of the genera], a natural order of exogenous trees, herbs, and shrubs. As at present constituted, it contains (1) the *Ulmæ*, or elm family; (2) the *Artocarpeæ*, or bread-fruit family; (3) the *Urticæ*, or nettle family; (4) the *Cannabineæ*, or hemp family. This is a large and important order, including a very great number of useful species, mostly tropical.

**Uruguay**, or **Banda Oriental del Uruguay**, a republic of S. Amer., bounded N. by Brazil, E. by the Atlantic, S. by the Rio de la Plata, and W. by the Uruguay, which separates it from the Argentine Republic. Area, 72,000 sq. m. Pop. 1880, 432,000. The native pop. is a blending of Indian, European, and Afr. blood, the aborigines having entirely disappeared. The lang. is Sp. The prevailing religious denomination is the R. Cath. The govt. is a republic after the model of the U. S. of N. Amer., but the hist. of the country is an alternation of despotism and anarchy. The cap. is Montevideo, with 73,853 inhabs.; other prin. towns are Salto, Villa de Melo, and San José. The Atlantic coast, about 300 m. long, is low, sandy, and without safe harbors; the shore of the Rio de la Plata, about 155 m. long, is higher, rocky, and affords several good harbors; the shore of the Uruguay, about 270 m. long in a straight line, presents alternately low plains and more elevated table-lands. The interior is not well known. Several ridges traverse the country, such as the Cuchilla Grande, Carapay, Castillos, and Yerbál. They are low, and covered with forests of walnut, cedar, laurel, and myrtle trees, and contain much valuable timber, hard woods, dyewoods, and numerous medicinal plants—the poppy, sarsaparilla, balsam,



liquorice, etc. Numerous streams descend from these ridges in all directions. The largest is the Rio Negro, which joins the Uruguay after a course of about 350 m. The Dayman, Queguay, San José, Santa Lucia, etc. are not navigable for more than 15-25 m. The general character of the country is that of wide, open, grassy plains, sometimes of an elevation of 2000 ft., but generally lower. The climate is mild and healthy, though very changeable. The soil is very rich, and could produce large crops of grain, vegetables, fruits, sugar, and cotton if properly cultivated; but agriculture is still in a very backward state, though progressing; the prin. occupation is cattle-breeding. The prin. articles of exportation are hides, wool, tallow, skins, salted and jerked beef, etc. Gold, silver, copper, iron, marble, etc. are found, but very few mines are in operation. Of manufactures there are almost none; some coarse articles are produced, but only for home use. The prin. articles of import are textile fabrics, furniture, utensils, tools, colonial wares, and coal. The commerce of the country is principally carried on with Gr. Brit., Fr., Brazil, and the U. S. 260 m. of railway lines are in operation, and 1405 m. of telegraph lines, connecting Montevideo with Buenos Ayres, Valparaíso, and Rio Janeiro.

**Uruguay**, river of S. Amer., rises in lat. 28° S., lon. 50° W., in the Brazilian prov. of Santa Catharina, on the W. slope of the Sierra do Mar; flows first W., then S., forming the boundary between the Argentine provs. of Corrientes and Entre Ríos on the one side, and Brazil and the republic of Uruguay on the other, and joins the Parana, after a course of 1020 m., in lat. 34° S., lon. 61° 40' W.

**Urumeyah**, town of Per., prov. of Azerbaijan, is on an elevated plain 12 m. W. of Lake Urumeyah. It is well built, and is in a densely peopled and well-cultivated dist., which by European travellers has often been compared with Lombardy. Pop. estimated at from 25,000 to 50,000.

**Urumeyah (or Urmeah), Lake**, in the prov. of Azerbaijan, Per., 64 m. S. W. of Tabreez, covers an area of nearly 1900 sq. m. It receives several large rivers, and its waters are so salt that neither fish nor mollusca can live in it.

**Urumi'si**, city of Central Asia, with a pop. estimated at 150,000, is at the N. foot of the Thian Shan Mts. It is the cap. of the Chi. Mongolian prov. of the same name, and since 1882 has formed the centre of the Dungan rebellion. Dungan, a corruption of *Tangut*, is the name of the 4,000,000 Mussulmans of Turkish-Tartarian descent who inhabit the N. provs. of China.

**Urus** [Lat.], a great and fierce animal of the ox kind mentioned by Cæsar as inhabiting the forests of Ger.

**Usbeks, or Oozbeks**, a people of mixed Tur. blood inhabiting nearly all parts of Turkestan, where they are the dominant race. Intellectually and morally, they are the superiors of those about them. They are zealous Mohammedans, mostly non-nomadic, and pride themselves on their culture and civilization, which are but scanty.

**Usher, or Ussher** (JAMES), D. D., b. at Dublin, Ire., Jan. 4, 1686, ed. at Trinity Coll., Dublin, where he became a fellow; took orders in the Ch. of Eng. 1701; became chancellor of the cathedral of St. Patrick 1707; was prof. of divinity at the Univ. of Dublin 1707-30; drew up the Articles of Faith of the Irish Ch. 1615; became bp. of Meath 1620, abp. of Armagh and primate of Ire. 1633; had his house destroyed by the Irish rebels 1641, while visiting Eng., in which country he thenceforth remained; was appointed by Charles I. bp. of Carlisle, and was preacher of Lincoln's Inn 1647-54, residing chiefly at Oxford. Author of numerous theological treatises, mostly in Lat. His *Annals Veteris et Novi Testamenti* contain a scheme of biblical chronology, since printed in the margin of the authorized version of the Bible, though now admitted to be incorrect. D. Mar. 21, 1656.

**Ustilaginæ**, an order of Fungi to which belong the smuts. The species of this order grow upon living phanerogams, and attack most frequently some part of the floral organs. In all the species the spores are very numerous and of a black or dark-purplish color. After producing more or less distortion of the mother-plant they rupture the epidermis, and appear in the form of powdery spots or masses, which cover with a blackish dust all bodies which come in contact with them. The mycelium, or mass of threads from which the spores are produced is in all the species of the order comparatively minute, and easily escapes notice, being often concealed by the preponderating mass of spores. The mycelium is not provided with any proper suckers, such as are found in some orders of Fungi, and is almost entirely limited to the part of the mother-plant where the smutty spots are to make their appearance. The spores are produced directly from the mycelium, without the intervention of any sexual organs. Very little is known of the development of the members of this order, which, although comparatively few in number, includes a large proportion of injurious species.

**Usury and Usury Laws** [Fr. *usure*; Lat. *usura*, from the root *uti*, to "use"]. The term "usury" was originally equivalent to "interest," the compensation paid for the use of money. Present usage restricts the term to *illegal interest*, the payment or the stipulation to pay for the use of money a rate higher than that established by law. The old ideas of extortion as connected with interest still linger, and perpetuate in most States U. laws—that is, laws which define a certain rate as the highest rate of interest permissible. Experience has clearly shown that such laws are not only ineffective but mischievous. U. laws can never be thoroughly enforced. They work injury to honest and prudent people, both borrowers and lenders, for the benefit of sharper and reckless adventurers. They offer a premium for the defiance of law, and confer a monopoly on unscrupulous extortioners. The reasons given for their enactment apply with equal force to all other things, and would require the law to fix arbitrarily the prices of commodities; which would be as absurd and futile as to attempt by legislation to regulate the tides of the ocean.

**Utah**, a Terr. of the U. S., lying mostly in the great Wahsatch basin between the Rocky Mts. and the Sierra Nevada, extending from 37° to 42° N. lat., and from 109° to 114° W. lon. It is bounded on the N. by Id. and Wyo. Terrs., on the N. E. by Wyo., on the E. by Col., on the S. by Ari. Terr., and on the W. by Nev. Its greatest length from N. to S. is about 350 m., and its greatest breadth nearly 300 m.; area, 84,970 sq. m.

**Face of the Country and Geology.**—The Wahsatch range of mts., which form the E. wall of the Great Basin, traverse the Terr. from N. to S. W. of this range the rivers fall into the Great Salt Lake or some of the other lakes of the basin. E. of the Wahsatch Mts. there is a plateau 30 or 40 m. in width, sloping down to the elevated valley or plain in which the San Rafael, Uintah, Dirty Devil, White, Green, Grand, and San Juan rivers have their sources. All these rivers form cañons varying in depth from 2000 to 5000 ft., and unite to form the Rio Colorado of the W. A part of this E. section is fertile and largely productive. W. U. is also elevated, the summits of the Wahsatch attaining a further elevation of from 6000 to 7000 ft. above the valley. Mt. Nebo, the Twin Peaks, and some others are from 12,000 to 13,000 ft. in height. In the N. W. and W. much of the elevated plateau is a barren alkaline desert. W. of the Great Salt Lake and the other lakes of the central valley there are several chains of mts. running nearly parallel with the Wahsatch, but of lower elevation. The chains E. of the Wahsatch range are mostly portions of the Col. Mt. system; the most prominent of them are the Uintah, the Roan or Book Mts., the Little Mts., the Sierra La Salle, Sierra Tucan, Sierra Pancho, and in the extreme S. E. the Sierra Abajo and the Ojeros del Oso.

**Rivers, Lakes, Etc.**—E. U. is drained solely by the Col. and its affluents. The succession of valleys, lying between the Wahsatch range and the lower chain wholly within the Great Basin, abounds in lakes. The Great Salt Lake is 100 m. in length and about 50 m. in width. Its area is about 1900 sq. m. Its waters contain nearly 22 per cent. of pure salt, and no fish can exist in them. It receives the Bear and Jordan rivers and some smaller streams. Forty-five m. S. of this lake, and connected with it by the Jordan River, is Utah Lake; it has an area of about 190 sq. m. Its waters are fresh and pure. It receives the Timpanagos, Provo, and Spanish Fork Rivers. Other large lakes farther S. are Sevier, Little Salt, Preuss, and Fish lakes, none of which have any apparent outlet, though they receive considerable streams. Sevier River discharges its waters into Sevier Lake. The Preuss River, emptying into Preuss Lake, and the Rio Virgin, a tributary of the Col., drain the S. W. part of the Terr.

**Mineralogy.**—Gold, silver, and lead ores exist in large quantities in U. The Terr. is richer in iron ores of all qualities than any other portion of the U. S. There are 10 separate deposits or mts. of hematite and magnetite in a distance of 10 m. in iron ore. In the Castle Valley region, on Green River, is another deposit, said to be equally extensive. Other deposits of vast extent have been found in the N. part of the Terr. These ores are all very rich, and both lignite and excellent bituminous coking coals are found in the immediate vicinity. The lignites of the Great Basin are very valuable coals for fuel, but do not coke. In San Pete co. and along the cañons of Green and Grand rivers is a bituminous coal belonging to the upper coal-measures, which is of great value for the furnace, and is in thick workable seams. Copper and zinc are metals which abound in the Terr. Rock-salt in vast quantities and the salt procured by evaporation from Salt Lake, sulphur in extensive beds, carbonate of soda, alum, borax, etc. are found.

**Climate.**—The yearly mean temperature ranges from 48.65° to 51.51° in the N. and S. of the Terr. The rainfall is about 15.10 inches annually.

**Zoology.**—The wild animals include the grizzly bear, panther, Cal. lion, the black bear, wolf, lynx, fox, raccoon, Cal. skunk, etc., and among the game animals the buffalo, antelope, black-tailed deer, hares, especially the sage hare, and the singular animal known as Baird's rabbit; squirrels, marmots, etc. 175 species of birds belonging to the Terr. have been described.

**Agricultural Products.**—The productive soil being of limited area, U. produced for the census year 1880—wheat, 72,542 bushels; Indian corn, 163,342 bushels; barley, 217,140 bushels; oats, 418,062 bushels; rye, 9605 bushels. The wool clip of 1880 yielded 373,246 pounds.

**Farm Animals.**—The census of 1880 showed 38,131 horses, 95,416 cattle, 233,121 sheep, and 17,198 swine.

**Manufactures.**—The census of 1880 showed 640 manufacturing establishments in the Terr., with capital of \$2,656,697, employing 2495 hands, and paying \$858,863 as wages; total value of products, \$4,324,962. Coal mined in 1881, 275,000 tons. There were 10 salt manufacturing concerns, producing 483,800 bushels.

**Railroads.**—U. had, Jan. 1, 1882, 908 m. of railway in operation, costing \$31,802,259, with net earnings of \$1,356,695, paying in interest and dividends, \$904,955. The prin. are the Utah Central, 280 m.; Central Pacific, 163 m.; Union Pacific, 105 m., and Denver and Rio Grande Western, 100 m.

**Finances.**—U. has no Territorial debt; aggregate of local public debts, 1880, \$116,251; valuation of taxable property, 1881, real and personal, \$25,579,234, producing \$153,475; rate of Territorial tax, \$1.30 on \$100; total taxation, 1880, Territorial and local, \$435,238.

**Commerce.**—The freight business by R. R. is large, but U. has no shipping and no foreign trade.

**Banks, Etc.**—In Oct. 1881 there was 1 national bank, with capital of \$100,000; circulation, \$152,500; deposits, \$1,012,082; beside 10 private bankers, with deposits of \$1,434,711; and 2 trust cos., with \$97,808 deposits. Insurance cos. paid \$183,900 for losses in 1881.

**Education.**—In 1880 the number of children of school age (6-18 yrs.) was 40,672, of whom 25,792 were enrolled in public schools, with average attendance of 17,513. Amount ex-



pended for public schools, 1880, \$170,887, of which \$130,187 was for teachers' salaries. There were pub. in 1882, 18 newspapers in the Terr. The Univ. of Deseret at Salt Lake City is the only one in the Terr.

**Churches.**—The Mormon Church claims 55,676 members, with 477 chs. and 3307 high priests. All other chs. combined are reported as having less than 1000 members, with 27 chs. and the same number of ministers.

**Population.**—1860, 40,273; 1870, 86,786; 1880, 143,963 (white 142,423, colored 1540, including 501 Chl. and 807 Indians).

**Principal Cities and Towns, Pop. 1880.**—Salt Lake City (cap.), 20,768; Ogden City, 6069; Provo City, 3432; Logan, 3396; Mt. Pleasant, 2004; Brigham City, 1877; Mantli, 1748; Beaver City, 1732; Park City, 1542; St. George, 1332; Silver Reef, 1046.

COUNTIES.	† Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
Beaver.....	4-F	2,007	3,918	Beaver.....	1,732
Box Elder.....	2-F	4,355	6,761	Box Elder.....	tp, 2,184
Cache.....	2-G	3,592	12,582	Logan.....	3,396
Davis.....	2-G	4,459	5,279	Farmington.....	tp, 1,073
Emery.....	2-H	.....	536	Castle Dale.....	.....
Garfield.....	4-G	.....	.....	Panguitch.....	664
Iron.....	4-G	2,377	4,013	Parowan.....	957
Junab.....	3-F	2,034	3,474	Nephi.....	1,787
Kane.....	4-G	1,513	3,065	Kanab.....	394
Millard.....	3-F	2,753	3,737	Fillmore.....	957
Morgan.....	2-G	1,972	1,783	Morgan.....	433
Pi.Ute.....	4-G	82	1,651	Junction.....	71
Rich.....	2-G	1,955	1,263	Randolph.....	263
*Rio Virgin.....	.....	450	.....	.....	.....
Salt Lake.....	2-G	18,337	31,977	Salt Lake City.....	20,768
San Juan.....	4-H	.....	204	Bluff.....	.....
San Pete.....	3-G	6,786	11,557	Manti.....	1,743
Sevier.....	3-G	19	4,457	Richfield.....	1,197
Summit.....	2-G	2,512	4,291	Coalville.....	911
Tooele.....	2-F	2,177	4,467	Tooele.....	914
Utah.....	2-G	12,203	17,973	Ashley.....	tp, 799
Wasatch.....	2-G	1,244	2,297	Provo City.....	3,432
Washington.....	3-F	3,064	4,235	Heber.....	1,291
Weber.....	2-G	7,508	12,344	St. George.....	1,332
				Ogden City.....	6,069
Total.....		86,786	143,963		

\* Part set off to State of Nev. 1871; remainder to Washington co. 1872.

† Reference for location of counties. See map of Utah in article CALIFORNIA.

‡ Formed since census of 1880.

**History.**—Utah derives its name from the Utes, a tribe of Indians originally inhabiting it. It was originally a part of Upper Cal., and was conveyed to the U. S. by Mex. by the treaty of 1845. The Mormons, driven from Ill. and Mo., emigrated hither in 1847 and 1848. In 1850 it was organized as a Terr. There have been serious difficulties between the Terr. and the U. S. govt., growing out of the claims of the Mormon prophet, Brigham Young, to the supreme authority, and also from the recognized practice of polygamy in the Terr. In 1857 a party of settlers, while passing through Utah, having incurred the suspicion of the community at Salt Lake City, were surrounded in Mountain Meadows, Santa Clara co., U., by a band of Indians, controlled by the Mormons, and massacred, a few children alone being spared. The development of their mines has brought in many settlers who are not Mormons.

#### Governors.

Brigham Young.....	1850-54	George L. Woods.....	1871-73
Edwin J. Steptoe.....	1854-57	Samuel B. Axtell.....	1873-75
Alfred Cummings.....	1857-61	George W. Emery.....	1875-80
Stephen S. Harding.....	1861-64	Eli H. Murray.....	1880-88
James D. Doty.....	1864-65		
Charles Durkee.....	1865-69		
J. Wilson Shaffer.....	1870-71		

REVISED BY A. R. SPOFFORD.

**Utah Lake.** The largest body of fresh water in the Terr. of Ut.; N. lat. 40° 15', W. lon. 111° 45'. Its altitude above the sea is 4475 ft.; its length from N. to S. is 25 m.; its extreme width 13 m.; area, 150 sq. m. It has no island. Corn Creek, Hobbie Creek, and the Amer. Fork rise in the Wahsatch Mts., but the Spanish Fork and Provo River head to the E. of the range, and pass through it in deep defiles. Its outlet is the river Jordan. U. L. abounds in trout and other fish, and is visited by a great variety of water-fowl.

**Uterine Diseases.** Diseases of the womb or uterus, so called "female diseases" are comparatively infrequent in the women of aboriginal and savage tribes, and in civilized races among the women of rural districts who labor, are much in the open air, and free from artificial and effeminate habits of dress and living. For the most part they exist in delicate women, those whose health is impaired by some other and primary disease, and relatively more often in women resident in great cities. The predisposing causes of a majority of all U. D. are the constant recurrence during the greater part of adult life of the menstrual period, the complications and sequelæ of child-bearing, and the intimate nervous and vascular sympathy connecting the uterus with every part of a woman's organism. U. D. comprise also the derangements of the appendages of the uterus—the ovaries, vagina, and peri-uterine connective tissue and ligaments which maintain the organ normally *in situ*. The uterus is subject to congestion and inflammation. The term metritis denotes inflammation of the body proper of the organ, endometritis of the mucous interior. Attacks of congestion and inflammation change the shape, size, symmetry, and position of the uterus. The organ as a whole may be tilted, giving rise to "version," or the body may be bent on the neck, a condition termed "flexion." Flexions of the uterus are a common cause of the "dysmenorrhœa," or difficult menstruation; flexion of the uterus canal is also a cause of sterility. "Falling of the womb" is termed "prolapse," and, when extreme, "procidencia." The lower end of the uterus, the neck or cervix, is often ulcerated as the result of congestion, inflammation, contact of its end with the floor of the pelvis, and the irritation of the acrid

mucus discharged in endometritis. Tumors may develop within the cavity of the uterus, in the substance of its walls, or upon its outer surface, either beneath its serous covering or loosely attached by pedicles. The uterus is occasionally the seat of cancer, and chiefly at the climacteric period or "change of life." The vagina is the frequent seat of catarrhal inflammations, causing a discharge termed "leucorrhœa" (Gr. λευκος, "white" (matter), and ρεω, to "flow"). It may also be acutely inflamed, "vaginitis;" the seat of ulcers, and also of spasm. Most common of all U. D. are merely functional derangements or irregularities of menstruation. By amenorrhœa is understood absence of menstruation; dysmenorrhœa is characterized by pain, sickness, and deficient flow at the period; and menorrhagia is a prolonged and excessive menstrual flow, or persistent loss of blood from the uterus, as when cancer or polypus exists. Most U. D. are benefited by use of general tonics, by rest, corrected habits, and by supporting the abdominal viscera; but many are not even alleviated by these general measures. Physical exploration, both manual and by aid of the speculum, will often reveal an unsuspected disease, and point to the special topical treatment or surgical procedure which is the essential means of cure. (See OVARIAN DROPSY.) E. DARWIN HUDSON, JR.

**Utica,** an anc. city of Afr., occupied the site of the modern v. of Duar. When Carthage was taken and destroyed by the Romans, U. rose in importance and became the cap. of the Rom. prov. The remains of its temples, amphitheatre, and aqueduct show that it must have been a magnificent place. In the latter part of the 7th century it was destroyed by the Arabs.

**Utica,** city and important R. R. centre, cap. of Onondaga co., N. Y., 96 m. W. of Albany. The v. of U. was incorporated Apr. 3, 1798, chartered as a city Feb. 13, 1832. It is the N. terminus of the Chenango Canal. The first electric telegraph company (the N. Y., Albany and Buffalo) was organized and had its chief office here. Rich beds of iron ore lie just S., and 2 blast furnaces are run a few miles distant. It has extensive manufactures of cotton, woolen, boots and shoes, etc. The farms about U. are devoted in good part to the dairy, and it is a chief market for cheese in the U. S. The water-works have a capacity of 400,000 gals. a year. Three parks lie within the city, and a fine driving-park on its eastern boundary. Pop. 1870, 28,804; 1880, 33,914.

**Utilitarianism** (Lat. *utilitas*), a peculiar political and moral theory based on the assumption that happiness is the ultimate principle of all human actions, and characteristically symbolized by its fundamental maxim, "The greatest happiness to the greatest number." Ethical systems refusing to acknowledge any moral obligation in a postulated revelation of the will of God, denying the existence of any innate organ in the human soul by which to distinguish absolutely between right and wrong, and establishing the natural self-love of the individual as the necessary principle of his whole conduct, seem to have existed as far back in time as there existed any comprehensive reasoning on moral subjects; but in the peculiar form in which this theory has received the name of utilitarianism it originated with Jeremy Bentham.

**Utopia** (Gr. οὐ, "not," and τόπος, "place"), an imaginary island, the abode of a people free from care, folly, and the common miseries of life, described by Sir Thomas More in his *Utopia* (1516).

**Utraquists, or Calixtines,** a Hussite sect, so called because they demanded the Lord's Supper administered to them *sub utraque specie*—that is, both bread and wine.

**Utrecht,** yoo'trekt, town of the Old Rhine, where the prov. of the same name, on the left bank, traversed by the Vechte branches off from it. It is well built, traversed by canals, and surrounded with finely planted promenades, and has, among other educational insts., a celebrated univ. Its manufactures of plush, velvet, and carpets, of leather, soap, salt, and brandy, of metal ware and cigars, are very extensive, and it carries on an active trade in grain, cattle, and its own manufactures. Pop. 73,516.

**Utricularia.** See BLADDER-WORT.

**Uvalde, Tex.** See APPENDIX.

**Uvaroff** (SERGEI SEMENOVITCH), COUNT, b. at Moscow in 1785, studied at Göttingen; was made curator of the Univ. of St. Petersburg in 1811, pres. of the Acad. of Science in 1818, director of the dept. of commerce and industry in 1822, minister of public education in 1832; retired in 1848, and d. at Moscow Sept. 16, 1855. He was the founder of the Oriental School and the Asiatic Museum in St. Petersburg. He wrote *Etudes de Philologie et de Critique et Esquisses politiques et littéraires*.

**Uvic Acid.** See RACEMIC ACID.

**Uzbecks.** See USBEKS.

## V.

**V,** a consonant letter formerly interchangeable with U in writing and printing. In power also v is to some extent interchangeable with the vowel u, and with the consonants b, p, f, and w; v stands for *versus*, "against." V represents the numeral 5, and in chem. is the symbol of vanadium.

**Vaccination** (Lat. *vaccæ*, a "cow"), the inoculation of the human being with vaccine or cowpox, to protect against smallpox or variola. Jenner discovered V. in 1796, and it has replaced inoculation (with virus of smallpox), and is now generally practised in all civilized countries. In many it is obligatory; in Eng. every infant must be vaccinated before 3 yrs. old. V. should be carefully performed with a clean lancet or needle. The V. matures on the 8th day—a circle of white vesicles with a red congested base or areola, and should be repeated once in 7 yrs. until mid-life.

**Vacuum** (Lat. in physics, a portion of space void of matter. If a receiver filled with pure carbonic acid gas be exhausted by means of a good air-pump, a small vessel hav-



ing been previously introduced containing moist caustic potash, and another containing concentrated sulphuric acid, a V. will be produced so nearly absolute that the electric spark fails to pass through it.

**Va'ga, del** (PERINO), whose true name was PIETRO BUONACCORSI, b. at Florence in 1500, went to Rome, where he became an intimate friend of Raphael, and was generally considered his most gifted pupil next to Giulio Romano. Among the best of his pictures is the *Creation of Eve*, in the Vatican. D. 1547.

**Vail, Ia.** See APPENDIX.

**Vail** (RT. REV. THOMAS H.), LL.D. See APPENDIX.

**Vaishnavas.** The V. are a sect of Hindoos, who regard as their peculiar patron, and as the most especial object of their veneration, the second person in the Indian Trimūrti—namely, Vishnu. The V. sect is itself subdivided into almost innumerable sects. The term *Vaishnavas* is as elastic as that of Christian. Even the mark on the V.'s forehead, which is shaped like a trident, cannot invariably be depended upon. One sect prolongs the central prong, so to speak, of the trident to the tip of the nose, and holds that it is necessary to salvation that this should be done. The opposing sect stops short at the eyebrows. Many a bloody feud between V. has arisen on account of this one controversy. Then some of the sectarian marks differ in the thickness of the lines; and even that, in the watchful eye of a scrupulous Hindoo, is of immense importance. So are also the necklaces and rosaries, the forms of the garments worn, and, above all, the sacred initiatory formulae. The sects of V. may be classed in bulk as the "Northerners" and the "Southerners." The distinctive mark of the Northerners is formed by 2 white perpendicular streaks, or 2 streaks converging like the lines of a V from the roots of the hair, across the forehead, to the eyebrows. These streaks are of powdered sandal-wood made into an adhesive paste. From between the eyebrows another white streak is drawn, connecting the lower portion of the V to the tip of the nose, thus making the mark resemble a Y. The distinctive mark of the Southerners consists of 2 white lines of chalk, perpendicular and parallel, from the roots of the hair to the eyebrows, with a streak of similar color joining the base of the lines, and running at right angles to them above the nose. In the middle, between the 2 perpendicular white lines, is drawn, parallel with them, a line of red paste composed of turmeric and lime, or simple red chalk. This subdivision of V. pay peculiar regard to the lotus. Like other V., they hold the basil sacred to Vishnu. The V. adores Vishnu as the personification of everything lovable, and basil is everywhere the emblem of love.

In the great valley of the Ganges we come to the V. sect of the *Rāmānanda*, whose distinctive mark is similar to that of the sect we have just referred to, only the central red mark is made as narrow as possible. The V. followers of Vallabha Āchārya bear on their foreheads 2 parallel perpendicular lines, generally of white, and joined together at the eyebrows with a semicircular line of the same color. Between the parallel lines no other line is drawn, but it is replaced by a dot of red, generally made by a paste composed of turmeric and lime. They smear themselves with black clay, which they mould on their breasts and arms in devices indicating the usual emblems of Vishnu. The Kabir Panthis are a sect of V. who, as a distinctive emblem, adopt the distinctive mark simply as a form, and are utterly careless as to its size, shape, or color. The last sect of the principal 6 whose distinctive religious marks need be referred to are the Mādhwāchāryas of Central India. "The marks common to them are the symbols of Vishnu upon the shoulders and breast, and the frontal mark consisting of 2 perpendicular lines made of the white clay *gopichandana*, and joined at the root of the nose; but instead of a red line in the centre, they make a straight black charcoal line from incense offered to Nārāyana." This black line terminates at the root of the nose in a red round dot, made of lime-turmeric paste.

The Northerners number more than 45,000,000 in the India of the present day. Two out of 3 V. in Bengal are of this sect. The first conspicuous doctrine we come to in the teaching of these "*Vaidakais*" Vaishnavites is that of *bhaghti* or *bhakti*—i. e. "faith." They believe that *faith* in Vishnu will save more swiftly, surely, and effectually than ever any works can. Knowledge is of little account; faith is all in all. It is good to subjugate the passions, to practise the *yoga*, to give alms, to be of a mind filled with charity, to call on the sacred name, etc.; but FAITH is the sole and supreme fount of salvation. The Northerners must be considered the most liberal. They are the Protestants of V. theology. They insist on *faith* as the supreme requisite. They adhere as much as possible to the simplest tie which can possibly bind them to the worship of Vishnu as a distinctive connecting link—that is, the repetition, the oftener the better, of the name of the god in the person of the greatest of his avatārs, "KRISHNA! Krishna! Krishna!" Only repeat this, and your worship is complete, and all ceremonial observances are wholly needless. But the Northern V. are, in several of their dogmas, more degraded than any other class of their fellow-worshippers of Vishnu. They cannot approach to worship their god, Vishnu, unless they first approach and pay divine honors to his priest. They are expressly taught, and enjoined to believe that "first the *guru* (priest) is to be worshipped; then Vishnu is to be worshipped." This servility is fortified by other texts which the Bengal V. Brahman regards as sacred. One of these is, "When Vishnu is in anger, the priest will protect us; but when the priest is angry, who can deliver us?" Again: "The prayer is made manifest in the priest, and the priest is God himself."

The Southern Rāmāntja V. are especially fond of worshipping Lakshmi, the consort of Vishnu. No South-Indian V. will allow any one to look on his food while he is eating it. A look would be pollution. He believes that Vishnu is

the spring, centre, foundation, cause, and creator of all. Matter and spirit unite in him as God and as the Incarnate. In S. India the Rāmāntja V. number many tens of millions, and their temples are among the most splendid in India. They are more Vedantist in their bent of religious thought than the Bengal V., who do not believe in final absorption into the Divine Essence.

We now come to the intermediate sects. The *Vallabha-Achāryas* are a strong, well-organized sect of V. Their head priests are called *mahārājas*. They have made a strange name for themselves as spiritual teachers. They live the most debased and debauched lives, owing their position purely to their parentage, being utterly without erudition themselves, ready to poison, cheat, forge, lie, or swindle, all under the cloak of religion. The votaries of this sect of V. are bound to reverence the teacher as God.

The *Mādhvā Achārya* believe in Vishnu as the great invisible First Spirit, the Prime Cause, the Originator of the Universal, the primeval Sole and Supreme, perfectly good, omnipotent, and of nature totally indescribable. This sect brand themselves with V. symbolic emblems as a preventive against schism. As a part of their worship they demand that virtue shall be invariably practised, aims freely offered, truth always told, and that kindness and protection and courtesy be shown to all men, especially strangers. This sect deny the doctrine of absorption, and so differ in a vital point of doctrine from many of their co-religionists.

The *Kabir Panthis* are a very numerous sect. of V. in N. and Central India. They are strict unitarians, believing in one sole Creator of the universe, perfect in holiness, omnipotent, irresistible, yet with corporeal form; endowed with the 3 senses or qualities, and embodied by a combination of 5 elements. All that is good in earth resembles him. The perfect man after death shares equally with Vishnu his perfection of character, blissfulness, and power. Indeed, God and man are identical. The whole visible creation is also God, begot by the female form, *Māya*, created by God, to relieve his loneliness and give birth to nature. The Kabir Panthis are very careful to teach that pure morality is the highest good and the way to God. However, one thing should be especially noted: the Kabir Panthis prefer to term the Supreme "the God-Thing," rather than "Vishnu." Indeed, they suppose some infinite, indefinable, omnipotent essence higher than any person of the Trimūrti. But of the Hindoo triad they regard Vishnu as the leading power. [From orig. art in *J. S. Univ. Cyc.*, by R. C. CALDWELL.]

**Valdés**, vahl-des', de (JUAN), b. at Cuenca, Sp., about 1500, of a noble and wealthy family, and was early introduced at the court of Ferdinand and Isabella; after serving a short time as *camarero* to Pope Adrian VI. (1522), joined the imperial service in Ger., where he became a convert to the Ref.; took up his residence at Naples; was for a time sec. to the king, and gathered around him a small circle of congenial friends, with whom he pursued the study of the Bible untrammelled by the interpretations of the R. Cath. theologians, and wrote commentaries and several religious works, some of which were subsequently printed and secretly circulated. After his death his friends were accused by the Inquisition of having formed a sect called "Valdesians," and some of his followers were put to death and others took refuge in foreign countries. D. 1540.

**Valdivia**, vahl-dee'-vay, de (PEDRO), b. in Sp. about 1505, accompanied Pizarro to Peru as one of his caps. 1532; took part in the conquest of Venezuela 1535; aided Pizarro in his c. war with Almagro; effected the conquest of Chili, and was rewarded with that prov.; founded the cities of Santiago Feb. 12, 1541, and Coquimbo 1544; was recalled to Peru by the troubles consequent upon the murder of Francisco Pizarro; was appointed capt.-gen. of Chili and all the regions S. of Peru which he might be able to conquer (1548); made a series of daring campaigns in S. Chili (1550), where he founded the cities of Concepcion, Villa Imperial, Villa Rica, and Valdivia (1551); was taken prisoner by the Araucanians and put to death in 1559.

**Valdosta**, Ga. See APPENDIX.

**Valencia**, town of Sp., is surrounded by old picturesque walls, within which its narrow, tortuous streets wind along in endless confusion. But the houses are neat and substantially built; the squares, though small, are elegant; the streets, though crooked and narrow, are clean, well paved, and well lighted. Its cathedral is a vast edifice, and its univ. is a well-endowed inst. Its manufactures of silk, tobacco, sackcloth, and tiles are celebrated, and its export-trade in corn, rice, oil, wine, almonds, figs, and oranges is very considerable. Pop. 143,836.

**Valenciennes**. See APPENDIX.

**Valens**, Rom. emp. of the East (364-378), b. in 328. In 367 V. received baptism from the chief leader of the Arian party, and intrigues and persecutions between the Catholics and the Arians form one of the most prominent features of his reign. Of still more importance, however, was his relation to the Goths settled in Dacia to the N. of the Danube. In 365, while V. was at Cæsarea, a rebellion broke out in Constantinople, and Procopius was declared emp.; 3900 Goths were taken into the service of Procopius, and when he d. and the insurrection was suppressed, this body of men was captured, scattered over the empire, and settled at various points under military surveillance. Athanaric, king of the Goths, demanded the surrender of these men; V. refused, and war began. During the protracted war with Per. which now ensued the Huns appeared in Europe on the N. shores of the Black Sea. They fell upon the Goths, and drove them before them to the S. In 377 large swarms of Goths gathered on the banks of the Danube and asked permission to enter the Rom. terr. They were received, and spread over the whole of Thrace and Macedonia. But collisions between the Roms. and the Goths rapidly developed into open war. The Roms. were defeated. In this emergency V. returned from Antioch, and at the head of a large army met the Goths outside of Adrianople. A severe contest took



place Aug. 9, 378, the Romans were defeated, and V. was never seen or heard of afterward.

**Valentine** (MILTON), D. D., b. near Uniontown, Md., Jan. 1, 1825, grad. at Pa. Coll., Gettysburg, 1850, and at the theological sem. at Gettysburg 1853; was ordained to the ministry of the Lutheran Ch. Oct. 4, 1852; preached at Winchester, Va., 1853-54, and at Greensburg and Adamsburg, Pa., 1854-55; was prin. of Emmaus Inst., Middletown, Pa., 1855-59; pastor of St. Matthew's ch., Reading, Pa., 1859-66; became prof. of ecclesiastical hist. and ch. polity at Gettysburg Sem. 1866, and has been pres. of Pa. Coll., Gettysburg, since May 15, 1868. Wrote *Justification by Faith, The Dynamics of Success*, etc.

**Valentine, Saint.** See VALENTINE'S DAY, SAINT.

**Valentine's Day, Saint,** the 14th day of Feb., observed in commemoration of St. Valentinus, a bp. or presbyter who was decapitated in 270 A. D., during the Claudian persecution at Rome. The custom of sending valentines is a very anc. one.

**Valentinian**, the name of 3 Rom. emps. VALENTINIAN I. (364-375), b. in 321 at Cibalis in Pannonia, was raised to the throne on the sudden death of the emp. Jovian by the officers of the army, at Nicea Feb. 16, 364, and on Mar. 28 made his brother Valens, emp. of the East, and proceeded himself to It. He was a man of military talent and a laborious and prudent administrator. During his reign Theodosius once more extended the Rom. dominion in Britannia to the wall of the Antonines in 367, and put down the rebellion of Firmus in Afr. in 370, while the emp. himself fought successfully against the Germanic tribes along the Rhine and the Danube. Treves was his favorite residence, but he d. at Bregetto, near Presburg, Nov. 17, 375. He was succeeded by his oldest son, Gratian, who, however, was compelled by the army at Bregetto to take his younger half-brother, VALENTINIAN II., as co-emp. (375-392). After the death of Gratian in 383, Maximus usurped the throne of Gratian in Gaul, Sp., and Britain, and in 387 he even crossed the Alps and marched against Milan. V. fled to Thessalonica, but by the aid of the Byzantine emp., Theodosius I., V. was reinstated. It was now Theodosius who actually ruled both in the W. and E. empires, and the first attempt the young emp. made to vindicate himself cost him his life. D. May 15, 392. —VALENTINIAN III. (425-455) was only 6 yrs. old when his uncle, Theodosius II., emp. of the East, established him as emp. of the West, and the empire suffered severely from the rivalry between Bonifacius and Aëtius. In spite of the great military ability of the latter, who defeated Attila at Châlons-sur-Marne in 451, the W. Rom. empire now began to crumble. In 454 the emp. killed Aëtius with his own hand, jealous of his merits. In the following yr., however, V. himself was murdered.

**Valentinians**, a Gnostic sect founded by Valentinus, who descended from Egypt, lived in Alexandria and Cyprus, and taught in Rome from 140 to 160. In this system the great mythological apparatus which the Gnostics employed is spiritualized, and transformed into speculative elements, personifications of ideas, etc.

**Valentinois**, DUCHESS OF (DIANE DE POITIERS), a beautiful Fr. lady, b. Sept. 3, 1499, was married at 13 to Louis de Brézé. After his death (1531) she became a favorite of the king's son, who in 1547 ascended the throne as Henry II., and created her duchess of Valentinois in 1548. She had great influence over the king, who permitted her to exercise royal power and control his foreign policy. She maintained her ascendancy until the death of Henry in 1559. D. April 22, 1566.

**Valeria gens**, one of the oldest and most prominent patrician families of anc. Rome, was of Sabine extraction, and is said to have settled at Rome with Titus Tatius. It was still powerful and flourishing in the last days of the Empire.

**Valerian**, a genus of plants of the natural order Valerianaceæ. The most important species is *V. officinalis*, the root of which is used in med. It is an herbaceous perennial plant, the stem being erect and round, rising from 2 to 4 ft., and bearing small white flowers in terminal panicles. The fruit is a capsule containing a single oblong seed. The root consists of an upright root-stock about as thick as the little finger, from which spring numerous slender cylindrical rootlets about 3 or 4 inches in length. This root, though nearly odorless when fresh, develops a strong and peculiar smell upon drying. The taste is somewhat bitter, acid, and disagreeable. The important ingredient of the drug is a pale greenish volatile oil (oil of V.). Upon man, preparations of V. sometimes reduce undue nervous irritability, and are therefore resorted to in affections characterized by this condition, such as hysteria, chorea, and milder forms of so-called "nervousness." The most elegant preparation is the ammoniated tincture, but the oil itself may also be used. The valerianates of ammonium, quinine, and zinc are official meds., but their effect is inferior to that of the oil or preparations of the root.

**Valerian**, Roman emp. (253-260), descended from a noble Rom. family, was elected emp. after the assassination of Æmilianus. The empire was in a dangerous state. The Franks had invaded Gaul and Sp. The Alemanni had crossed the Danube, and descended even into It. The Goths devastated Mesia, and penetrated into Thrace and Macedonia, and in the E. the Pers. under King Sapor had conquered Mesopotamia and Syria. V., who was over 60 yrs. old, took his eldest son, Gallienus, as co-emp., and sent him to Gaul, while he himself hastened to Syria. In the beginning he was successful, but at Edessa (in 260) he was completely defeated by Sapor, taken prisoner, and d. several yrs. afterward in Pers. captivity.

**Valerianos** (Apostolos). See FUCA, DE (JUAN).

**Valer'ic** (of Valerianic) Acid [*Delphinic Acid*, *Phenetic Acid*, *Butyricarbonic Acid*; Ger. *Baldrian'säure*] was first obtained in 1817 by Chevreul from the fat of a dolphin, *Delphinum phocæna*, and by Grote in 1830 from the essential

oil of valerian. In the vegetable kingdom it occurs in the berries of *Viburnum opulus*, in the angelica-root, in the root of *Athamanta oreoselinum*, and in the bark of the elder tree; in the animal kingdom it is found in numerous animal oils and in the products of the oxidation of oleic acid and other fats. It is likewise contained in decayed cheese. V. A. forms a limpid, colorless oil, possessing a sour, burning taste and a powerful odor, resembling that of valerian-root, also like that of rancid cheese and butyric acid. It has a sp. gr. of 0.955 at 32° F. (*Kopp*), remains liquid at 0° F., and boils at 347° F., the density of its vapor being 3.66. V. A. is sparingly soluble in water, but dissolves in all proportions in alcohol and in ether; also in concentrated acetic acid. It unites with water, forming a definite hydrate, which is also produced upon decomposing a valerate with strong sulphuric acid. This hydrate is also oily, but it possesses a lower boiling-point than the anhydrous acid.

**Valerius Flaccus** (CAIUS). See FLACCUS (CAIUS VALENTINUS).

**Valerius Maximus**, the name of a compiler of a large collection of historical anecdotes, *De Factis Dilectis Memorabilibus Libri IX.*, which is still extant. During the Middle Ages the book was highly esteemed.

**Valetta**, cap. of the island of Malta, on a rocky promontory on the N. E. coast which forms 2 large, deep, and safe harbors. These harbors as the whole city, are strongly fortified by lines of works and defended by forts, of which St. Elmo is deemed impregnable. On account of its harbors and fortifications, V. has been made the station of the Eng. fleet in the Mediterranean.

**Valette, de la** (JEAN PARISET), b. in 1494 at Toulouse, Fr., entered very early the order of St. John, and distinguished himself so much that in 1557 he was chosen grand-master of the order. A Tur. armament appeared off the coast of Malta before the fortifications of Valette in 1565, and a most memorable siege began. La V. resisted the Turks for several months. The viceroy of Naples arrived with reinforcements. The Turks embarked; once more, however, they returned, but were completely routed and driven off in wild disorder. La V. d. Aug. 21, 1568.

**Valhalla, or Walhalla.** See SCANDINAVIAN MYTHOLOGY and WALHALLA.

**Vali**, in Scandinavian mythology, a son of Odin and brother to Vidar, was destined in the popular faith to reappear in the new heavens which the All-Father should create after the fall of Valhalla, but remained in other respects a vague name, and received no distinct form in the popular imagination.

**Val'ia** (LAURENTIUS), b. at Rome about 1410, was ordained priest in 1431; taught rhetoric and philos. at Pavia and Milan, but had bitter controversies with the scholastic philosophers of the Aristotelian school; went to Naples, where he was treated with great kindness by King Alfonso V.; returned to Rome in 1443, but provoked the wrath of Pope Eugenius IV. by his *De Falso Credita et Ementita Constantini Donatione Declamatio*; fled to Naples, where he established a school, but fell out with the priests; was accused of heresy, and saved from death in the dungeons of the Inquisition only by the exertions of the king, who, however, could not prevent his being publicly whipped by the monks; was reconciled to Pope Nicholas V., who restored him as canon of St. John Lateran, and d. in Rome about 1460. He was one of the earliest and most ardent revivers of classical studies.

**Valladolid**, See COMAYAGUA, Honduras.

**Valladolid**, town of Sp., cap. of the prov. of the same name, on the Pisuerga, communicates by the Duero, and a vast system of canals with the Atlantic and the interior. It was formerly the capital of the Spanish empire, but after the removal of the royal residence to Madrid at the close of the 16th century, it fell into decay. Of late, however, it has given signs of revival. Its manufactures of silk, yarn, perfumery, earthenware, paper, and leather have been enlarged, and its trade has increased. Its univ. was founded in 1346. Pop. 52,206.

**Valladolid**, Mexico. See MORELIA.

**Vallandigham**, val-an-dig'ham (CLEMENT L.), b. at New Lisbon, O., in 1822, studied law, and was admitted to the bar in 1842; was member of the O. legislature 1845-46; edited the Dayton *Empire* 1847-49, after which he devoted himself especially to politics. He was elected a rep. in Cong. in 1857. He was especially active in opposing the measures of the national gov't in carrying on the c. war; tried by court-martial and sentenced to close confinement during the war—a sentence which Pres. Lincoln commuted to banishment beyond the lines. Dissatisfied with his reception by the Confed., he went to Canada. He soon returned to O., was not molested, and in 1861 was an active member of the national Dem. convention. D. June 17, 1871.

**Vallejo**, val-la'ho, on R. R. city and seaport of Solano co., Cal., on an arm of San Pablo Bay, has a spacious harbor, flouring-mills, ship-yards, iron-foundries and machine-shops. Large quantities of grain are shipped from this point. Pop. tp. 1870, 6391; 1880, 6587, including 5987 in city.

**Valley**. See EARTH, by PROF. A. GUYOT, LL.D.

**Valley City**, Dak. See APPENDIX.

**Valley Falls**, Kan. See APPENDIX.

**Vallisneria** (named in honor of Antonio Vallisneri, an It. botanist (1661-1730)), a genus of plants of the order Hydrocharitaceæ. *V. spiralis*, a plant common in slow waters in the U. S. and in the S. of Europe, is remarkable for its curious process of fecundation. The fertile or pistillate plants put up long, spirally twisted flower-stalks, which allow the flowers to float upon the surface. But the male flowers are held to the bottom by their short stems. Accordingly, when the proper time for fertilization comes, the sterile or staminate flowers break their stems, rise, float upon the surface, and shed their pollen around the fertile flowers. The spiral stems of the latter (which are from 1 to 4 ft. long) now contract and draw the fertilized germ under



water, where it is perfected. Upon its roots the canvas-back duck feeds.

**Valmy**, DUKE OF. See KELLERMANN.

**Valois**, vah-lwah', a part of the former prov. of Fr. Ile de Fr., corresponding nearly to the present dept. of Oise, formed under the Capet dynasty a county in the possession of the house of Vermandois, but was incorporated with the Fr. crown by Philip II. Augustus on the extinction of this family in 1215. In 1285 Philip III. gave the county of V. to his younger son, Charles (b. 1270, d. 1325), and when the direct line of the Capet dynasty died out in 1328 with Charles IV., the eldest son of this Charles of Valois ascended the Fr. throne under the name of Philip VI., and founded the dynasty of Valois, which ruled Fr. to 1589.

**Valonia** [It. *vallonia*], the acorn-cups of *Quercus Eglotops*, a large oak tree of the Levant. They are of a light drab color and very rich in tannic acid; are imported from Trieste, Greece, and Smyrna, and largely employed by tanners and dyers.

**Valparaiso**, vah-pah-ri'so, city of Chili, S. Amer., cap. of a prov. of the same name, is in lat. 33° 1' S., on a large bay of the Pacific, sheltered on all sides except the N. Its position as a commercial place is very favorable, being the only good harbor along the Amer. coast of the S. Pacific, and forming the only outlet from a vast tract of rich and productive land. It is connected with Santiago by a railway, and communicates with Hamburg by a Ger. line of steamers; with Panama by an Eng. and a Chilian. Gold, copper, lead, hides, and tallow are the prin. articles of export. The educational and benevolent insts. of the city have increased with its commercial prosperity. There is an Eng., Fr., and U. S. hospital, attended by resident phys. The most prominent public buildings are the govt. palace, the govt. warehouses, the custom-house, etc. Pop. 100,926.

**Valparaiso**, val-pa-ra'zo, city and R. R. centre, cap. of Porter co., Ind., 44 m. E. of Chicago, contains the N. Ind. Normal School. Prin. business, manufacturing and farming. Pop. 1870, 2765; 1880, 4461.

**Value**, val'yü [Fr. *valeur*; Sp. *valor*, from Lat. *valere*, to "be strong," to "have influence," to "be worth"]. In ordinary usage, the word expresses that quality of a thing which makes it desirable. But the term is here introduced as a technical term of modern political economy, and so to be considered. Ambiguity in the use of this term leads to much confusion of ideas on economical problems; hence the necessity of a strict definition, to be closely adhered to. Value is purchasing power—i. e. as applied to any object, that which gives it power to command other objects in exchange. It supposes always a comparison of two objects in view of an exchange actual or contemplated. Hence it is always a relative term, and the measure of it pertaining to anything can be expressed only by naming some other thing for which it can be exchanged—the *quid pro quo*.

V. should be distinguished from price. Price is V. with reference to a single article—viz. money. V. is the power to command commodities generally. Money is made the general standard of V., and so V. may be indicated by a comparison of prices; but it is important to observe the distinction between the two terms. V. should also be distinguished from utility. Utility is simply adaptedness to satisfy a want or gratify a desire. Things that have V. have always utility in the sense of capacity to gratify desire. The power of a commodity in exchange is measured by its desirableness. But some things of the very highest utility have no V.; as, for instance, air, sunlight, water. They cost nothing, and cannot ordinarily be appropriated in exclusive possession.

With these distinctions in mind it is plain that V. may be resolved into 2 elements: (1) Utility—i. e. desirableness for gratification; (2) cost—i. e. difficulty of attainment, measured by the amount of labor necessary to secure the object. Recognizing the presence of these 2 elements, we have the limits of V. defined. The maximum limit of V. in any commodity is its utility; that is, its purchasing power is determined by the intensity of desire for its possession by the parties to the exchange. The minimum limit of V. in any article, for any long time, is the cost—i. e. the exponent of the labor either actually expended in its production or which must be expended for its reproduction. When the market V. of a commodity falls permanently below its cost, its production will be suspended. Between these two limits there is room for a considerable variation, which is determined by the law of supply and demand. Concisely stated, the rule is, That V. increases directly as the demand, and inversely as the supply. Monopolies artificially limit supply for the purpose of increasing V. When left free from artificial interference, demand and supply rush toward an equilibrium; and the condition of stable equilibrium is that things exchange for each other according to the cost of production, or according to their natural V. A. L. CHAPIN.

**Vambery** (ARMINUS (HERMAN)), b. at Szerdahely in the Danubian island of Schütt, near Presburg, Hungary, in 1832, of Jewish parentage; studied laws at Presburg, Vienna, and Pesth; went to Constantinople, where he supported himself by teaching Fr.; pub. in 1858 a Tur.-Ger. pocket dict.; undertook in 1862, with the support of the Acad. of Pesth, an extensive journey of exploration through Per. into Turkestan; visited Khiva, Bokhara, and Samarcand, and was appointed prof. of Oriental langs. at the Univ. of Pesth in 1865. He wrote *Cagataische Sprachstudien Uigurische Sprachmonumente und das Kudatku-Bükh, The Islam in the Nineteenth Century*, etc.

**Vampire** [Fr.], according to a superstition still existing among the lower classes in Hungary, Servia, Romania, and the Chr. pop. of the Balkan peninsula, a kind of ghost which during the night leaves the grave and maintains a semblance of life by sucking the warm blood of living men and women. It is probable that this superstition originated from the anc. myth of the *lamie*.

**Vampire Bat**. See BAT.

**Vana'dium**, one of the elements of matter, a very in-

teresting metal, named after the Scandinavian myth *Vana-dis*. It was first discovered in 1801. In 1830 Sefström found it again in some commercial metallic iron, and called it *vana'dium*. For a long time the lowest oxide of V. was mistaken for the metal itself, and it is only within a few yrs. that the Eng. chemist Roscoe discovered that V. is one of the relatives (chemically speaking) of phosphorus and arsenic, and, like these, is a *pentad* in its chemical equivalency with oxygen. V. occurs as an essential constituent of several mineral species, *dechenite* and *descloizite* being vanadates of lead, *vanadinite* being chloro-vanadate of lead, similar in constitution to *pyromorphite* and *apatite*, *vorbortite* being a hydric vanadate of copper, *chileite* a vanadate of lead and copper, and others. Two Amer. localities of V. minerals were in 1876 announced by an Amer. chemist and mineralogist, Genth of Phila. One is at Granite Creek, El Dorado co., Cal., in a gold-mine; the other is at the Iron Rod Mine, Silver Star dist., Mont., where a new hydric vanadate of lead and copper was recognized and analyzed by him, which he named *paillacinite*. Other Mont. gold-mines furnish the same mineral.

**Vanbrugh**, van-broo' (Sir JOHN), b. probably in Chester, Eng., in 1666, was of Flemish descent; received a liberal education, partly in Fr.; entered the Fr. army as ensign, and rose to the rank of capt.; became in 1695 sec. to the commission for completing Greenwich Hospital; devoted himself to lit. and to the profession of an arch.; brought out the comedies *The Relapse*, *The Provoked Wife*, *Esop*, and an adaptation of Fletcher's *Pilgrim*; made in 1702 the architectural designs for Castle Howard, Yorkshire, the seat of the earl of Carlisle; became Clarendieu's king-at-arms 1703; was for a short time manager of the Haymarket; produced there his *Confederacy* and 3 adaptations from Molière; was the arch. of the palace of Blenheim, built by order of Parl. for the duke of Marlborough—a task which occupied him for several yrs. (1706-15) and involved him in a quarrel with the duchess; was knighted and made comptroller of the royal works 1714, and surveyor of the works at Greenwich Hospital 1716. D. Mar. 26, 1726.

**Van Buren**, Ark. See APPENDIX.

**Van Buren** (JOHN), second son of Pres. Martin Van Buren, b. at Hudson, N. Y., Feb. 18, 1810, grad. at Yale in 1828; studied law, and was admitted to the bar in 1830. In 1832 he attended his father, who had been appointed minister to Eng.; was atty.-gen. of N. Y. 1845-47, and in 1848 took an active part in the Presidential canvass. After this he devoted himself wholly to his profession. D. Oct. 13, 1866.

**Van Buren** (MARTIN), 8th Pres. of the U. S., b. at Kinderhook, N. Y., Dec. 5, 1782; in 1812 was elected to the State senate; was atty.-gen. 1815-19, and in 1816 a State senator for a second time. In 1818 he became a member of a clique of politicians known as the "Albany regency." In 1821 he was chosen a member of the convention for revising the State const. In this yr. he was also elected U. S. Senator, and at the conclusion of his term, in 1827, was re-elected, but resigned in the following yr., having been chosen gov. of the State. In Mar. 1829 he was appointed by Pres. Jackson sec. of state, but resigned in Apr. 1831. In May 1832 he was nominated as the Dem. candidate for V.-P., and elected in the following Nov. In 1836 he was elected Pres. The opening of his administration was at a time of severe financial difficulty, which resulted in the suspension of specie payments by the banks, and the Pres. urged the adoption of the independent treasury system, which became a law near the close of his administration. Another important measure was the passage of a pre-emption law, giving actual settlers the preference in the purchase of public lands. The question of slavery now began to assume great prominence in national politics. In the Presidential election of 1840 Mr. V. B. was nominated without opposition as the Dem. candidate. The Dems. carried only 7 States, and out of 294 electoral votes only 60 were for Mr. V. B. In 1844 he was proposed as the Dem. candidate for the Presidency, and a majority of the delegates to the nominating convention were in his favor, but owing to his opposition to the proposed annexation of Texas he could not secure the requisite vote of two thirds; his name was at length withdrawn by his friends, and Mr. Polk received the nomination, and was elected. In 1848 Mr. Cass was the regular Dem. candidate; a portion of the party, taking the name of "Free-Sollers," nominated Mr. V. B.; they drew away sufficient votes to secure the election of Gen. Taylor, the Whig candidate. After this, Mr. V. B. retired to his estate at Kinderhook. Wrote *An Inquiry into the Origin and Course of Political Parties in the U. S.* D. July 24, 1862.

**Vance** (JOSEPH), b. in Washington co., Pa., Mar. 21, 1786, went at an early age, with his father, to Ky., and afterward to Urbana, O.; successfully engaged in mercantile pursuits; became a farmer and stock-raiser upon a large scale; was a member of the State legislature 1812-16; M. C. 1821-35, and again 1843-47, serving as chairman of the committee on claims; and gov. of O. 1836-38; was also maj.-gen. of militia. D. Aug. 24, 1862.

**Vance** (ZEBULON B.), b. in Buncombe co., N. C., May 13, 1830, studied law, and was admitted to the bar in 1853; in 1854 was elected to the State legislature; in 1858 was elected M. C., and was re-elected in 1859. He was gov. of N. C. at the time of its secession, to which he was originally opposed, but afterward took an active part in it; in 1870 was elected to the U. S. Senate, and re-elected gov. in Nov. 1876. In 1879 was elected U. S. Senator; re-elected 1885.

**Van Cleve** (HORATIO PHILLIPS), b. at Princeton, N. J., Nov. 23, 1809, grad. at W. Pt. in 1831; became a farmer and civil engineer in Mich., and afterward in Minn.; in July 1861 was made col. of volunteers, led his regiment at the battle of Mill Spring, and was made brig.-gen. Mar. 21, 1862; commanded a brigade at Corinth, and subsequently a division. He bore a distinguished part in the battle of Stone River, where he was wounded; was engaged in several other battles, notably at Chickamauga; was in command



at Murfreesboro' 1863-65, and in 1866 was appointed adjutant-gen. of Minnesota.

**Van Cortlandt** (PHILIP), b. in New York Sept. 1, 1749, became a land-surveyor, at the opening of the Revolutionary war lieutenant-col., and subsequently col.; served at the battle of Stillwater, and against the Indians on the frontier in 1778; was made brig.-gen. for gallant conduct at the siege of Yorktown; was a member of the N. Y. house of reps. 1788-90, of the State convention of 1788 by which the const. of the U. S. was adopted, State senator 1791-94, and M. C. 1799-1809. D. Nov. 5, 1831.

**Van Cortlandt** (PIERRE), brother of Philip, b. in 1730, was a member of the first provincial cong., and of committee which framed const. of the State; pres. of the senate, and first lieutenant-gov. of N. Y. 1797-1805. D. May 1, 1814.

**Vancouver**, city, cap. of Clarke co., Wash. Terr. Pop. 1880, 1722.

**Vancouver**, van-koo'ver (GEORGE), b. about 1758, entered the Brit. navy as midpn. in 1771; was with Cook in his first and second voyages; was made first lieutenant in 1780, and served in the W. I. until 1789. In 1790 he was put in command of a small squadron sent to take possession of Nootka. He received from the Sp. commandant the formal surrender of Nootka, and passed the 3 summers of 1792-94 in surveying the coast as far N. as Cook's Inlet, lat. 58°-61°, wintering at the S. I., and convinced himself that no N. W. passage existed. On his return voyage he surveyed most of the W. coast of S. Amer. A narrative of his voyage was nearly finished at the time of his death, and published at the expense of the govt. He became post-capt. in 1794, and Vancouver's Island was named after him. D. May 10, 1798.

**Vancouver's Island** [named from Capt. George Vancouver], an island which forms a part of Brit. Columbia and the Dominion of Canada, lies between lat. 48° 30' and 50° 35' N., and between lon. 123° 10' and 128° 30' W. It is bounded W. by the Pacific Ocean, and occupies the greater part of the S. and Queen Charlotte's Sound on the N. affording communication between this sound and the open sea. The island is 300 m. long and from 30 to 70 m. wide. Area, 18,750 sq. m. It is mostly a mt.-region, and is in part a waste of rocks, with large tracts of heavily timbered land and open grassy glades. The W. coast is precipitous and forbidding, and is deeply cut up by high-walled fiords called *canals*. The climate is much like that of Scot., but is perhaps more rainy. Only 1/3 of the surface is fit for cultivation, but the arable soil is of the most productive character, well adapted for all ordinary crops except Indian corn. Wheat, apples, root-crops, oats, and barley are extensively produced. Gold and other metals are abundant. Coal of Tertiary origin, partly anthracite of good quality, is very abundant. The timber-trade and the fisheries are the most important industries.

**Population.**—The Indians constitute the most numerous portion of the people, and number some 18,000. They are mostly tribes or bands which belong to the confederation known as the Ahts. The R. Caths. maintain missions among them. The chief town is Victoria, which is the cap. of Brit. Columbia. Pop. 1881, 5925.

**Vandalia**, van-dā'le-a, R. R. centre, cap. of Fayette co., Ill., 67 m. E. of St. Louis (Mo.). V. was the former cap. of the State (1820-40). Excellent hard-wood timber abounds in the vicinity. Pop. 1870, 1771; 1880, 2056.

**Vandals**, *The*, a barbaric tribe, of Germanic, Slavic, or mixed origin, were settled in the 2d century on the E. slopes of the Riesengebirge, which after them were called *Montes Vandali*. In the 3d century they removed into the Rom. prov. of Dacia, and in the 4th century were found in Pannonia as quiet and peaceable inhabs. But in the beginning of the 5th century they suddenly arose, overran the S. part of Gaul, thronged into Sp., and formed here an independent empire, *Vandalitia*, the modern Andalusia. In 429 Bonifacius, gov. of the Rom. prov. of Afr., invited them to Afr. in order to avenge himself on Valentinian III., and a horde of from 50,000 to 80,000 crossed the Strait of Gibraltar under the leadership of Genseric. Meanwhile Bonifacius had become reconciled to the emp., and now turned against the Vandals, but was completely defeated and shut up in Hippo. In 435 a peace was concluded between Valentinian III. and Genseric, and the largest part of the prov. of Afr. was ceded to the Vandals; but in 439 Genseric broke the peace and conquered Sard. and Sic. In 455 he invaded It., and captured and sacked Rome. But the power of the Vandals was only of short duration. Genseric d. in 477, and none of his successors were prominent men. Hilderic (529-530) was overthrown by Gelimir. But the Byzantine emp. sent an army to Afr. under Belisarius. Gelimir was captured and sent to Constantinople, and most of the Vandals were drafted into the Byzantine army to serve in the wars against Pers.

**Vandenhoff** (GEORGE), b. in Eng. about 1820, made his debut upon the stage at Covent Garden Theatre in Oct. 1839; came to New York in 1842; continued to act until 1856; studied law and was admitted to the bar in 1858. He has given public readings and lessons in elocution in Amer. and Eng., and has pub. *The Art of Elocution, Dramatic Reminiscences*, etc.

**Vanderbilt** (CORNELIUS), b. on Staten Island, N. Y., May 27, 1794. He had a very meagre education, and at an early age devoted himself to sailing boats in New York Bay. At 16 he purchased a boat of his own, and ran it as a ferry between New York and Staten Island. During the war of 1812 he carried some officers from Ft. Richmond during a perilous storm. In 1814 he built a small schooner for his increased business; in the yr. following he built a larger schooner for the coast-trade. In 1817 he entered the employ of Thomas Gibbons, and became capt. of a small steamboat running between New York and New Brunswick, N. J., on the road to Phila. He also took charge of a hotel at New Brunswick, where the passengers remained over night. He

remained with Mr. Gibbons for 12 yrs., during which time the line of steamboats had grown to be one of great importance; at the end of that time he resigned his position and started out for himself: he built several small steamboats, and ran them to points on the Hudson River and other places near New York. In 1851 he established the route of steamships between New York and Cal. by way of Nicaragua. In May 1853, having amassed immense wealth, he built the steamship North Star, and, taking his family on board, made a tour of Europe in it at his private expense. In Apr. 1855 he established an independent line of steamships between New York and Havre. In the spring of 1862 he presented the govt. with his finest steamship, the *Vanderbilt*. Subsequently he withdrew his money from vessels and invested it in R.Rs. He was pres. of the N. Y. Central and Hudson River R.R., the Harlem R.R., and the Lake Shore and Michigan Southern R.R., and was a director in the W. U. Telegraph Co. In 1870 he purchased the building known as the Mercer st. Presb. ch. in New York, and presented it to the Rev. Charles Force Deems. On Mar. 27, 1873, Mr. V. presented the M. E. Ch. S. with \$500,000, afterward increasing the amount to about \$1,000,000, to be used in founding a univ. at Nashville, Tenn. D. Jan. 4, 1877.—His son, WILLIAM HENRY, b. in New Brunswick, N. J., May 8, 1821, received a common-school education, and became pres. of the Hudson River and other R.Rs., retiring in 1883.

**Vanderbilt University**, an inst. of learning at Nashville, Tenn., founded in 1872 under the name of Central Univ. of the M. E. Ch. S., and received its present name in 1873 in consequence of a donation of \$500,000 by Cornelius Vanderbilt of New York, subsequently increased to \$1,000,000, of which \$600,000 is to remain as a permanent invested endowment. The corner-stone was laid Apr. 28, 1874, in the W. suburbs of Nashville, and the inst. was opened for students Oct. 4, 1875. There are 6 depts., academic, theological, legal, medical, dental, and pharmaceutical.

**Van'derlyn** (JOHN), b. at Kingston, Ulster co., N. Y., Oct. 1776, received instruction from Stuart, and in 1796 went to Europe through the assistance of Aaron Burr, where he remained 5 yrs. He returned to Europe in 1803, remaining until 1815; made many admirable copies from the old masters; painted the picture of *Marius seated amid the Ruins of Carthage*, which gained the Louvre gold medal in 1808, *The Murder of Jane MacCree by the Indians*, etc. Returning to Amer., he painted the portraits of Calhoun, Clinton, Madison, Monroe, Jackson, and others. In 1832 he was commissioned to paint a full-length portrait of Washington for the hall of the House of Reps., and in 1839 the *Landing of Columbus* for the Rotunda of the capitol. Among his best works is the *Ariadne*. D. Sept. 23, 1852.

**Van der Meer** (JAN), THE ELDER, b. at Haarlem about 1625, painted landscapes with animals and sea-pieces, and held various positions in the civil service. D. in Haarlem about 1685.—His son, JAN VAN DER MEER THE YOUNGER, b. at Haarlem about 1660, acquired a great reputation as a painter of landscapes and marine battles. His best picture is a *View of the Rhine*. D. about 1704.

**Van der Meulen** (ANTOINE FRANÇOIS), b. at Brussels 1634, was invited to Fr. by Colbert through the influence of Lebrun, and appointed designer at the Gobelins manufactories; attracted attention by his talent for battle-pieces, and accompanied Louis XIV. in several campaigns; was elected member of Acad. in 1673. D. Oct. 15, 1690.

**Vandervelde** (WILLEM), THE ELDER, b. at Leyden in 1610, acquired great reputation by his sketches of manoeuvres, engagements, etc.; was invited to Eng. in 1675 by Charles II., who made him court-painter of sea-fights. D. in 1698.—WILLEM VANDERVELDE THE YOUNGER, b. at Amsterdam in 1633, succeeded his father as marine-painter to the king of Eng., and attained great fame. D. Apr. 6, 1707.

**Van Diemen's Land**. See TASMANIA.

**Van Dorn** (EARL), b. in Miss. in 1821, grad. at W. Pt. in 1842; served with distinction in the Mex. war, at Cerro Gordo, Contreras, and Chapultepec; was wounded in the final assault upon the City of Mex.; was sec. of the military asylum at Pascagoula, Miss., 1853-55; was subsequently employed in scouting in Tex., led an expedition against the Comanches in 1858, and severely wounded at Washita Village, Ind. Terr., Oct. 1, 1858. In Jan. 1861 he entered the Confed. army as col., taking command of a regiment of Tex. volunteers; early in 1861 he captured the steamer Star of the West at Indianola, and soon after received the surrender of Major Sibley and of Col. Reeve, with 13 companies of U. S. inf. He rose to the rank of maj.-gen., and in Jan. 1862 was placed in command of the Trans-Mississippi dist.; was defeated at Pea Ridge; commanded at the battle of Corinth, where he was defeated, and was superseded by Gen. Pemberton. D. May 8, 1863.

**Vandyke**, or **Van Dyck** (ANTHONY), b. at Antwerp Mar. 22, 1599, received his first instruction in painting from Van Balen (1610-15), then from Rubens (1615-20), whose most illustrious pupil he became; travelled in It. 1620-25, visiting Venice, Genoa, Florence, Rome, Palermo, and other cities; resided after his return partly in Antwerp, partly at the Hague; went in 1632 to Eng. on the invitation of Charles I., was knighted, received a pension of £200 a year, and lived in great style in Lond. During the first period of his career the influence of Rubens is very apparent; but after his It. journey his own style became fully developed. A deep, pensive, sometimes almost melancholy sentiment, and a subdued, refined, and elegant harmony of colors, took the place of the active, often violent passion, with its burst into brilliant colors, which characterizes Rubens. In this manner he has painted numerous *Holy Families*, *Crucifixions*, etc. But it was principally as a portrait-painter that V. achieved his great fame. D. Dec. 9, 1641.

**Vane**. See LONDONDERRY, MARQUIS OF.

**Vane** (SIR HENRY), b. at Hadlow, Kent, Eng., in 1612, ed. at Westminster School, and entered as gentleman commoner Magdalen Coll., Ox.; renounced the Ch. of Eng. and



refused to take the oath of allegiance; completed his education at Geneva, where he became a Puritan and a republican; arrived at Boston 1635; was chosen gov. for the yr. 1636; lost his popularity, and was not re-elected; was chosen a member of the general court; returned to Eng. Aug. 1637; was knighted, elected to Parl., and made joint-treas. of the navy 1640; took part in the impeachment of Strafford; became sole treas. of the navy 1642; went in June 1643 to Scot. as one of the joint coms. to negotiate an alliance, and was influential in securing the adoption of the "Solemn League and Covenant;" enabled Roger Williams to obtain the R. I. charter 1643; was a promoter of the "Self-denying Ordinance" 1644; opposed the terms of settlement offered by Charles in 1648; condemned the execution of Charles and the "purge" of Parl. effected by Cromwell; became in Feb. 1649 a member of the council of state; came into conflict with Cromwell in consequence of the forcible dissolution of the Long Parliament Apr. 1653; wrote religious treatises and political pamphlets, one of which led to an imprisonment of 4 months in Carisbrooke Castle by order of Cromwell Mar. 1656; remained in opposition until the death of the Protector, when he was chosen to Parl.; became the leader of the republican party; was a member of the committee of safety and pres. of the council of state during the brief renewed existence of the Long Parliament 1659; was imprisoned; tried for high treason before the court of king's bench June 2, 1662; was unjustly convicted and sentenced to be hanged, and in violation of a promise made by Charles was beheaded on Tower Hill June 14, 1662.

**Vanilla** [Fr. and Ger. *vanille*], the fruit of the *Vanilla planifolia* and of the *Vanilla aromatica*, which are climbing plants native in Mex. and Brazil and cultivated in the W. I. The pods of the plant are from 6 to 8 inches in length, possess a very pleasant odor, and are often incruusted with needle-shaped crystals of *vanilline*, their aromatic constituent. They also contain an iron-greening tannin, a fatty oil, and a resin. V. is chiefly used for flavoring ice-cream, chocolate, etc., and, to a slight extent, in med.

**Vanini**, yah-nee'ne (LUCILIO, or, as he afterward called himself in his writings, JULIUS CESAR), b. at Taurisano, near Naples, about 1585; studied philos., theol., and natural science at Rome and Padua; took holy orders; taught at Geneva, Paris, and Lyons; visited Eng.; pub. in 1615 at Lyons his *Amphitheatrum Aeternae Providentiae*; pub. next yr. at Paris his dialogues, *De Admiranda Naturae, Regine Deaeque Mortalium, Arcanis*, which was burned by order of the Sorbonne; was accused of atheism and burned at the stake Feb. 19, 1619.

**Van Lennep**. See LENNEP, VAN.

**Van Len'neep** (HENRY JOHN), D. D., b. in Smyrna Mar. 18, 1815, descending from a Dutch family of scholars, was sent to the U. S. at 15; attended school at the Mt. Pleasant Inst. in Amherst, Mass., and grad. at the coll. in the same town in 1837; studied theol. in Andover, and returned as a missionary to the land of his nativity in 1839; established new posts in European Tur., Asia Minor, and Syria; was subsequently connected with theological insts. in Constantinople, Smyrna, and Tocat; made many exploring tours in Gr., Roumelia, Asia Minor, Syria, Pal., and Egypt, and became familiar with most of the Oriental langs., so that he can read and write in 10 different dialects and preach extempore in 5. Having lost his eyesight from cataract, he returned to the U. S. in 1869; wrote *Travels in Asia Minor and Bible Lands*.

**Vanloo**, the name of a family of painters of Flemish descent, but settled in Fr. The 2 most celebrated members of this family were the brothers JEAN BAPTISTE (b. 1684, d. 1745), who painted mostly portraits, and CARLE VANLOO (b. 1705, d. 1765), who painted mostly historical pieces.

**Van Ness** (CORNELIUS PETER), LL.D., b. in Vt. Jan. 26, 1782, studied law; was U. S. dist. atty. 1809-13, rep. in the legislature 1818-21, com. for the settlement of the boundaries between the U. S. and G. Brit. 1818-21, collector of the port of Burlington 1815-18, chief-justice of Vt. 1821-23, gov. of the State 1823-26, minister to Sp. 1829-39, and collector of the port of New York 1844-45. D. Dec. 15, 1852.

**Van Ostade**. See OSTADE, VAN.

**Van Rensselaer**, ren'sel'er (MAUNSELL), D. D., LL.D., b. at Albany, N. Y., Apr. 15, 1819, ed. at the Albany Acad.; grad. at Union Coll. in 1838, and at the General Theological Sem. of the P. E. Ch. in 1841; was admitted to holy orders June 30, 1841; was missionary at Whitehall, N. Y., till 1845; founder and first rector of Grace ch., Albany, till 1847; was rector in succession of St. John's ch., Mt. Morris, St. Paul's, Oxford, and Grace, Rochester, in the diocese of W. N. Y.; pres. of the De Veaux Coll. from 1859 to 1869, and of Hobart Coll. from 1872 to 1876.

**Van Rensselaer** (STEPHEN), LL.D., known as "the patron," b. in New York Nov. 1, 1764, grad. at Harvard in 1782; was member of the assembly in 1789, of the State senate 1790-95, lieut.-gov. 1795-1801, member of the constitutional convention 1801; in 1810 was appointed one of the coms. to explore the proposed line for a canal from Lake Erie to the Hudson. He was in command of the State militia at the commencement of the war of 1812, and directed the unsuccessful assault upon Queenstown Heights. In 1819 he was chosen one of the regents of the New York Univ., of which he was subsequently chancellor; in 1821-23 instituted the geological surveys of N. Y., and in 1824 established at Troy a scientific school for the instruction of teachers, which was 2 yrs. afterward incorporated as the Rensselaer Inst. He was M. C. 1823-29, and it was by his casting vote in the N. Y. delegation that John Quincy Adams was made Pres. of the U. S. Wrote *A Geological and Agricultural Survey of the Dist. adjoining the Erie Canal*. D. Jan. 26, 1839.

**Van Tromp**. See TROMP, VAN.

**Van Wert**, R. R. centre, cap. of Van Wert co., O. Pop. 1870, 2625; 1880, 4079.

**Varal'io**, small town of It., province of Novara, in the

centre of the Val Sesia. In its immediate neighborhood is the Sacro Monte di Varallo, one of the most celebrated sanctuaries in the kingdom of It., and annually visited by many thousands of pilgrims. Pop. 3200.

**Var'iable** [Lat. *variare*, to "vary"]. Variables are quantities which admit of an infinite number of sets of values in the same equation. If there are two or more V. in an equation, all but one may be regarded as *independent*; that is, we may assign values to them at pleasure, but the value of that one must be such as to satisfy the given equation. Because one V. always depends on the form of the equation, as well as on the values assigned to the others, it is called the *dependent V.* or the *function*.

**Variations, Calculus of**, an extension of the principles of the differential and integral calculus to the determination of maxima and minima resulting from a change in the form of a *limited function*. Its scope and power are well illustrated in the solution of the famous problem proposed by John Bernoulli, in which he requires the nature of the curve of quickest descent from one point to another. In solving this problem we first suppose a vertical plane curve to be drawn through the 2 points, the ordinate *y*, of which is an arbitrary function of *x*, except at the limiting points. Then, from an elementary law of mechanics we find the time *t* required for a body to roll down this curve (from the upper to the lower point) in terms of *y* and *x*. If we then give to *y* an infinitesimal increment, called its *variation* (*Δ* remaining unchanged), we shall have a second curve consecutive with the first and passing through the given point; the change will also cause a corresponding change of *t*, called its *variation*. The minimum value of *t* will be found by placing the variation of *t* equal to 0; from this equation the curve is found to be that of an inverted cycloid.—It is called a *brachystochrone*.

**Varicose Veins**, relaxation of the coats of the superficial veins, with increased calibre, occurring most frequently in the lower extremities. Varicocoele in the male is a local varicosity of the spermatic veins. Hemorrhoids or piles are V. V. at the verge of the anus. The varicose limb may be benefited by daily friction, cold effusion, and salt bathing. But the extension of the disease is best checked, and the best prospect of cure insured, by constant external support. This is secured by uniform bandaging with rubber ribbon bandages, or by wearing an elastic stocking or laced leg-corset. V. V. are radically cured by ligation and by hypodermic injection of a drop of liquor ferri-pernitratris within the vein. Arsenical preparations act well on V. V.

**Varioloid**. See SMALLPOX and VACCINATION.

**Var'nish** [Lat. *vernix*; Ger. *Firniss*; Fr. *vernis*], a resinous solution which is employed for coating various objects in order to produce a thin, transparent, and hard surface, forming a protection against moisture and air. The principal resins employed are the gums copal, shellac, animé, mastic, and sandarac; the solvents being spirit of wine, wood-spirit, oil of turpentine, linseed and other drying oils. From the nature of the solvent used V. may be conveniently divided into 4 classes—viz. fixed oil, spirit, volatile oil, and ether V.

**Var'nish-Tree**, a name given to *Rhus vernicefera* of Japan, *Melanorrhæa usitata* of India, *Stagmaria verniceifera* of the Malay Islands, *Semecarpus anacardium* of Sylhet, and other varnish-producing trees of the order Anacardiaceæ.

**Var'num** (JAMES MITCHELL), b. at Dracut, Mass., in 1749, grad. at R. I. Coll. in 1769; studied law, and practised at E. Greenwich, R. I.; in 1774 headed a company called the Kentish Guards; commanded the Amer. troops on the Del. when the Brit. took possession of Phila.; took part in the battle of Monmouth, and afterward served under La Fayette in R. I., leaving the army in 1779. He was twice elected to the old Cong., and in 1788 was appointed a judge of the supreme court of the N. W. Terr. D. Jan. 10, 1789.

**Varnum** (JOSEPH BRADLEY), brother to James M., b. at Dracut, Mass., in 1750, after serving in the Revolutionary army was successively member of both houses of the Mass. legislature, M. C. 1795-1811, speaker of the House 1807-11, and Senator 1811-17. D. Sept. 11, 1821.

**Var'ro** (MARCUS TERENTIUS), D. B. C. 116 in the Sabine territory, of anc. family of senatorial rank. He early devoted himself to antiquarian lore and to lit., but did not neglect his duties toward the state, and was often employed by Pompey on grave political occasions. When the c. war arose, he espoused the republican cause, but was reconciled to the victorious Caesar, who made him librarian of his contemplated collection. He was a very prolific writer. His prose works embraced almost all branches of knowledge—gram., rhetoric, geog., hist., philos., jurisprudence, and husbandry. D. B. C. 28. Of all his works, only *Rerum Rusticarum Libri III.*, portions of *De Lingua Latina* are extant.

**Varu'na** (i. e. "that which surrounds") is adored as a deity by Hindoos. He is the greatest offspring of the Lord of Space, *Aditi*. V. is shrouded in mystery. At first he was the hidden sun. He had set, but he would rise. While hidden underneath the earth, in the bosom of night, *Sârya*, the sun, was "Varuna." No one knew aught of him. Mitra was the rising sun, Agni was the god of fire, but V. was the heavenly mystery. The golden light of the beautiful Mitra (dawn) precedes V., who loves the dark shades of night, which are especially sacred to him. He gives coolness to the people who are faint with the ardent beams of Agni. Yet, though a night-god and a lover of cool winds and dews, V. is luminous as the moonbeams themselves. He is described as the guardian of immortality, the lover of truth, having in his hand a rope with many nooses, with which he seizes evil-doers by flinging the slip-knot round their necks; all-powerful and all-merciful.

**Var'us** (PUBLIUS QUINTILIUS), consul in 13 B. C., and afterward gov. of Syria, was sent in 7 A. D. to Ger. as gov. A formidable conspiracy had been formed under the lead of Hermann between the chieftains of the Cherusci, Marsi, Catti, and Bructeri. By the information of the insurrection



of a distant Ger. tribe, V. was allured out of his fortified camp. His way to the place of the insurrection led through the *Saltus Teutoburgiensis*. He had hardly entered the pass, however, before he was attacked on all sides by the Gers, lying in ambuscade. After 3 days' hard fighting, he finally succeeded in making his way through the passes, and emerged, much reduced in numbers and utterly exhausted, into the open country; but here he was met by the main force of the Ger. tribes, and his army was completely annihilated. In despair, he killed himself.

**Vas'a, House of.** One of the most celebrated royal families of Europe, was founded by Gustav Ericsson Vasa in 1523, and ruled over Swe. till 1818. Thrice the succession passed into collateral female branches, the direct male having become extinct.

**Vasari** (GIORGIO), b. at Arezzo in Tuscany in 1512, belonged to a family of painters; studied art, arch., and painting practically; became a pupil and friend of Michael Angelo; was much employed by Pope Clement VII. in Rome, and by Alessandro and Cosmo de' Medici in Florence; built the ch. of Abbadia in Arezzo and the Palazzo degli Uffizi in Florence; painted several noted pictures in the Palazzo Vecchio in Florence and in the Scala Regia in the Vatican; became one of the founders of the Acad. of Fine Arts in Florence, and d. there June 27, 1574. His fame rests less on his artistic productions than on his celebrated work, *Vite de' più eccellenti Pittori, Scultori ed Architetti*.

**Vasco da Gama.** See GAMA, DA.  
**Vasishtha** was a celebrated Brahman sage and rishi. He comes before us chiefly as a champion of Brahmanic claims to supremacy. He is accredited with many of the Vedie hymns. In the epic period of Sans. poetry he is extolled in the *Mahabharata*. In Puranic times every poetical history, or nearly so, records some legend of the sage. V. represented the true principle of exclusive Brahmanism. He was the greatest champion they ever had. There is little doubt but that in early Aryan times there was constantly going on a struggle between the priestly and royal castes of Hindoos. It appears that at one period the Brahmanic element rose to an undoubted ascendancy. The legend records that the struggle lasted over cycles of time. But at length the Kshattriya champion became the equal at least of his Brahman-born competitor. We see in it a foreshadowing, as it were, of a custom now prevalent among the royal race of Travancore. The Travancore kings are of the Sudra, or one of the lower castes. But each of these maharajahs, as he ascends the throne, has a cow made of his own weight in gold, through which, literally, he passes, after great display and ceremonial. The cow of gold is then broken up, and the pieces of the costly metal are distributed among the temple Brahmans. The rajah then is "twice-born." He is no longer a mere Sudra. V. is said to have been the emanation of the intellect of Urvashi; he is also called the offspring of Mitra and Varuna. He was endowed with wonderful knowledge of efficacious sacrifices, and possessed a cow of plenty, which not only gave him everything he desired, but also protected him from all machinations and assaults. He could tell that which passed in the minds of the gods, and was possessed of divine power. He was one who, through the wonderful merits of his cow of plenty, could make barren women bear children. He also was a profound lawyer. But his chief characteristic was arrogance.

**Vasquez** (vash-keth') **de Corona'do** (FRANCISCO), b. at Salamanca, Sp., about 1505, was an early settler in Mex.; was given command of an expedition which left Culiacan, Sinaloa, Apr. 1540, with which he passed through Sonora northward, crossed the Gila, reached the Little Colorado River, and visited the famous "seven cities of Cibola;" reached the city of Quivira, 170 m. N. E. of the present town of El Paso, and was the first European to give an account of the great W. prairies and of the buffalo. D. 1542.

**Vassar**, Mich. See APPENDIX.  
**Vassar** (JOHN GUY). See APPENDIX.  
**Vassar** (MATTHEW), b. at E. Dereham, Norfolk, Eng., Apr. 29, 1792, was brought to the U. S. in 1796 by his father, who settled on a farm near Poughkeepsie and carried on an extensive brewery, and acquired a fortune in the same business. D. June 23, 1868. (See VASSAR COLLEGE.)

**Vassar** (MATTHEW), JR. See APPENDIX.  
**Vassar College**, an inst. of learning at Poughkeepsie, N. Y., founded by Matthew Vassar in 1861 for the advanced education of young women. A sum of \$408,000 was delivered in Feb. of that yr. to an incorporated board of trustees, and he also gave 200 acres of land, beautifully situated 2 m. E. of Poughkeepsie, where, in accordance with his wishes, about \$200,000 was expended in the erection of a fine brick edifice with blue freestone trimmings, 5 stories in height, 500 ft. in length, 200 ft. in breadth at the centre, and 164 ft. at the transverse wings. The coll. was opened in Sept. 1865, with 8 profs. and 20 other instructors, and 300 students, which number was augmented to 350 during the academic yr. The course of studies is equivalent to that of other first-class colls., and good facilities are given for literary, scientific, and artistic training outside the regular course, and the baccalaureate degree is given in regular course, and the degree of M. A. is conferred after examination upon studies equivalent to a post-graduate course of 2 yrs.

**Vatican Codex.** See CODEX VATICANUS.  
**Vatican Council**, the 20th oecumenical council of the R. Cath. Ch., has its name from the Vatican Palace in Rome, where it was held. It marks the greatest event in the hist. of the R. Cath. Ch. since the Council of Trent, and completes the doctrine of the papacy. It was called by Pope Pius IX., and solemnly opened on the festival of the Immaculate Conception of the Blessed Virgin, Dec. 8, 1869, in the basilica of the Vatican. It was adjourned and indefinitely postponed Oct. 20, 1870, in consequence of the Franco-Ger. war, which broke out immediately after the passage of the infallibility decree, and ended in the prostration of

France and the destruction of the temporal power of the papacy. Whether it will ever be reconvened (like the twice-interrupted Council of Trent) to finish its work remains to be seen. The attendance was larger than on any previous council, and presented an array of hierarchical dignity and power such as even the Eternal City never saw before, nor is likely ever to see again. At the opening there were present 719 prelates from all parts of the globe, including 49 cardinals, 9 patriarchs, 4 primates, 121 abps., 470 bps., 57 abbots and generals of monastic orders. This number gradually increased to 764, but after the outbreak of the war it dwindled down to less than 300. The whole number of prelates who are entitled to a seat in an oecumenical council and were invited is 1097. Among the many nations represented, the Its. had a majority of 276, of whom 148 belonged to the former Papal States alone. The deliberations of the council were conducted in strict secrecy, but 4 public sessions were held for the solemn proclamation of the results. The chief object of the council was to protest against modern infidelity and to settle the vexed question of papal infallibility. Both objects were fully attained. The V. C. rung the death-bell to Gallicanism and liberal Catholicism, and put the topstone to the pyramid of papal absolutism. But it also gave rise to the Old Catholic secession and to a serious conflict with the sovereignty of secular govts., especially in Ger. The results are embodied in 2 sets of decrees, the first against outside infidelity, the second against inside liberalism.

(1) "The decrees on the dogmatic constitution of the Catholic faith" were unanimously adopted in the third public session, Apr. 24, 1870. They are directed against modern rationalism, pantheism, materialism, and atheism, and set forth the orthodox doctrine of God, the creation, and the relation of faith to reason.

(2) Far more important are the "decrees on the dogmatic constitution of the Church of Christ," or the decrees of papal absolutism and papal infallibility, which agitated the council for several months, and after a vigorous opposition and the departure of the anti-infallibilist bps., passed with 2 dissenting votes, in the fourth public session, July 18, 1870. This is the crowning act of the council on which its historical significance rests. (See INFALLIBILITY.)

The lit. on the V. C. is very extensive: *Acta et Decreta sacrosancti et oecumenici Concilii Vaticani* (Friburg, 1872, in 2 parts); *Actes et Histoire du Concile oecumenique de Rome, premier du Vatican* (Paris, 1879, seq., 6 vols.); Cardinal Manning, *Petri Privilegium* (Lond., 1871); Joh. Friederich, *Documenta ad illustrandum Concilium Vaticanum* (Nördlingen, 1871), and *Gesch. des V. C.*, 1877; Quirinus, *Letters from Rome on the Council* (Lond., 1870); Emil Friedberg, *Sammlung der Actenstücke zum ersten vatikanischen Concil* (Tübingen, 1872); Cecconi, *Hist. of the V. C.*, 1873 (It. and Ultramont.); Gladstone's 2 pamphlets—*The Vatican Decrees* (Lond. and New York, 1874) and *Vaticanism*, in reply to Newman and Manning (Lond. and New York, 1875). PHILIP SCHAFF.

**Vatican Decrees.** See VATICAN COUNCIL AND INFALLIBILITY.

**Vatican Palace**, the prin. residence of the pope, is in Rome, on the right bank of the Tiber, in the Leonine City, so called, and on the Vatican Hill. It is the largest palace in the world. It is reported to have been founded by Pope Symmachus about 300 A. D., and to have been at one time the residence of Charlemagne. In 1450 Nicholas V. commenced the great work of making it what it now is, the noblest palace of Christendom.

**Vauban**, vò-bon' (SEBASTIAN LE PRESTRE), b. near Saulieu, Burgundy, Fr., May 15, 1633, one of the most celebrated of the military engineers of that country. To his inventive genius is due the creation or perfection of the bastioned system of fortification, or that modification of mediæval forms which the invention of gunpowder and the perfecting of artill. imposed. He constructed 33 new fortresses and repaired and improved about 100. He conducted 53 sieges, and shared in 140 battles and skirmishes. The inventor of "parallels" in sieges and of the "ricochet" fire, he developed that irresistible system of attack which has ever since been so successfully followed. He was made gov. of Lisle 1663, commissary-gen. of the fortifications of Fr. 1678, gov. of the maritime ports of Flanders 1680, marshal of Fr. 1703. D. Mar. 30, 1707.

**Vaudols.** See WALDENSES.

**Vaudreuil**, vò-drul', the title of a Fr. family, several members of which are notable in Canadian hist.—PHILIP DE RIGAUD, MARQUIS DE, b. in Fr. about 1641, came to Canada in 1687; served in various expeditions against the Seneca, Onondaga, and Oneida Indians; was made gov. of Montreal in 1698, and gov.-gen. of Canada in 1703. D. Oct. 10, 1725.—PIERRE DE RIGAUD, MARQUIS DE, b. in Que. Nov. 23, 1698, was made gov. of the Trois Rivières in 1733, of La. in 1742, and his having in 1748 succeeded by the death of his brothers to his father's title, became in 1755 gov.-gen. of Canada. He made strenuous but unavailing efforts to avert the capture of Que. by Wolfe, and afterward endeavored to recapture it, but was obliged to capitulate. D. 1764.

**Vaughan**, van'an, or vawn (BENJAMIN), LL.D., b. in Jamaica Apr. 19, 1751, ed. at the Univ. of Cambridge; studied law at the Temple, Lond., and med. at the Univ. of Edinburgh; was a Whig M. P. 1792-96; settled in the latter yr. at Hallowell, Me., where he cultivated a large farm, practised med. gratuitously, and devoted himself to literary pursuits. Wrote *The Rural Sports*, etc. D. Dec. 8, 1835.

**Vaughan** (CHARLES JOHN), D. D., b. at Leicester, Eng., in 1816, ed. at Rugby School under Dr. Arnold; grad. at Trinity Coll., Cambridge, as senior classic and chancellor's medallist 1838; became a fellow of Trinity 1839; took orders in the Ch. of Eng.; held the living of St. Martin's, Leicester (formerly his father's), 1841-44; was head-master of Harrow School 1844-59, raising that inst. from a comparatively low ebb to great prosperity; refused the bishopric of Rochester 1860; was vicar of Doncaster 1861-69, since which he has



been master of the Temple; is chancellor of York cathedral and chaplain in ordinary to the queen, and is noted as a pulpit-orator and as a commentator.

**Vaughan** (Sir JOHN), b. in Eng. in 1738, was a son of the earl of Lisburne; entered the army 1746; served in Ger. and the W. I.; was col. of the 40th regiment in the war of the Amer. Revolution; became maj.-gen. Jan. 25, 1777; took part in the battle of L. I. and in the storming of Ft. Montgomery, which was renamed from him Ft. Vaughan; destroyed Esopus Oct. 1777; captured Stony Point and Verplanck's-on-the-Hudson May 1779; became commander-in-chief of the Leeward Islands Dec. 1779; was subsequently lieutenant-gen. and gov. of Berwick. D. June 30, 1795.

**Vaughan** (ROBERT), D. D., b. in Wales in 1795, ed. for the Independent ministry at Bristol Coll.; was pastor of chs. at Worcester and Kensington; prof. of anc. and modern hist. in Lond. Univ. 1830-42; pres. of and prof. of theology in the Lancashire Independent Coll., Manchester, 1842-57; was for a time pastor of a ch. at Uxbridge; projected the *Brit. Quarterly Review* as an organ of the Independents, and edited it from 1845 to 1865; visited the U. S. in 1865, and spent his later yrs. in Lond. Wrote *John de Wycliffe, D. D., a Monograph, with some Account of the Wycliffe MSS., Memorials of the Stuart Dynasty, The Protectorate of Oliver Cromwell*, etc. D. June 15, 1868.

**Vaughan** (ROBERT ALFRED), son of Dr. Robert, b. at Worcester, Eng., Mar. 1823, grad. at Lond. Univ. 1842, and at the Lancashire Independent coll. 1846; studied theol. at Halle 1846; visited It. 1847; became an Independent minister; was colleague with Rev. William Jay as pastor of Argyle Chapel, Bath, 1848-50, and pastor of a ch. at Birmingham 1850-55. Wrote *The Witch of Endor, and other Poems, and Hours with the Mystics, a Contribution to the History of Religious Opinions*. D. Oct. 26, 1857.

**Vaughan** (Sir WILLIAM), M. D., LL.D., b. at Golden Grove, Caernarthshire, Wales, in 1577, brother of the first earl of Carbery, the patron of Jeremy Taylor; ed. at Jesus Coll., Ox., where he grad. in law; became a phys. about 1625; was the founder of a settlement called Cambriol in Newfoundland, and wrote the praises of that colony in a quaint tract in prose and verse called *The Golden Fleece, divided into Three Parts, etc.*, by Orpheus Junior. Author of *Varia Poemata, The Golden Grove, The Newlander's Cure*, etc. D. about 1650.

**Vaughay**, the native name of a S. Indian tree, probably a *Rhizophora*, the bark of which is much valued by fishermen for tanning their nets.

**Vautier**, VÖ-te-ä' (BENJAMIN), b. at Geneva in 1830, studied painting at Düsseldorf 1850-51, and acquired great celebrity as a genre painter. Among his most remarkable pictures are *Devout Singers in a Ch.*, the *Spinning-Woman*, the *Surprise*, and a *Village Funeral*.

**Vaux**, VAWX (THOMAS), BARON VAUX, b. at Harroden, Eng., about 1510, ed. at Cambridge; attended Cardinal Wolsey in his embassy to Charles V. 1527; succeeded to the title, and took his seat in the House of 1590; accompanied Henry VIII. to Calais and Boulogne 1532; became a knight of the Bath and gov. of the island of Jersey 1533. Author of admired poems—e. g. *The Assault of Cupid* and *The Aged Lover renounceth Love*. D. Oct. 1556.

**Vaux** (WILLIAM SANDYS W.), F. R. S., b. in Eng. in 1818, ed. at Westminster School, grad. at Balliol Coll., Ox., 1840; became an assistant in the dept. of antiquities at the Brit. Museum 1841; was keeper of coins and medals 1861-70; is sec. of the Royal Society of Lit., pres. of the Numismatic Society, and co-editor of the *Numismatic Chronicle*; deciphered and edited for the trustees of the Brit. Museum in 1863 a collection of 90 Phœnician inscriptions found at Carthage; is a high authority upon Oriental subjects; has pub. *Nineveh and Persepolis, A Handbook to the Antiquities in the Brit. Museum, being a Description of Gr., Assyrian, Egyptian, and Etruscan Art preserved there*, etc.

**Vāyu**, v'ōo, is the Vedic god of wind, often confounded with Indra, god of heaven. V. is sometimes classed, together with Indra, in Vedic mythologies, with *Agni*, fire, and *Sūrya*, the sun. The tradition is that Anjana was the wife of V., and that by her he had the monkey-god Hanumān. V. is not much respected as a deity in India now.

**Veda**. See SANSKRIT LANGUAGE AND LITERATURE.

**Veddass**. See WEDDASS.

**Vega** (GARCILASO DE LA). See GARCILASO DE LA VEGA.

**Vega Carpio, de la** (LOPE FELIX), usually called **Lope de Vega**, b. at Madrid, Sp., Nov. 25, 1562, lost his father in early childhood; was placed at the Royal Coll. of Madrid by his uncle, the inquisitor Miguel de Carpio, by whom he was destined for the Ch.; served in a campaign against the Port. at the island of Terceira 1517, during an escapade from coll., which lost him the patronage of his uncle; was sent to complete his studies at the Univ. of Alcalá de Henares; entered the service of the younger duke of Alva as his sec. about 1585; composed for his new patron his first notable literary effort, a pastoral entitled *Arcadia*; was imprisoned and exiled to Valencia for having wounded a courtier in a duel; served as a volunteer in the Invincible Armada sent against Eng. 1588, during which expedition he composed a long poem, *La Hermosura de Angelica*; passed at Madrid several yrs. of happiness, prosperity, and almost incredible literary activity, pouring forth innumerable plays, *autos sacramentales*, madrigals, and sonnets, often writing a whole drama in a day; acquired a literary popularity unexampled in Spain; became in 1609 a priest of the Franciscan order; continued his literary activity without intermission, though his later productions were tinged with fanaticism and religious melancholy; underwent the severest self-imposed penances, dying at Madrid Aug. 26, 1635. The number of his plays is variously calculated at from 1500 to 1800; his *autos* numbered several hundreds, and his miscellaneous pieces of prose and verse baffle all attempts at exact statement.

**Vega, von** (GEORG), BARON, b. at Sagoritz, Carniola,

in humble circumstances in 1756, studied at the lyceum of Laibach; taught math. in the school of navigation, then in the school of artill.; became prof. of math. at the military acad.; was made commander of a regiment of artill., and fought with distinction in the wars against the Turks and the Fr.; was ennobled in 1800, and murdered Sept. 26, 1802. His *Logarithmentafeln* reached their 57th ed. in 1876. He also pub. *Logarithmisch-trigonometrisches Handbuch, Thesaurus Logarithmorum Completus*, etc.

**Vegetable Alkali**. See POTASH.

**Vegetable Flannel** is woven in Ger. from "fl-wool," called also *wald-wolle*, a fibre produced from the leaves of *Pinus sylvestris* after the turpentine has been distilled off. The fabric is reputed to have useful medicinal properties, and is worn by rheumatic and other patients.

**Vegetable Ivory**, a substance considerably resembling ivory, is the hardened kernel of the carrozo-nut, the fruit of *Phylephaps macrocarpa*, a S. Amer. tree. V. I. is extensively employed as a substitute for real ivory.

**Vegetable Physiology** treats of the phenomena of plant-life. It investigates the development, growth, and functions of vegetable organisms, and the relations of plants to their surroundings.

**Vegetable Wax**, the wax-like product of various plants, used to a considerable extent as a substitute for beeswax. (1) Myrtle wax, produced from the bayberry or wax-myrtle, *Myrica cerifera* of the U. S. It is of a greenish hue, and is sparingly used in pharmacy. (2) The wax of the Carnahuba palm, *Copernicia cerifera* of Brazil. It is used in Europe in candle-making and waxing floors and furniture. (3) That of *Ceroxylon andicola*, a fine palm tree of the Andes. It is abundant, but rather resinous, and for candles is mixed with tallow. (4) The Japan wax, obtained from the seeds of *Rhus succedanea*, a sumach tree. It is nearly equal to beeswax, and is used in candle-making. It should not be confounded with China wax, which is an insect product.

**Vegetarianism**, a view according to which vegetable substances ought to form the sole food of man, while the use of all animal substances, or at least of meat proper, ought to be avoided in the diet as something wrong, both physiologically and morally. Many of the anc. philos. encouraged a vegetable diet as the most suitable for the well-being of man. In modern times the view found eloquent advocates in Rousseau, Shelley, and others.

**Vegetius** (FLAVIUS RENATUS), probably b. in Rome about the middle of the 4th century A. D.; wrote an *Epitome (Institutionum) Rei Militaris*. The work is in 5 books, and is chiefly a compilation from previous writers. From some expressions of V. it is believed that he was a Christian.

**Vehmic Court**. See FEMMIC COURT.

**Veit**, vit or fit (PHILIPP), b. at Berlin Feb. 13, 1793, became one of the most vehement champions of the romantic school in painting. In 1830 he was appointed director of the Stadel inst. of art in Frankfurt, but resigned this position in 1843 because the inst. bought Lessing's picture of *Huss before the Council of Constance*. Among his most remarkable pictures are the *Seven Years of Plenty*, in the Villa Bartholdy at Rome; *Christianity bringing the Fine Arts into Ger.*, in the Stadel inst. of Frankfurt; the *Assumption of the Virgin*, in the cathedral of Frankfurt, and the *Egyptian Darkness*, for the king of Prus. D. Dec. 1877.

**Velasquez**, vá-lahs'keth (DIEGO RODRIGUEZ DE SILVA), b. at Seville, Sp., in June 1599, of Port. descent on the father's side, displayed in childhood such a fondness for drawing that he was placed in the school of Francisco de Herrera the elder, and afterward in that of Francisco Pacheco; acquired wonderful skill in taking likenesses, as well as in his representation of still life. To his earliest period belong his celebrated *Water-Carrier*, at Apsley House, Lond., the *Adoration of the Shepherds and Beggar Boy*, at the Louvre, Paris, and a *Laughing Peasant*, in Vienna. In 1622 he made a short visit to Madrid to see the royal galleries; was invited to Madrid the following yr. (1623); was appointed court-painter, with a regular salary in addition to handsome compensation for his separate works; gained great applause by his *Expulsion of the Moriscos from Sp.* (1627); became intimate with Rubens on the arrival of the latter at Madrid on a diplomatic mission (1628), but was not seriously affected by his florid style; visited It. 1629; was received with great honor by Pope Urban VIII., and assigned apartments in the Vatican; returned to Madrid 1631; was given a painting-room in the palace, and became more than ever a royal favorite; went a second time to It. to buy pictures and statuary for the royal gallery 1648-51, and was appointed chief chamberlain of the court. D. Aug. 7, 1660.

**Vellum**. See PARCHMENT.

**Velocimeter** [Lat. *velox*, "swift," and *μετρον*, "measure"], an instrument for measuring with extreme accuracy the velocity of projectiles by means of electricity, was invented by Wheatstone in 1840.

**Velocipede** [Lat. *velox*, "swift," and *pes*, "foot"], originally a vehicle invented in 1817 by M. Drais of Mannheim, consisting of a seat resting upon 2 wheels, one before the other. The rider sat astride the seat, and propelled the vehicle by striking the ground with his toes. More recently V. are propelled by the action of the feet upon a crank attached to the axle of the forward wheel. V. are called bicycles, tricycles, or quadricycles, according to the number of wheels.

**Velocify**. See MOTION.

**Velvet** [It. *velluto*, from Lat. *vellus*, a "fleece," or Lat. *villus*, a "flock of hair or wool," "the nap of cloth"], a woven fabric composed of a warp and weft, usually twilled, as in what is called Genoa V., with a thick additional filling consisting of single, double, or formerly triple (whence *three-pile*) threads of a finer quality passed under the ordinary weft and brought up in loops on the right side. The loops are so close as entirely to cover the proper web, and are generally cut and evenly singed or sheared, so as to



form a soft and somewhat lustrous surface, like the fine fur of small quadrupeds; but they are sometimes left uncut.

It has been generally supposed that V., like other fabrics of silk, is of Chi. origin, but we find no evidence that it was first introduced into Europe from the East. Merchandise of foreign production usually brings its native designation with it, but we believe that V. is not called by an Oriental name in any European lang. It is a curious fact that V. was common in Europe long before any specific name seems to have been generally applied to it. In the early lit. of the modern langs. it is spoken of simply as *pourpre*, *cramoisi*, *écarlate* (It. *porpora*, *chermisi*, *scarlatta*), though these terms were probably sometimes used to designate other fine fabrics. The most anc. existing specimens of V., as of other European silk tissues, consist of fragments of ecclesiastical and regal vestments, covers of books, scabbards, and saddles, still preserved in public museums or ch. treasures, and especially of broad strips of fine fabrics of silk or other soft material found in illuminated mediæval MSS., where they served, like modern tissue-paper, to protect the miniatures, borders, and ornamented capitals. But though from these and from purely literary sources we gather sufficient proof of the existence of V. at a remote period of the Middle Ages, we are not able to point out with certainty any of the seats of its production before the establishment of the silk-works of It., and especially those of Lucca and Florence, in the 13th and 14th centuries. The secrets of the processes of this complicated industry were jealously guarded, like those of other mediæval *mysteries*, and but slowly extorted from the It. producers by the cunning of foreign artisans. V. shot with gold or silver thread, and figured V. in which the design only was provided with a cut pile, were formerly in vogue, but the simple elegance of the plain fabric is more pleasing to modern taste. The beauty of V., its warmth, its durability, and the skill required for its fabrication, have made it at all times costly.

There are no climatic reasons why this and all other branches of silk industry should not succeed in the U. S.; but, though the cost of the purely mechanical processes of weaving and dressing may be diminished by Amer. ingenuity, yet the high rates of manual labor make the gathering of the mulberry leaves, the feeding and tending of the worms, and other preliminary processes far more expensive with us than in Europe or the East.

GEORGE P. MARSH.

**Venantius.** See FORTUNATUS (VENANTIUS).

**Ven'dace,** the *Coregonus Wilughbi*, a trout-like fish of the family Coregonidae, found in the Scot. and Swe. lakes, and probably in Pomerania also. Its introduction into Scot. is ascribed to Mary Queen of Scots.

**Vendémiaire**, von-dä-me-air' ("wine month"), in the Fr. revolutionary calendar, lasted from Sept. 23 to Oct. 21. It was the first month in the revolutionary yr.

**Vendetta** (It.). Before the administration of justice becomes a social institution, the idea of justice manifests itself in social life by the formation of customs which make vengeance one of the most sacred duties of the individual. When a man is slain, his son, his brother, or his nearest kinsman must avenge the blood by slaying the murderer, or the whole family will stand disgraced. In its gravest and most sublime form this custom existed among the anc. Scandinavians. Traces of it still occur among the Monténegrins, Albanians, Druses, Circassians, etc., and it flourishes among the Bedouins and in Corsica. In this last place it has received a most rigid and cruel form, and plays a most important part in social life. The name *vendetta* originated here.

**Vendôme**, von-dôm', an anc. countship of Fr., corresponding nearly to the present dept. of Loir-et-Cher, was erected into a duchy by Francis I., and given to Charles of Bourbon. It returned to the Crown with the accession of Henry IV. in 1589, but in 1598 he bestowed it on his eldest son by Gabrielle d'Estrées, CÉSAR (b. in 1594, d. Oct. 22, 1665), from whom descended the house of Vendôme. Of all the members of the family, LOUIS JOSEPH (b. July 1, 1654, d. June 11, 1712) was the only one who exhibited really great talents. He entered the army in 1672, and fought with distinction under Turenne in Ger. and Alsace, and under Crequi in Flanders, to the Peace of Nymwegen (1678). He earned still greater renown in the following war (1688), under Luxembourg in the Low Countries and under Catinat in It. In 1695 he was placed in command of the army of Sp., and the result was a singularly rapid campaign, in which one brilliant success followed another; the whole finally was wound up with the capture of Barcelona, which enabled Louis XIV. to negotiate the Peace of Ryswick (1697). In the Sp. war of succession he was sent in 1702 to supersede Villeroi in It. He defeated the Aus. at Ustiano and San Vittorio, and drove Prince Eugene beyond the Mincio. His attempt to penetrate into Ger. through the Tyrol failed, as the duke of Savoy rose in his rear; but with great alertness he turned round, defeated the Piedmontese completely, and gained new victories over Eugene at Cassano (1705) and over Reventlow at Calcinato (1706). Having been removed to the army of the Rhine, he was completely defeated by Marlborough and Eugene at Oudenarde (July 11, 1708). He left the army and retired in disgust to his estates. But in 1710 the situation of the Fr. party in Sp. became so desperate that Philip IV. implored his grandfather to send him V. V. created an army, defeated the Eng. at Brihuega and the Aus. at Villa Viciosa, carried the king back to Madrid, and finished the war in Sp.

**Vendôme, Column of.** See PARIS.

**Vencer'ing** (Fr. *journaier*, to "furnish"), in cabinet-work, the art of laying thin leaves of some valuable wood or other material upon a foundation of inferior material. It was known to the Romans, and is referred to by Pliny as a novelty of his period. The plates were formerly sawn by hand, but in 1806 Brunel introduced a method of splitting them from straight-grained wood, and employed circular saws for carved and knotted wood.

**Venetian Architecture.** See RENAISSANCE.

**Vene'tian Chalk,** the same as Fr. chalk, a soft white talc used by tailors instead of chalk; also used in making pastels and cosmetics.

**Venezuela**, ven-é-zwe-lá, **United States of**, a republic of S. Amer., extends between lat. 1° 8' and 12° 19' N., and between lon. 60° and 73° 17' W., bounded W. by the U. S. of Colombia, N. by the Caribbean Sea, E. by the Atlantic and Brit. Guiana, and S. by Brazil, and comprises an area of 439,120 sq. m., with 2,075,245 inhabs. The lang. is Sp.; the religion is R. Cath., but other religions are tolerated; the const. is a close imitation of that of the U. S. of N. Amer. The cap. Caracas, has 55,638 inhabs.; Valencia, 36,145; Barquisimeto, 28,918; Maracaybo, 22,224; Carúpano, 12,889. The coast along the Atlantic is low, sandy, and mostly occupied by the delta of the Orinoco; along the Caribbean Sea it is alternately low, swampy, and lined with lagoons, and bold and rocky, but forming many good harbors. The interior comprises 2 different mt.-systems, N. and S. of the Orinoco. From Colombia the Andes enter this country, and at Pamplona separate into 2 branches—the one running N., never rising above 5000 ft.; the other running first N. E., rising in the 2 peaks of the Sierra Nevada to 15,000 ft., then more directly E. under the name of the Venezuela Coast Mts., rising in the Silla de Caracas to 8547 ft., and in the Picacho de Naiguata even to 9100 ft. S. of the Orinoco stretches the Sierra Parima, consisting of many ranges. Between these 2 mt.-systems extend along the banks of the Orinoco the Llanos, grassy plains of various elevation and of various surface-formation. The climate varies with the elevation. In the low regions, not rising beyond 2000 ft. above the sea, it is very hot. At an elevation of from 2000 to 7000 ft. the climate is delightful and healthy. Where the country rises above 7000 ft. it generally becomes uninhabitable because of the perpetual mists which hang over these regions, and the terrible hail and snow storms which visit them. The mean annual rainfall at Caracas is about 330 inches in 80 days. The country is everywhere well watered. Beside the Orinoco with its 400 navigable affluents, several hundred rivers, most of them navigable, enter the Caribbean Sea, and lakes and lagoons are numerous. The soil is generally exceedingly fertile, and the mineral wealth of the country seems to be very great. Still richer is the vegetable kingdom. The primeval forests of Guayana contain excellent timber and fine cabinet woods, such as mahogany, satin-wood, ebony, etc. The cinchona occurs in large forests; also the cauchó, or India-rubber tree, gum trees, dyewoods, among which the famous *dei-diti*, and medicinal plants. The cocoa, sago, wax, and royal palm abound in the low regions. The coffee tree is extensively cultivated, and so are cacao and cotton. Sugar and indigo were formerly raised in larger quantities, but tobacco forms still a very important crop. The prin. occupation, however, of the inhabs. is cattle-breeding. Excellent fish, beautiful birds, game, and barnyard fowls abound, but the lower regions are much infested by noxious insects, immense spiders, bats and centipedes, venomous serpents and alligators; the boa constrictor reaches a length of 50 ft. The manufacturing industry is very little developed, but in spite of the lack of good roads and other proper means of communication, the commerce is considerable.

The island of Margarita and the opposite coast of the mainland were discovered in 1498 by Columbus. The first permanent settlement was made in 1520 at Cumaná, and new colonies soon followed. Of great consequence for the development of the country were the discovery of gold in the coast range in 1540. The republic of Colombia, comprising V., New Granada, and Ecuador, was organized in 1819, and its independence was recognized by Sp. in 1823. In 1829 the republic dissolved into 3 republics, and in 1830 V. adopted a new const. The transition from a monarchical and absolutist to a free republican govt. caused a total change in the ideas and customs of the people, and brought on a series of c. wars, in which much that was good and pleasant became lost, while confusion, disturbances, and degeneration seemed to take its place. Nevertheless, real progress, foreshadowing a higher development, was accomplished in many points.

**Venice**, ven'iss (It. *Venezia*), a city of It., the chief town of the prov. which bears its name. It is situated on, or rather in, the Adriatic, in lat. 45° 25' N., lon. 12° 19' E., and occupies a large number of small islands and shoals which lie between the mouth of the Piave on the N. and the Adige on the S. These islets are connected by bridges (more than 300 in number) sufficiently raised to allow boats to pass freely under them; most of the houses and other edifices rest on piles, and there is generally a strip of artificial terra firma either in front or at the rear of every building. By means of these and of the bridges a slender land-communication is kept up throughout the city, but most of the business and amusement of the town is carried on through the canals. The shallow waters which separate V. from the mainland, as well as those which flow between the city and the low, narrow, outlying islands, or *littorali* to the E., are called *lagoons*, though the latter are generally meant when the singular, *lagoon*, is used. Between the *littorali* there are several more or less navigable passages from the open sea into the lagoon, but only 3 of these, the Malamocco Pass, and the Porto del Lido, and the city of V. has been connected with the peninsula by a railway bridge, and is thus brought within an easy hour of Padua. This bridge is built on piles more than 80,000 of which were used in its construction, consists of 222 circular arches of nearly 33 ft. span each, and is 2½ m. in length. The Canal Grande runs through the heart of the city, nearly in the form of an inverted  $\omega$ , and divides it into 2 not very unequal parts. The famous bridge, the Rialto or Rivo Alto (1588), crosses the Canal Grande at the most central point. There are naturally few squares or gardens in V.; the Piazza San Marco



is the great square of V. and the centre of its life. At the E. end of this piazza, where the Piazzetta joins it almost at a right angle, stands the Basilica of San Marco, begun in 828. On the left, as you leave the ch., stands the great campanile or bell-tower (begun 902). On the right, but farther in the rear, rises the Torre dell' Orologio or clock-tower (1494). Directly in front of the ch., and supported by highly ornamented bronze pedestals, are the 3 masts from which once floated brilliant banners of silk and gold, emblematic of the republic and her proudest dependencies, Cyprus and the Morea. The following may be mentioned among the most noteworthy chs. of different periods and different styles of arch.: The Chiesa d' Frarl (1250); the SS. Giovanni e Paolo, more commonly called San Zanipolo (1264); the Santa Maria della Salute (1630), San Giobbe, the Madonna dell' Orto, San Stefano Protomartire (1294), San Giorgio de' Greci, San Giorgio Maggiore and San Giorgio del Schiavoni, San Giovanni in Bragola, San Giovanni Crisostomo, San Giacomo, on the site of the first ch. erected in Venice, and many others—all rich in pictures by the great Venetian masters. The secular edifices of V. are not less remarkable than the ecclesiastical. The Palazzo Ducale or doge's palace (1354-55, 1420-71) stands almost adjoining the ch. of St. Mark. E. of the ducal palace, and connected with it by the Bridge of Sighs, a covered footway over the canal, are the two famous *carceri* or public prisons, in a building rather handsome externally, and in themselves probably not worse than those in general use elsewhere at the time they were constructed. The buildings known as the Procuratie Vecchie, on the N. side of the Piazza San Marco, are occupied as shops and for other business purposes, and the elegant Café Florian is here. The Procuratie Nuove, opposite the former, form a part, as does also the celebrated Libreria Vecchia (Sansovino, 1536), of the Palazzo Reale. The Zecca or mint (Sansovino, 1536), is also a very admirable piece of arch. The 2 granite columns (brought from the E. in 1127) standing at the S. end of the Piazzetta, the one surmounted by a statue of St. Theodore, the other by the Lion of St. Mark, were considered as especially symbolic of the republic, and were copied in many of her dependent cities. The number and beauty of the private palaces of V. are such as to preclude any attempt to enumerate and describe them here. The Accademia delle Belle Arti of V. is one of the richest picture-galleries in the world, and here the great masters of the gorgeous Venetian school are seen in all their splendor. La Fenice is the prin. theatre.

**History.**—The first regular settlements were made in the 5th century by fugitives from the violence of the N. hordes. The little colony thrived so well that about the middle of the 6th century it was able to maintain an independent govt. Rivalries between the different islands compelled them to elect a chief magistrate, with the title of *dux* or *doge*. This election took place in 697. In 737 V. helped to reinstate the exarch of Ravenna, who had been driven out by the Lombards, and thus began the relations which afterward existed between the 2 cities and the long career of Venetian enterprise which followed. Early in the 9th century, the doge Obelerio having shown himself subservient to the Grs., Pepin invaded the islands and overran several of them, but the Venetians gained such decided advantages that Pepin was glad to retire after concluding a peace very honorable to the little republic. The city advanced rapidly. In 828-829 the supposed body of St. Mark was surreptitiously taken from Alexandria in Egypt by 2 zealots and transported to V., and the apostle was at once raised to the dignity of patron saint of the republic. It was to serve as a fitting monument for these relics that the first ch. of St. Mark was immediately designed and begun. In 991 Pietro Orseolo was placed in the ducal chair, the internal disorders were quieted, piracy was repressed, the coasts of Istria and Dalmatia became a part of the Venetian terr., and the doge received the additional title of duke of Dalmatia. In 1099 V. sent out more than 200 vessels to aid the first Crusade, and in the early part of the 12th century V. obtained very important commercial concessions throughout almost every part of the Christian East, but the false and fickle policy of the Gr. emps. soon threatened their loss. They sent out a fleet, captured and overran Rhodes, Samos, and several other Gr. islands, and even a considerable portion of the Morea. In 1177 V. espoused the cause of the Ch. against F. Barbarossa, and won a brilliant victory over the Ghibellines. In 1204 she obtained fresh victories, possessions, and privileges in the E., and in 1260 was able to annul the influence acquired at Constantinople by her rival, Genoa, though the latter inflicted a blow in return at the battle of Curzola (1298). But she had already lost much of her liberty at home. The election of the doge was less and less the act of the people, and at the end of the century V. had really ceased to be a democracy. The Inquisition had been established here as early as 1289, and in 1335 the Council of Ten declared itself permanent. Throughout nearly the whole of the 14th century V. and Genoa were carrying on wars against each other, alternately disastrous to both. Toward the close of the century, and only a few yrs. after Genoa had boldly entered the Adriatic, defeated the Venetian fleet at Pola and seized Chioggia itself, the Ligurian republic placed herself under the protectorate of Fr., and V. was once more at peace. Another short period of almost unparalleled prosperity followed. A successful war with Padua made her mistress not only of Padua itself, but of Verona, Vicenza, Bassano, Belluno, etc. Another war with Milan added Brescia, Bergamo, Crema, Cremona, Rovigo, and Treviso to the republic; but all this accession of terr. by arms was at the cost of her commerce, which now began to decline. Unfortunately, the same policy was pursued during the 15th and 16th centuries. V. continued to take part in all the quarrels which divided the Peninsula, her govt. became more and more oligarchical, and every attempt on the part of the people to obtain a larger share in it failed. The westward advance of the Turks, especially the fall of

Constantinople (1453), was a cruel blow to the commerce of the republic, and the somewhat later exploits of the Port. navigators were not less damaging to it. The chivalric wars of the republic with the Porte, particularly that begun in 1645, are a sufficient evidence of the energy and the resources which still survived. Even in the 18th century the old maritime spirit was far from extinct, as was shown by the defence of Corfu (1716) and by the naval victories of Angelo Emo, who d. in 1792. The final extinction of the republic of V. by Bonaparte (1797), and the means through which it was accomplished, are now familiarly known. The story of V. from the treaty of Campo Formio (1797) to 1848 is a succession of secret conspiracies or open attempts at rebellion against Aus. domination. In 1848 a revolution broke out which was successful for a time, but V. once more fell into the hands of her Northern lord. In 1866, however, as a consequence of the Austro-Prus. war, V. and the so-called Venetian provs. became a part of the united kingdom of It. Pop. of commune, 1881, 132,826. [From orig. art. in *J.'s Univ. Cyc.*, by CAROLINE C. MARSH.]

**Veni' Crea'tor Spir'itus**, a hymn of the Rom. Breviary, was probably composed by Pope Gregory I. (540-604), though it was once ascribed to Charlemagne. It is one of the "seven great hymns of the mediæval Church."

**Veni Sanc'tus Spir'itus**, a hymn of the Rom. Missal, ascribed to King Robert II. of Fr. (d. 1081 A. D.). It is in the mediæval Lat., is rhymed, and its metre is not according to quantity.

**Ven'om** [Lat. *venenum*], the poisons elaborated by healthy animals as distinguished from *tirius*, the virulent liquid product of disease in animals or man. Bees and wasps as a rule leave their sting in the wound they inflict; this should be extracted, the wound protected from the air or bathed in cooling and stimulating evaporating lotions; ammonia is a useful application. The scorpion is dangerously venomous in the tropical regions of the Indies and Afr., but in the milder climates it inhabits does little harm. Contrary to the fabulous accounts of the tarantula V., it rarely causes death, and seldom causes alarming symptoms. The chief venomous serpents of the U. S. are the rattlesnake, moccasin, and adder. The phoora of India and the cobra are exceedingly virulent. The V. of serpents is elaborated in special glandular apparatus adjacent to the mouth, stored in a sac or canal, and reserved for sudden voluntary ejection as a part of the reptile's means of self-defence. Venomous wounds should at once be cleansed, encouraged to bleed freely by suction or excision, a ligature speedily placed on the limb, or the part sedulously rubbed toward the wound and away from the centre of circulation, to evacuate all contaminated blood. Bold and thorough cauterization is of value. Strength is to be kept up by the heroic use of alcohol, ammonia, and other stimulants. (See POISON OF SERPENTS.) E. D. HUDSON.

**Ventilation.** See WARMING AND VENTILATION.  
**Ventril'quism** [Lat. *venter*, the "belly," and *loquor*, to "speak"] is the art of producing vocal sounds so as to create the illusion that the voice proceeds from a distant source, or in imitation of sounds produced by animate or inanimate objects. The ease with which we may be deceived respecting the distance or locality of sounds enables the ventriloquist, by changing the intensity, and to some extent the pitch and quality of the voice, to make it appear to come from a definite locality, attention to which is directed by gestures. The immobility of the lips aids in the deception while it lessens the distinctness of the words, thus increasing the apparent distance. The vocal cords are usually approximated closely, producing high-pitched sounds. W. R. BIRDSELL.

**Venus**, the second planet in order of distance from the sun, and the next neighbor of the earth within her orbit. V. travels at a mean distance from the sun of 66,134,000 m. As the earth's mean distance from the sun varies by about 3,000,000 m., the distance of V. when between the earth and the sun depends more directly on the earth's position in her orbit than on that on V. in hers. It varies from about 26½ to about 24 millions of miles. V. is most favorably placed for observation when near her elongations, when she appears like a half moon, or slightly gibbous or slightly horned. V. completes a sidereal revolution in 224,7008 days on a path inclined 3° 23½' to the ecliptic, but her synodical revolution is much greater, amounting to 583,920 days. Half this period, or 291,960 days, is the interval between successive conjunctions, which are of course alternately inferior and superior. Between inferior conjunction and the next superior conjunction V. is a morning star, while between superior conjunction and the next inferior conjunction she is an evening star. But for a considerable interval on either side of a conjunction of either sort she is invisible on account of her proximity to the sun's place in the heavens. V. has a diameter estimated at about 7500 m.; her volume is equal to about ⅓ of the earth. Her density is slightly greater than the earth's, inasmuch that her mass is about ⅓ of the earth. [From orig. art. in *J.'s Univ. Cyc.*, by R. A. PROCTOR.]

**Venus**, in Rom. mythology, the goddess of spring, generation, sensual love, etc., seems to have played no very prominent part in the oldest epoch of Rom. civilization, but became afterward completely identified with Aphrodite, the Gr. goddess of love, and appropriated to herself all the myths belonging to the Gr. deity, without adding a single one of Rom. origin. Of special Rom. interest was her adventure with Anchises, to whom she bore Æneas, the founder of Rome.

**Venus's Flower-Basket**, the common name of *Euplectella speciosa*, a beautiful silicious sponge found chiefly in the Philippine Islands, consisting of a delicate lace-like skeleton or framework, which, when the enveloping gelatinous animal tissue is removed by immersion in chloride of lime, assumes the shape of a cornucopia 12 or 15 inches in height by 2 inches in width. A hermit crab has sometimes been found imprisoned within.



**Venus's Fly-Trap.** See DIONEÆA.

**Venus's Girdle.** See GIRDLE OF VENUS.

**Vera Cruz,** va'rah kroos, state of Mex., extending along the Gulf of Mexico from Tamaulipas to Tabasco, nearly 500 m., is bounded inland by the states of San Luis Potosí, Hidalgo, Puebla, Oaxaca, and Chiapas; consists of a low sandy tract along the sea, and a mountainous inland region having several lofty peaks; produces a great variety of valuable staples, including sugar, cotton, tobacco, cacao, coffee, vanilla, the jalap-root, and many dyestuffs, as well as the cereals and fruits of both tropical and temperate climates, while cattle in vast numbers are pastured in the lowlands. Area, 26,232 sq. m. Pop. 542,918.

**Vera Cruz,** city and the prin. seaport of Mex., state of the same name, is surrounded by strong walls with 2 redoubts, and defended by the famous castle of San Juan de Ulloa on the island of the same name, half a mile from the shore; is regularly and strongly built in the old Spanish style; is the entrepot for more than half the foreign commerce of the republic. The city was founded by Cortez in 1519 upon its present site. In Mar. 1847 V. C. was besieged and captured by the army of the U. S. under Gen. Scott. Pop. 14,000.

**Vera-tria,** a vegetable alkaloid used in med. It is obtained from cevadilla-seeds. Pure V. commonly occurs as a white powder. It has no smell, but has a bitter, acrid taste, and is very irritating to both tongue and nostrils. It is scarcely soluble in water, but dissolves in alcohol and ether. V. is too irritating to warrant its use as an internal med., but is considerably employed externally as a local application for the relief of neuralgias. For such use it is made into an ointment with lard.

**Veratrine.** See VERATRIA.

**Verrazano,** va-raht-sah'-no, or **Verrazano, da** (GIOVANNI), b. near Florence about 1480, was employed as a corsair or privateer by the Fr. govt. in 1521 and the following yrs.; took many prizes of Sp. vessels returning from the W. I., and captured in 1523 the treasure-ship in which Cortez had sent from Mex. to Charles V. a large portion of the personal spoils of Montezuma; sailed from the Madeira Islands Jan. 17, 1524, on a voyage of exploration to N. Amer.; discovered land at a point near Cape Fear; coasted thence northward, discovering a bay, usually supposed to be that of New York, though others argue for Narragansett Bay; proceeded thence 150 leagues N. E. to lat. 50° N.; returned thence to Fr., and addressed a letter to King Francis I., claiming to have discovered 700 leagues of coast, of which he gave a confused description. He was captured on the S. coast of Sp., and executed as a pirate at Pico, near Colmenar de Arenas, New Castle, Nov. 1527.

**Verbeña** [Lat. for Eng. *vervain*], a genus of herbs and shrubs of the order Verbenaceæ, found in various warm and temperate regions. The U. S. has numerous species, some of them European also. One of the most interesting is *V. hastata*, the "simpler's joy," once highly prized in med. and believed to possess magical virtues. The garden V. are fine border-plants of many varieties, belonging to *V. chamædrifolia* of the Argentine Republic, to *V. sororia* of Asia, and to *V. aubletia* of the U. S.

**Verd, Cape.** See CAPE VERD.

**Verde Antique** [Fr. "antique green"], a fine dark-green stone, with patches of red, white, and sometimes black, highly prized in anc. and modern It. The name is sometimes applied to a marble, sometimes to a breccia, and again to a handsome porphyry.

**Verdi,** ver'de (GIUSEPPE), b. Oct. 9, 1814, at Busseto, near Parma. His first operatic production was *Oberto di San Bonifazio*. In 1842 he brought out with great success, at the La Scala in Milan, his *Nabucco*; in 1843, *I Lombardi*; in 1844-45, *Ernani*, *I due Foscari*; in 1846, *Attila*; in 1851, *Rigoletto*; in 1853, *Il Trovatore*; in 1854, *La Traviata*; in 1855, *I Vespri Siciliani*. These were followed by *Un Ballo in Maschera*, *La Forza del Destino*, *Aida*, etc., and finally a *Requiem*. V. is a senator of the kingdom.

**Verdigris,** ver'de-gris [Fr. *vert-de-gris*; Ger. *Grünspan*]. Commercial V., used as a pigment, is sometimes made by exposing the "marc" or "pomace" of grapes, left after pressing out the juice, spread on plates of copper. The plates become incrustated with a green crystalline matter, which is a mixture of several basic acetates, with some carbonate, of copper. Solution in warm water and spontaneous evaporation furnish a blue crystalline acetate. *Distilled V.* is the name given commercially to a preparation obtained by the use of so called distilled or wood vinegar, sometimes by soaking cloths therein and applying them to plates of copper.

**Vere** (Sir FRANCIS), b. in Eng. in 1554, served in the army in the Netherlands; was knighted for gallantry; relieved the garrison at Berg on the Rhine 1589; contributed to the capture of Zutphen; was instrumental in the retaking of Deventer and in the defeat of the prince of Parma near Nymwegen 1591; was lord-marshal in the expedition against Cadiz 1596; distinguished himself at the siege of the threatened Sp. invasion 1599; determined the victory for Prince Maurice at Nieuport, July 5, 1600, and successfully defended Ostend against great odds 1601-02. D. Aug. 28, 1608.

**Vere, de** (JOHN), 13th earl of Oxford, b. in Eng. about 1450, became a prominent Lancastrian leader; fought at Barnet 1471; joined the earl of Pembroke in Wales; was captured, imprisoned, and attainted 1474; took part with the earl of Richmond (Henry VII.), and commanded the van of his army at Bosworth 1485; contributed to the defeat of the insurgents on Blackheath June 22, 1497; was made lord high steward, and in that capacity pronounced sentence upon Edward Plantagenet, earl of Warwick, accused of conspiring with Perkin Warbeck 1499. D. in 1513.

**Vere, de** (MAXIMILIAN SCHELE). See DE VERE.

**Vergennes,** ver-jenz', city, on R. R. and Otter Creek. Addison co., Vt., chartered in 1783, 6 m. from Lake Cham-

plain, at the head of navigation. The State reform school is located here. MacDonough's fleet, with which he captured the Brit. squadron off Plattsburg Sept. 11, 1814, was built here. It has steamboat communication with the lakeports during the summer. Pop. 1870, 1570; 1880, 1782.

**Vergil** (POLYDOR), b. at Urbino, It., about 1470, became a priest and acquired literary reputation by his *Proverbia Urbis* (1498), and *De Rerum Inventoribus* (1499); was sent by Pope Alexander VI. to Eng. to collect the papal tribute called "Peter's pence" 1501; was made rector of Church Langton, Leicestershire, archdeacon of Wells, prebendary of Hereford and of Lincoln, all in 1507; exchanged the latter prebend for one in St. Paul's, Lond., 1518; wrote a *Historie Anglice Libri XXXVI.*, and edited Gildas's *De Culumitate, Excidio et Conquestu Britannia*, etc. He returned to It. in 1550, and d. about 1555.

**Vergil** (PUBLIUS VERGILIUS MARO), b. at Andes near Mantua b. c. 70; lived partly in Rome, partly at Naples, always suffering from delicate health, but in the possession of sufficient means. He was himself a gentle and amiable character, and as a poet most successful in subjects which admit of genial treatment. Elegance in style and correctness in metre made him the standard of classicism in Rom. poetry for a long period. In subsequent times his writings were drawn upon for *centos*, superstition consulted them as an oracle, and in popular belief he was himself turned into a magician. During the Renaissance his works exercised a great influence. D. a. c. 19.

V.'s extant poems are (1) *Ecloga*, 10 bucolics, written a. c. 41-39, imitations of Theocritus, but partly with an admixture of persons and events of his own time and country. (2) *Georgica*, in 4 books, composed a. c. 37-30, the first on agriculture, the second on the culture of trees, the third on domestic animals, and the fourth on bees. (3) *Aeneis*, in 12 books, begun about a. c. 29, but not finished when the poet d. (b. c. 19), yet made public by his executors. The *Aeneid* turns on the fate of Aeneas, the founder of a second Ilum and indirectly of Rome, and the ancestor of the Julian family. Beside these great and genuine works of V., certain minor poems have come down to us under his name: (1) *Culex*, a description of Hades; (2) *Ciris*, an account of the treacherous conduct of the Megarian princess Scylla against her father Nisus, and her transformation into the bird Ciris; (3) *Morietum*, a pleasing idyl; (4) *Copa*, a short elegy; (5) *Catalecta*, 14 poems in elegiac and iambic metre on various subjects.

**Vergniaud,** ver-nay-6' (PIERRE VICTORIN), b. at Limoges, dept. of Haute-Vienne, Fr., May 31, 1759, settled in 1781 as an advocate in Bordeaux. Elected a deputy to the Legislative Assembly of 1791 from the dept. of Gironde, he soon became leader of the Girondist party; Oct. 16 he was chosen V.-p., Oct. 31 pres., of the Assembly. The Girondists were brought into bitter conflicts with the royalists, and on Aug. 10 V. proposed the suspension of the royal power. In the trial of the king, V. supported the proposition of an appeal to the people, but when the proposition fell, he voted for the execution without delay (Jan. 30, 1793). In the contest between the Girondists and the Jacobins V. broke down before Marat, and the Jacobins finally succeeded (June 1) in carrying a decree for the arrest and trial of the Girondists. V. was guillotined Oct. 31, 1793.

**Verjuice** [Fr. *verjus*], the juice of unripe grapes, an austere drink, much prized by the anc. and by peasants in parts of modern Europe. The vinegar of cider and the juice of sour crab-apples are sometimes called verjuice.

**Vermicelli.** See MACARONI.

**Vermifuges** [Lat. *vermis*, "worm," and *fugare*, to "cause to flee"], also termed **Anthelmintics** (Gr. *anti*, "against," and *elmuus*, "worm"), also **Helminthogogues** (Gr. *elmuus*, "worm," and *gogos*, to "lead" or "expel"), remedies intended to remove worms from the stomach and intestines, and prevent their recurrence by the destruction of their germs. Pink-root (*Spigelia marilandica*) is well known, and for children much used in the form of fluid extract of spigelia and senna. The oil of wormseed (*Chenopodium anthelminticum*) is employed, as is *Spigelia*, against round worms. For the same purpose, and preferable, is santoline, the acid extract of *Santonica* or Levant wormseed (*Artemisia contra*). Thread-worms are usually in the lower bowel, and easily removed by enemata of salt and water, aloes in milk, or any irritating or astringent material in solution. The removal of tapeworm is often difficult. (See TAPEWORM.)

**Vermilion** [Fr. *vermill*; It. *vermiglione*], a pigment composed of mercuric sulphide, prepared by grinding red cinnabar. The so called Chinese V. is obtainable by agitating mercury and sulphur together for some hours with a warm solution of an alkaline sulphide.

**Vermillion,** cap. of Clay co., Dak. Terr., on R. R. and Mo. River at the mouth of the Vermilion River, about 35 m. N. W. of Sioux city, Ia., and 30 m. S. E. of Yankton, the cap. of Dak. Terr. Large quantities of wheat are shipped from this town by rail and by water. Pop. 1880, 714.

**Vermilye** (ROBERT GEORGE), D. D., b. in New York Mar. 3, 1813, of Huguenot ancestry, grad. at Columbia Coll. 1831; was licensed by the presbytery of New York Apr. 19, 1831; was licensed by the presbytery of New York Apr. 19, 1831; preached in the Duane st. ch. 1838-39; was pastor of a Presb. ch. at German Valley, N. J., 1843-46, and of the Congl. ch. at Clinton, N. Y., 1846-57; was a member of its board of trustees 1850-57; prof. of theol. in the E. Windsor Theological Inst.; afterward removed to Hartford, Conn., and retained that position through several yrs. D. July 5, 1875.

**Vermilye** (THOMAS EDWARD), D. D., LL.D., brother of Robert George, b. in New York Feb. 28, 1803, ed. at Yale; studied theol. at Princeton Sem.; was licensed and ordained by the presbytery of New York; was for some yrs. pastor of the Presb. ch. in Vandewater st., New York, of the Congl. ch. at W. Springfield, Mass., 1829-34, of a Reformed Dutch ch. at Albany, N. Y., 1834-39, and from 1839 pastor of the Collegiate Reformed ch., New York.



**Vermont**, one of the E. or N. Eng. States of the Amer. Union, but not one of the original 13, is situated wholly inland, between 43° 44' and 45° N. lat. and 71° 30' and 73° 20' W. lon. It is bounded N. by the prov. of Que., Dominion of Canada, E. by N. H., S. by Mass., and W. by N. Y. Its area is 9565 sq. m. or 6,121,600 acres; length from N. to S. 157½ m.; greatest breadth, 85 m.; its least, 35 m.



The Seal of Vermont.

**Face of the Country.**—The Green Mt. range runs through the State, but above the 44th parallel it divides into 2 chains, one maintaining the same direction (N. by E.) with the lower portion; the other, turning N. E., extends to the N. H. line. This last range forms the watershed between the affluents of the upper Conn. and the streams flowing northward or westward into Lake Champlain, and the lower portion fulfils a similar office between the waters flowing into the Hudson and those tributary to the Conn. The E. part of the State is drained by the Conn. River and its numerous affluents; the N. portion sends some small streams to Lake Memphremagog, but the prin. rivers of the W. part of the State, the Missisquoi, Lamolle, Winooski or Onion River, and Otter Creek, with their tributaries, are feeders of Lake Champlain, while Hubbardston Creek and Poultny River fall into the S. arm or extension of the lake. The Hoosac, Battenkill, and other small tributaries of the Hudson drain the S. W. corner of the State. There are numerous beautiful waterfalls in the Conn., Winooski, Lamolle, Clyde, Missisquoi, Passumpsic, and other rivers, and many interesting caves, natural bridges, etc.

**Lakes.**—Beside Lake Champlain, which forms so large a part of the W. boundary of the State, and Lake Memphremagog, which is partly in V. and partly in Canada, there are nearly 100 smaller lakes or ponds, some of them of considerable size and great beauty, in the State. The prin. are Willoughby, Seymour, Maldstone, Great Trout Pond, Dunmore, Bombazine, and Austin. Several large islands in Lake Champlain belong to V., and one co. (Grand Isle) is composed wholly of these islands.

**Mineralogy.**—The State is rich in minerals. Gold has been found, but not in veins which would repay the working. There are pyritic copper ores of considerable value. Lead ores, more or less argentiferous, occur at several localities; iron, in the form of chromic ores, hematite, magnetite, and bog ores, is found in almost every part of the State. Granite suitable for building purposes, black, white, and variegated marbles of excellent quality and great beauty, abound. Slates, both writing and roofing, as well as those used for mantels, bathing-tubs, etc., are quarried in great abundance. Porcelain clay or kaolin, steatite, fire-clay, talc, manganese, and limestone for burning are also among the mineral products of the State.

**Soil and Vegetation.**—The meadow and arable lands of the State are generally fertile; the mt. slopes, where not covered with timber, furnish rich and nutritious pasturage to the horses, cattle, and sheep, which furnish a considerable share of the wealth of the State. The forest trees are the evergreens—hemlock, fir, and spruce, and some pine on the mountains; oak, hickory, beech, birch, elm, sugar, rock, and red maple, butternut, basswood, tulip tree, etc., on the lower slopes of the hills, and cedar and juniper in the swamps. The sugar maple is the most abundant of the forest trees of the State, and from its sap a large quantity of maple sugar and syrup is made.

**Zoology.**—The moose is found rarely around Lake Memphremagog. The elk is also rare; the black bear, panther, wild-cat, lynx, wolf, fox, and raccoon are still seen in considerable numbers, and deer are moderately plentiful. The smaller game, rabbits, squirrels, etc., are abundant. In the vicinity of Lakes Champlain and Memphremagog great numbers of aquatic birds make their appearance early in the season. The birds of prey and song-birds are those common to N. Eng. Lake Champlain is remarkable for its excellent varieties of fish. The masacalonge is the largest and most highly prized, but its lake-trout, lake whitefish, pickerel, roach, and perch are abundant and of excellent quality. Among its reptiles is the proteus, which is not known to exist in any other waters so far N. The serpent tribe has only the species, either venomous or harmless, common to N. Eng.

**Climate.**—The climate of V. is, in general, marked by wide extremes; the winters are cold and long, the summers short and, for a few days at a time, hot; but there are few more healthful climates in the U. S. The isothermal of 44° annual mean temperature intersects the State almost diagonally. In the N. E. the mean annual temperature is 40°; in the S. W. and S. it is about 46°. The average annual rainfall is 48.60 inches, the greatest amount falling in Oct.

**Agricultural Productions.**—In spite of a sterile soil, good crops of grain are raised, the census of 1880 showing, of Indian corn, 2,014,271 bushels; barley, 267,625 bushels; buckwheat, 356,618 bushels; wheat, 337,257 bushels; rye, 71,733

bushels; oats, 3,742,282 bushels. The tobacco crop yielded 131,432 lbs. The wool clip of 1880 was 2,551,113 lbs.

**Farm Animals.**—In 1880 V. had 75,215 horses, 403,105 cattle, 439,870 sheep, and 76,384 swine.

**Manufactures.**—In 1880 there were 2874 manufacturing establishments, with a capital of \$23,265,224, employing 17,540 hands, and paying \$5,164,479 as wages; total value of products, \$31,354,366; pig iron product, 1881, 2796 tons.

**Railroads.**—There were in operation, Jan. 1, 1882, 916 m. of railway, costing \$42,092,266, with net earnings of \$798,736, and paying \$609,772 interest and dividends. The more important lines are the Central Vermont, Rutland, Conn. and Passumpsic Rivers, and St. Johnsbury and Lake Champlain.

**Finances.**—The assessed valuation in 1882 was—real estate, \$102,437,102; personal, \$46,896,967; rate of State tax, 1 cent 7 mills, producing \$278,397. V. has no State debt; total public indebtedness, county and municipal, 1880, \$4,352,168.

**Commerce.**—V. has a large shipping business through Lake Champlain and connecting waters, and its internal trade by railway is heavy. There is one port of entry, Burlington, at which the imports amounted to \$6,385,945 in 1881, and the exports to \$1,344,717. The shipping of V. in 1882 consisted of 17 sailing vessels and 11 steam vessels; tonnage, 41,116.

**Banks, Etc.**—There were in operation, Oct. 1881, 47 national banks, with capital of \$8,151,000; circulation, \$6,442,899; U. S. bonds to secure circulation, \$7,219,000; aggregate deposits, \$5,236,492. There were also 16 savings banks, with deposits of \$7,971,927; 6 state banks and trust cos., with \$2,057,666 deposits; and 1 private banker, with \$17,267 deposits. Insurance cos. paid losses in 1881 to amount of \$251,100.

**Education.**—The number of children of school age (5-20 yrs.) in 1878 was 92,831; number enrolled in public schools, 1880, 73,237, with average attendance of 47,206. Total expenditure for public schools, 1880, \$452,693, of which teachers' salaries required \$361,039. There are 3 colls., with 18 instructors and 102 students, beside several normal schools. Middlebury Coll. and the Univ. of Vt. at Burlington, both founded in 1800, are excellent institutions.

**Churches.**—The Congl. ch. leads, having 198 chs., 195 ministers, and 20,117 members; M. E., 174 chs., 141 ministers, 18,448 members; Bap., 114 chs., 84 ministers, 9876 members; R. Cath., 66 chs., 32 priests; P. E., 46 chs., 2825 members; and 10 other denominations, with from 2 to 50 chs. each.

**Population.**—In 1860, 315,098; 1870, 330,551; 1880, 332,286 (white 331,218, colored 1068, including 11 Indians).

**Principal Cities and Towns, Pop. 1880.**—Burlington, 11,365; Rutland, 7502; St. Alban's tp., 7193; Bennington tp., 6393; Brattleboro', 4471; St. Johnsbury, 3560; Brandon tp., 3280; Winooski, 2835; Bellows Falls, 2229; Montpelier (cap.), 1847; Middlebury, 1834; Vergennes, 1782.

COUNTIES.	* Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
Addison.....	5-A	23,484	24,173	Middlebury.....	1,834
Bennington.....	9-B	21,325	21,950	(Bennington).....	tp. 6,333
Caledonia.....	4-D	22,235	23,607	(Manchester).....	tp. 1,928
Chittenden.....	4-B	36,490	32,792	St. Johnsbury.....	3,360
Essex.....	3-E	6,811	7,981	Burlington.....	11,365
Franklin.....	3-B	30,231	30,323	Gulldahl.....	135
Grand Isle.....	5-A	4,052	4,124	St. Alban's.....	tp. 7,193
Lamolle.....	7-C	12,448	12,684	North Hero.....	637
Orange.....	5-C	23,090	23,525	Hyde Park.....	331
Orleans.....	2-D	21,035	22,083	Chelsea.....	415
Rutland.....	7-B	40,651	41,529	Irassburg.....	294
Washington.....	4-C	26,650	26,444	Rutland.....	7,502
Windham.....	9-C	26,036	26,763	Montpelier.....	1,847
Windsor.....	7-C	36,063	35,196	Newfane.....	210
				Woodstock.....	1,266
Total.....		330,551	332,286		

\* Reference for location of counties. See map of Vermont.

**History.**—V. was during the 17th century the battle-ground between the Algonkin tribes and the Iroquois or Six Nations of N. Y. Champlain discovered it in 1609, but no attempt was made to effect a settlement within its present bounds till 1724, when Ft. Dummer was erected by a party of settlers from Mass. In the French war of 1745 soldiers marched from this fort against the Fr., who occupied points along Lake Champlain. The rich and fertile lands along Otter Creek, the Winooski and Lamolle rivers attracted the attention of these soldiers, and after the Fr. war of 1755-58 the emigrants began to come W. of the Conn. River in large numbers. Gov. Wentworth of N. H. claimed that all this terr. belonged to that colony, and granted 138 tps. It was only known at that time as the "New Hampshire grants." But about this time another claimant appeared. This was the gov. of the colony of N. Y., who made proclamation in Dec. 1763 that these lands belonged to N. Y. under grants from Charles II. to the duke of York. Gov. Wentworth issued a counter-proclamation in Mar. 1764, maintaining his own jurisdiction. The matter went to Eng. on an appeal to the king; it was adjudged in favor of N. Y.; but the settlers, who were largely from Conn., had paid Gov. Wentworth for the titles to their lands, and they had no intention of paying the N. Y. gov. for them a second time. They therefore resisted all attempts at ejection and dispossession. Meantime the Revolutionary war came on, and the settlers in the "New Hampshire grants" took an active part in the struggle for liberty. In 1776 they applied to the Continental Cong. for admission into the Confederacy, but N. Y. opposed, and they withdrew. In 1777 they formed a const. and proclaimed themselves independent under the name of "New Connecticut" *alias* "Vermont." In 1781 Cong. offered to admit them with smaller boundaries, giving a considerable tract to N. Y., but they refused and remained independent. Finally the State of V. was admitted into the Union in Mar. 1791. V. took an active part both in the Revolutionary war and the war of 1812. In the Canadian troubles in 1837 and the Fenian raids since, the expeditions, though not of V., started from her soil, and more than once during the c. war rebel bands descended on her N. towns from Canada. During the period from 1790 to 1840 her growth was rapid.







D Long. W. 72 from E Greenwich

30° 73B C 36° 71 30°

MAP OF

NEW HAMPSHIRE  
AND  
VERMONT

Drawn and Engraved on Copper-Plate  
EXPRESSLY  
FOR

JOHNSON'S CYCLOPEDIA













## Governors.

Moses Robinson.....	1789-90	John S. Robinson.....	1853-54
Thomas Chittenden.....	1790-97	Stephen Royce.....	1854-56
Isaac Tichenor.....	1797-1807	Ryland Fletcher.....	1856-58
Israel Smith.....	1807-08	Hiland Hall.....	1858-60
Isaac Tichenor.....	1808-09	Erastus Fairbanks.....	1860-61
Jonas Galusha.....	1809-13	Frederick Holbrook.....	1861-63
Martin Chittenden.....	1813-15	John G. Smith.....	1863-65
Jonas Galusha.....	1815-20	Paul Dillingham.....	1865-67
Richard Skinner.....	1820-23	John B. Page.....	1867-69
Cornelius P. Van Ness.....	1823-26	Peter T. Washburn.....	1869-70
Ezra Butler.....	1826-28	John W. Stewart.....	1870-72
Samuel C. Crafts.....	1828-31	Julius Converse.....	1872-74
William A. Palmer.....	1831-35	Asabel Peck.....	1874-76
Silas A. Jenison.....	1835-41	Horace Fairbanks.....	1876-78
Charles Paine.....	1841-43	Redfield Proctor.....	1878-80
John Mattocks.....	1843-44	Roswell Farnham.....	1880-82
William Slade.....	1844-46	John L. Barstow.....	1882-84
Horace Eaton.....	1846-49	Samuel E. Pingree.....	1884-86
Carlos Coolidge.....	1849-50		
Charles K. Williams.....	1850-52		
Erastus Fairbanks.....	1852-53		

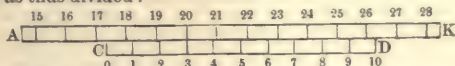
REVISED BY A. R. SPOFFORD.

## Vermont, University of. See BURLINGTON, Vt.

**Vernet**, ver-nê' (JEAN ÉMILE HORACE), generally called HORACE VERNET, b. in Paris June 30, 1789, descended from a celebrated family of painters, and began to paint battle-pictures entirely according to his own ideas, without any previous systematic education. In 1810 he exhibited *The Capture of a Redoubt*; in 1811, *The Dog of the Regiment* and *The Hall of Fr. Soldiers*; in 1812, *The Taking of an Intrenched Camp*, for which the Acad. gave him a medal. The result was a boundless enthusiasm. The Bourbons gave the young painter large orders, and he filled them. But he continued all the while to paint the hero of the nation, and through engravings and lithography these representations, *The Death of Poniatowski*, *The Bridge of Aroka*, *The Soldier of Waterloo*, etc., passed into the hands of the humblest Frenchman. In 1822 his pictures were refused admittance to the exhibition of the Acad. on account of their Bonapartist tendency, but V. opened a private exhibition, and multitudes crowded his *salon*. Charles X. became actually afraid of the painter, and sent him in 1827 to Rome as director of the Fr. school there. In 1831 he returned to Paris, but his relation to Louis Philippe became very friendly. V. resided in Algeria from 1833-35, and visited it again in 1837, 1845, 1853, and oftener. He continued to paint Nap.—the battles of Jena, Friedland, Wagram, etc.—but from 1836 to his death he chiefly treated subjects of the Algerian campaigns—*The Capture of the Smala*, *The Battle of Isly*, *The Siege of Constantine*, etc.—whereby he became almost as troublesome to Nap. III. as he had been to the Bourbons. Beside battle-pieces, he painted a number of excellent pictures, half genre and half history, such as *Rebecca at the Well*, *The School of Raphael*, *The Lion-Hunt*, etc.; several portraits, among which were those of Nap. I., of Louis Philippe, of Nap. III., etc.; and gave a great number of illustrations. D. Jan. 17, 1863.

CLEMENTS PETERSEN.

**Vernier** [named from the inventor *P. Vernier*], a contrivance for measuring a fractional part of one of the equal divisions of a graduated scale or arc. It consists of an auxiliary graduated scale, the divisions of which differ from those of the primary scale. The V. scale is formed by taking a space equal to an exact number of parts of the primary scale, and dividing it into a number of equal parts, either greater by 1 or less by 1 than the number that it covers on the primary scale. The former is the method of division usually adopted, and for that reason we shall explain the V. as thus divided:



Let A K be a scale of equal parts, and let each part represent 1 foot; let C D be a parallel scale, such that it is exactly equal to 9 parts of the primary scale; suppose C D to be divided into 10 equal parts; then will each part represent .9 of 1 ft. By means of these scales we can measure distances to within .1 of 1 ft. Suppose the 0 of the V. in the first instance to coincide with the division 17 of the primary scale; then is the distance from the 0 of the scale to the 0 of the V. exactly 17 ft. If we suppose the V. to slide along the primary scale till the division 1 coincides with 18, the distance from the 0 of the scale to the 0 of the V. will obviously be equal to 17.1; if it slides along till the division 2 coincides with 19, the distance between the 0 of the scale and the 0 of the V. is 17.2; and so on. In the present position of the V. the reading is 17.3. This is obvious, for the distance from the 0 to the divisions which coincide is 20, and the distance from the 0 of the V. to the same division is 3 times .9 or 2.7; hence, the difference is 17.3.

The difference between one space on the limb and one space on the V. is called the *least count*; this is always equal to one space on the limb divided by the number of spaces on the V. To read an instrument by means of a V., we have the following rule: Read the prin. scale up to the last division preceding the 0 of the V., and call the result *the reading on the limb*; then look along the V. for the division that coincides most nearly with a space on the limb, and multiply the number of that division by the least count; this result is called *the reading on the vernier*; then will the sum of the two readings be the *true reading* of the instrument.

W. G. PECK.

**Vernon** (EDWARD), b. at Westminster, Eng., Nov. 12, 1684, ed. at Westminster School and at the Univ. of Ox.; received a commission in the navy 1702; was engaged in the destruction of the Fr. and Sp. fleets off Vigo Oct. 12, 1702, in the capture of Gibraltar July 23, and in the sea-fight off Malaga Aug. 13, 1704; became rear-admiral 1708; was in

active service until 1727, when he was elected M. P.; declared in Parl. 1739 that Puerto Bello, on the Sp. Main, could be taken with 6 ships; was given the command of 6 men-of-war, with the rank of vice-admiral of the blue; took Puerto Bello Nov. 22, 1739, after an assault of one day, with a loss of only 7 men; sailed from Jamaica in Jan. 1741, with 29 ships of the line, 80 smaller vessels, 12,000 troops, including several Amer. regiments, and 15,000 sailors; appeared before Cartagena Mar. 4; was repulsed with great loss, which was augmented by a fearful pestilence; made in 1742 an unsuccessful expedition against Panama; was made admiral 1745, and charged to guard the coasts of Kent and Sussex against an expected attack by the Pretender, but was stricken from the list of admirals Apr. 11, 1746, in consequence of a quarrel with the admiralty. Wrote *A New Hist. of Jamaica, from the Earliest Account to the Taking of Porto Bello (1740)*, *Original Papers relating to the Expedition to Panama (1744)*, etc. D. Oct. 29, 1757.

**Vernon** (GEORGE JOHN WARREN), FIFTH BARON **Vernon**, b. at Stapleford Hall, Eng., in 1803, succeeded to the title 1835, and gained great distinction as a student of mediæval lit., especially that relating to Dante. He pub. at Florence in 1842 the first 7 cantos of Dante's *Inferno*; edited the Lat. text of a *Commentary on Dante* by Pietro Alighieri. D. 1866.

**Vernon Harcourt**, SIR. See HARCOURT.

**Vernona**, a very strongly fortified town in the prov. of the same name in N. It., at the foot of the Alps, and traversed by the river Adige. V. retains many striking monuments of the Rom. empire as well as of the mediæval period. Foremost among these is the arena or amphitheatre. There are also remains of a Rom. theatre, and an arch, called the Porta de' Borsari. Another Roman gateway, the Porta de' Leoni, is still preserved. The palaces and public squares of V. contain much to attract the notice of the stranger, and the group of monuments known as the Tombs of the Scaligers well deserves a careful examination. The Ponte del Castello, built of brick in the 14th century, one of the arches of which has a span of 161 ft., is perhaps the boldest structure of the kind of so early a date. The chs. of V. are numerous. The cathedral dates chiefly from the 12th century. Sta. Anastasia is much admired for its arch., paintings, and bas-reliefs. San Bernardino is remarkable chiefly for the Pellegrini chapel by Sanmicheli; San Fermo, of fine brick-work and with good pictures; San Giorgio Maggiore, excellent sculptures and paintings; others are remarkable for their works of art, and San Zenone, a large ch. of the 12th century, is surpassed by few ecclesiastical edifices in It. Sanmicheli enriched V. with many fine palaces. V. as a fortress constitutes, with Peschiera, Mantua, and Legnano, the "quadrilateral." Pop. of commune, 68,741.

**Veronese** (PAUL). See PAUL VERONESE.

**Verplanck**' (GULIAN CROMMELIN), LL.D., b. in New York Aug. 6, 1786, grad. at Columbia Coll. 1801; studied law; was in 1804 a candidate of the so called "Macontents" for the N. Y. legislature, to which he was elected in 1830, when he was chairman of the committee on education; became in 1822 prof. of the evidences of Christianity in the General P. E. Sem., New York; was M. C. 1825-33; member of the N. Y. senate for several yrs., in the judicial duties of which he took a prin. part; was one of the govrs. of the New York Hospital, vice-chancellor of the State Univ., pres. of the New York board of emigration coms. 1846-61, and prepared nearly all the *Annual Reports* of the latter body. Wrote *The Bucktail Bards, Evidences of Revealed Religion, An Essay on the Doctrine of Contracts*, etc. D. Mar. 13, 1870.

**Verrazano, da** (GIOVANNI). See VERRAZANO.

**Verill** (ADDISON EMERY), b. at Greenwood, Me., Feb. 9, 1839, ed. at Lawrence Scientific School, Harvard Univ.; since 1864 he has been prof. of zoology in Yale, and is a member of numerous scientific societies; has written largely upon zoology in scientific periodicals.

**Versailles**, ver-sâlz; Fr. ver-sâl'; town of Fr., cap. of the dept. of Seine-et-Oise, 11 m. S. W. of Paris, is regularly built, with broad and straight streets, and intersected by elegant avenues planted with trees. The chief attractions of the place are the palace and the park. The palace was erected by Louis XIV., and was the residence of the Fr. kings till 1792. In 1857 Louis Philippe transformed it into a kind of national museum. Pop. 48,334.

**Versailles**, cap. of Woodford co., Ky., 15 m. S. E. of Frankfort, laid out in 1794, and the centre of a wealthy agricultural dist., has an acad. and orphan asylum. Pop. 1870, 3268; 1880, 2126.

**Vertebrates** [Lat. *vertebratus*, from *vertebra*, "provided with a backbone"], the most important and the most distinct branch of the animal kingdom. V. may be briefly defined as those animals provided with an axial skeleton and 2 cavities—one dorsal, or above the vertebral column, for the accommodation of the cerebro-spinal nervous system, and the other ventral, or below the vertebral column, and containing the intestinal canal and other viscera. The animals possessing these characteristics are the Mammals or viviparous warm-blooded quadrupeds and cetaceans, the Birds, the Reptiles, and Amphibians, and those known under the collective name of Fishes. The name Vertebrata was proposed in the year 1812 by Cuvier, who contrasted the branch or sub-kingdom so designated with three others, under which were combined all other animals. By Cuvier, as by Linnaeus and his predecessors generally, the V. were separated into 4 classes—the Mammals, the Birds, the Reptiles, and the Fishes. By De Blainville the old class of reptiles was differentiated into 2 classes—Reptiles proper and Amphibians. By recent naturalists the branch has been divided into a still greater number of classes, and chiefly at the expense of the old class of Fishes; thus, some recent authors recognize as classes of V., (1) the Mammals, (2) the Birds, (3) the Reptiles, (4) the Amphibians, (5) the Fishes, (6) the Elasmobranchiates or Selachians, (7) the Marsipobranchiates (lampreys, etc.), and (8) the Leptocephalians.



**Vertex** [Lat. *vertere*, to "turn"], a turning-point. A V. of a polygon is a point at which 2 sides meet. The V. of a cone or of a pyramid is its apex.

**Vertical**, a line perpendicular to the horizon. A V. line is determined by a plumb-line. A V. line at any point is always perpendicular to the free surface of a liquid at that point. A V. plane is a plane through a V. line, and any angle in such a plane is a V. angle.

**Vertigo** [Lat.], a subjective or apparent impairment of the equilibrium of the body. It assumes 2 prin. forms: In one it appears to the subject as if the objects in his vicinity were whirling about him; in the other, he fancies that he is forced to fall in some definite direction, forward, backward, or to either side. V. is rarely if ever continuous, but occurs in paroxysms provoked by some appreciable cause, as changing posture, eating, using the eyes, etc. The subjects of V. often stagger or fall in consequence of the sensation of motion. V. is sometimes the expression of disease of the brain, or of interference with the circulation of blood in that organ, but more usually it is a sympathetic disorder, caused by indigestion, anemia, sudden impairment of parallelism between the 2 eyes, disease of the internal organs of hearing, etc. V. may be artificially produced by the administration of stimulants (alcohol), and by the application of galvanism to the head in a transverse direction or to the superior ganglion of the cervical sympathetic nerve. A variety of subjective unsteadiness, without definite direction to the apparent movement, is better designated as dizziness. The proper management of V. consists in the treatment of the disease causing it. E. C. SEGGIN.

**Vertue** (GEORGE), b. in Westminster, England, in 1684, became a distinguished engraver and antiquary; was an original member of the Acad. of Painting 1711; became engraver to the Society of Antiquaries 1717; made many journeys through Eng. during 40 yrs., taking drawings of chs., monuments, and ruins as materials for an intended hist. of the fine arts in Eng. Among his best-known works are sets of 12 *Portraits of Poets* (1730), 10 *Portraits of Charles I. and his Friends*, etc. D. July 24, 1756.

**Vertumnus**, or **Vortumnus**, in Roman mythology, the god of the seasons, and, as the husband of Pomona, more especially the god of fruit. A feast, *Vertumnalia*, was celebrated in his honor on Aug. 23.

**Verulam**, BARON. See BACON (FRANCIS).

**Verus** (LUCIUS). See ANTONINUS (MARCUS AURELIUS).

**Vervain**. See VERBENA.

**Vesalius** (ANDREAS), b. in Brussels Dec. 31, 1514, studied med. at Louvain, Montpellier, and Paris; lectured on anat. at Bale, Pavia, Bologna, and Pisa; was appointed phys. to Charles V. in 1544, and afterward to Philip II.; was accused of heresy by the Sp. Inquisition and condemned to death, but the sentence was commuted to a pilgrimage, and in 1563 he went to the Holy Land, returning from which he suffered shipwreck at Zante, and d. from starvation Oct. 15, 1564. His *De Corporis Humani Fabrica* formed the foundation of the modern science of anatomy.

**Vesicants** [Fr. *vésciant*], a term used in med. to signify agents that produce blistering. For the ordinary purposes of blistering some preparation of cantharides is commonly used; but where haste is urgent, cotton soaked in water of ammonia may be employed or a hot iron momentarily applied to the skin.

**Vespa'sianus** (TITUS FLAVIUS SABINUS), b. at Reate, in the country of the Sabines, Nov. 17, 9 A. D., entered the army; held superior commands under Claudius in Ger. and Brit.; governed Afr. as proconsul under Nero, and was sent by him in 66, at the head of a large army, to suppress the rebellion in Judaea. When, after the murder of Galba, the c. war broke out between Otho and Vitellius, V. was proclaimed emp. (July 1, 69). A great change now took place in the govt. of the state. The finances were restored to order; the senate and the higher administration were purged, and the worst elements expelled; a firm discipline was established in the army. Jerusalem, and with it the whole of Judaea, were taken in 70; an insurrection in Gaul was speedily suppressed; new conquests were made in Brit. and Ger. He rebuilt the Capitol, erected a temple of peace, commenced the Colosseum, and encouraged the restoration and rebuilding of those parts of the city which had remained in ruins since the great conflagration under Nero. D. June 24, 79.

**Ves'pers** [Lat. *vesper*, "evening," the "evening star"], in the Roman Breviary, the last but one of the canonical hours, the one preceding compline and following the nones. It is celebrated in the chs., often with brilliant music.

**Vespucci**, ves-poot'che (AMERIGO), better known under the Latinized form AMERICUS VESPUTIUS, b. at Florence, It., Mar. 9, 1451; settled at Seville, Sp., as an agent of the Medici family, about 1490; accompanied Alonso de Ojeda in his voyage of 1499-1500, in which he visited Cape Paria and explored several hundred miles of the coasts of S. Amer.; made voyages to Brazil in the service of the king of Port. 1501-02 and 1503-04; was naturalized in Sp. 1505; was appointed pilot-major Mar. 22, 1508, and was occupied for several yrs. in preparing descriptions of the newly discovered regions. The name America was first applied by the Ger. geog. Martin Waldseemüller (Martinus Hylacomylus), who printed in 1507 at St. Die, Lorraine, a small vol., *Cosmographie Introductio, insuper quatuor Americi Vesputii Navigationes*, in which the new continent was called *Americi Terra*. D. Feb. 22, 1512.

**Vesta**, in Rom. mythology, the goddess of the home or hearth, corresponding to the Gr. Hestia. The grave and sublime rites which her worship developed show that of the whole religious feeling which underlay the Rom. mythology she formed the centre. A perpetual fire burned on her altars, and each It. city or community had raised an altar to her. The V. of the city of Rome was served by her own priestesses, the vestal virgins. The number of the vestal virgins was originally 4, but afterward 6. They were chosen

by the pontifex maximus when between 6 and 10 yrs. old, and they served the goddess for 30 yrs., spending 10 yrs. in learning their duties, 10 in the actual performance of them, and 10 in teaching them to the novices. Their prin. duty consisted simply in keeping alive the sacred fire on the altar of the goddess, but thereby the guardianship of the holiest which Rom. life contained was intrusted to them. When a consul met one of the vestal virgins in the streets, he bowed with reverence, and the lictors lowered the fasces while she passed by. If the sacred fire went out from neglect, the priestess during whose watch it happened was stripped and scourged by the pontifex. If one of them committed adultery, she was buried alive, and her seducer was flogged to death in the Forum.

**Vestals**, or **Vestal Virgins**. See VESTA.

**Vesuvian**, or **Id'ocrase** [named from Vesuvius, in the lava of which it is often found], a hard silicate of lime and alumina, with iron and manganese, sometimes used as a gem, but not much esteemed, and is of various colors.

**Vesuvius**. See VOLCANOES, by PROF. A. GUYOT.

**Vetch**, **Fitch**, or **Tare**, the name of several leguminous twining herbs of the genus *Vicia*. One of the most important is *Vicia sativa*, extensively cultivated in Europe as a forage plant.

**Veterinary Science** [Lat. *veterinum*, "beast of burden"], the application of the principles and practice of med. and surgery to domestic animals. It is as intimately connected with comparative anat., comparative physiology and pathology, as human med. and surgery are with the anat., physiology, etc. of the human body. This gives it immense scope, and opens fields of investigation directly connected with V. S. which are absolutely limitless. The facts that man is heir to many of the identical maladies that afflict his domestic animals; that he takes disease from them to an alarming extent; that their diseases may not only be communicated to him, but many which are not affect him perhaps even more seriously in diminishing his supply of food, in influencing disastrously commercial interests, in rendering beasts of burden and draught unfit for use in peace, and, more frequently, in war, where their energies are most severely taxed, indicate, considered separately or altogether, the bearing and importance of veterinary knowledge.

Modern veterinary med. and surgery dates from the founding of the school at Lyons, Fr., in 1762. The Fr. govt. intrusted the whole management of the school to M. Bourgelat, an eminent advocate and political economist. This school increased rapidly in popularity and efficiency. It was attended by pupils sent by all the more powerful European states, and through these graduates of the school similar insts. sprang up, first or last, in Rus., Prus., Aus., and others in smaller states. So rapidly did the number of students increase that it was soon necessary to establish other schools, and M. Bourgelat selected and purchased the site of the school at Alfort, not far from Paris, and established that famous veterinary school and hospital, as well as also the inst. at Toulouse; and in all important veterinary matters Fr. still maintains this early pre-eminence. Nothing was done in G. Brit. toward the establishment of veterinary colls. until M. St. Bel, a graduate of the Lyons school, visited Lond. armed with an enthusiasm for his art, great perseverance, and good letters of introduction. This was in 1788. He labored with little encouragement until 1791, when the Veterinary Coll. of Lond. was organized. The next yr. it was opened to students, and the next (1793) St. Bel died. The coll., however, lived, and veterinary education in Lond., and subsequently in Edinburgh, was established.

In Amer. there have been several attempts made to establish veterinary colls. A charter was granted for one by the State of Pa. in 1853, and again in 1866, but nothing came of either. In 1855 George H. Dadd and others obtained a charter from the legislature of Mass. for the Boston Veterinary Inst., and announced lectures and a faculty; and that was the end of it. In 1857 Dr. John Busted secured a charter from the State of New York for the New York College of Veterinary Surgeons, which after one false start was finally successful in offering in the city of New York educational facilities of a high order to students. Its classes increased rapidly, its diplomas were valued and honored, and its permanence seemed assured, when an unfortunate rupture occurred, the entire faculty of instructors withdrawing with the students and establishing themselves as the American Veterinary College, which is now the only inst. of its kind in Amer. The study of comparative anat. and physiology has been the most important means by which phys. and physiologists have arrived at conclusions in regard to the structure and functions of the human body, while at the same time the knowledge of animals has been increased in like degree. Consequently, many of the most distinguished phys. of the world have been and are contributors to our knowledge of veterinary matters. Among purely veterinary practitioners, however, the number who have distinguished themselves is very small. [From orig. art. in *J.'s Univ. Cyc.*, by M. C. WELD, Ph. B.]

**Vethake** (HENRY), LL.D., b. at Essequibo, Guiana, S. Amer., in 1792, came to the U. S. in early childhood; grad. at Columbia Coll. 1808; studied law; was instructor in math. and geog. in Columbia Coll. 1813, prof. of math. and natural phs. at Rutgers Coll. 1813-17, at Princeton 1817-21 and 1829-32, at Dickinson Coll., Carlisle, Pa., 1821-29, and at the University of New York 1832-35; pres. of Washington Coll., Lexington, Va., 1835-36, prof. of math. at the Univ. of Pa. 1836-54, vice-provost 1846-54, and provost of that inst. and prof. of moral and intellectual philos. 1854-59, and became prof. of the higher math. in the Phila. Polytechnic Coll. 1859. D. Dec. 16, 1866.

**Vet'iver**, a highly fragrant substance, the dried roots of *Andropogon muricatus*, used for making mats, fans, palanquin covers, and baskets, and often placed in linen for its strong and persistent perfume. It is brought from India.

**Veto**. See APPENDIX.



**Vevay**, Ind. See APPENDIX.

**Viaduct** [Lat. *via*, a "way" or "road," and *ductus*, from *ducere*, to "lead"], the structure by which a way (or road of any kind) is carried over some break of continuity or gap in its wanted earth-bearings, as, for instance, across a ravine.

**Viareggio**, ve-ah-red'jo [*Viaregium*], town of It., prov. of Lucca, lying on the sea-shore N. W. of Pisa. A century ago V. was a small, unhealthy hamlet, containing about 300 inhabs.; now it is one of the most salubrious and frequented bathing-places of the Peninsula. This change is due to the hydraulic operations of the celebrated engineer Zendrini, who drained the stagnant pools which had so long poisoned the air of the neighborhood.

**Vibration**, the reciprocating movement consequent upon the effort of a body, or of the parts of a body, disturbed from the position or figure of equilibrium, to recover that position or form again. Of the first kind of V. a common pendulum affords the simplest example; of the second, a metallic spring fixed at one extremity and free at the other. When at rest, the pendulum or the spring is held in position by the equal action of opposing forces. When disturbed from this position, it acquires in returning to it a moment or living force which carries it as far beyond the point of equilibrium as the distance to which the original disturbance had removed it, after which its course is reversed and it retraces its path, returning as far to the side of the first disturbance again. This supposes the motion not to be in any manner resisted by the action of extraneous forces, in which case the reciprocating motion once established would continue forever. But as such resistances are always present, the living force of the vibrating body is gradually absorbed by them, and the body finally assumes once more its original condition of rest.

The laws of vibratory motion lie at the foundation of the theories devised by modern science to account for the phenomena of acoustics and optics. Light and sound are supposed to be propagated through elastic media, of which the particles have to each other the same mechanical relations as if they possessed the property of mutual repulsion. These particles, in the condition of equilibrium, are assumed to be equidistant from each other; their absolute distances being very great compared with the magnitude of the particles themselves. If a slow movement be excited among these particles by the action of a foreign body, they will not sensibly alter their relative distances; but if any one particle or stratum of particles be driven toward those adjacent by a sudden impulse, then the intervening distance will be momentarily diminished, or there will occur a local compression of the medium at that place. The second particle, or stratum of particles, being therefore acted upon, on the side of the compression, by a greater repelling force than on the other, will be driven forward toward the third, which in its turn will be impelled toward the fourth, and so on indefinitely. A molecular movement is thus propagated throughout the medium. It is obvious that such a molecular disturbance can only be created by a body foreign to the medium, since in the nature of things it is impossible that an elastic fluid should unequally compress itself. Moreover, if the foreign body exerts but one impulse, and then remains at rest, only a single tremor will pass through the medium, and there will be no V. But if, after giving a forward impulse, the foreign body as suddenly recoils, the particle or stratum of particles in contact with it, being deprived of its support, will yield to the repulsive force on the opposite side, and the distance between the first and second particles or strata of particles will be diminished, or there will be a local dilatation at that place. The third particle or stratum will similarly move backward toward the 2d, the 4th toward the 3d, and so on, and a tremor by dilatation will pass through the medium. If such alternate impulses be persistently maintained, a vibratory movement will be imparted to all the particles of the medium to which their influence extends. But in order to this the foreign body which produces them must itself be in a state of V.

It is found experimentally in acoustics that the pitch of a sound depends on the number of V. of the sounding body accomplished in a unit of time, and that the intensity or loudness of a given sound depends not on the number, but upon the amplitude, of the V.—that is, upon the space passed over by the vibrating body in each alternate movement. Also, that variation of intensity produces no effect upon pitch: whence it follows that the V. of bodies producing musical sounds are strictly isochronous, whether the amplitude of V. be great or small. It is hence inferred that the forces acting upon the vibrating body must be always proportional to the distance of displacement from the position of equilibrium. For as velocity, when time is constant, is proportional to force, and as space traversed is proportional to velocity, the condition of invariability of time requires an increase of force proportional to the amplitude of V. For an investigation of the laws of V. upon which depend the theories of acoustics and optics, see VIBRATION in *J's Univ. Cyc.* F. A. P. BARNARD.

**Vibrio** [Lat. plu. *Vibronæ*], a genus and a family (Vibrionidae) of Infusoria having spindle-shaped bodies. Familiar examples are the so-called *cola* of vinegar and paste. Some few kinds, like the ear-codkle, which devours wheat (*V. tritici*), attain the length of  $\frac{1}{4}$  of an inch, but others are microscopical.

**Vibroscope**, an instrument designed to enable an observer to make direct observation of the movements of a vibrating body. The essential part of this instrument is a rotating disk, perforated near the circumference with equidistant sight-holes. Suppose that an observer, with this disk before his eyes, directs his attention to a vibrating rod. If the duration of the vibration is just equal to the interval between the passages of the successive sight-holes before the eye, the aspect of the rod will be unchanged. Thus, if

the rod happen to be caught at the point of extreme flexure on one side of the mean position, it will appear to be a permanently bent rod. But such an exact coincidence of intervals could hardly occur. The object will therefore be seen at its successive reappearances in as many successive conditions; and owing to the persistence of impressions upon the eye it will not have been consciously lost sight of at all. The vibration, therefore, which is really rapid, will appear to be a motion comparatively deliberate, and the form of the path may be easily inferred.

**Vicente** (GIL). See GIL VICENTE.

**Vicen'za**, an anc. town in the prov. of the same name, in N. It., on the torrent Bacchiglione and near Montl Berico. V. is best known abroad for its palaces constructed by Palladio. Pop. of commune, 39,431.

**Vicenza**, DUKE OF. See CALLAINCOURT, DE.

**Vice-President**, an officer of the U. S. govt., chosen at the same time and in the same manner as the Pres. His only official duty is to act as pres. of the Senate. In case of a vacancy in the Presidency he becomes Pres. of the U. S. As pres. of the Senate he has a casting vote in case of a tie. His salary is \$8000 per annum.

**Vichy**, ve-she', in Central Fr., dept. of Allier, on the Allier, is beautifully situated, 9 hours by rail from Paris, and is celebrated for its hot mineral springs and elegant bathing establishments. The prin. ingredients of the water are carbonate of soda and carbonic acid gas.

**Vicksburg**, city and R. R. centre, cap. of Warren co., Miss., on Miss. River, midway between Memphis and New Orleans. It has a regular line of packets plying on the Miss. River to St. Louis, a weekly packet to Memphis, a tri-weekly mail line to New Orleans, and a large fleet of boats plying on the tributaries. It is the first city in size and importance in Miss., the second port of importance on the Miss. River between St. Louis and New Orleans, and has a large trade in cotton. Pop. 1870, 12,443; 1880, 11,814.

**Vicksburg, Siege of**. By the capture of New Orleans (Apr. 1862) V. remained the only fortified point on the Miss. held by the Confed. forces. Hostilities were commenced June 28, when Gen. Williams with 4 regiments and 8 field-pieces occupied the peninsula opposite V. The forces in that city were gradually increased to about 34,000, under Gen. John C. Pemberton, and in the autumn Gens. Grant and Sherman approached with an army of some 40,000 men. After some skirmishing Sherman was superseded by McClelland (Jan. 4), and Gen. Grant, with all his forces, moved against V. On May 18 the formal siege of V. may be considered to have begun. Gen. Sherman had meanwhile made feints from Milliken's Bend, and Pemberton soon abandoned his outside intrenchments on Haines's Bluff and concentrated within the city. Grant made an experimental assault upon Pemberton's lines May 19, and, being repulsed, settled down to a regular siege. His forces were gradually increased to 70,000 men, while Pemberton had but 25,000 effective men, was deficient in ammunition, and had rations for only 60 days. The investment continued with an almost constant bombardment until July 3, when Pemberton surrendered the city upon honorable terms, which took effect the following day (July 4, 1863).

**Vico**, vee'ko (GIOVANNI BATTISTA), b. at Naples in 1668, was ed. by the Jesuits; studied law; lived for several yrs. in the house of the bp. of Ischia as tutor to one of his nephews; was afterward appointed prof. of rhetoric at Naples, and in 1735 royal historiographer. His *Principi di una Scienza Nuova d'Interno alla Comune Natura delle Nazioni* was an attempt to create a philos. of history. D. Jan. 26, 1744.

**Victor Amade'us**, the name of 3 sovereigns of the house of Savoy, of whom the first bore the title of duke of Savoy, the 2 latter that of king of Sard. **VICTOR AMADEUS I.**, b. in 1617, duke of Savoy in 1630, d. Oct. 7, 1637.—**VICTOR AMADEUS II.**, b. May 14, 1666, a grandson of the preceding, succeeded his father, Charles Emmanuel II., in 1675, and married in 1684 Anne Marie of Orleans, a niece of Louis XIV. His eldest daughter was married to the duke of Burgundy, by whom she became mother to Louis XV., and the younger to Philip of Anjou, soon after king of Sp. In 1720 he exchanged Sic. for Sard., and on Sept. 2, 1730, abdicated. D. Oct. 31, 1732.—**VICTOR AMADEUS III.**, b. in 1737, a grandson of the preceding, succeeded his father, Charles Emmanuel III., in 1773; declared war against the Fr. republic, but was compelled to accept the Peace of Paris (1796), by which he lost Savoy and Nice. D. in the same yr.

**Victor** (AURELIUS). See AURELIUS VICTOR.

**Victor** (CLAUDE), duke of Belluno, b. at Lamarche, dept. of Vosges, Fr., Dec. 7, 1764, was created a brig.-gen. in 1795, gen. of division in 1797, marshal and duke after the battle of Friedland; commanded in Sp. from 1809 to 1812; fought with distinction in the Rus. and Ger. campaigns 1812-14; adhered to the Bourbons during the Hundred Days; was minister of war from 1821 to 1823; accompanied in the latter yr. the Fr. army to Sp. as commander under the duke of Angoulême, but was recalled on account of frauds in the administration of which he could not have been ignorant. D. Mar. 1, 1841.

**Victor Emmanuel I.**, king of Sard. (1802-21), b. July 24, 1759, the second son of Victor Amadeus III., ascended the throne June 4, 1802, and resided at Cagliari till 1814, his possessions on the mainland being occupied by the Fr. By the Cong. of Vienna the duchy of Genoa was added to his dominions, but the reactionary measures he introduced caused a violent revolution, and he abdicated Mar. 13, 1821. D. Jan. 10, 1824.

**Victor Emmanuel II.**, king of Sard. from 1849, and king of It. from 1861, b. at Turin Mar. 14, 1820, the eldest son of Charles Albert; married (Apr. 12, 1842) Archduchess Adelaide of Aus.; commanded the Savoy brigade in the campaigns against Aus. in 1848-49, and distinguished himself by his brilliant personal valor in the battles of Gatto and Novara. On the very evening of the disastrous battle of Novara (Mar. 23, 1849) Charles Albert abdicated in favor of his son. Supported by his minister, Cavour, V. E. succeeded in



restoring the finances to order, reorganized the army, concluded commercial treaties with foreign powers, limited the privileges of the clergy, secularized the Ch. property, and established a new system of popular education independent of the control of the Church. By his participation in the Crimean war he made the kingdom of Sardinia a noted part of the political system of Europe, and finally, in 1859, he was able to renew the contest with Aus. by the aid of Fr. By the Treaty of Villafranca (July 11) and the Peace of Zurich (Nov. 10, 1859) Lombardy was added to his dominions. The aid of Fr. he had to pay for by ceding Savoy and Nice; but at the same time Parma, Modena, Tuscany, and parts of the Papal States annexed themselves to Sard., and soon after, the campaign of Garibaldi in Sic. and Naples produced the same result with respect to the whole S. part of It. On Mar. 17, 1861, V. E. assumed the title of king of It., and early in 1865 the royal residence was removed from Turin to Florence. As France was not likely to further support the It. movement, V. E. sought and found a new ally in Prus.; and although the Its. lost the battle of Custoza (June 24, 1866), by the Peace of Vienna (in Oct.) Aus. ceded Venetia; and when, during the Franco-Ger. war, the Fr. garrison was withdrawn from Rome, the city annexed itself by a popular vote to It., and July 2, 1871, V. E. entered the city and took up his residence in the Quirinal Palace. D. Jan. 9, 1878.

**Victoria**, city of Hone-Kone (which see).

**Victoria**, a Brit. colony in Australia, formerly called **Australia Felix**, occupies the S. E. part of the continent, and comprises an area of 87,884 sq. m. The extent of its coast-line is nearly 600 m. The prin. harbor is Port Phillip Bay, an inland sea. Western Port is also of importance. The country is traversed throughout its whole length by a chain of hills completely dividing it into 2 parts, and thence called the Dividing Range. This range runs in an E. and W. direction. The streams to the N. of it run toward the Murray, those to the S. of it toward the sea. There are also other ranges extending in different parts of the country, many of which are offshoots of the main chain. The rivers are for the most part of inconsiderable size. With the exception of the Yarra, on the banks of which the metropolis, Melbourne, is situated, the Goulburn, which empties itself into the Murray, and the Murray itself, not one of them is navigable except by boats. Of the numerous lakes which the country contains, and of which several are craters of extinct volcanoes, Lake Corangamite is the largest. It is salt. The climate equals that of the most beautiful European countries; Melbourne has many of the advantages of Lisbon. The soil is fertile, offers excellent fields, meadows, pastures, and forests, and is rich in metals, especially in gold. Silver, copper, antimony, coal, iron, slate, etc. also abound.

**Population.**—The natives, whose number at the time when the first settlement was made comprised about 5000, have now become nearly extinct. The number of settlers amounted in 1851 to 77,345; in 1861 to 340,322; in 1871 to 731,528; in 1881 to 892,346. With respect to creed, the census of 1881 showed that there were 811,291 Episcopalians, 182,591 Presbs., 115,058 Meths., 59,457 other Prots., 303,480 R. Caths., 4330 Jews, 11,159 Pagans; other sects, 24,885. In 1881 the pop. of Melbourne was 65,860; including a ten-mile radius, 282,947.

**Commerce.**—The external commerce is very considerable. The discovery of gold in 1851 gave it at once a vigorous impulse. The 2 staple articles of export are wool and gold. Wool is the most important; it amounted in 1882 to 108,028,601 lbs., valued at \$5,902,574. V. is the prin. gold-producing colony of Australia: from the discovery of gold in 1851 to the end of the year 1880 the quantity mined, estimated at \$4 per ounce, amounted in value to \$198,586,868. The prin. items of import are woollen manufactures, live stock, sugar, cottons, apparel and haberdashery, and tea. Beside these chief articles, the colony also imports grain in varying quantities. According to value, nearly  $\frac{1}{2}$  of the imports is set down as the produce of the manufactures of the United Kingdom, and more than  $\frac{1}{2}$  of other Brit. possessions. Of railways there were 1199 m. completed at the end of Mar. 1880—between Melbourne and Sandhurst and Echuca, between Melbourne and Geelong and Ballarat, the Williams-town branch, and the Melbourne and North-eastern road, etc.—all of which are govt. lines. The postal dept. had, in 1882, 1908 stations, carried 28,877,577 letters, 12,383,928 newspapers, 4,972,490 packets, and had an income of \$194,339. The telegraph had 336 stations and 6922 m. of wire, carried 1,418,769 despatches, and had an income of \$42,826. The govt. of the colony consists of a gov. and a council. According to the const. of Nov. 23, 1855, the legislative council or upper house consists of 30, and the legislative assembly or lower house of 60 members, elected by the people. The financial returns for 1881 showed a revenue of \$5,115,121, an expenditure of \$4,875,029 (1880), and a public debt of £20,056,600 (1880).

**History.**—Capt. Cook was the first European who entered the country, Apr. 19, 1770. On Jan. 18, 1788, Capt. Philip landed at Botany Bay in order to establish a penal colony, but selected Port Jackson for the purpose Jan. 15, 1802. Port Phillip Bay was discovered by Lieut. John Murray, and in 1803 Lieut.-Col. Collins founded a colony here. In 1824 the harbor of Geelong was discovered, and a settlement was attempted at Western Port, but also given up; a permanent settlement, however, was made in this yr. at Portland Bay. It was not until 1835 that John Batman founded a colony at Port Phillip from Van Dieman's land. In 1839 the colony numbered 6000 inhabs.; in 1850 the pop. had increased to 76,000, and the colony had 52,000 acres of land under cultivation, 6,000,000 sheep, and 380,000 cattle; it was then separated from New S. Wales and made independent. Shortly after, gold was discovered, and immediately the immigration increased immensely. [From orig. art. in *J.'s Univ. Cyc.*, by AUGUST NIEMANN.]

**Victoria**, city, port of entry, and cap. of Brit. Columbia, at the S. E. extremity of Vancouver's Island, on the Strait

of Fuca, is beautifully situated and tolerably well built; has handsome buildings for the govt., including Cary Castle, the residence of the gov.; is a free port with considerable commerce and fortnightly lines of steamers to New Westminster, Olympia, and San Francisco. The climate is very severe in winter. The earliest establishment here was a trading-fort of the Hudson's Bay Co. (1843); it became the cap. of the new colony of Vancouver's Island 1859, rose into importance on the discovery of gold in Columbia, and on the annexation to that colony in 1866 became its capital. Pop. in 1881, 5925.

**Victoria**, on R. R., cap. of Victoria co., Tex. Pop. 1870, 2534; 1880, pop. not given.

**Victoria Alexandrina**, queen of G. Brit. and Ire. and empress of India, b. at Kensington Palace, Lond., May 24, 1819, only child of Edward, duke of Kent, fourth son of George III., and of his wife, Victoria Mary Louisa, daughter of the duke of Saxe-Coburg-Saalfeld, and sister of Leopold, king of the Belgians; became heiress-presumptive to the crown on the accession of William IV. in 1830, and on his death without issue (June 20, 1837) assumed the throne of G. Brit. and Ire. She was crowned in Westminster Abbey June 28, 1838; was married at St. James's Palace to her cousin, Prince Albert of Saxe-Coburg-Gotha, Feb. 10, 1840; became widow Dec. 14, 1861. She has had 9 children, by whom she has above 20 grandchildren. Queen V. has shown literary culture by the publication of *Leaves from the Journal of Our Life in the Highlands* (1868), and by supervising 2 biographical sketches of Prince Albert, *The Early Days of his Royal Highness, the Prince-Consort* (1867), by Gen. C. Grey, and *The Life of the Prince-Consort* (1874), by Theodore Martin.

**Victoria Nyanza**. See NYANZA.

**Victoria Regia**, a great water-lily of the rivers of tropical S. Amer. It has huge floating circular leaves, often 6 ft. across, and large and very fragrant flowers, white without and rose-colored within.

**Vicuña**, ve-kū'n'yah, or **Vicuña**, the *Auchenia vicuña* (family Camelidae), an extremely wild and active animal of the Andes, considerably smaller than the llama, and somewhat smaller than the alpaca. Its fine hair is even more valuable than that of the alpaca.

**Vidaurre**, ve-dōw're (SANTIAGO), b. in the present state of Nuevo Leon, Mex., about 1803, became about 1833 gov. of Nuevo Leon, to which he forcibly annexed (1856) the state of Coahuila; exercised for some yrs. a species of dictatorship over the N. states of Mex.; aided in the campaign for the overthrow of Santa Anna 1854-55; was a candidate for the presidency at the junta of Cuernavaca Oct. 1855. He did not recognize the govt. of Comonfort until Nov. 1866; held the N. states against Zuloaga and Miramon during the "war of reform" 1857-60, and took part in the war against Fr. intervention 1862-64, but was induced to recognize the "empire" of Maximilian, of whom he ultimately became a cabinet minister; was captured at the fall of the City of Mexico, and shot there as a traitor Aug. 8, 1867.

**Vielé**, vee'la (EGBERT L.), b. at Waterford, N. Y., June 17, 1825, grad. at the U. S. Military Academy July 1, 1847; ordered to the seat of war in Mex., serving at the cap. 1847-48; in campaign against Indians 1848-52. Resigned June 1, 1853, to enter upon the profession of civil engineering; was State engineer of N. J. 1854-56, chief engineer of Central Park, New York, 1856-57; served in the c. war (1861-64) as capt. of engineers 7th N. Y. militia Aug. 1861, appointed brig.-gen. U. S. volunteers, and engaged in the Port Royal expedition, siege and capture of Ft. Pulaski, Ga., capture of Norfolk, Va., and military gov. of that city 1862-63. Resigned Oct. 1863, and resumed his profession at New York. Appointed com. of parks, New York, 1883. M. C. from N. Y. 1883-87. Author of *Hand-Book of Active Service*.

**Vienna**, ve-en'na (Ger. *Wien*), cap. of Aus., is beautifully situated on the right bank of the Danube, traversed by the river Wien and an arm of the Danube. V. is one of the most beautiful and interesting cities in Europe. In the period from 1866 to 1876 there were erected a greater number of buildings of architectural consequence in V. than were ever erected in an equal space of time in any other city in the world, with perhaps the exception of Rome. The city is divided into 10 wards—the Innere Stadt, or city proper, Leopoldstadt, Landstrasse, Wieden, Margarethen, Mariahilf, Neubau, Josephstadt, Alsergrund, and Favoriten. The Ring, the liveliest and most brilliant part of the city, consists of a series of broad streets planted with trees, surrounding the Innere Stadt, and leading through numerous large and beautiful open places; it occupies the site of the former fortifications. To the N. W. the Donaukanal, with the Franz-Joseph quay, forms the boundary of the Innere Stadt, and connects the 2 ends of the Ring. The edifices are generally remarkable for their solidity, and many of them also for the purity of their style. Even the tenement-houses which have been erected on mere speculation show often a peculiar character which distinguishes them favorably from similar constructions in other cities. Numerous palaces belonging to the Aus. and Hungarian nobility or to rich burghers adorn the city. The largest and most remarkable among them is the Burg, the residence of the emp. The most prominent among the other palaces are those of Archduke Albrecht, Prince August of Sax., Prince Kinsky, Lobkowitz, Montenuovo, Count Harrach, etc. Other remarkable edifices are the opera-house, finished in 1869 by Siccardi-burg and Van der Nüll; the Heinrichshof, situated opposite the opera-house on the Operaring, a most original structure by Hansen, destined only for a tenement-house, but having its whole upper part gilded and covered with frescoes; the palaces of the ministries of foreign affairs, commerce, war, finance, and police; the Acad. of Science, the Acad. of Art, etc. Furthermore, the city-hall; the Acad. of Fine Arts, containing important collections, among which is a valuable picture-gallery; the Theresien Acad., with a large, beautiful garden, etc. The arsenal is an immense establishment,



forming a square 700 metres long and 420 broad, and comprising a gun-factory, a cannon-foundry, several barracks, etc., and a museum of arms, a magnificent structure in rich Byzantine style, by Hansen, and containing many interesting trophies. The general hospital has 3000 beds, and is the largest inn of the kind in Europe. Of the chs., St. Stephen's cathedral, situated in the centre of the Innere Stadt, is the most interesting, built in Gothic style from 1300 to 1510, in the form of a Lat. cross. The Innere Stadt contains, in all, 30 chs., beside chapels. The other parts of the city contain 35 large chs., of which the most important is the Karls ch. in Wieden, built under Charles VI. by Fischer von Erlach in 17. rococo style, with a high dome and a portal resting on 6 Corinthian columns and ornamented in the frontispiece with an interesting relief representing the effects of the plague. The city has 25 monasteries and ecclesiastical orders. Of the educational insts., the univ. is the most prominent, founded in 1385 by Rudolf IV., and richly provided with apparatus for scientific investigation; there are also a polytechnic school and a medical school. V. has numerous establishments for recreation and amusement. The Prater, a park and forest, E. of Leopoldstadt, was laid out by Joseph II., and is traversed by magnificent avenues, of which the prin. one is the rendezvous of the elegant world, and is lined with crowded cafés, while another, the so called Wurstel-prater, is filled with transportable museums, dancing establishments in the open air, etc.

The commerce and industry of the city are very important. Several branches of industry have been carried to a high degree of perfection, such as the manufacture of leather, carriages, furniture, meerschaum and amber goods, etc. The musical, mathematical, optical, and physical instruments made here enjoy a high reputation. The prin. articles of commerce are wool, cotton, silk, fur, paper, leather, metal, and glassware, objects of art, chemicals, spices, and colonial ware. Pop. 1880, 1,103,857. [From orig. art. in J's Univ. Cyc., by AUGUST NIEMANN.]

**Vienna, Congress of**, opened Oct. 3, 1814, and closed June 9, 1815. There were present the monarchs of Aus., Prus., Rus., Den., Bavaria, and Württemberg, beside a crowd of minor princes and diplomatic representatives of all European states except Tur.—Talleyrand from Fr., Castlereagh from Eng., Metternich from Aus., Nesselrode from Rus., Hardenberg from Prus., Münster from Hanover, etc.—beside a multitude of diplomats without any distinct official character, such as Stein, Wilhelm von Humboldt, Pozzo di Borgo, etc. The task of the assembly was to restore to Europe that state of affairs which prevailed before the Fr. revolution. The pope was reinstated in all his possessions, with the exception of Avignon and Venosin, which were given to Fr., and some small It. dists., which were given to Aus. The rest of It. was again parcelled out in domains for Fr. and Aus. princes. Aus. was re-established as an agglomeration of 17 different nationalities. A kingdom of Poland was erected, but the Polish provs. which Rus., Prus., and Aus. had seized 20 yrs. before were not returned to the new Polish crown, and the crown itself was tendered to the Rus. czar. Nor. was taken from Den. and added to Swe., and Den. was paid with Lauenburg and other Ger. dists. The Sp. Netherlands or Belg. were added to the Dutch Netherlands, and the whole formed into the kingdom of Hol. To restore the Ger. empire was found impossible, but, having restored as many of the princes as possible, the cong. founded a *Bund*.

**Vienna Paste, or Vienna Caustic.** See LIME, MEDICINAL USES OF.

**Vieta**, ve-ä'tah, or **Viète** (FRANÇOIS), b. at Fontenay-le-Comte, dept. of Vendée, Fr., in 1540, held various offices in the civil service of the Fr. govt. during the reigns of Henry III. and Henry IV., and d. in Paris in 1603. It is, however, as a math. he has become known in later times, having been the creator of modern algebra.

**Vieuxtemps**, ve-uh-ton' (HENRI), b. at Verviers, Belg., Feb. 20, 1820, made his first concert-tour as a virtuoso on the violin when only 8 yrs. old; resided from 1846 to 1852 in St. Petersburg, subsequently in Paris, but spent most of his time in concert-tours; visited Amer. in 1843, 1855, and 1870, and pub. a considerable number of compositions for the violin and pianoforte. D. June 6, 1881.

**Vieyra**, ve-ä'e-rah (ANTONIO), b. at Lisbon, Port., in 1608, became a Franciscan monk and the most celebrated Port. preacher of his age; was employed on public missions at the courts of Paris (1646), Lond., and Rome (1650), and spent his latter yrs. as a missionary in Brazil, where he preached to the Indians in the Tapi or Guarani lang. and advocated the abolition of slavery. D. at Bahia in 1697.

**Viger**, ve-zhä' (JAMES), b. at Montreal, Canada, May 7, 1787, served as an officer of militia in the war of 1812-15; filled several political offices; was the first mayor of Montreal, and a distinguished archeologist. Wrote a *Hist. of the Parishes of the Diocese of Montreal*, etc. D. Dec. 12, 1858.

**Vigil**, vid'jil [Lat. *vigilia*, a "watching"], in ecclesiastical lang. the evening before any ch. fest. festival, or other important day of the calendar. Special services are appointed in the R. Cath. Ch. for the more important vigils.

**Vigilius**, Pope (537-555), a native of Rome, was appointed a deacon by Boniface II., and accompanied Agapetus by Constantinople in 536. Here the pope d., Apr. 23, 536, and by intrigues of Theodora, V. was appointed pope by Justinian, on the condition that he should lend his authority to those measures by which the emp. hoped to reconcile the Monophysites with the orthodox Ch. On his return to Rome, however, he found the papal see occupied by Sylvester; but partly by money, partly by intrigues of Antonina, wife of Belisarius, he obtained the aid of the Byzantine commander at Ravenna, and Sylvester was expelled. Vigilius d. June 7, 555.

**Vihara** meant, in post-Vedic times in India, first, pleasure, relaxation, and then a pleasure-ground or place of relaxation; and after the rise of Booddhism it was ap-

plied to the Booddhist temples, these being at first only meeting-places for the Booddhist monks; but after images of Booddha began to be put up, and dwellings for the priests to be permanently erected round the image-house, the word *vihāra* was used to denote, first, the temple itself, secondly, the whole monastic establishment.

**Villas** (W. F.). See APPENDIX.

**Villafranca di Vero'na**, commune in the prov. of Verona in N. It., about 11 m. S. of that city and 12 m. N. of Mantua, consisting of 11 hamlets, with a total pop. of 8698. The largest, which gives name to the commune, is a well-built and flourishing town, with a fine castle of the 14th century.

**Villars**, vel-är', de (CLAUDE LOUIS HECTOR), DUKE, b. at Moulins, dept. of Allier, Fr., May 8, 1653, entered the army in 1672; fought with distinction under Turenne, Luxembourg, and Crequi; was also employed in diplomatic negotiations, and received in 1702, in the Sp. war of succession, his first independent command. Oct. 14, 1702, he defeated Prince Louis of Baden at Friedlingen, and was made a marshal; on Sept. 30, 1708, he won a new victory over the imperial forces at Höchstädt; succeeded Vendôme in 1709 in the command of the grand army in the Netherlands, but was defeated and severely wounded at Malplaquet, Sept. 12, 1709. Having recovered, he gained a brilliant victory over the allied Eng.-Aus. force under the earl of Albemarle at Denain, July 24, 1712. After a successful diversion against Prince Eugene, he finally negotiated and signed the Treaty of Rastadt (Mar. 6, 1714); when, in 1733, a new war with Aus. broke out, he was placed in command of the army in N. It., and received the title of marshal-general. D. June 17, 1734.

**Villemain**, vel-man' (ABEL FRANÇOIS), b. in Paris June 9, 1790, was appointed prof. of rhetoric at the Lycée Charlemagne in 1810; won the prize of the Acad. 3 times between 1812 and 1816; pub. in 1819 his *Histoire de Crumwell d'après les Mémoires du Temps et les Recueils parlementaires*; received in 1820 a position in the dept. of the Interior. But his connection with politics soon carried him into the ranks of the opposition, and in 1827 the Acad. commissioned him to draw up its protest against the re-establishment of the censorship of the press. He now lost his position in the govt., but his lectures at the Sorbonne gathered immense audiences, and contributed to foment the movement which terminated with the Revolution of 1830. In 1831 he became a member of the council of public instruction; in 1832 was created a peer; in 1839-40 and 1840-44 was minister of public instruction. In 1848 he retired altogether from politics, devoting himself exclusively to lit. His prin. works are *Cours de Littérature française, Discours et Mélanges littéraires, Études de Littérature ancienne et étrangère*. D. May 8, 1870.

**Villena**, vel-äh'nah, de (JUAN PACHECO), MARQUIS, b. in Sp. about 1425, became the favorite and chief minister of the imbecile king of Castile, Henry IV., about 1454; was supplanted by Beltran de la Cueva, upon which he joined the confederacy of nobles which deposed Henry, and ultimately placed Isabella (the Catholic) on the throne. D. in 1474.

**Villiers** (GEORGE). See BUCKINGHAM, DUKE OF.

**Villis'ca**, R. K. Junc., Montgomery co., Ia., 66 m. E. of Council Bluffs, is a prominent shipping-point for cattle, hogs, and grain. Pop. 1870, 457; 1880, 1299.

**Villoison**, ve-lwah-zön', de (JEAN BAPTISTE GASPARD D'ANSE), b. at Corbeil-sur-Seine, Fr., Mar. 5, 1750, acquired a great reputation as a Gr. scholar; was made member of the National Inst. of Paris, and d. in that city Apr. 26, 1805. His prin. publications are *Apollonius's Lexicon Grecum Hindu et Odyssæe*; *Longis, Pastoralia, Anecdota Græca*; *Homer's Iliad* after the Venetian Codex with the Scholia, beside a number of essays in the *Mémoires de l'Académie des Inscriptions*.

**Vil'na**, or **Wil'na**, town of Rus., cap. of the govt. of Vilna, on the Wil'na, is surrounded with old walls and mostly built of wood. It contains, however, many fine buildings, and has many good educational insts. It has an extensive trade in corn and timber. Pop. 88,693.

**Vimeur**, de (DONATIN). See ROCHAMBEAU.

**Vinea**. See PERIWINKLE.

**Vincennes**, vin-senz'; Fr. van-senn', a commune (or tp.) of Fr., adjoining Paris on the E., celebrated for its chateau and forest. The present chateau was commenced by Philip de Valois (1333), and finished by his successors. The chateau of V. was, up to the time of Louis XI., a royal residence. It became a state prison. Pop. 17,064.

**Vincennes**, city and R. R. centre, cap. of Knox co., Ind., on the E. bank of the river Wabash, 90 m. from its mouth. It is built on a level, dry, sandy plain, and is entirely above overflow, behind which rises a beautiful plateau having an elevation of 100 ft. above high-water mark, and occupied by well-tilled farms, vineyards, and gardens. The V. Univ., a well-endowed school, chartered in 1807, is a prosperous inst. of learning. V. is the entrepot for a rich agricultural region, in which there are vast quantities of valuable timber and coal of a superior quality. There are 3 artificial earth-mounds standing upon the high land overlooking the city, representing an anc. civilization. The town was settled by the Fr. in 1702, and was the cap. of the N. W. and Indiana Terrs. until 1813. Pop. 1870, 5440; 1880, 7680.

**Vincennes**, de (JEAN BAPTISTE BISSOT), SIEUR, b. at Que., Canada, in Jan. 1688; took part from childhood in expeditions to the W. country; was at Michilimackinac in 1698; entered the army as ensign; resided long among the Miami Indians, with whom he was a great favorite; rescued some Iroquois prisoners from the Ottawas 1704; came in collision with La Mothe Cadillac, the commander at Detroit; rendered valuable services against the Foxes near Detroit 1712; built soon afterward a fort and trading-post on the site of the present city of Vincennes, Ind., and in 1730 joined the expedition of D'Artaguet against the Chickasaws, by whom, after several victories, he was taken prisoner and burned alive.

**Vin'cent** (JOHN H.), D. D., b. at Tuscaloosa, Ala., Feb. 23, 1832, entered the M. E. ministry at an early age, and became distinguished by his efforts to improve the organi-



zation and the lit. of Sunday-schools; in 1872 was placed by General Conference at head of its Sunday-School Tract Society; founded the *Sunday-School Teacher* at Chicago, Ill.

**Vincent** (MARVIN RICHARDSON). See APPENDIX.

**Vincent** (WILLIAM), D. D., b. in Lond., Eng., Nov. 2, 1739, ed. at Westminster School and at Trinity Coll., Cambridge, where he became a fellow in 1761; took orders in the Ch. of Eng.; was usher in Westminster School 1762-71, second master 1771-83, and head-master 1783-1802; became rector of All-Hallows, Lond., 1778, prebendary of Westminster 1801, and Dean of Westminster 1802. Wrote *The Hist. of the Commerce and Navigation of the Ancs. in the Indian Ocean*, *Defence of Public Education*. D. Dec. 21, 1815.

**Vincent de Paul**. See PAUL, DE (VINCENT).

**Vincentians**, a congregation of secular R. Cath. priests not under a monastic rule, but under special obligations to preach and hear confession among the poor, to assist in the education of clerics, and to further the annual devotion called the "ecclesiastical retreat."

**Vincent of Lerins** (VINCENTIUS LERINENSIS), so called from the monastery to which he belonged in the islands of Lerins, flourished in the middle of the 5th century A. D. He was the author of the treatise entitled *Commonitorium pro Catholica Aite Antiquitate et Unitate* (A. D. 434), directed against the heretics, which came to be regarded as a text-book of orthodoxy in which he lays down as the test of catholic doctrine, "*Quod semper, quod ubique, quod ab omnibus creditum est.*" D. A. D. 450.

**Vincent, St., Island of**. See SAINT VINCENT.

**Vinci, da**. (LEONARDO). See LEONARDO DA VINCI.

**Vinds**. See SLOVENTZI.

**Vine-Culture, History**.—The culture of the vine (*Vitis vinifera*) and the making of wine by the fermentation of the juice of the grape are among the most ancient industries of mankind. As the vine has accompanied the Aryan race to every congenial climate, its origin is usually referred to the same regions as that of its cultivators. It is said to attain its highest perfection in Per., and in the forests of Mingrelia and Georgia it assumes proportions even more gigantic than do the Amer. vines in our own. The early Norse discoverers of Amer. were delighted to find the native vine on the coast of S. N. Eng. Wine is said to have been made in Fla. from native grapes as early as 1564. The Sp. and Port. colonists carried the European grape to the temperate portions of S. Amer. at an early date. About 1620 the London Company sent Fr. and Sp. vines to Va., and some time afterward Fr. vine-dressers went out to take care of them, but failed of success. In 1648 vines trained on trees existed in Uvedale, now Del. In 1683 William Penn set out a vineyard near Phila.; this also failed. The first step that became of general importance was the bringing out of the Catawba grape by Major Adlum of Georgetown, D. C., about 1835. It seems to have been first planted on a large scale by Nicholas Longworth, near Cin. In 1858 the area of vine-culture near Cin. was estimated at 1300 acres; in 1867 it exceeded 2000. From Cin. the culture of the Catawba spread rapidly to the westward, especially to Ill. and Mo., between 1845 and 1850. The success of *Norton's Virginia, Concord*, and other now well-known varieties revived the spirits of the vine-growers, so that the total acreage of vines in 1867 was estimated by Mr. Husman at 2,000,000. On the Pacific slope, in N. Mex., and Cal., V.-C. has had its independent history. About 1771 missionaries brought with them probably the seeds of Sp. grapes. Vineyards everywhere surrounded the missions, and wine for home consumption was abundant. After the breaking up of the missions, the vineyards and orchards were neglected, but the "Mission grape" soon attracted the attention of the immigrants, after the first flush of the gold-fever had subsided; and after it was proved in 1858 that the vine could be grown in Cal. without irrigation, its culture increased rapidly, the chief variety planted being the blue "Mission."

**Geographical Distribution**.—The culture of the vine on a large scale belongs to the warmer portions of the temperate zones. In the Old World, beginning at the mouth of the Loire, it reaches its extreme N. limits about the confluence of the Rhine and Moselle, 51° N. lat.; in the neighborhood of Berlin, 52° 30' N. lat.; and about lat. 49° in Hungary. To the southward we find its outposts on the island of Ferro, lat. 27° 45' N., and on that of Bahrein in the Per. Gulf, lat. 26° N. The production of palatable wines, however, usually falls far within these extreme limits, and is, moreover, largely controlled by local conditions of soil and climate. The chief wine-producing countries of the Old World are, in the order of their commercial importance, Fr., Sp. and Port., Ger. (especially the valley of the Rhine), Aus. (especially Hungary), and It. The vineyards of Gr., Tur. in Europe, the Black Sea and Caucasian provs. of Rus., of Asia Minor, Syria, and Per. are at present mainly of local importance, but the small raisin of the Gr. Islands—"currants," corrupted from *Corinth*—and the seedless "Sultana" raisins of Smyrna, are everywhere known as articles of commerce. S. of the equator we find the vine in successful cultivation at the Cape of Good Hope, in lat. 32° S.; in S. Australia, especially in the Hunter River region in New S. Wales; and in New Zealand. On the S. Amer. continent it ranges nearer to the equator. In N. Amer. also the zone of V.-C. lies nearer the equator than in the Old World. The N. limit of wine-production on a manufacturing scale is about lat. 42° N., in S. N. Y., Pa., and the group of islands at the W. extremity of Lake Erie. The culture of grapes chiefly for table use is extensively pursued on the E. shore of Lake Mich., about St. Joseph. Away from the tempering influence of the great lakes, however, we see little of V.-C. until we approach, to the southward, the wine-growing region of the O. River, S. Ill., and Mo. Thence southward to the shores of the Gulf of Mex. and to the Rio Grande various species of vine flourish in the forests, and the European grape itself on the sandy shores of the Gulf. The vine is the type of the natural order Vitaceæ, which includes, beside, the Va.

creeper (*Ampelopsis*) and the numerous *Ciss* of the tropics. In the genus *Vitis* the calyx is minute, at the base of the petals. The main products of V.-C., apart from the fresh fruit, of which enormous quantities are consumed, are *wine*, *brandy*, dried grapes or *raisins*, and *laster*.

**Species and Varieties**.—The varieties of the vine heretofore almost exclusively planted in the Old World are all derived from the *Vitis vinifera*. The cultivated varieties of the latter are derived from 4 or 5 wild species:

(1) *Vitis riparia* and *cordifolia*, or *Frost Grape*.—W. of the Alleghany range, from Canada to the Gulf of Mex., on the banks of streams, often running over tall trees. Among the more important cultivated varieties of this species are the *Taylor*, *Clinton*, and perhaps the *Delaware*.

(2) *Vitis aestivalis*, or *Summer Grape*.—In the Middle and S. States, on uplands, in open woods or thickets, not usually climbing as high as the preceding; fruit ripening in Sept.; sweeter than the preceding, and of all natives the least foxy in taste. Exceedingly variable even in the wild state. The chief cultivated varieties are *Norton's Virginia*, *Cynthiana*, *Herbmont*, *Louisiana*.

(3) *Vitis vinifera*, of the Old World, is in many respects intermediate between the frost grape and the summer grape of the U. S. The berries of most of the cultivated European grapes approach in size those of the 2 Amer. species mentioned, and among the wild grapes of It., of the lower Danube, of the Caucasus, etc., the Amer. species *riparia*, *cordifolia*, and *aestivalis* seem to be represented. Of wine grapes, *Riesling*, *Traminer*, *Black Burgundy*, *Chasselas*, *Orleans*, *Rulander*, *Black Hamburg*, *Tokay* of Hungary, *Mission* of Cal. Of table and raisin grapes (more pulpy than the above), the *Spanish* or *Alexandrian Muscat* (from which the Malaga raisins are chiefly made), the *White Damascus*, *White Malvoisie*, *Black* and *White Gutedel*.

(4) *Vitis Labrusca*, or *Northern Fox Grape*.—Native of the E. slope of the Alleghanies from N. Eng. to S. C.; not in the Miss. Valley. The chiefly important cultivated varieties of this species are the *Catawba* (supposed to have originated on the Catawba River in N. C.), *Isabella*, *Concord*, *Cunningham*, *Harford* *Profligate*, *Delaware*.

(5) *Vitis vulpina*, or *rotundifolia*; *Southern Muscadine*, *Bullace*, *Scuppernong*.—Differs greatly in habit from all other cultivated species, and occurs only in the States S. of the 36th parallel. The mustang grape of Tex. (*V. candicans*, Eng.) is probably a variety. Of cultivated varieties there are the black, red, and white *Scuppernong*.

Beside the varieties that may be considered as derived from the wild species by simple variation, a number of hybrids have been purposely bred, such as *Arnold's* (between foreign and *Clinton*) and *Rogers's* (foreign and *Labrusca*). [From orig. art. in *J.'s Univ. Cyc.*, by PROF. EUGENE W. HILGARD, PH. D.]

**Vine, Diseases and Insect Enemies of**. See PHYTOXERA.

**Vinegar** [Fr. *vin*, "wine," and *aigre*, "sour;" Ger. *Essig*], a dilute solution of acetic acid, mixed with small quantities of sugar and other organic and vegetable matters. It is produced by the oxidation of alcoholic solutions. In the oxidation of alcohol an intermediate compound, *aldehyde*, is at first formed, which by the continued action of oxygen is ultimately converted into acetic acid. A dilute solution of alcohol is not, however, oxidized to acetic acid by simple exposure to air or oxygen; it is usually necessary that a peculiar fungoid plant (*Mycoderma aceti*) should be present. This fungus forms a gelatinous mass, having the appearance of glue that has been soaked in cold water. Its surface becomes rapidly coated with a bluish mould (*Penicillium glaucum*), which is sometimes observed in old bread. The formation of V. occurs more readily when, in addition to the presence of the *Mycoderma*, the following conditions prevail: The alcoholic fluid should be sufficiently dilute, not containing more than 10 per cent. of alcohol; the temperature should not be much below 70° F.; air (oxygen) should be supplied in abundance, and come into intimate contact with the solution to be aceticated. During the oxidation of alcohol to acetic acid an increase of the temperature and specific gravity of the liquid occurs.

*Wine vinegar* is manufactured in Paris by the following process: The wine is first mixed with wine-lees, and is then put into sacks, which are placed in a large vat and submitted to pressure from above. It is next introduced into large upright casks having an opening at the top, and allowed to aceticify. The regulation of the temperature exerts an important influence upon the quality of the V. produced. In summer, when the casks are exposed to the heat of the sun, the oxidation is usually completed in 2 weeks, but in winter, when they are placed in a warmed chamber, a month's time is often required. The liquid is then run off into barrels containing shavings of birch-wood, in which it is allowed to remain for 2 weeks, when the V. will be clarified and ready for use. The *Quick or German process* (*Schnell-essigbereitung*) is accomplished by causing the alcoholic liquid to fall in drops and meet an ascending current of air. The vessel employed consists of a large vat, about 8 ft. in height, and having a diameter of 3½ ft. at the top and 3 ft. at the bottom. About a foot from the real lower bottom it contains a false bottom, similar to a sieve in construction, which supports a layer of beech-shavings extending nearly to the top of the vat. Between the true and false bottom a row of air-holes half an inch in diameter is bored in a slanting direction from the outside downward. The beech-shavings are first boiled in water and dried; they are then "soured," or allowed to soak in warm V. for 24 hours, with which they become impregnated. At a short distance from the top of the vat a perforated wooden disk is fitted in, the perforations of which have about the diameter of a goose-quill; this also has several larger orifices inclosing glass tubes which permit the escape of the air from below. The space about the disk is filled with cotton batting or yarn, which becomes swollen and penetrates through the holes,



for a short distance, thus causing the liquid to trickle slowly upon the shavings. At the top of the vat is a closely fitting wooden lid, having in its centre a circular hole through which the liquid is introduced. After the shavings have been "soured," the liquid to be converted into V. is poured into one vat, and, as it flows off, is introduced into a second. The V., as it collects between the true and false bottoms of the vat, is removed by a tap, the end of which dips in the lower stratum of the liquid, and has its exterior end raised so that the liquid cannot flow out until quite a layer has accumulated. The temperature of the V.-room should be from 75° to 85° F., that of the vat from 95° to 100° F. This arrangement assists in the clarification of the V. The composition of the liquid to be acidified varies greatly. The prepared V. is preserved in a large vat to which  $\frac{1}{2}$  gal. of molasses is added every day, until a layer having a thickness of 2 to 3 inches is formed; in this way a fine color is imparted to the product.

**Malt vinegar**, which is the variety chiefly used in Eng., is generally prepared by submitting the wort obtained by mashing malt or a mixture of malt and barley to vinous fermentation, and oxidizing the resulting alcoholic liquor. This latter process can be effected as in the preparation of wine V., or by repeatedly passing the liquid through vats containing beech-shavings as in the quick process.

**Cider vinegar**, if made from good, sweet and ripe apples, is perhaps the most agreeable variety in use. In its preparation fresh cider is allowed to ferment in barrels having the bung-holes open, which are exposed either to the heat of the sun or to that of a warm cellar. It is well to allow several separate fermentations to take place, fresh quantities of cider being added to the barrels every 2 weeks; the acetification of the cider being also greatly accelerated by the addition of mother of V.

Pasteur has suggested a process of V.-making by the direct aid of the *Mycoderma aceti*. This fungus is first propagated in an aqueous solution containing 2 per cent. of alcohol, 1 per cent. of V., and small amounts of phosphates of potash, lime, and magnesia. When  $\frac{1}{2}$  of the alcohol has been acidified, small quantities of wine or alcohol, mixed with beer, are daily added, the complete conversion of the alcohol into V. being allowed to take place as soon as the acetification becomes weaker. The V. formed is then drawn off, and the plant again used in the same apparatus. Wine or malt liquors can be directly converted into V. by this process; but when only alcohol is used, the addition of sulphate of ammonia and phosphates of potash and magnesia, and a little V., is necessary in order to furnish the organic and inorganic food needful for the V.-plant.

**Distilled vinegar**—which is generally employed for pharmaceutical purposes—is weaker than ordinary V., since the boiling-point of concentrated acetic acid is above that of water. It is often contaminated with small quantities of alcohol, aldehyde, and empyreumatic substances. The quantity of acetic acid in V. differs greatly. The specific gravity is not an accurate indication of the strength, owing to the presence of foreign bodies. A preferable method consists in determining the amount of a standardized alkaline solution necessary to saturate the acetic acid present. [From orig. art. in *J. s. Univ. Cyc.*, by J. P. BATTERSHALL, Ph. D.]

**Vinegar Eels.** See ANGIULLULA.

**Vinegar-Plant.** See VINEGAR.

**Vineyard, R. R. centre**, Cumberland co., N. J., 34 m. S. of Phila. and 115 m. from New York. The town-plat is 1 m. square, not closely built, except for a few blocks on the main avenue. The prin. avenues are 100 ft. wide, the remaining avenues and streets 60 ft. in width. Outside the town-plat the tract is laid out in fruit-farms of from 5 to 25 acres, and there being few fences the appearance is that of an extended park. V. was founded by Charles K. Landis in 1861, and is devoted mainly to the culture of small fruits, to which the soil is especially adapted. The shipping of fruit is an important industry. Pop. of borough, 1880, 2519.

**Vines (RICHARD)**, b. in Eng. about 1580, received a med. education; was sent by Sir Ferdinando Gorges in 1614 or 1616 to act as his agent in planting a settlement on Saco Bay, Me.; spent there the winter of 1616-17, during the great pestilence which depopulated the N. Eng. Indians; gave them med. assistance; ascended the Saco River in a canoe to Crawford's Notch 1617; was the first white man who visited and described the White Mts., and received from the council of the Plymouth Co. in 1630 a grant of land on the Saco River, where, with John Oldham, he founded the towns of Biddeford and Saco.

**Vineyard Haven**, in N. E. part of Martha's Vineyard Island, Dukes co., Mass. Pop. 1880, 934.

**Vineyard Sound**, the passage between Martha's Vineyard and the Elizabeth Islands, on the S. coast of Mass. It is 30 m. long and 6 broad.

**Vinland** (the "wine-land"), the name which Leif the Lucky gave to those regions of N. Amer.—probably the coasts of Mass. and R. I.—which he visited in 1000 A. D. Leif was a son of Eric the Red, who had made the first settlement in Greenland, and on their way from Greenland to their home (Iceland) these settlers discovered Amer. In 1003 came Thorvald, a brother of Leif, and in 1007 Thorfinn Karlsefne, his brother-in-law. But when Thorfinn, after 3 years' stay, returned to Iceland, no more attempts were made to explore and settle the new country.

**Vinton**, city, cap. of Benton co., Ia., on R. R. and Cedar River, 25 m. N. W. of Cedar Rapids, has an acad. and the State coll. for the blind. Pop. 1870, 2460; 1880, 2906.

**Vinton (ALEXANDER HAMILTON)**, M. D., D. D., b. at Providence, R. I., May 2, 1807, studied med. at New Haven; practised as a phys. 1828-32; pursued a theological course in the P. E. Sem. at New York; was ordained 1835; was pastor of chs. at Portland, Me., 1835-36, Providence, R. I., 1836-42, Boston, Mass., 1842-58, Phila., Pa., 1858-61, New York 1861-70, and rector of Emanuel ch., Boston. D. Apr. 26, 1881.

**Vinton (DAVID H.)**, brother of following, b. in Provi-

dence, R. I., May 4, 1803, grad. at the U. S. Military Acad. in 1822; was sent to Fla. in 1836, where employed on quartermaster duty, and in 1837 made quartermaster-gen. of Fla. In 1846 he was made chief quartermaster on the staff of Gen. Wool, serving with the latter in Mex.; was chief quartermaster dept. of the W. 1852-56, of the dept. of Tex. 1857-61; was in Aug. 1861 made deputy quartermaster-gen., and chief quartermaster at New York. Promoted to be col. in 1864, in 1866 he became assistant quartermaster-gen.; was brevetted col. and brig.-gen. D. Feb. 21, 1873.

**Vinton (FRANCIS)**, brother of Alexander, b. at Providence, R. I., Aug. 20, 1809, grad. at W. Pt. 1830; studied law at Harvard Law School; acted as C. E. to several R. Rs.; was admitted to the bar at Portsmouth, N. H., 1834; served in the Creek war in Ala. and Ga. 1836; left the army in that yr.; studied theol. in the P. E. Sem., New York; was ordained 1838; was successively rector of chs. at Providence and Newport, R. I. (1840-44), and Brooklyn, N. Y. (1844-55); declined the bishopric of Ind. 1847; became assistant minister of Trinity ch., New York, 1855, and prof. of ecclesiastical law and polity at the General Theological Sem. 1869. Wrote *Manual Commentary on the General Canon Law of the P. E. Ch. in the U. S.* D. Sept. 29, 1872.

**Vinton (FRANCIS LAURENS)**, nephew of Dr. Francis, b. at Ft. Preble, Me., June 1, 1835, grad. at W. Pt. 1856; studied metallurgy at the Imperial School of Mines, Paris; examined the mineral resources of Central Amer.; was appointed capt. of the 16th U. S. Infantry, 1861; became col. of the 43d N. Y. Volunteers; was engaged in the Peninsular campaign in Hancock's brigade; was wounded at Fredericksburg; became brig.-gen. of volunteers Mar. 13, 1863; resigned May 5, 1863, and was made prof. of engineering in Columbia Coll. Sept. 1864. D. Oct. 6, 1879.

**Vinton (SAMUEL FINLEY)**, LL.D., b. at S. Hadley, Mass., Sept. 25, 1792, grad. at Williams Coll., Mass., in 1814; studied law in Middletown, Conn., and was admitted to the bar in 1816; removed to O., where he practised with eminent success; was M. C. from 1825 to 1837 and from 1843 to 1851; was appointed a com. under the act emancipating the slaves in D. C. in 1862. D. May 1862.

**Viola** (Lat. *violæ*), a large genus (*Viola*) of exogenous herbs of the order Violaceæ. Of the 200 recorded species, most are natives of the N. temperate zone. Many varieties have resulted from cultivation. Among these are the sorts called pansies, heartsease, etc. The cultivated sorts are mostly of the Old-World species, *V. tricolor*, *V. odorata*, *V. grandiflora*, *V. alba*, and their hybrids. One fine N. Amer. species, *V. pedata*, is becoming common in gardens, but most of our Amer. V. are not very showy plants in culture.

**Viollet-le-Duc**, ve-o-la'-leh-dûk (EUGÈNE EMMANUEL), b. in Paris Jan. 27, 1814, studied arch. under Leclerc, afterward in It. 1836-39; was employed after 1840 in the restoration of the prin. mediæval architectural monuments of Fr., among which was the cathedral of Notre Dame in Paris, and was appointed prof. of the hist. of art in 1863. Wrote *Histoire d'une Maison*, *Histoire d'une Forteresse*, *Histoire de l'Habitation humaine*, etc. D. Sept. 17, 1879.

**Vioménil**, ve-o-mā-nel', de (ANTOINE CHARLES DU HOUX), VISCONT, b. at Fancoucourt, Lorraine, Fr., in 1728, came to the U. S. in 1780 as second in command to Count Rochambeau; distinguished himself at the siege and capture of Yorktown 1781, where he led his troops in the storming of the redoubt; was promoted to a lieut.-generalship; returned to Fr. and became gov. of La Rochelle 1782, and was so severely wounded while defending the king during the assault upon the Tuilleries, Aug. 10, that he d. a few weeks later, Nov. 9, 1792.—His brother, CHARLES JOSEPH HYACINTHE DU HOUX, MARQUIS DE VIOMÉNIL, b. in 1734, was a maj.-gen. under Rochambeau in the U. S. 1780-82; was at Yorktown; was gov. of Martinique 1789-90; emigrated from Fr. as a royalist 1791; served under the prince of Condé 1791-97; became a peer 1814, a marshal of Fr. July 3, 1816, and a marquis 1817. D. Mar. 5, 1827.

**Viperidae**, a family of the order of serpents, embracing the viper of Europe and related species. The form is typified by the common viper; the scales on the back and sides are oblong and imbricated, those on the abdomen transverse scutellæ; the head is well distinguished from the body, and depressed oval; the upper surface covered with plates or scales; the eyes have, mostly, elliptical pupils; no lachrymal fosse are developed; the poison-fangs are truly solenoglyph, and destitute of external grooves. The family includes a number of poisonous serpents peculiar to the Old World. The most notable species are the viper of Europe (*Vipera berus*), the cobra de capello (*Naja tripartita*), and the Egyptian *Naja haje* and *Crotalus hussakovi*.

**Virchow**, fear-ko (RUDOLF), b. at Schivelbein, Pomerania, Oct. 13, 1821, studied med. in Berlin; received in 1849 a professorship of pathological anat. at the Univ. of Würzburg, and was in 1852 sent by the Bavarian gov. to the Spessart to investigate a famine fever which had broken out there; returned to the Univ. of Berlin in 1856, and acted as director of the hospitals during the campaigns of 1856 and 1870-71, taking part all the while with great energy in the political movements as a representative of the city of Berlin in the Frus. house of reps. He is the creator of the cellular theory in pathology.

**Vir'den**, city and R. R. June., Macoupin co., Ill. Pop. 1880, 1608.

**Virgil.** See VERGIL.

**Virgil (POLYDORÉ).** See VERGIL.

**Virgil'ia**, a genus of S. Afr. leguminous trees, to which the Amer. yellow-wood (*F. ulma*) is ascribed by Michaux; and though Rafinesque denies the connection, calling it *Cladrastis tinctoria*, it is usually known in the U. S. by the former name. It is a beautiful tree, about 40 ft. in height, with flowers in loose pendent racemes 20 inches long; is much prized for lawn-planting, and is hardy and easily grown from the seed.



**Virginia**, ver-jin'e-a, one of the Middle Atlantic States of the Amer. Union, and one of the original 13, lying between 36° 31' and 39° 27' N. lat., and 75° 13' and 83° 37' W. lon. Md. forms its N. and N. E. boundary; the Atlantic Ocean borders it on the E. and S. E.; on the S. it is bounded by N. C. and by Tenn.; on the W. and N. W. by Ky. and W. Va. The longest line in the State is from the Atlantic S. W. to the Ky. line, 476 m. The longest line from N. to S. is 192 m. The area of the State is 42,450 sq. m. or 27,168,000 acres.



Obverse.

yielding large crops. The Slope or third terrace running back to the watershed or head of tide-water, is thinner and less fertile. The ridge-lands of the Tidewater region are

Reverse.



The Seal of Virginia.

always level and very poor. Middle V. has much good and fertile land, but it has also much very poor and sterile soil. The soils of the Piedmont region are very fertile, as are also portions of the Blue Ridge country; but where the sandstones prevail on the W. slope, they are sandy and poor. The greater part of the soils of the Valley of V. are very rich and productive.

**Topography and Physical Geography.**—Tidewater V. is the alluvial and diluvial plain in the E. portion of the State, and is divided by Chesapeake Bay and the large tidal rivers which flow into it, into 9 primary and many subordinate peninsulas. It extends as far W. as Richmond. Middle V., a triangular tract extending from a N. and S. line running through Richmond to the foot-hills of S. W. Mt., is a wide undulating plain of no great elevation, through which many rivers have cut their channels to a considerable depth. Piedmont includes both slopes of S. W. Mt., and an undulating plain, broken into valleys in some portions, extending to the foot-hills of the Blue Ridge. It has many small streams, and its hills are rounded and fertile. The Blue Ridge country is a narrow belt, parallel with the preceding, including both slopes of the Blue Ridge Mts., and forming the E. wall of the Valley of V. The Valley of V. is a part of the great Appalachian Valley, lying between the Blue Ridge on the E. and the Kittatinny or Endless Mts. on the W. It is a broad belt of rolling country, diversified by hills and valleys, with many winding streams of water. Its soil is very fertile, and it is sheltered by the mts. on either side from chilling winds. Appalachia is the region covered by that part of the Kittatinny Mt. range traversing V. It is made up of a number of parallel mt.-chains, with trough-like valleys between them, the mts. often running 50 m. or more in an unbroken, single, straight, lofty ridge, with a narrow and equally uniform valley alongside; sometimes the mts. slope gently down and the valleys widen.

**Rivers and Lakes.**—Of the numerous rivers which drain the State,  $\frac{1}{2}$  belong to the Atlantic system and  $\frac{1}{2}$  to the O. and its tributaries. Of the streams flowing into Chesapeake Bay and the Atlantic, the prin. are—the Potomac, with its large tributaries, the Shenandoah and S. Branch, and several smaller ones; the Rappahannock, with its prin. affluent, the Rapidan, and numerous smaller ones; the Plankentank; the York, with its branches, the Pamunkey and Mattaponi, as well as smaller tributaries; the James, one of the largest rivers in the State, which receives the Chickahominy, Elizabeth, Nansemond, Appomattox, Rivanna, Willis, Slate, Rockfish, Tyne, Pedlar, South, Cowpasture, Jackson's, and other rivers and creeks. All these flow into Chesapeake Bay. The Chowan, with its affluents, the Blackwater, Notoway, and Meherrin; the Roanoke, by its branches, the Dan, Otter, Pig, and other streams, falls into Albemarle Sound in N. C.; and the Yadkin joins the Great Pedee and falls into the Atlantic in S. C. V. is not a country of lakes, but it has a number of bays and extensive estuaries at the mouths of its rivers.

**Minerals.**—Gold is found in Middle V., averaging in favorable localities from \$10 to \$24 per ton of ore. Silver and copper are also found in the same region, the latter mostly in the form of sulphurets or copper pyrites. Plumbago of good quality occurs in Halifax, Amelia, and other cos. Iron is found in the forms of limonite, magnetite, hematite, specular ores, micaceous peroxides, chromates, sulphurets, etc. Coal abounds in several parts of the State. In the S. W. it is bituminous; in the Valley, semi-anthracite; in the Richmond and other Middle V. coal-fields, bituminous. Gypsum (sulphate of lime) is found in extensive beds along the N. fork of Holston River, and so nearly pure that it yields with in 1 per cent. of an absolutely pure sulphate. Rock-salt and salt springs of very strong brine are found in the same vicinity, and from the artesian salt-wells at Saltville more than 1000 bushels of salt a day are made. Lead and zinc ores are found in the Valley. Umber exists in many places. There is a large deposit of kaolin in Augusta co., and barytes in Smyth and other cos. Manganese also occurs with hematite in Augusta co. Of building material—marble, breccia, limestone, freestone, Potsdam sandstone, slate, granite of excellent quality, brick and fire clays, etc.—there is a great abundance in all parts of the State except the Tidewater region; and of agricultural and fertilizing minerals—marls, greensand marls, gypsum, and the rich decomposed material of the epidotic rocks—the Tidewater region, S. W. V., and even the Blue Ridge region, furnish unlimited quantities. V. is remarkable for its mineral springs, both sulphurous and chalybeate.

**Soil and Vegetation.**—The soils of the first or alluvial bottoms deposited by the rivers and estuaries is of perpetual fertility. The second bottoms are of excellent quality,

This has been called the "garden of America." The valleys in the Appalachian region are generally rich and productive, but many of the ridges and mt.-slopes are sterile. There are considerable alluvial tracts here which are very rich. The forest trees of V. are numerous. The Tidewater region has large forests of yellow pine, oak, cypress, cedar, and locust, and the usual shrubs of marsh and low lands. Middle V. has much hard pine, black, white, and other oaks, hickory, locust, persimmon, gum, cedar, holly, and other trees, and among the shrubs sassafras and sumach. Piedmont has many varieties of oak, hickory, tulip tree, black walnut, locust, cedar, chestnut, butternut, and some pines. The Blue Ridge region is mostly covered with forests of white, black, red, rock, yellow, and black-jack oaks, hickory, chestnut, locust, birch, and some yellow pine. The Valley has nearly half its surface covered with oaks, hickories, locusts, black and white walnuts, yellow and other pines. Portions of Appalachia have forest trees, oaks, walnuts, white and yellow poplars, birches, beeches, locusts, wild cherries, sycamores, etc., of immense size, but generally very few pines, firs, or hemlocks.

**Climate.**—The mean annual temperature for the State ranges from 60° to 64° in the S. E. to 48° to 52° in the Valley and Appalachia, while the annual range from the severest cold of winter to the greatest heat of summer is not more than 86°. The annual rainfall ranges from 29.27 inches (Comorn, lat. 38° 17', lon. 77° 18', elevation about 75 ft.) to 48.58 (Lexington, lat. 37° 44', lon. 79° 25', elevation 2300 ft.).

**Zoology.**—The wild animals of V. are the black bear, panther, wild-cat, wolf, the lynx, raccoon, red fox, opossum, ground-hog, rabbit, squirrels of several species, the Va. deer; of birds, many species of ducks, teal, brant, wild-geese, swans, and the game-birds generally, especially wild-turkeys, grouse, pheasants, quail, partridges, pigeons, snipe, woodcock, etc. Song-birds and birds of prey are likewise very numerous. The fish are equally abundant, especially of edible species. The Crustacea are also well represented. Oysters of excellent quality abound in Chesapeake Bay.

**Agricultural Productions.**—The largest crops are wheat, Indian corn, and tobacco, the latter being valued at \$5,406,744 in 1880, being a production of 79,988,868 lbs. raised on 140,791 acres. Other crops yielded—wheat, 7,826,174 bushels; corn, 29,119,761 bushels; oats, 5,333,181 bushels; rye, 324,431 bushels; buckwheat, 186,004 bushels; barley, 14,223 bushels. Of cotton there were raised 19,595 bales. The wool clip of 1880 yielded 1,896,673 lbs.

**Farm Animals.**—The census of 1880 showed—horses, 218,838; mules and asses, 33,598; cattle, 686,184; sheep, 497,289; swine, 956,451.

**Manufactures and Mining Products.**—V. had, in 1880, 5710 manufacturing establishments, with capital of \$26,968,990, employing 40,184 hands, and paying in wages \$7,425,261; total value of products, \$51,780,692. Of these the iron and steel industry produced \$2,585,999. Of cotton factories V. had 8 in 1880, with 1322 looms and 14,340 spindles, using 11,461 bales of cotton, and employing 1112 hands; value of cotton goods manufactured, \$1,040,962. Amount of coal mined, 1881, 100,000 tons. Pig-iron production, 1881, 83,711 tons.

**Fisheries.**—The oyster fisheries of V.'s numerous and productive rivers have long formed a considerable element of wealth. The destruction of food-fishes of late yrs. by sweeping methods has led to the wide distribution of spawn and small fry by the U. S. Fish Commission, and this industry is now on the recovery. The shad, sturgeon, and black bass stand foremost among food-fishes produced.

**Railroads.**—There were in operation, Jan. 1882, in V. 2194 m. of railway, costing \$142,541,043, with net earnings of \$3,654,115, paying in interest and dividends \$1,934,508. The V. Midland, the Chesapeake and O., the Norfolk and Western, the Richmond and Danville, Richmond and Alleghany, and the Shenandoah Valley R. R. are the leading lines.

**Finances.**—The assessed valuation of property in 1880 was—real estate, \$233,601,599; personal, \$74,853,536; State tax, 5 mills on a dollar, producing \$2,067,678. State debt, 1882, \$29,614,798; the State, however, has "readjusted" its debt (1881), on the basis of paying in new 3 per cent. bonds from 53 per cent. to 69 per cent. of its face value. Total public indebtedness, State, county, and municipal, 1880, \$42,099,802; total raised by taxation, State and local, 1880, \$4,642,302.



**Commerce.**—V. has 4 ports of entry—Alexandria, Norfolk, Petersburg, and Richmond. The foreign commerce (chiefly exports of cotton) was, in 1881—exports, \$30,171,000; imports, \$236,735. The internal trade, by railway and river, is extensive, but without statistics. Shipping in 1882, 1152 sailing vessels and 107 steamers, measuring 37,312 tons.

**Banks, Etc.**—In Oct. 1881 V. had 18 national banks, with capital of \$2,966,000; circulation, \$2,444,700; U. S. bonds to secure circulation, \$2,753,350; aggregate deposits, \$9,564,387. There were also 53 State banks and trust cos., with \$2,280,452 capital and \$6,371,435 deposits; 18 private bankers, with \$369,792 capital and \$2,102,077 deposits; and 8 savings banks, with \$813,449 deposits. The insurance cos. paid losses in 1881 to the amount of \$624,200.

**Population.**—1860, 1,219,630; 1870, 1,225,163; 1880, 1,512,565 (white 880,858, colored 631,707, including 6 Chi. and 85 Indians).

**Principal Cities and Towns.** Pop. 1880.—Richmond (cap.), 63,600; Norfolk, 21,966; Petersburg, 21,636; Lynchburg, 15,959; Alexandria, 13,659; Portsmouth, including navy-yard, 11,390; Danville, 7526; Staunton, 6664; Manchester, 5729; Fredericksburg, 5010; Winchester, 4958.

**Education, Etc.**—There were, in 1880, 555,807 children of school age (5-21 yrs.), of whom 230,733 were enrolled in public schools, with average daily attendance of 129,006. Out of an aggregate pop., 10 yrs. and over, of 1,059,084, there were 360,495 unable to read, and 430,352 unable to write; of the latter number 315,660 were colored. Total expenditure for public schools, 1880, \$889,802, of which teachers' salaries required \$716,153. V. has 8 colls. and univs., with 68 instructors and 381 students, receiving in tuition fees, 1880, \$16,379. The Univ. of V. at Charlottesville, and Washington and Lee Univ. at Lexington, are the prin. There are also normal schools and many sems. for higher education of women. There were pub. in 1882 in V., 176 newspapers and periodicals, 17 of which were daily. There are 3 State insane asylums, and 1 for the deaf, dumb, and blind.

**Churches.**—The Bap. denomination leads, with 1316 chs., 708 ministers, and 205,909 members; M. E. S., 315 ministers, 88,326 members; Presb. S., 226 chs., 162 ministers, 18,884 members; Disciples of Christ, 150 chs., 115 ministers, 16,500 members; P. E., 140 chs., 128 ministers, 12,616 members; there are about 30 other denominations, having 50 to 12,000 members each.

**History.**—V. was the earliest settled of the Eng. colonies, but the first attempts at planting a colony there well-nigh miscarried. On May 13, 1607, the first party of 105 colonists, sent out by the Lond. Va. Co., landed at what is now known as Old Jamestown. They were mostly a company of needy adventurers, and the whole company would have perished but for the enterprise of Capt. John Smith. Smith took command of the colonists, and held it until the officers appointed by the Lond. Va. Co. should make their appearance. Nine vessels had been sent out by the company with 500 colonists, and the admiral, Sir George Somers, the vice-admiral, Christopher Newport, the lieutenant-gov., Sir Thomas Gates, and the high marshal, Sir Thomas Dale, all embarked on the same vessel; this vessel was wrecked on the Bermudas, but all the passengers were saved; one of the other vessels was lost, but the remaining 7 arrived safely at Jamestown, but without any rulers. They were as worthless as their predecessors, and Smith had great trouble with them. Having been severely wounded by an accident, he was compelled to return to Eng. in Dec. 1609. He left 500 colonists, well supplied with all necessities. Six months later, the number of colonists had dwindled to 60, and these on the verge of starvation. At this juncture (June 1610) Newport, Gates, and Somers arrived at Jamestown with 150 men and a moderate store of supplies, but finding the colonists in so sad a plight they resolved to abandon V. As they descended the river, they met Lord De la Warr with 3 ships, bringing supplies and colonists. They then returned to Jamestown, and Lord De la Warr established a trading-post at Hampton. Lord De la Warr's health failing, he returned to Eng., leaving Capt. George Percy as his deputy. New settlements were made at Henrico and at what is now City Point, and the lands, which had previously been held in common, were divided among the colonists. Lord De la Warr returned to resume the governorship, but died at the entrance of the bay. Sir George Yeardley, who succeeded him, was more popular. The culture of tobacco became profitable; new and more favorable laws were made; servants began to come into the colony in 1619 from 2 sources—felons or convicts sent over from Eng. prisons and sold to the planters for a term of yrs., and negro slaves brought by Dutch vessels from the Afr. coast. In 1624-25 the Va. Co. was dissolved by writ of *quo warranto*, and the colony reverted to the Crown. In 1652 the colonists reluctantly submitted to the rule of Cromwell, but in 1660 they reaffirmed their loyalty to the Stuart dynasty. Bacon's rebellion, which occurred in 1676, was the result of the rapacity of Gov. Berkeley and 2 favorite courtiers of Charles II. (Arlington and Culpeper), to whom he had given a patent of the V. colony. In 1683 William and Mary Coll. was founded. In 1689 the colony reluctantly acknowledged the accession of William and Mary. There were occasional conflicts with the Indians, but these were not serious until 1754, when the Fr. war commenced. V. resented the levying of taxes by the mother-country without representation as warmly as did Mass., and in 1765 adopted resolutions denying the right of any foreign body to levy such taxes. The colony was not a member of the first colonial congress of Oct. 1765, but approved its action, and asserted strongly, 4 yrs. later, their rights and liberties. But it was not until the accession of Lord Dunmore as gov. in 1772 that the opposition to the measures of the Brit. ministry began to be generally manifested. Lord Dunmore became at length so obnoxious to the people by his tyranny that he took refuge on board a Brit. man-of-war off Yorktown, and in June 1775 sailed down the river, and was declared by the general assembly to have abdicated his office. He subsequently attacked with a Brit. and Tory force several of the towns along the coast, but was eventually driven S. with heavy losses. In the autumn of 1774 a battle occurred between the Indians and a Virginian force of about 1200 men, at Pt. Pleasant on the O. River. The Indians were defeated, but the Virginians sustained considerable losses. In May 1776 a convention of delegates met at Williamsburg, issued a declaration of rights, and on the 12th of June adopted a State const. Committed thus to the cause of the Revolution, to which she contributed its commander-in-chief, V. was one of the theatres of the Revolutionary war, especially in its closing acts. Naval attacks were made on Norfolk, Portsmouth, and Gosport in 1779, and Benedict Arnold captured and burned Richmond in Jan. 1781. The battle of Jamestown was fought July 9, 1781, and the surrender of Cornwallis (the real close of the war) took place at Yorktown Oct. 19 of the same yr. V. led the way in calling the national convention which framed the const. of the U. S., and ratified that const. June 25, 1788. In 1784 she ceded to the U. S. her claim to the lands lying N. W. of the O. In 1860 and 1861 the people of V. were divided in their views on the subject of

COUNTIES.	Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
Accomack.....	6-J	20,409	24,408	Accomack C. H.....	.....
Albemarle.....	5-G	27,544	32,618	Charlottesville.....	2,676
Alexandria.....	4-I	16,755	17,549	Alexandria.....	13,659
Alleghany.....	3-E	3,874	5,586	Lexington.....	436
Amelia.....	6-G	9,878	10,377	Amelia C. H.....	.....
Amherst.....	6-F	14,900	18,709	Amherst C. H.....	.....
Appomattox.....	6-F	8,950	10,080	Appomattox C. H.....	.....
Augusta.....	5-F	28,763	35,710	Staunton.....	6,664
Bath.....	3-E	3,795	4,482	Warren Springs.....	dist. 1,075
Bedford.....	6-E	25,327	31,205	Liberty.....	2,191
Bland.....	7-D	4,000	5,004	Bland C. H.....	.....
Botetourt.....	6-E	11,329	14,809	Fincastle.....	675
Brunswick.....	7-H	13,427	16,705	Lawrenceville.....	238
Buchanan.....	7-B	3,777	5,694	Charlottesville C. H.....	123
Buckingham.....	6-G	13,371	15,540	Buckingham C. H.....	.....
Campbell.....	7-F	28,384	36,250	Rustburg.....	194
Caroline.....	5-H	15,128	17,743	Bowling Green.....	426
Carroll.....	7-D	9,147	15,323	Hillville.....	297
Charles City.....	6-B	4,375	5,512	Charles City C. H.....	.....
Charlotte.....	7-F	14,513	16,653	Smithville.....	.....
Chesterfield.....	6-H	18,470	25,085	Chesterfield.....	.....
Clarke.....	3-G	6,670	7,682	Berryville.....	189
Craig.....	6-E	2,942	3,784	New Castle.....	1,613
Culpeper.....	6-G	13,227	18,408	Culpeper.....	.....
Cumberland.....	6-G	8,142	10,540	Cumberland C. H.....	.....
*Dickenson.....	7-B	.....	.....	Clintwood.....	.....
Dinwiddie.....	7-H	30,709	32,870	Dinwiddie C. H.....	2,684
Elizabeth City.....	7-I	8,303	10,689	Hampton.....	574
Essex.....	6-E	9,927	11,032	Richmond.....	674
Fairfax.....	4-H	12,952	16,025	Fairfax C. H.....	376
Fauquier.....	4-G	19,680	22,993	Warrenton.....	1,464
Floyd.....	7-D	9,894	13,255	Floyd C. H.....	dist. 2,099
Fluvanna.....	5-G	9,875	10,809	Palmyra.....	310
Franklin.....	7-E	16,364	25,084	King George.....	845
Frederick.....	6-G	16,596	17,553	Winchester.....	4,958
Giles.....	6-D	8,575	8,794	Pearisburg.....	284
Gloucester.....	6-I	10,211	11,876	Gloucester C. H.....	72
Goocland.....	6-G	10,313	10,299	Goocland C. H.....	19
Grayson.....	7-C	9,587	13,068	Independence.....	308
Greene.....	6-G	4,634	5,830	Stauntonville.....	322
Greenville.....	7-H	6,382	8,407	Hicksford.....	621
Halifax.....	7-F	27,898	33,588	Halifax C. H.....	.....
Hanover.....	6-H	16,455	18,888	Hanover C. H.....	63,600
Henrico.....	6-H	66,179	82,702	Richmond.....	259
Henry.....	7-E	19,203	16,009	Martinsville.....	184
Highland.....	5-F	4,151	5,164	Monterey.....	154
Ile of Wight.....	7-I	8,390	10,572	Ile of Wight C. H.....	1,498
James City.....	6-I	4,495	5,422	Williamsburg.....	2,681
King and Queen.....	6-I	9,709	10,507	King & Queen C. H.....	.....
King George.....	5-H	6,742	6,297	King George C. H.....	.....
King William.....	5-I	7,515	8,751	King William C. H.....	79
Lancaster.....	6-I	5,355	6,160	Lancaster C. H.....	277
Lee.....	7-A	13,268	15,116	Jonessville.....	1,726
Loudoun.....	4-H	20,529	23,834	Leesburg.....	815
Louis.....	6-C	16,332	18,942	Louis C. H.....	347
Lunenburg.....	7-G	10,403	11,535	Lunenburg C. H.....	461
Madison.....	5-G	8,670	10,562	Madison C. H.....	382
Mathews.....	6-I	6,200	7,501	Mathews.....	103
Mecklenburg.....	7-G	21,318	24,610	Mecklenburg.....	166
Middlesex.....	6-I	4,981	6,252	Saluda.....	763
Montgomery.....	7-D	12,456	16,693	Christiansburg.....	1,963
Naseamond.....	7-I	11,576	15,903	Suffolk.....	.....
Nelson.....	6-F	13,898	16,536	Lexington.....	.....
New Kent.....	6-I	4,381	5,515	New Kent C. H.....	11,390
Norfolk.....	7-I	46,709	58,657	Portsmouth.....	dist. 3,653
Northampton.....	6-J	8,048	9,152	Eastville.....	dist. 2,063
Northumberland.....	5-I	6,563	7,929	Heathsville.....	.....
Nottoway.....	6-G	9,291	11,156	Nottoway C. H.....	632
Orange.....	5-G	10,396	13,052	Orange C. H.....	119
Page.....	6-G	8,469	9,965	Luray.....	614
Patrick.....	7-D	10,161	12,833	Stuart.....	543
Pittsylvania.....	7-F	31,343	35,589	Chatham.....	84
Powhatan.....	6-G	7,667	7,817	Powhatan C. H.....	2,058
Prince Edward.....	7-G	12,004	14,688	Farmville.....	.....
Prince George.....	6-H	7,430	10,054	Prince George C. H.....	212
Princess Anne.....	7-I	8,272	9,384	Princess Anne C. H.....	dist. 1,285
Prince William.....	4-H	7,504	9,150	Brentsville.....	.....
Pulaski.....	7-D	6,538	8,785	Newbern.....	254
Rappahannock.....	4-G	8,961	9,291	Washington.....	115
Richmond.....	6-E	6,503	7,195	Warrenton.....	1,599
Rosnoke.....	6-E	9,350	13,105	Salem.....	2,771
Rockbridge.....	6-F	16,058	20,003	Lexington.....	2,881
Rockingham.....	5-F	23,668	29,567	Harrisonburg.....	344
Russell.....	7-B	11,103	13,906	Lebanon.....	155
Routt.....	7-A	13,036	17,323	Eastville.....	1,000
Shenandoah.....	4-G	14,936	18,936	Woodstock.....	919
Smyth.....	7-C	8,898	12,160	Marion.....	95
Southampton.....	7-H	12,285	16,012	Jerusalem.....	.....
Spottsylvania.....	5-H	11,728	14,838	Spottsylvania C. H.....	.....
Stafford.....	7-I	6,420	7,211	Stafford C. H.....	.....
Sully.....	7-I	5,585	7,291	Sully C. H.....	.....
Sussex.....	7-H	7,885	10,062	Sussex C. H.....	.....
Tazewell.....	7-C	10,791	12,861	Tazewell C. H.....	829
Warren.....	4-G	5,716	7,399	Front Royal.....	1,064
Warwick.....	7-I	1,472	2,958	Warwick C. H.....	dist. 2,158
Washington.....	5-B	16,816	25,203	Abington.....	.....
Westmoreland.....	5-I	7,882	8,846	Montross.....	.....
Wise.....	7-B	4,785	7,772	Wise C. H.....	1,885
Wythe.....	7-D	11,611	14,318	Wythe.....	250
York.....	7-I	7,198	7,349	Yorktown.....	.....
Total.....		1,295,163	1,512,565		

\* Organized since census of 1880.

† Reference for location of counties. See map of Virginia.



secession. There was a long discussion, but on Apr. 17, 3 days after the capture of Ft. Sumter, the ordinance of secession was passed by 89 yeas to 55 nays. The W. counties opposed it, and as a result the State of W. Va. was formed in Oct. of the same yr. Richmond became the cap. of the Confed. States in the summer of 1861. The State was occupied by hostile armies during the whole of the c. war that followed. The battles of Bull Run, Carnifery Ferry, Ball's Bluff, Williamsburg, Winchester, Hanover C. H., Seven Pines and Fair Oaks, "the 7 days," June and July 1862, Cross Keys and Port Republic, Cedar Mountain, Manassas, Fredericksburg, Chancellorsville, Hanover Junction, the series of battles from the Wilderness to Cold Harbor in May and June 1864, Petersburg, Cedar Creek, Winchester, Fisher's Hill, the battles in the Valley, Lynchburg, Hatcher's Run, Five Forks, the capture of Petersburg, and the surrender at Appomattox, together with many less important actions, were all on Virginian soil. During a part of this time there were 2 State govts., the cos. which were loyal and under Federal control having instituted a State govt. at Alexandria in 1863. The State remained under military control till Jan. 26, 1870, when it was restored to the Union by Cong. under a const. adopted by the people July 1869, and compliance with the other provisions of the reconstruction acts.

#### Governors.

<i>Officers under the Virginia Co.</i>	John Blair, lieut.-gov. ....	1768
Edw. M. Wingfield, pres. ....	Norborne Berkeley, Lord	
John Ratcliffe, pres. ....	de Botetourt, gov. ....	1768-70
Capt. John Smith, pres. ....	William Nelson, lt.-gov. ....	1770-72
Sir George Percy, pres. ....	John, Lord Dunmore, gov. ....	1772-76

Thomas West, Lord De la		
Warr, gov. ....	1609-11	
Thos. Dale, high marshal. ....	1611-16	
George Yeardley, lt.-gov. ....	1616-17	
Capt. Sam'l Argall, lt.-gov. ....	1617-19	
Sir Geo. Yeardley, gov. ....	1619-21	
Francis Wyatt, gov. ....	1621-25	

#### Governors and Lieutenant-Governors under the Crown.

Sir George Yeardley. ....	1626-27
Francis West. ....	1627-28
John Potts. ....	1628-29
John Hervey. ....	1629-35
John West. ....	1635
John Hervey. ....	1635-39
Francis Wyatt. ....	1639-41
Sir William Berkeley. ....	1641-45
Richard Kemp, lieut.-gov. ....	1645
Sir William Berkeley. ....	1645-52

#### Governors (Commonwealth).

Richard Bennett. ....	1652-56
Edward Digges. ....	1656-58
Samuel Matthews. ....	1658-60

#### Governors under the Crown.

Sir William Berkeley. ....	1660-77
Herbert Jeffries, lt.-gov. ....	1677
Herbert Jeffries. ....	1677-78
Henry Chicheley. ....	1678-79
Thomas, Lord Culpeper. ....	1679-80
Henry Chicheley, lt.-gov. ....	1680-84
Lord Howard of Effingham. ....	1684-89
Nathaniel Bacon, lt.-gov. ....	1689-90
Francis Nicholson, lt.-gov. ....	1690-92
Sir Edmund Andros, gov. ....	1692-98
Francis Nicholson, gov. ....	1698-1704
The earl of Orkney. ....	1704-06
Edward Nott, lieut.-gov. ....	1706-06
Edmund Jennings, lt.-gov. ....	1706-10
Robert Hunter, lt.-gov. ....	1710
Alex. Spotswood, lt.-gov. ....	1710-21
Hugh Drysdale, lieut.-gov. ....	1722-26
Robert Carter, lieut.-gov. ....	1726-27
William Gooch, lieut.-gov. ....	1727-49
John Robinson, Sr., lt.-gov. ....	1749
Lord Albemarle, gov. ....	1749-50
Louis Burwell, lieut.-gov. ....	1750-52
Robt. Dinwiddie, lieut.-gov. ....	1752-56
John Blair, lieut.-gov. ....	1758
Francis Fauquier, gov. ....	1758-68

#### REVISED BY A. R. SPOFFORD.

**Virginia**, city and R. R. junc., cap. of Cass co., Ill., 32 m. W. of Springfield. It was laid out in 1836. Pop. 1870, 954; 1880, 1420.

**Virginia, or Verginia**, a Rom. maiden, daughter of Lucius Virginus, a patrician, and betrothed to Lucius Iellius. The decemvir Appius Claudius devised with one of his clients a plot to obtain possession of her, under pretence that she was a slave; and when, in spite of all the efforts of the maiden's father and lover, the decemvir had in his magisterial capacity adjudged her to be the slave of his accomplice, Virginus plunged a knife into his daughter's breast in the midst of the Forum, and the people, excited by this tragedy, overthrew the govt. of the decemvirs, and Appius committed suicide in prison.

**Virginia City**, city, cap. of Madison co., Mont., on the N. bank of Alder Creek and on the E. slope of the Rocky Mts., nearly 6000 ft. above the sea, in the vicinity of the gold-mines of Alder Gulch, to which it owes its settlement in 1863, and which has yielded over \$40,000,000. It was the cap. of the Terr. until Jan. 1875. Pop. 1870, 867; 1880, 624.

**Virginia City**, on R. R., cap. of Storey co., Nev., is the chief mining centre of the Pacific coast, containing the famous Comstock Lode, which has yielded gold and silver ore to the amount of \$5,000,000 per month. The city is built at E. base of Mt. Davidson. Pop. 1870, 7048; 1880, 10,917.

**Virginia Military Institute**, at Lexington, Va., established by Va. in 1819 upon the basis of the U. S. Military Acad. A State arsenal, containing 30,000 stand of arms, was located here and guarded by a company of soldiers at an annual charge to the State of \$6000. Through the earnest efforts of J. T. L. Preston, Esq., this appropriation was transferred to the support of the V. M. I., the cadets admitted by the State, free for board and tuition, doing duty as a guard in consideration therefor. Beside the State cadets admitted upon the basis of free board and tuition, a large number of pay cadets are received each yr., whose annual

expenses are about \$500. The depts. of instruction embrace — (1) math.; (2) Lat. and Eng.; (3) practical engineering; (4) animal and vegetable physiology; (5) inf., cav., and artill. tactics; (6) natural and experimental philos.; (7) practical astron., physics, descriptive geog., and geodesy; (8) mineralogy, geol., and metallurgy; (9) general and applied chem.; (10) modern langs., Fr. and Ger.; (11) civil and military engineering and applied mechanics. Each of these depts. is under the charge of a prof., with assistant profs. from the graduates as instructors.

**Virginia, University of**, an inst. of learning near Charlottesville, Albemarle co., Va., chartered in 1819 through the influence of Thomas Jefferson. Among the peculiar features which distinguish the Univ. of Va. from all other Amer. insts., the prin. one is its division into separate schools, 19 in number, each under the charge of a prof., who in several instances has assistant instructors. There is no general curriculum, but students select their schools, usually 3 in number, for each yr., and receive upon examination their respective degrees, which may be of six different kinds — namely, for proficiency in separate branches, for graduation in a single school, and the degrees of bachelor of letters, of science and of arts, and the degree of M. A., reserved for those who have grad. in a sufficient number of the schools. The inst. is under State patronage, having enjoyed from the beginning an annual appropriation of \$15,000, a sum which in 1875 was increased to \$30,000, on condition of free tuition for suitably prepared students who may be natives. There are 11 competitive scholarships open to students from any State, and 40 agricultural scholarships in connection with the dept. of agriculture founded in 1869 by Samuel Miller of Lynchburg with an endowment of \$100,000.

**Virgin Mary**. See IMMACULATE CONCEPTION OF THE VIRGIN MARY; MARY, THE BLESSED VIRGIN, and PURIFICATION OF THE VIRGIN.

**Viroqua**, Wis. See APPENDIX.

**Virus**. See APPENDIX.

**Visalia**, city, cap. of Tulare co., Cal., about 200 m. S. E. of San Francisco. It is within the delta of Kaweah River. Pop. 1870, 913; 1880, 1412.

**Visconti**, ves-kon'te [from the Lat. *vicecomites*, "vice-counts"], a Lombard family, obtained the sovereignty of Milan and extended its power over the whole of N. It. from Venice to Florence. The members of the family were conspicuous as shrewd politicians, able gens., and great patrons of lit. and art; but they were generally unscrupulous and cruel, and conspiracies, depositions, and assassinations fill the pages of their history. With GIAN GALEAZZO (1378-1402) the power of the family culminated. He founded the library at Pavia, re-established the Univ. at Piacenza, commenced the erection of the cathedral of Milan, built the Certosa and the bridge across the Ticino at Pavia, etc. He conquered Padua, Verona, Vicenza, etc., bought the title of duke of Milan from the emp. Wenceslas, and aspired to the royal crown of It., when he suddenly d. from the plague.

**Visum**. See MISTLETOE.

**Vishnu**, the second person of the Hindoo Trimurti. While Brahma is said to create, and Siva to destroy, the chief function of V. is said to be preservation. V. is presented to us under almost innumerable aspects. If we are to believe his votaries and those who have written in praise of him, we are bound to confess that he stands alone, as the incomparable chief of the Hindoo pantheon. The most remarkable thing about V. as a god is his avatars. It is his incarnations which present him to us as he is supposed to be, the champion of gods and men. First, we come to the incarnation in which V. took the form of a fish. There are many indications that the hist. of this avatar has some connection with that of the Hebrew account of the Deluge. Brahma, we are told, fell asleep, and a demon saw him thus unconscious. The demon's name was Hayagriva, who took the opportunity to steal the *Vedas*. These *Vedas* had proceeded from the 4 mouths of Brahma. Hayagriva succeeded in robbing Brahma, but was caught in the act and fast by the ever-watchful V., who determined to slay the doughty devil. V. took the form of a fish. The sage Manu was performing his religious ablutions. The fish slipped into his hands, addressed the pious sage, and claimed protection from the larger fish. Manu consented, and placed it in a pitcher of water. But the fish grew so large that he placed it in a pond. Then the pond was found too small, and the fish was placed in a lake. Then nothing but the sea would contain the enormous creature whereupon Manu became convinced of the divine character of the fish. "Satyavrata now understood that the fish was none other than Nârâyana, and after he had paid his adoration to the god, V. revealed to him the imminence of a deluge which would destroy the world, and told him that a large vessel would appear to him, in which he was to embark, together with the 7 Rishis, taking with him all the plants and all the seeds of created things. Manu obeyed the behest of the god, and when the water covered the face of the earth, V. again appeared to him in the shape of a golden fish, with a single horn 10 thousand m. long, and to this horn Manu attached the vessel. V.'s serpent serving as a cord. While thus floating in the vessel, Manu was instructed by the fish-god in the philosophical doctrines and the science of the Supreme Spirit; and after the deluge had subsided, the fish-god killed Hayagriva, restored the *Vedas* to Brahma, and taught them to the Manu Satyavrata."

Next comes, in the usual order assigned, the tortoise avatar. The gods had been growing weak; the demons were growing stronger and stronger. Even the men on earth, by performing meritorious acts of austerity or by offering up extraordinary sacrifices, were getting stronger, and equal in strength with the gods themselves. So the gods, after solemn consultation, repaired to the omnipotent V., who directed them to churn the ocean of milk, with the mt. *Mandara* for their churning-stick. This was to be stuck down into the sea, cone downward, and the long serpent of



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MAP OF  
**DELAWARE, MARYLAND,**  
**VIRGINIA**  
AND  
**WEST VIRGINIA.**

Drawn and Engraved on Copper-Plate  
EXPRESSLY  
FOR

**JOHNSON'S CYCLOPEDIA**

Scale of Miles

0 5 10 20 30 40 50













V., *Vāsuki*, to be coiled round the mt. The demons were to pull at the head of the snake, and the gods to pull at the tail, each alternately, so that the mt. should revolve in the sea of milk, and churn it. V. himself, taking the form of a tortoise, descended to the bottom of the sea to support the mt. on his back while it revolved on the pivot of his scales. All this was done that the nectar of immortality, called *Amrita*, should be obtained for the gods, that their strength might be renewed and perfect invulnerability obtained.

We now come to the avatar in which V. takes upon himself the form of a boar. In one version of the legend, Brahma tries to reach the head of Siva, while V. assumes the form of a boar, and, digging to the foundations of the earth, tries to arrive at the feet of the god. But he is the illimitable one. Brahma descends, and tries to make believe he has accomplished the feat he attempted, but is exposed and cursed by Siva. V. ascends crestfallen, his tusks utterly worn out, without having been near the fulfilment of his purpose. But, according to some accounts, it was Brahma who, taking the form of a boar, tried to raise up the earth above the waters. The deluge was wickedness; the boar was the power of religious ceremonial.

The *Vāmana-avatāra*, or incarnation in which V. appears as a dwarf, is certainly one of the most poetical and pleasing of his many appearances among mortals. King *Bali* was so powerful a monarch that he overcame *Indra* himself. He was lord of heaven, earth, and hell, and tyrannized over the greatest gods. By excessive austerities and unrivalled sacrifices he became so powerful that it was only by craft that the almighty V. could himself overcome him. So, while Bali was performing on an extraordinary scale a sacrifice in honor of the gods, so that thereby he might acquire still more power by his meritorious action, and rule more despotically and supremely than ever, a dwarf approached him and did him reverence. Bali was pleased, and asked the little Brahman what he would like for a gift. The dwarf said, "Only as much ground as I can cover by taking three steps." This comical request was at once granted, when the god leaped up as the mightiest of the host of heaven, and, placing one foot on earth, one on the middle space, and one over heaven, gained to himself the three worlds, leaving only hell to Bali. In the next avatar V. appears as a man-lion, and this incarnation is called *Nṛ-siṃha-avatāra*. In it the Preserver is represented as saving the gods from the might, acquired by the most rigorous penances, of *Hiran'yakas'ipu*. This man could not die. He was lord of all the universe. He performed the omnipotent, god-overpowering horse-sacrifice. But even in his case the wily V. was too much for him, and again upheld the might and supremacy of heaven.

*Hiran'yakas'ipu*, in consequence of his prolonged meritorious austerities and sacrifices, forced from Brahma the gift of a life which could not be destroyed by any created being. His motive was anger against V. The moment *Hiran'yakas'ipu* obtained this invulnerability, he began to molest the gods and to persecute the votaries of V. At length V. took upon himself to slay this demon without there being any need for Brahma's vow being broken. He came, therefore, not in the form of a being which had been "created," but as a new creation, a man-lion, and tore the heart of the demon from out of his breast with his sharp claws.

The *Parasū-Rāma* avatar of V. is not very interesting, as its glory is overshadowed by that of the great *Ramachandra Avatāra*. It was the liberation of the universe from Arjuna of the thousand arms which was accomplished under this incarnation. Arjuna acquired malignant power by deeds of unexampled piety. Arjuna was of the military class of Hindoos, a Kshatriya, and V. vowed to extirpate him and his whole caste. Using an axe or a bow, he did this; and it has been supposed that the legend is in essence historical, recording a great struggle in primeval times between Brahmans and Kshatriyas.

The avatar of V. as Rama is one of the most remarkable of Oriental myths, and is given in full in that magnificent epic, the *Rāmāyana*. The whole history of this incarnation is one wild fight with demons and powers. It can scarcely be doubted that the myth is intimately connected with the inroad of S. Indian Aryans into Ceylon.

Next comes the Krishna avatar. Krishna was born a hero and champion of the great Pānduva kings in their wars against the Kurus. He first comes to earth as the opponent of *Kausa*, the fend-king, who terrorized over gods and men. To annihilate *Kausa*, he, with *Balarāma*, determined to become incarnate, born of the 7th and 8th births of *Devaki*. When a few yrs. old they killed powerful demons and played all kinds of pranks with shepherds, uprooting trees, overturning heavy wagons, etc. When 7 yrs. old he killed a 7-headed snake-demon on the Jumna. A little time afterward he persuaded some votaries of *Indra* to worship the mt. *Govardhana*, rather than V. himself. This greatly incensed the sky-god, who, to punish the land, sent down for a whole week a deluge of rain on the shepherds who had left off worshipping him; but these were not injured, for Krishna tore up by its roots the mt. *Govardhana*, and held it up, base upward, like an umbrella, over the heads of those who obeyed his behests! Finally, *Indra* worshipped Krishna as omnipotent. V. now took to the wildest excesses of carnal lust. His dark-blue face and comely form at once produced an impression on the hearts of susceptible *Gōpis*, or shepherdesses, and led to a thousand of them being ravished by Krishna. Krishna and his brother at length slay their great enemy *Kausa*, after having killed 2 of his pugilists before thought to be invincible. Krishna was especially noted for lust and for thieving; so now we read of him stealing a miraculous tree from *Indra's* heaven. He died by an arrow from a hunter's bow. The hunter thought he was a deer, and wounded him in the sole of his foot. Much more might be written of V., but we must conclude our remarks by a passing allusion to the *Boodha* avatar, the 9th. It is evi-

dently a late invention of the Jain sect, who tried to reconcile Brahmanism with Buddhism. The last avatar is yet to come, when the great god with the 4 hands will accomplish all things in the final *Kalki* avatar. [From orig. art. in *J. S. Univ. Cyc.*, by R. C. CALDWELL.]

**Visible Speech.** See DEAF AND DUMB.

**Visigoths.** See GOTHES.

**Vision**, vizh'un [Lat. *visio*, "seeing," *videre*, to "see"], the power or faculty by which we perceive the forms and colors of objects through the sense of sight. The faculty itself it is impossible to explain, but the physical conditions necessary to its manifestation are capable of very explicit statement. The medium of V. is light, and the organ of V. is the eye. Of this organ the structure has been described under its proper title. (See EYE.)

**Vision, Defects of.** See SIGHT, DEFECTS OF.

**Visitation Nuns**, first established in 1610 at Annecy, Savoy, by St. Francis de Sales and St. Jane Frances de Chantal, received papal approbation in 1626; introduced into the U. S. in 1808 by Teresa LaSalle.

**Vis'tula** [Pol. *Wisła*; Ger. *Weichsel*], river of Europe, rises in Aus. Silesia in the Carpathian Mts., 2000 ft. above the sea, flows with a winding course, but generally in a N. direction, through Poland and E. Prus., and enters the Baltic through several mouths. Its entire course is 616 m.; at its entrance into Poland, after receiving the San, it is navigable for large vessels.

**Vital Statistics** may be defined as that branch of statistical science which has for its office the collection and arrangement of facts relative to the 3 epochs of human life, including special information bearing upon the preservation of health and the causes of disease; and from the study of these facts the discovery of certain laws bearing upon the increase of pop., and the duration of human life. The birth, the marriage, and the death of an individual are the 3 events which should be recorded and preserved among public archives for future reference.

Birth-rates are usually estimated in proportion to the entire pop. or to every 1000 of the pop.; and in countries where the registration has been brought to any considerable degree of perfection it is found that the annual number of recorded births varies from 29 to 40 for every 1000. It is also shown that more boys than girls are born. Several ingenious theories have been advanced in explanation of this excess of male over female births. But it is generally believed that one strong determining cause of the excess of male over female births is the difference in the ages of the parents. Times, places, and seasons all exert their influence upon birth-rates. In times of prosperity and plenty we may expect more births than during periods of reverses, pestilence, and famine. In N. countries, where many marriages occur late in life, there will be fewer births than among the more precocious inhabs. of warmer countries. The birth-rate is usually highest in the first 3 months of the yr. According to Dr. Buek of Hamburg, of 1000 births, 312 take place between midnight and 6 A. M., 249 between 6 A. M. and noon, 183 between noon and 6 P. M., and 256 between 6 P. M. and midnight.

Marriage under ordinary circumstances is favorable to longevity. According to the statistics of Fr., Belg., and Hol., married men from 25 to 30 yrs. of age die at the rate of 6, unmarried at the rate of 10, and widowers at the rate of 22, per 1000 per annum: from 30 to 35, the death-rates of these several classes are respectively 7, 11, 19½; from 35 to 40, married men die at the rate of 7½, per 1000 per annum, unmarried at the rate of 13, and widowers at the rate of 17½. On the other hand, men who marry between the ages of 18 and 20 yrs. die as rapidly as men aged from 65 to 70. From 30 to 35 yrs. of age spinsters die at the rate of 11, and wives at the rate of 9, per 1000 per annum, while under 25 the mortality is somewhat greater in wives than in spinsters. The expectation of a man married at 25 is that he will live to the age of 65, while that of the unmarried man of the same age is that he will live to the age of 60. The married woman at 25 may expect to attain the age of 65, the unmarried at that of 56. Crime is least frequent among the married, more so among the widowed, and most common among those who have never married. Marriages of consanguinity are regarded as tending to some imperfection in the physical and mental development of children. According to Fr. statistics it appears that there is in the offspring of such marriages a strong tendency to insanity, idiocy, deaf-mutism, scrofula, or some physical deformity.

In order to be able to estimate accurately the value of death-records as indicating the rate of mortality and the sanitary condition of a city or country, it is necessary to have a complete registration of births, the amount of yearly immigration, together with a frequent and correct census of the pop. It is customary to estimate the death-rate, as well as the birth-rate, in proportion to every 1000 of the inhabs. as given by the last census or as estimated yr. by yr. according to the usual rate of yearly increase. There seems to be a fixed law requiring that at least 11 human beings out of every 1000 of the entire pop. die annually. These are regarded as inevitable deaths, and any considerable number in excess of these are generally set down as resulting from the ignorant or wilful violation of some one or more of nature's laws.

The subject of infant mortality is one of great interest alike to the sanitarian and the philanthropist. It is a melancholy fact that of all the deaths which occur throughout the world, a large percentage is of children under 5 yrs. of age. This is more so in cities, where there are large tenement pops., and less so in the country, where the children are fed upon good milk and are allowed to breathe a pure atmosphere. In cities it is necessary for health authorities to pay a good deal of attention to the sanitary wants of tenement pops., with a view of saving infant life. [From orig. art. in *J. S. Univ. Cyc.* by E. H. JAMES, M. D.]

**Vit'elline** [Lat. *vitellus*, "yolk of egg"], the albuminoid



or proteid constituent of the yolk of eggs. It is deemed to be merely a mixture of ordinary albumen and caseine.

**Vitellus** (AUCRES), b. in Rome Sept. 24, 15 A. D., was a great favorite with Tiberius, Caligula, Claudius, and Nero. Galba sent him to Ger. in Dec. 68, as commander of the legions there, and here he was proclaimed emp. by the soldiers Jan. 8, 69. Galba was murdered Jan. 15, and Sp. and Gallia recognized V. In Rome Otho had assumed the imperial dignity, but he was defeated at Bedriacum by V.'s gens., and stabbed himself Apr. 15, 69. July 18, V. entered Rome at the head of an army. Meanwhile Vespasian had been proclaimed emp. by the armies of the East, and his gens. approached It. V. was found hiding in a corner of the palace, dragged out into the Forum, and put to death by a common soldier Dec. 21, 69.

**Viterbo** [anc. *Viterbium*], a city and commune in the prov. of Rome, Central It., in a region fertile in a great variety of agricultural products, among which hemp is particularly important, with rich pasture and many valuable mineral deposits. From these sources is derived a great quantity of raw material, the elaboration of which furnishes employment to many laborers. V. has also several mineral springs, very various in temperature and composition, which are beneficial in many diseases. With these great natural advantages V. naturally very early became an important seat of industry and civilization. Pop. 19,654.

**Viti Islands.** See FIJI ISLANDS.

**Vitrified Forts,** a remarkable class of pre-historic fortifications almost peculiar to Scot. and its islands. They are made of silicious stone, and the inside has been vitrified by the action of fire and of wood-ashes, the stone being transformed into a kind of glass.

**Vitriol, Oil of.** See SULPHURIC ACID.

**Vitriols** [Lat. *vitrum*, from the glassy character of the crystals], a generic name among the earlier chemists for the sulphates, often still applied in common lang. Thus, ferrous sulphate is green V. or iron V., cupric sulphate is blue V. or copper V., zinc sulphate is white V. or zinc V.

**Vitruvius Pollio**, a Rom. architect and author of a treatise on arch. in 10 books, dedicated to the emp. Augustus, and which appears from internal evidence to have been composed about B. C. 14. In respect to its subject it is very important, as it is the only one of the kind that has come down to us. V. discussed his art in its widest sense. In the first 7 books he treats of arch. proper, ecclesiastical and private building; in the 8th, of water and aqueducts; in the 9th, of sun-dials; and in the 10th, of machines.

**Vittoria Colonna.** See COLONNA (VITTORIA).

**Vives**, vee'ves (JUAN LUIS), D. C. L., b. at Valencia, Sp., in Mar. 1492, studied at the Univ. of Paris and Louvain, after which he visited Eng., and was chosen one of the first fellows of Corpus Christi Coll., Ox., 1517; was employed by Henry VIII. as tutor to the princess Mary (1523), for whose use he wrote his *De Ratione Studii Puerilis* and *De Institutione Fœminæ Christianæ*; was disgraced and imprisoned for having argued and written against the divorce of Queen Catharine of Aragon (1528), and afterward settled as a classical teacher at Bruges (1529), where he spent the remainder of his life; with his intimate friends, Erasmus and Budeus, formed a triumvirate to which was ascribed the leading part in the revival of lit. D. May 6, 1540.

**Vivisection** [literally, the "opening of the living body" (*sectio vivi*), in contradistinction to that of the dead body (*sectio cadaveris*)]. The examination of the interior of the dead body, both in animals and in man, is resorted to for purposes of anatomical research, and also to ascertain the changes produced by disease. V., on the other hand, is employed for investigating, in the lower animals, the action of the organs during life. The term, however, is used to designate all experiments of a scientific nature performed upon living animals. The necessity for resorting to experiments upon living animals in physiology and the allied sciences depends upon the obvious fact that these sciences have to deal with the actions and phenomena of life; and consequently, in order to study them successfully, the necessary investigations must be made while life is going on. Where the necessary steps of an experiment are of a nature to cause pain to the animal, as in cutting operations, this is generally avoided by the use of ether or chloroform.

The results which have been attained by means of experiment upon the living body constitute nearly the whole of the actual knowledge possessed in physiology. The earliest investigator of note who employed this method was Galen, and his discovery of the true function of the arteries, about 150 A. D., forms a striking illustration of its necessity and usefulness. This was the first demonstration of the important fact that the arteries are blood-vessels, and that there are in the body 2 kinds of blood—namely, venous blood in the veins, and arterial blood in the arteries. William Harvey in 1628 completed our fundamental knowledge of the circulation by his discovery that the blood, after passing from the heart outward through the arteries, returns again to the heart by the veins, thus moving in a continuous round through the vascular system. This discovery was also the fruit of experimentation on living animals. The knowledge thus gained of the circulation soon led to other important results, one of which was the possibility of the *transfusion of blood* from one animal to another. This was first demonstrated in 1665 by Richard Lower, who succeeded in transferring blood from the vessels of one dog into those of another, the second dog being allowed to bleed freely at the same time, but being kept alive by the blood received from the first.

The function of *respiration*, which is immediately essential to life, has come to be understood mainly through experiments upon animals. The first important knowledge in regard to it was obtained in 1670 by the Hon. Robert Boyle, who inclosed animals of various kinds in the receiver of the air-pump. He demonstrated in this way not only that atmospheric air is necessary in all cases to the maintenance

of life, but also that when confined in a limited space it becomes vitiated by continued respiration, and that in order to maintain life the vitiated air must be removed and replaced by a fresh supply. Lavoisier in 1777 discovered, by experimenting with sparrows, that the respirable ingredient of the air could be removed by the calcination or oxidation of mercury, showing that the substance (oxygen) which combined with the metal was the same with that absorbed by animals in the process of breathing. But if he set free the oxygen from its metallic combination, and added it to the irrespirable residue of the air, the mixture again became respirable and capable of supporting life. He further proved that the animals in breathing not only consumed the oxygen of the atmospheric air, but at the same time exhaled another gas—namely, carbonic acid—which could be made to unite with lime-water and form carbonate of lime. In this manner it was ascertained that the process of respiration consists essentially in the absorption of oxygen and the exhalation of carbonic acid.

The functions of the *nervous system* have been the subject of experimental investigation from very early times. Galen showed that the nerves are the channels through which the commands of the will are conveyed to the muscles, and that the spinal cord is the conductor for voluntary impulses proceeding from the brain to the nerves of the body and limbs. The researches of modern physiologists have been directed to ascertain the special functions residing in particular nerves or nervous centres.

The natural mode of the *reproduction of bone* when a portion of its substance is destroyed or removed was discovered by a series of researches extending from 1740 to 1858. It was discovered that if the fibrous covering of the bone, or its "periosteum," were left behind in such cases, while the broken fragments were removed, new bony tissue would be produced and a solid union effected.

The foregoing illustrations indicate the manner in which experimentation on animals has been rendered serviceable to physiological science and to practical med. [From orig. art. in *J.'s Univ. Cyc.*, by Prof. J. C. DALTON, M. D.]

**Vizier**, viz'yer [Ar. "burden-bearer"], the title of many dignitaries in Mohammedan countries, first bestowed in 750 A. D. by Abul Abbas (Al Saffah), the first Abbasside caliph, upon his prime minister, whose duty it was to bear as far as possible the burdens of his master. At present the grand V. of Turkey is the chief minister of state.

**Vogel**, fo'jel (EDUARD), b. at Crefeld, Rhenish Prus., Mar. 7, 1829, went in 1853 to Afr., with the support of the Eng. govt., to join the expedition of Clapperton, Barth, and Overweg. Feb. 20, 1858, he sailed from Eng. to Tripolis; Aug. 5 he reached Moorsook, and Jan. 13, 1864, Kuka, the cap. of Bornoo. From this place he undertook various expeditions to the adjacent countries; met Barth at Bunde Dec. 1, 1864; visited Yacoba, and returned to Kuka Dec. 1, 1865. At this date his own notes stop, but it was afterward ascertained that on Jan. 1, 1866, he started eastward, penetrated to Wara, the cap. of Waday, and was assassinated there Feb. 8, 1866.

**Vogt** (KARL), b. at Giessen, in Hesse-Darmstadt, July 5, 1817, studied med. at the univ. of his native city, and worked a year and a half in the laboratory of Liebig; removed in 1835 to Berne, where he studied anat. and physiology under Valentin; settled in 1839 at Neuchâtel, where for 5 yrs. he assisted Agassiz in his various investigations; pub. *Untersuchungen über die Entwicklung der Geburtshelferknöte und im Gebirg und auf dem Gletschern*; resided from 1844 to 1846 in Paris, and pub. *Lehrbuch der Geologie und Petrographische und Physiologische Briefe*; travelled in It., and was in 1847 appointed prof. of nat. hist. at Giessen; in 1852 was appointed prof. of geol. at Geneva, and in 1853 at Berne. Pub. forth *Ocean und Mittelmeer, Untersuchungen über Thierstaaten, Bilder aus dem Thierleben*, etc.

**Voice, Loss of.** See APHONIA; THROAT, DISEASES OF.

**Void and Voidable.** *Void*, in its strict and only correct sense, denotes that a transaction, contract, conveyance, or other instrument is an absolute nullity. *Voidable*, on the other hand, denotes that a transaction, contract, conveyance, or other instrument is so tainted with imperfection that it may in some manner and by some method be avoided and rendered null. It was a general doctrine of the common law that no person but an immediate party to the voidable transaction or relation, and his personal representatives, could object to its legality and render it, or procure it to be rendered, a nullity. Statutes have in certain instances modified this principle, and have extended the power of nullifying to others who have been made special representatives of the party for that purpose.

**Volatile or Essential Oils.** See OILS.

**Volcanoes** [Lat. *vulcanus*]. *Nature and Formation of Volcanoes.*—A V. is a mt., generally of conical shape, with a circular cup-like opening, or basin, at its summit, called a *crater*. In the centre of the crater is the mouth of a perpendicular shaft or chimney, which emits clouds of hot vapor, gases, and, at times of greater activity, masses of ashes, hot fragments of rocks, and streams of fiery, liquid rocks, called *lava*, which flow down the slopes of the mt. The gradual accumulation of these ejected materials around the mouth of the V. forms a succession of concentric layers, which explains its conical form. Volcanic activity, though it be continuous, differs very much in degree at different times. Nearly all the active V. have times of relative repose, interrupted, often at great intervals, by periods of increased activity, which terminate in a violent ejection of incandescent matter from the interior. The V. is then said to be in a state of *eruption*. Vesuvius rises solitary to the height of nearly 4000 ft., from the midst of a highly cultivated plain bordering the shores of the Bay of Naples. Though the mt. is of a regular conical shape, 2 summits, almost equal in height, are visible from Naples—Monte Somma on the N., Vesuvius proper on the S. The first, however, is but the N. half of the crater-rim of the old



Vesuvius, the S. half of which was destroyed by the first eruption of that V. in historical time, in the year 79 A. D. Vesuvius proper is the new cone, which gradually grew out of the old crater by the accumulation of the materials ejected during subsequent eruptions.

**State of Repose.**—After an eruption the energies of the V. seem to be exhausted. It enters into a state of relative repose. After the great eruption of Oct. 1822 the crater of Vesuvius was emptied to the depth of 700 to 800 ft.; its rim was broken and partially sunk on the S. several hundred ft. Of the dense clouds of smoke nothing remained but a few jets of vapor and gases, called *fumaroles*. The lava, deeply sunk in the chimney, had almost disappeared from sight. Gradually, however, the V. rallies; the fumaroles become again more active and more numerous, and their united vapors form the usual column which rises from the crater. The lava reappears in the chimney. On its boiling surface, exposed to the atmosphere, a crust is formed which bursts under the effort of the captive steam, sending into the air fragments of red-hot and melted lava, which fall back and accumulate around the chimney. This process is repeated every few minutes; a cone of eruption is thus built up around the mouth of the chimney. This cone grows more and more in dimensions. Occasional overflows of lava, and the materials which fall from the crumbling walls, help to fill the intervals, and the crater is once more full to the edge. When the crater is thus full and its mouth choked, a great eruption is expected. Under the weight of these masses the expansive forces below accumulate, and the signs of an approaching eruption soon appear.

**Forebodings of the Eruption.**—In Vesuvius the usual forebodings of a great eruption are the drying up of the wells and springs, caused by internal evaporation and numerous fissures in which the underground waters are lost. Loud subterranean noises, like explosions of distant artill., shocks of earthquake which shake the surroundings of the V., and the large increase of the volume of vapors which escape from the boiling lava in the crater, indicate the mighty struggle which is going on within the bowels of the mt.

**Eruption.**—At last the eruption begins, generally with a tremendous burst, which seems to shake the mt. to its very foundations, and hurls into the air dense clouds of vapor and of pulverized lava or ashes. The explosions succeed each other with rapidity and increasing violence. Each sends upward a globular cloud of white steam. This long array of fleecy clouds, accompanied by dark ashes, volcanic sand, and fragments of hot lava of all sizes, soon assumes the form of a stupendous column. Checked in its ascending motion by gravity, it expands, in a quiet atmosphere, into a dark circular cloud, which, with the pillar beneath, has the shape of an immense umbrella.

**Atmospheric Phenomena accompanying the Eruptions.**—The sudden condensation of such an enormous accumulation of hot vapors gives rise to striking atmospheric phenomena. Vivid flashes of lightning start from all parts of the column. Electricity rages also in the cloud above, and a local thunderstorm is often formed in the midst of the clear surrounding sky, which pours a heavy rain of warm water and ashes along the slopes of the mt.

**Emission of Lava.**—At last the boiling lava flows over the rim of the crater in fiery torrents along the slope of the cone, or bursting the mt. itself by its weight, finds vent by some fissure far below on some point of its declivity. After the expulsion of lava the V. seems to be relieved, and the eruption is generally near its end.

**Period of Eruption.**—The eruption, however, does not necessarily terminate here. The alternate phases of outbursting steam, ashes, and lava may continue, with more or less violence, for weeks and months, until the V. enters again into a slumbering state. A series of such eruptions, separated by intervals of a few yrs., in which signs of activity are still numerous, constitute a period of eruption.

**Form of Volcanic Products.**—**Ashes.**—The microscopic examination and chemical analysis of volcanic ashes prove them to be nothing but the pulverized lava, containing sometimes a large proportion of minute crystals. These fragments of lava are of all sizes. The most minute fragments, forming an impalpable powder suspended in the air, and often transported by the winds to a distance of hundreds of miles, are called ashes. Coarser materials take the name of volcanic sand. Larger fragments are called by the Italians *lapilli*—i. e. "small stones." Still larger pieces of melted lava assume by cooling in their descent a pear-shape form. Others, exploding in their ascent, are called volcanic bombs. Irregular fragments of all sizes, large pieces of the walls of the crater, are also thrown out with great violence.

**Lavas.**—Lavas are remarkable for an almost complete absence of quartz. The lava-stream, when flowing from the crater white-hot, is not unlike a jet of melted iron escaping from the furnace. Moving at first with considerable rapidity, it soon cools on the surface, and is covered by a hard, black, and porous crust, the interior remaining in an incandescent state. Innumerable jets of vapor escape and nearly hide the surface. Inclosed, as in a sheath, by that hard covering, the stream rolls slowly upon itself, progressing at a rate which varies according to the slope, and the liquidity of the lava. The cooling, though rapid at the surface, is very slow in the interior; if the stream is thick, the lava will be found still warm after 10 or 20 yrs. This slow cooling allows the lava to crystallize into a compact rock much resembling granite or porphyry. Glassy lavas, like obsidian, reduced into foam by the action of hot vapors and cooled, give pumice-stone.

**Arrangement of Volcanoes on the Earth's Surface.**—Though V. are but local and apparently independent accumulations of ejected materials, they are mostly arranged in long, straight lines, more or less interrupted. The V. of S. Amer. are all on the long line of the Andes; those of N. Amer. on the line of the Sierra Nevada and Cascade ranges. On a similar line are also the numerous V. of Sumatra, those of Java, and many others along the coast of the Asiatic con-

tinents. Other V. seem more isolated, or form groups composed of a central V. surrounded by secondary ones. Vesuvius and Etna in Europe; the Canary Islands, the Azores, and Iceland in the Atlantic; the S. I. and the numerous groups of Polynesia in the Pacific, and many more in the Indian Ocean, are usually considered as examples of this class.

**Distribution of Volcanoes.**—Though V. are found in every continent and ocean, and in all lats., they are not equally distributed on the surface of the globe. They follow certain lines and cluster in distinct groups. The most important feature of their distribution is, that nearly all are situated along the mt.-chains and rows of islands which border the shores of the continents, while the interior of these great land-masses is nearly free from them. Leaving out a few extinct V., the only well-authenticated exception to that rule is the existence of a few volcanic centres around the Thian Shan Mts., in the very heart of the continent of Asia, midway between the Arctic and Indian oceans, nearly 2000 m. from the sea in every direction—the V. Bo-Shan, with lava streams; that of Turfan; the Solfatara of Ourumtzi, which sometimes emits ashes.

**Two Great Volcanic Zones.**—There are 2 great terrestrial zones in which are found, arranged in long lines or isolated groups, nearly all the V. of the globe. The first zone is the vast circle of mt.-chains, peninsulas, and rows of islands which surround the Pacific Ocean and girdle it with a belt of burning mts. Beginning at the extreme point of S. Amer., in Terra del Fuego, with the somewhat doubtful V. of Sarmiento, it extends along the Andes, in which are found 3 of the most remarkable series of V., separated by intervals of hundreds of miles, those of Chili, Bolivia, and Ecuador counting together 67 V., 37 of which are still active. Then follows the rich group of Central Amer., with 57 V., 22 being active. The series of Mex. has 6 active V., beside full as many extinct ones. In N. Amer., the series of the Sierra Nevada and Cascade Mts., the group of Alaska, and the long series of the Aleutian Islands, have together over 80 V., half of which are active, mostly in the Aleutian Islands. Passing to the Asiatic continent, we find the series of Kamchatka peninsula, with not less than 38 V., 12 of which are active; the line of not less than 35 V., with 20 V., half of which are now extinct; the group of the Japan Islands, which numbers 46 V., with only 7 active. Between Japan and the Philippine Isles 23 V. may be counted, of which 7 are active; in the Philippine and Molucca Isles, 31, most of which are in a state of activity. At last the Australian line: New Guinea, with 3 active; New Britain, with 2 active and 1 extinct; New Hebrides, with 2; New Zealand, with 7 extinct and 2 active volcanic cones, terminate that brilliant girdle of fiery beacons around the Great Ocean. Including those which are extinct, the number of V. in that zone reaches 392.

The second volcanic zone, though less continuous, is hardly less remarkable. It is a belt of broken lands, islands, peninsulas, and inland seas, which runs in a slanting direction around the globe, separating the N. from the S. continents. Starting from Central Amer., with its isthmus full of V., its landlocked seas, its peninsulas and islands, and the volcanic series of the Lesser Antilles, it passes through the volcanic groups of the Azores and Canary Islands to the Mediterranean and its peninsulas, including the active V. of Europe—Vesuvius, Etna, the Lipari Islands, and Santorin. Entering Asia Minor, with its numerous extinct V., it passes through Ar., the Red Sea, the Per. Gulf, and the 2 peninsulas of India, all rich in traces of the activity of the internal fires. Thence crossing the E. I. Archipelago and its hundreds of burning mts., it reaches those of the Friendly Isles, and, running through all the Polynesian volcanic groups, meets again the great isthmus of Central Amer. Including those of the latter region, this zone has 108 V.

The 2 zones just described contain therefore, together, no less than 500, or  $\frac{2}{3}$ , of all the existing V.

**Height of Volcanoes.**—V. are of all heights, from the submarine cones which do not reach the surface of the ocean to that of Sahama in Bolivia, the highest of the known V., which rises to 23,000 ft. above it. Nay, if we accept as probable the idea that such V. as Mauna Loa, nearly 14,000 ft. high, have their base at the bottom of the deep ocean which surrounds them, the total elevation of such a structure may even reach that of the highest mts. of the globe.

**Vole** [Fr.], the name given in Eng. to species of the genus *Arvicola*, which is the type of the sub-family Arvicolinae, belonging to the family Muridae. The related species found in the U. S. are generally known under the name field-mice.

**Volga**, vol'ga, the largest river of Europe, rises in the govt. of Tver, Rus., in the Valdai Hills, at an elevation of 663 ft. above the level of the Caspian Sea, flows southward with a winding and tortuous course, and enters the Caspian Sea through 60 or 70 mouths after a course of 2500 m. It receives from the right the Oka and the Svora, and from the left the Tvertsa, Mologa, Sheksna, and Kama, and by canals is connected with the Dwina, Neva, and Dnieper, thus communicating with the Baltic and the White and Black seas. Between Nizhnee-Novgorod and Astrakhan it is navigable for the largest vessels; above Nizhnee-Novgorod, only smaller crafts can ascend it; and below Astrakhan, and throughout the whole of its mouth, it is very shallow.

**Volney**, vol'nei: Fr. vol'ná, de CONSTANTIN FRANÇOIS CHASSEBIEU, COCNET, b. at CRUON, dept. of Mayenne, Fr., Feb. 3, 1757, studied med. and Oriental langs. in Paris; spent subsequently several yrs. in Egypt and Syria, and pub. after his return to Fr., *Voyage en Egypte et en Syrie*. Elected a deputy for Anjou to the States-General of 1789, he advocated the ideas of the Revolution; pub. in 1791 *Les Ruines, ou Méditations sur les Révolutions des Empires*, and *La Loi naturelle, ou Catechisme du Citoyen Français*. In 1794 he was appointed prof. of hist. at the Normal School; travelled in the U. S. from 1795 to 1798; was made a senator in 1799, and



pub. in 1803 *Tableau du Climat et du Sol des États-Unis d'Amérique*. After the establishment of the Empire he retired from the senate, but Nap. made him a count in 1808, and Louis XVIII. a peer in 1814. In 1814-15 he pub. *Recherches nouvelles sur l'Histoire ancienne*. D. Apr. 25, 1820.

**Volsci**, an anc. people of Central It., inhabs. of the region directly E. of that of the Latini and W. of that of the Samnites. They were the hereditary enemies of the Latini and of the Romans, and allies of the Æqui.

**Volta** (ALESSANDRO), b. at Como Feb. 18, 1745, was first prof. of physics at Como, and then in the Univ. of Pavia, where he taught and studied for 30 yrs. In 1769 he pub. a dissertation, *De Vi attractiva Ignis Electrici*: in 1775 invented the perpetual electrophore, in 1777 a lamp for inflammable gas, in 1782 the electric condenser, and finally arrived at the invention of the famous pile which bears his name, in 1800. D. Mar. 5, 1827.

**Voltaire**, de (FRANÇOIS-MARIE AROUET), b. at Châtenay Feb. 20, 1694, the most brilliant French author, who by his genius and wit ruled as an absolute monarch in the kingdom of letters during the 18th century. He was a master-architect of ruin, and prepared the way for the mighty upheaving of society in Fr. He received his education in a Jesuit coll.; studied law; became sec. to the Marquis Châteauneuf (ambassador to the Hague); was dismissed on account of a love-intrigue; imprisoned in the Bastille for a satirical pamphlet on the decease of Louis XIV., which he hailed as a national deliverance; wrote the *Henriade* and *Œdipe*, which created much sensation and procured his liberty; was presented to the regent, who gave him 1000 crowns; changed his name from AROUET to VOLTAIRE; became the idol of fashionable and literary society; fell desperately in love with a lady of high rank, who gave him no encouragement; challenged the Chevalier de Rohan, who had insulted him, to duel; was arrested by the police and again sent to prison. Disgusted with the society and govt. of Fr., he accepted an invitation from Lord Bolingbroke to Eng. Aug. 1726, and spent there nearly 3 yrs. in friendship with the leading deists, whose opinions he adopted. He returned to Paris 1729; pub. *Brutus*, *Zaïre*, the *Hist. of Charles XII.*, and *Letters on the English* (which gave great offence to the clergy and were condemned to be burned); formed a *liaison* with Mad. Gabrielle Châtelet 1735, which lasted till a yr. before her death (1749); wrote on the philos. of Newton (1738), *Mahomet* (1741), and *Méropé* (1743). On invitation of Frederick the Great, who admired his genius and sympathized with his infidelity, but after closer personal acquaintance despised his character, he spent 3 yrs. in Berlin and Potsdam (July 1750-53), but was dismissed in disgrace, and arrested on his return to Frankfurt, and required to give up some of the king's poetry (which he called "a quantity of dirty linen"). He then settled with his niece at Ferney near Geneva 1755, where he spent the most tranquil and useful part of his life. He procured by untiring exertions the restoration of the good name of Jean Calas, who had been unjustly condemned to death at Toulouse by Romish bigotry (1762); composed or finished *La Pucelle* (1755), *Essay on the Manners of Nations*, a sort of philos. of hist. (1756), *Candide* (1758), *Tancrède* (1768), and other works; and contributed to the famous *Encyclopédie* of Diderot and D'Alembert. In 1778 he once more visited Paris, and was received with extravagant demonstrations of enthusiasm. D. May 30, 1778.

V. was a man of sparkling genius, diversified talent, vast reading, untiring industry, quick wit, and unrivalled power of mockery; full of vanity, levity, petulance, avarice, malice, regardless of truth and charity—"half monkey, half tiger;" yet not without generous impulses and noble indignation against oppression, injustice, tyranny, and hypocrisy. His historical works (*Charles XII.* and *Siècle de Louis XIV.*) are models of clear, elegant, and lively narration. His poetic genius excels in tragedy (*Zaïre*) and epic (*Henriade*), but is destitute of heart and real pathos. His critical and satirical power is unsurpassed. He had a keen and bright intellect, a quick perception of defects, and could wield the dangerous weapons of irony and sarcasm with withering effect. "He had," says Carlyle, "the eye of a lynx, saw deeper at the first glance than any other man, but no second glance was given." He displayed his wit and power of ridicule at the expense of truth and justice, and he even uttered the most reckless falsehoods with unblushing assurance. He was a Mephistopheles who delighted in mischief, in ridicule, and denial. Yet he was necessary in Fr., and had the mission to lay bare the rotten state of society in Ch. and State, and by destruction to prepare the way for reconstruction. His talents excite admiration, his character contempt. His only claim to our regard are his few acts of generosity and his services to the cause of religious toleration, although he aimed at freedom of infidelity rather than freedom of faith.

**Literature.**—*Œuvres* (Geneva and Paris, 1768-96, 45 vols.; Paris, 1802, 55 vols.; 1825, 66 vols.; 1827, 72 vols.; 1832, 95 vols.; 1834, by Benoit, 70 vols. (Brunet calls this "la plus belle, du moins la plus complète et la meilleure édition"). Eng. translation of his works by Smollett, Franklin, and others (Lond., 1770, 87 vols.). The best biographies are by Strauss, Morley, and James Parton. PHILIP SCHAFF.

**Volturnus**, the tutelary goddess of the Etruscan confederation, at whose temple (*Fanum Volturnæ*) the general meetings of the deputies from the 12 cantons were held. The worship of V. was doubtless anterior to the irruption of Etruscans proper into the region called by their name.

**Volumetric Analysis**, a branch of quantitative chem. analysis, in which the substance to be estimated is subjected to characteristic reactions, solutions of known strength being employed for this purpose, from the quantity of which required, the substance sought can be determined, by aid of the fixed laws of equivalence. Volumetric processes usually require less time and less elaborate apparatus for their execution than the ordinary methods by weight; and as they afford equally if not more accurate

results, they are particularly well adapted for technical purposes, such as the valuation of commercial products. Gay-Lussac, who first suggested this method of analysis, was impressed with the advantage of estimating silver by the use of a solution of common salt (sodium chloride). But the method itself did not come into general use till within the last 30 yrs.

**Vomiting of Blood.** See HÆMATEMESIS.

**Voorhees** (DANIEL W.), b. in Fountain co., Ind., Sept. 26, 1828, grad. at Indiana Asbury Univ. 1849; was admitted to the bar 1851; was U. S. dist. atty. for Ind. 1858-61; defended John E. Cook for participation in the Harper's Ferry raid 1859; was a Dem. M. C. 1861-65 and 1869-71, and U. S. Senator 1877-85.

**Vörösmarty** (MIHÁLY), b. at Nyék, Hungary, Dec. 1, 1800, studied law in Pesth, but devoted himself subsequently entirely to literature, and wrote some of the finest epics—*Zalán Judás* (1825), *Eger* (1827), and dramas, *King Solomon* (1821), *Kont* (1825)—of the Hungarian lit. Some of his minor poems also became very celebrated, as, for instance, the patriotic song, *Szózal* (1845). After the unfortunate issue of the Hungarian revolution of 1848-49, V. retired broken-hearted to his country-seat. Subsequently he recovered his spirits and began a translation of Shakspeare, but d. Nov. 9, 1856, before finishing it.

**Vorstius**, for'ste-us (CONRAD), b. in Cologne July 19, 1559, studied theology at Heidelberg; was in 1596 appointed prof. of divinity at the gymnasium of Steinfurt. Meanwhile his treatises, *De Prædestinatione*, *De Sancta Trinitate*, and *De Persona et Officio Christi*, made him suspected of Socinianism, and he was compelled in 1599 to go to Heidelberg and vindicate his orthodoxy. He was acquitted, and in 1610 he succeeded Arminius as prof. of theol. at Leyden, but here his treatise *De Deo* was attacked most violently by the Gomarists. James I. of Eng. became interested in the case; *De Deo* was burned by the hangman in Lond. and Ox.; V. was deposed in 1612, and solemnly condemned as a heretic by the Synod of Dort in 1619. He lived concealed until 1622, when the duke of Holstein offered the Arminians an asylum. D. Sept. 29, 1622.

**Vosges** (vôzh) **Mountains**, a range of mts. on the left bank of the Rhine, situated partly in N. E. Fr., partly in S. W. Ger., and running parallel with the Schwarzwald (or Black Forest) Mts. in Baden, which they resemble very much, not only in direction, but also in form and geological structure. By the depression between Montbéliard and Mülhausen they are sharply separated from the Jura Mts., and their E. slopes toward the plain of the Rhine are steep and abrupt. But to the N. they connect with the Harde in Rhenish Bavaria, and to the S. W. by the plateau of Langres through the hills of Faucilles. They afford excellent pastures on their tops during the six months of the yr. in which they have no snow. Their highest peaks rise between 4000 and 5000 ft. Mineral and thermal springs are numerous, and copper, iron, lead, and rock-salt abound.

**Voss** (JOHANN HEINRICH), b. at Sommersdorf, Mecklenburg, Feb. 20, 1751, in 1778 was appointed rector of the gymnasium at Ottendorf in Hanover. In 1782 he removed to Eutin, near Lubeck, as rector of the gymnasium there. From 1802 to 1805 he resided in Jena, where he enjoyed a pension from the grand duke of Saxe-Weimar. In 1805 he accepted a chair in classical lit. at the Univ. of Heidelberg, and here he d. Mar. 29, 1826. He had an uncommon mastery of the Ger. lang. and a fine sense for formal correctness of verses. His translation of Homer had considerable influence.

**Vossius**, vosh'e-us (GERARD JOHANNES), b. near Heidelberg in 1577 of Dutch descent, studied classical langs. and lit. at Leyden and Dort, and was appointed in 1600 rector of the school of Dordrecht, and in 1615 director of the theological school at Leyden, later also prof. of eloquence in the univ., but became entangled in the controversies between the Arminians and Gomarists by his *Historia Pelagiana Libri IV.* (1618). Through Abp. Laud he received a prebend in the Cathedral of Canterbury, and in 1629 went to Eng. to be installed, but soon returned to Hol., and was made prof. of hist. at the newly founded Coll. of Amsterdam, in which city he d. Mar. 17, 1649. The most remarkable of his works are *Aristarchus sive de Arte Grammatica*, *Etymologicum Lingue Latine*, *Commentarium Rhetoricorum sive Oratoriarum Institutionum Libri VI.*, etc.—His 6 sons were all prominent men, but only the youngest, ISAAC VOSSIUS, survived him. He was b. at Leyden in 1618, and received the instruction of his father. In 1648 he went to Stockholm on the invitation of Queen Christina, but fell out with Salmasius, and returned to Hol. in 1658. In 1670 he removed to Eng., and was made canon of Windsor in 1673 by Charles II. His prin. works are *De Septuaginta Interpretibus*, *De Poematum Cæli et Viribus Rhythmi*, *Variarum Observationum Liber*. D. Feb. 21, 1689.

**Vulcan** [Lat. *vulcanus*], a planet supposed to be revolving around the sun, within the orbit of Mercury. About 20 yrs. ago Leverrier announced that certain perturbations in the orbit of Mercury could only be accounted for by the existence of another planet still nearer the sun. Within 3 yrs. after Leverrier's announcement, Dr. Lescarbault detected the supposed planet in its transit across the sun's disk.

**Vulcan**, in Rom. mythology, the god of fire, and of those arts which depend on the use of fire, became in course of time completely identified with the Gr. Hephæstus, and was, like him, imagined to have his earthly abodes, his workshops, in the volcanoes, where he was served by the Cyclopes. Numberless myths were formed in connection with Hephæstus and transferred to V., but most of them were of a humorous turn.

**Vulcanite and Vulcanization.** See INDIA RUBBER.

**Vulcano**, or **Volcano**, the southernmost of the Li. pari or Æolian islands, in the Mediterranean Sea, 12 m. off the N. coast of Sic., is 7 m. long, and 3 m. broad, and contains nearly in the centre a crater over 1200 ft. high and about ¼ m. in circumference. The S. part of the island is



very fertile, and produces excellent corn, grapes, fruit, and flax. The interior is sterile, and on the N. side the island is connected by a row of low rocks with the Vulcanello, a minor crater, likewise emitting smoke and vapors.

**Vulgate, The.** Lat. translations of the Bible. The Lat. is one of the 3 oldest versions of the O. T., the Gr., the Syriac, and the Lat., and one of the 2 oldest of the N. T., the Syriac and the Lat. The hist. of its origin is lost, but it is certain that it was made in Afr., and in the 2d century. The Lat. version of the N. T. appears to have arisen from individual and successive efforts; for St. Augustine says that any one in the first ages of Christianity who gained possession of a Gr. MS., and thought he had a fair knowledge of Gr. and Lat., ventured to translate it. And as the LXX. about A. C. 250 furnished the mould in which the thoughts and expressions of the Gr. Testament are cast, so the LXX. may have taken a Lat. form for the Lat.-speaking Jews, and thus may have made ready a dialect for the Lat. version of the N. T. But, however this may have been, there is found, in fact, a substantial similarity between the character of the O. T. and the N. T. in Lat., and this justifies the belief that there was one Lat. version of the Bible current in Afr. in the last quarter of the 2d century.

The name Vulgate originally answered to the designation of the Gr. version of the O. T., the *κοινή έκδοσις*. As the *vetus versio* of the O. T. was made from the LXX., and in substance identified with it, St. Jerome introduces Lat. quotations from the O. T. under the name of LXX. or *Vulgata editio* indifferently, and thus this term was transferred from the current Gr. to the current Lat. of the O. T. This use of the expression *Vulgata editio* continued to later times. After the translation received a definite shape in Afr., it was jealously guarded by ecclesiastical use, and was retained there even when St. Jerome's version was almost universally received elsewhere; and the disturbance caused by an Afr. bp.'s attempt to introduce one of the changes of St. Jerome shows how carefully intentional alterations were avoided. But at the same time the text suffered by the natural corruptions of copying and by the interpolation of glosses, especially in the Gospels, and thus the different forms of the text became almost as numerous as the copies.

St. Jerome had not long been in Rome (A. D. 383), when Pope Damasus consulted him on points of scriptural criticism. The answers the pope received may well have encouraged him to seek for greater services, and, apparently in the same yr., he applied to St. Jerome for a revision of the current Lat. version of the N. T. by means of the Gr. original. St. Jerome undertook it, and confined himself strictly to the labors of a reviser. In the prosecution of his work he collected early Gr. MSS. and introduced the necessary changes, but preserved the old renderings where the sense was not injured by it. Some of his alterations were made purely on linguistic grounds; others involved questions of interpretation; the greater number, however, consisted in the removal of the interpolations by which the first 3 Gospels especially were corrupted.

The old version of the O. T. was made from the unrevised form of LXX., and thus included many false readings and other imperfections. Therefore, about the same period in which St. Jerome revised the N. T. he put his hand to the O. T., and made a new version of it directly from the Heb., which seems to have been completed in 392. This stupendous work is an enduring monument of his piety, his genius, and his learning. The critical labors of St. Jerome were received with an outburst of reproach. He was accused of disturbing the peace of the Ch. and of undermining the foundations of the anc. faith. Acknowledged errors were looked upon as hallowed by usage, and few had either interest or courage to seek the purest text of Holy Script. Even St. Augustine was carried away by popular prejudice and endeavored to discourage St. Jerome from his work. But the improved translation gradually came into use side by side with the old, and at length supplanted it, and this without any direct ecclesiastical authority.

At the invention of the art of printing, St. Jerome's Bible was the first book produced from movable types, about 1455. It was printed again and again by various hands and in various forms, but it was not until the heat of controversy in the 16th century exaggerated the differences in the text and in the interpretation that an authorized edition was determined on for the Ch. of Rome. This was undertaken by Pope Sixtus Quintus, and put forth in 1590. Though declared by the pontiff *authenticum* and in a manner *absolutely perfect*, it contained such typographical and other errors as to compel the publication of a second and revised edition in 1592, of another in 1593, and still another in 1598, with a triple list of *errata*, one for each of the preceding editions. This is the standard of the *Vulgate*, or R. Cath. Bible, of the present day. The MS. form of St. Jerome's Bible—which, upon the whole, stands highest in the estimation of scholars—is the *Codex Amiatinus* of the 6th century, now in the Medicean Library at Florence. The editors employed by Pope Sixtus rightly valued this MS., and in some passages solely or chiefly followed its authority. The portion containing the N. T. has been repeatedly published, and is easily accessible, as ed. by Fleck (1840, 12mo), common text with the Amiatine variations; by Tischendorf (1854, roy. 8vo), Amiatine text with learned prolegomena.

The excellences of the V. are great and marvellous, and even its defects, generally arising from a scrupulous desire to keep close to the side of the sacred original, often suggest or confirm points of the gravest importance. Prof. Lachmann, Prof. Tischendorf, and Dr. Tregelles, the 3 greatest names connected with the textual criticism of the Gr. Testament in recent times, adopting the view of the learned Bentley, regarded the Lat. in the purest and most ancient forms as the most important witness to the integrity of the N. T. text to the Gr. MSS., nor did they fail to observe that the Lat., in some phases, goes back to a period which no Gr. MS. now extant represents. The V. is, to a degree not

generally understood, the venerable parent of our own translation, the Authorized Version. The hist. of our Eng. Bible begins with Wycliffe, and the Wycliffite version, as it is now more strictly called, was made directly from the V. But while this great work was completed by Wycliffe and his coadjutors, a certain preparatory work had, in God's providence, already been done. Cædmon embodied the entire hist. of the Bible in the alliterative A.-S. poetry; Aldhelm, bp. of Sherborne in the 7th century, translated the Psalter; Venerable Bede translated the Gospel of St. John; Alfred the Great translated the 4 chaps. of Exodus xx.-xxiv. as the basis of his laws, rendered some of the Psalms and other portions of the Bible for the use of his own children, and an old tradition—though we cannot substantiate it now—makes him the translator of the entire Bible; there is an A.-S. version of the Gospels, interlinear with the V., the *Durham Book*, which belongs to the 9th or 10th century; there is another, called the *Rushworth Gloss*, of the same period in the Bodleian Library; there is another of a somewhat later date in the Bodleian and in Christ Ch. Coll., Cambridge; we have the famous *Ornulum*, a metrical paraphrase of the Gospels, assigned to the latter half of the 12th century; there is a prose translation into Norman Fr. of about 1390, which shows that there must have been a demand for the Holy Scriptures, among the rich and refined, and perhaps in the court itself; 3 versions of the Psalms, that portion of the Bible which has always been most dear to the hearts of the Eng. people, were made in these early days—one toward the close of the 18th century, another by Schorham about 1390, and the 3d by Rolle of Hampole about 1349. All these partial and preliminary versions also were made directly from copies of the V.

The influence of the Wycliffite version, representing the whole V., has been great and constant on all the subsequent Eng. versions and revisions, furnishing apt and established words and phrases, which subsequent translators and revisers were neither willing nor able to lay aside. When the R. Cath. exiles in the reign of Elizabeth produced at Rheims an Eng. version for their own brethren, it was professed, of course, to be made out of the *authenticum Latin*, but the translators in innumerable cases, and most wisely, followed the previous Eng. versions; and though the Rheims has defects which time has brought to light, yet it has such and so many good points, chiefly by exactly representing the original Gr. in adhering closely to the faithful Lat. forms, that our new revision of 1881 often follows in its steps, as the Rheims did in those of the Reformers.

We have spoken in general of our indebtedness to the V. To be more particular, when the V. was turned into its earliest Eng. form, the A.-S. version, it was hardly possible that this act should not have greatly modified our lang. by introducing new words, mostly religious, and by giving us new forms of construction; and again, this work would be carried further by the Wycliffite version, and was perhaps nearly consummated in the Rheims, the last great version that preceded our own. Our Chr. nomenclature itself has thus in great measure been furnished to us by the V., and many of these precious words were either invented in Lat. or there first used in their higher and spiritual sense, such as *regeneration*, *conversion*, *justification*, *sanctification*, *predestination*, *election*, *propitiation*, *reconciliation*, *Saviour*, *salvation*, *Redeemer*, *redemption*, *Mediator*, *Spirit*, *cross*, *faith*, *grace*, *revelation*, *inspiration*, *Scripture*, *Testament*, *communion*, *orders*, *congregation*; some words are Gr., but given to us through the Lat., as *baptism*, *Paraclete*, and *presbyter* or *priest*; while some were coined in Lat. to copy the Gr., as *transgressor* from *transgressor*, in imitation of *παπαβαυρος*. If we say, as we may with truth, that Christianity in the first instance was received in the Gr. lang. and through Gr. thought, we may surely say that it was adopted in Europe chiefly in Lat. forms; and the influence of the V. upon the religious lang., thought, and culture of Europe, and upon our own, can hardly be overestimated.

CHARLES SHORT.

**Vulpius** (CHRISTIAN AUGUST), b. at Weimar Jan. 23, 1762, studied at Jena and Erlangen; received an appointment at the library in Weimar in 1797, and d. there June 26, 1827. He wrote a great multitude of operas, romantic dramas, romances, tales, etc. One of his original works became very famous—*Rinaldo Rinaldini, der Räuberhauptmann* (1797).—His sister, JOHANNA CHRISTIANA SOPHIE VULPIUS, b. at Weimar June 1, 1765, met Goethe for the first time in the summer of 1788; removed shortly after into his house as a kind of stewardess; bore him a son, August von Goethe, Dec. 25, 1789, and was married to him Oct. 10, 1806.

**Vulture**, vult'ur [Lat. *Vultur*] a name applied to certain representatives of the group Raptores or Étomorphæ.

1. *Falconidae vulturine*, or *Old-World Vultures*.—The forms in question are simply Falconidae without true feathers on the crown of the head, and, so far as known, have no other co-ordinated characters. Like the typical Falconidae, the nostrils are not perforate. The group is divisible into 6 genera—viz. (1) *Vultur*, (2) *Gyps*, (3) *Pseudogyps*, (4) *Otrogyps*, (5) *Lophogyps*, (6) *Neophron*; to which some add *Gypohierax* and *Gypætus*. These essentially agree in habits, living for the most part on dead animal matter, and even appearing to prefer that which is putrescent. They are birds of bold flight, and soar high in the air, scanning the ground in search of food. This they seem to find as much by the sense of sight, if not more than by that of smell. The species, as might naturally be supposed, are mostly inhab. of warm countries, especially Asia and Afr.; several, however, inhabit S. Europe.

2. *Cathartide*, or *New-World Vultures*.—These differ in many respects from their Old-World analogues, and contrast with them especially in the perforate internal membrane, through which anything can be seen on the opposite side. They essentially agree in habits with the typical V.

3. *Egyptian* (or *Mallasse*) *Vulture*, called also *Pharaoh's Hen* (*Neophron percnopterus*), a small V. of S. Europe, N. Afr., and of Asia, having almost white plumage.



## W.

**W**, a letter composed of two V's or two U's, the U and V having been once interchangeable. W is either a vowel with the sound of oo, or more frequently it is a consonant. W in chemistry designates tungsten (or wolfram). It is an abbreviation for west, and in martyrologies for widow.

**Wabash**, waw/bash, city and R. R. centre, cap. of Wabash co., Ind., on Wabash River, 136 m. S. W. of Toledo. Pop. 1870, 2881; 1880, 3800.

**Wabasha**, waw/ba-shaw, city and R. R. centre, cap. of Wabasha co., Minn., on the W. bank of Miss. River. Pop. 1870, 1739; 1880, 2088.

**Wabash College**, an inst. of learning at Crawfordsville, Ind., founded 1833 under Presb. management, has 4 coll. edifices, a cabinet of 30,000 specimens, and libraries of 30,000 vols., and an average of nearly 100 students in the regular coll. course.

**Wabash River** rises in Mercer co., O., flows at first N. to Wabash City, where it receives Big Beaver River; turning N. W., it sweeps in a devious course across Ind., and during the last 120 m. of its course is the boundary between Ind. and Ill. It is the largest N. tributary of the O.

**Wace**, vabs (RICHARD or ROBERT), usually known as MASTER WACE, b. in the island of Jersey about 1115, was taken to Caen, Normandy, in childhood, and there ed.; afterward resided in Fr., but returned to Caen; became a priest and reading-clerk in the royal chapel; was made canon of Bayeux by Henry II. of Eng. about 1160. D. in Eng. about 1180. He wrote (about 1155) *Brut d'Angleterre*, a rhyming paraphrase, in Romance verse of above 15,000 lines, of Geoffrey of Monmouth's *Brit. Hist.* and *Le Roman de Rou, et des Ducs de Normandie* (about 1170), a poem of nearly 17,000 lines, a chronicle of Norman dukes to his own time.

**Waco**, city and R. R. centre, cap. of McLennan co., Tex., on the W. bank of Brazos River. A wire suspension bridge spans the river at this place. It has a univ., female coll., and a convent. Pop. 1870, 3008; 1880, 7295.

**Waday**, wah-di, country in the interior of Afr., and, next to Borno and Darfoo, the most powerful empire of Soodan, is bounded W. by Bagirmi, N. by Sahara, and E. by Darfoo. Its surface is a somewhat elevated plain, with a general inclination from E. to W. Copious streams flow through these valleys, and form in the E. part of the country the large inland sea of Fitte, which is remarkably rich in fish. The soil is on the outskirts sandy and barren, but of a more productive quality in the central part. Rice, maize, durra, and all kinds of tropical fruits are raised; different kinds of palm, ebony, and sandal trees abound. The prin. occupation is rearing of cattle and horses. The inhabs. consist of Arabs and different tribes of negroes. The ruling tribe and the Arabs are Mohammedans; the rest are pagans. The cap. is Warra. The commerce of W. is quite considerable. Gums, ivory, ostrich-feathers, tamarinds, and skins are exchanged for armor, arms, cotton fabrics, and tobacco.

**Waddell** (JAMES), D. D., b. at Newry, Ire., in July 1739, was brought to Amer. in infancy by his parents, who settled on Whiteclay Creek, Pa.; studied theol. under Samuel Davies; was licensed as a Presb. preacher 1761; ordained pastor of a ch. in Lancaster co. 1762; removed to Augusta co., Va., 1776, and to Hopewell 1785; lost his sight while there, but continued to preach, and became renowned for his oratory. D. in Louisa co., Va., Sept. 17, 1805.

**Wad'dell** (JAMES IREDELL), b. July 13, 1824, at Pittsboro', Chatham co., N. C. Some of his ancestors settled in this State at its first colonization, and the family has always occupied a prominent position, socially and otherwise. Capt. W. was ed. at the Bingham School, Hillsboro', N. C., and entered the U. S. N. Sept. 10, 1841; became a passed midpn. in 1847 and a lieutenant in 1855. For his conduct during the time when the officers and crew of his supply-ship *Release* were all stricken down by the Chagres fever, in relieving the vessel and taking her to Matanzas, Cuba, he was most honorably mentioned in a special report made by his commanding officer to the navy dept. For his successful conduct of an expedition into the interior of China, while on that station in 1860, he was honorably mentioned in general orders, and was again commendably reported to the navy dept. At the breaking out of the war in 1861 he resigned his commission and returned to his native State. He entered the Confed. navy as lieutenant Mar. 27, 1862; in Apr. was ordered to burn the unfinished ram *Mississippi* at New Orleans; served as ordnance-officer at Drury's Bluff on James River, Va., where the Federal iron-clad fleet was repulsed; was sent to Europe on special service in 1863, and took charge of the Shenandoah on Oct. 19, 1864, on the N. side of the islands called Deserter, near the island of Madeira, where she set out on a cruise against the commerce of the U. S., with which the Confed. States were then at war. During this cruise she made 38 captures, valued at \$1,152,000, though the demands of claimants amounted in the aggregate to \$6,300,000. She destroyed 32 vessels, and released 6 on bonds. She visited every ocean except the Antarctic. She was the only vessel that carried the Confed. flag around the world, and bore it afloat, her commander not knowing the fact, 6 months after the surrender at Appomattox C.-H. The last gun fired from her deck was on June 22, 1865. Com. W. having been informed at sea in Aug. 1865, by the master of the Brit. bark *Baracouta*, of events in this country, desisted from all further belligerent acts, and proceeded to Liverpool with the Shenandoah, where by formal letter to the ministry on Nov. 5, 1865, she was turned over to the Brit. govt. After 8 days' detention, the Brit. authorities took charge of the vessel, and Lieut. W., after spending some time in Europe, returned to his native land. He afterwards engaged in the U. S. Pacific Mail Co.'s service as capt.

**Waddell** (JAMES PLEASANTS), A. M., oldest son of Rev. Moses, b. in Willington, S. C., Jan. 5, 1801, grad. at the Univ. of Ga. 1822, in which he was tutor of Lat. for 2 yrs.; re-

signed to take charge, as prin., of the Richmond Acad.; in 1836 elected prof. of belles-lettres and oratory in the Univ. of Ga.; in 1840 transferred to the chair of Gr.; in 1846 chosen prof. of Lat. and Gr. in that univ., which office he filled for 10 yrs. D. May 28, 1867.

**Waddell** (JOHN NEWTON), D. D., LL.D., youngest son of Rev. Moses, b. Apr. 2, 1812, at Willington, S. C., grad. at the Univ. of Ga. 1829; entered the Presb. ministry in 1841; was chosen prof. of Lat. and Gr. in the Univ. of Miss. in 1848; resigned in 1857 to occupy the like chair in La Grange Coll., Tenn.; was elected pres. of that coll. in 1860, which position he held till the place was occupied by the Federal army in 1862; appointed general supt. of Presb. missions in the W. Confed. army; was chiefly instrumental in founding the charity for the benefit of orphans at Tuskegee, Ala.; in 1865 elected chancellor of the Univ. of Miss.; sec. to the board of ministerial education of S. Presb. Ch.

**Waddell** (REV. MOSES), D. D., b. in Iredell co., N. C., July 29, 1770, grad. at Hampden-Sidney Coll., Va., 1791; was ordained a Presb. minister in 1792. The degree of D. D. was conferred upon him by the Coll. of S. C. in 1807. His fame rests upon the qualities exhibited by him in his success as a teacher, instructor, and educator of youth. In 1804 he established his classical boarding-school at Willington, S. C., from which he sent forth many prominent jurists, legislators, and divines. In 1819 he was called to the presidency of the Univ. of Ga. at Athens, which office he held until 1829, when he was compelled to resign in consequence of failing health. D. July 21, 1840.

**Wad'ding** (LUKE), b. at Waterford, Ire., Oct. 16, 1588, joined the Franciscan order 1605; became prof. of divinity at the Univ. of Salamanca; accompanied as chaplain an embassy to Rome in 1618 for the settlement of the controversy relating to the doctrine of the Immaculate Conception; remained at Rome; founded in 1625 the Coll. of St. Isidore for Irish Franciscans; is said to have encouraged the Irish rebellion of 1641; was one of the papal councillors appointed in the settlement of the Jansenist controversy, in which his own opinions coincided with those of Jansen, but he retracted them upon the publication of the papal bull of condemnation; was procurator of his order at Rome 1630-34, and vice-commissary 1645-48, and refused a cardinal's hat. He edited the works of Duns Scotus, and wrote *Annales Ordinis Minorum*. D. Nov. 18, 1657.

**Waddington** (WILLIAM HENRY). SEE APPENDIX.  
**Wade** (BENJAMIN FRANKLIN), b. at W. Springfield (now Agawam), Mass., Oct. 27, 1800, settled in Ashtabula co., O., 1821; studied law; admitted to the bar 1828; prosecuting atty. 1835, State senator 1837, pres. judge of the third judicial dist. 1837; was U. S. Senator 1851-59; was a firm opponent of slavery, and voted in 1852 against the Fugitive Slave law; ardently opposed the Nebraska bill, the Lecompton const., the appropriation of \$30,000,000 for the purchase of Cuba; and on the question of compromise between the North and the South, he strongly opposed any concessions. The Homestead bill, which he had for many yrs. advocated, finally passed the Senate in 1862; as chairman of the joint committee on the conduct of the war, he advocated the vigorous prosecution of the war, and favored the confiscation of property in slaves, and reported the bill for the abolition of slavery in D. C.; became pres. of the Senate *pro tempore* and acting V.-P. of the U. S. on the assassination of Pres. Lincoln, and was one of the commission sent in 1871 to Santo Domingo to report upon the proposed acquisition of that island. D. Mar. 2, 1878.

**Wadena**, Minn. SEE APPENDIX.  
**Wadsworth** (BENJAMIN), D. D., son of Capt. Samuel, b. at Milton, Mass., 1669, grad. at Harvard 1690; was colleague with Mr. Foxcroft as pastor of the First ch., Boston, from Feb. 8, 1696, until July 7, 1725, when he became pres. of Harvard Coll. D. Mar. 16, 1737.

**Wadsworth** (JAMES), b. at Durham, Conn., July 6, 1730, grad. at Yale 1748; during the war of the Revolution was a member of the committee of safety and maj.-gen. of the State militia; delegate to the Continental Cong. 1783-86, and a member of the State council 1785-90. D. Sept. 22, 1817.

**Wadsworth** (JAMES), nephew of Gen. James, b. at Durham, Conn., Apr. 20, 1768, grad. at Yale 1787; removed with his brother William to the Genesee country of W. N. Y. 1790, purchasing a large tract of land in that valley; became by the rise of value of landed estates one of the richest proprietors in the State, and disbursed in all nearly \$100,000 for the promotion of popular education. D. June 8, 1844.

**Wadsworth** (JAMES SAMUEL), b. at Genesee, N. Y., Oct. 30, 1807, studied law at Yale and in the office of Daniel Webster; was in 1842 elected pres. of the State Agricultural Society. Education and the interests of the community in which he lived were objects which he strove by every means to promote. In politics he took a special interest in the questions which affected his State and the nation. Of Federalist stock, he was a Dem. by conviction, but in the agitation of the slavery question in 1848 he supported the Free-Soil party. In 1856 he was nominated a State elector by the Reps., and in 1860 was chosen a dist. elector for Lincoln and Hamlin. In the events which succeeded he took an open and decided stand for the Union, and under appointment of the legislature of N. Y. attended the Peace conference in Feb. 1861. Upon the outbreak of war W. provisioned 2 vessels at New York, which he accompanied to Annapolis, where he superintended the delivery of the supplies. At the head of Bull Run he served as volunteer aide to Gen. McDowell. Commissioned a brig.-gen. of volunteers in Aug. 1861, he commanded a brigade in front of Wash. until Mar. 1862, when appointed military gov. of Wash.; was assigned to the 1st corps in Dec. 1862, participating in the battle of Fredericksburg. At Gettysburg, W.'s division was the first to engage the enemy on the morning of July 1, 1863. Early in 1864 he made an extended tour on special service through the S. and S. W. In Gen. Grant's Richmond campaign of 1864, W. commanded the 4th division of the 5th



corps, which crossed the Rapidan May 5. On the evening of the 5th he was engaged for several hours. In the fighting next morning W. was at once engaged with the 3d corps, and the enemy was defeated; but at noon, the enemy, being reinforced, took up the offensive; his men gave way, and while endeavoring to rally them he was fatally wounded. D. May 8, 1864.

**Wadsworth** (PELEG), b. at Duxbury, Mass., May 6, 1748, grad. at Harvard 1769; entered the army at Roxbury Apr. 1775, as capt. of minutemen; became aide to Gen. Ward and adjutant-gen. for Mass.; was present at the battle of L. I., Aug. 1776; became brig.-gen. of militia 1777; was second in command in the Penobscot expedition 1779; was taken prisoner Feb. 1781; escaped from the fort at Castine in June; settled at Portland, Me., 1784, as a land-surveyor; was elected a State senator 1792; was M. C. 1798-1807; received in the latter yr. a large grant of land in Oxford co., Me., as a recognition of his Revolutionary services; settled upon it, and spent the rest of his life in developing that region; maj.-gen. of Me. militia. D. Nov. 18, 1829.

**Waffer** [O. Fr. *wafre*], the small circular disk of unleavened bread employed in the celebration of the Eucharist in the R. Cath. Ch. It is usually marked with emblematical figures.—**WAFER**, a disk of dried paste for sealing letters. It is mixed with some non-poisonous coloring matter.

**Wages** [Lat. *vas, radis*, "security"]. The theory of W. accepted by most political economists a generation ago was that the normal price of labor depends on the cost of the laborer's subsistence. In the words of David Ricardo, "The natural price of labor depends on the price of the food, necessaries, and conveniences required for the support of the laborer. With a rise in the price of food and necessaries the price of labor will rise; with a fall in their price the natural price of labor will fall." Ricardo's doctrine was generally accepted, and it led to the Eng. corn laws; for the inference was that W. must rise with the price of food, so that taxes on corn cannot fall on the laborer. It is singular that at the same time it was part of the general creed of economists that the price of labor varies in different employments with the nature of the work. It was likewise held that there is in each country a certain aggregate amount of W., or "wages fund," formed by the accumulations of capitalists, the proportion of which to the number of laborers determines the general or average rate of W., the rates in particular employments varying according to their difficulty, severity, etc. Here a new element becomes the dominant factor, and it is evident that the rates of W. resulting from the amount of capital accumulated may have little or no relation to the cost of the laborer's living.

The foregoing doctrines were not only inconsistent with each other, but also with the actual rates of W. in every civilized country during the last 100 yrs., especially with the extraordinary diversity in the rates in different parts of the same country. The truth is, that the doctrines of Ricardo are applicable only to what may be called the mediæval as distinguished from the modern industrial system. In the Middle Ages the laborer was commonly paid in commodities, or, if in money, the sum was adjusted to the cost of his subsistence, and the W. of common labor varied but little throughout each country. Scot. was much behind Eng. in the 17th century, and W. were considerably higher in Eng. than in Scot., and they varied also considerably more from place to place. We have in these facts the principal key to the true law of W. in modern times. The natural sources of wealth, the fountains of W. and profits, are unequally distributed, not only among the different countries, but also among the different parts of each country. Their development, too, has been unequal. Hence the rate of production, the returns to capital and labor together, and the demand for labor have varied in different countries, and in different localities in the same country. The value of the joint produce of capital and labor together determines the maximum price of the labor, and this maximum varies with the local resources and powers of production of different regions, as well as with the energy and skill of both capitalist and laborer. Given the maximum, the actual partition between employers and laborers will depend on a variety of conditions which cannot be stated in a single proposition, although they are all consistent with the formula that W. depend on demand and supply. Sometimes we find that W. depend on demand and supply. Sometimes we find employers combining and laborers competing; in some cases machinery, animals, and natural agents co-operate with labor, compete for it, and in both ways add to its value; in other cases they compete with it and supersede it. So various being the conditions which determine the rates of W. in particular cases, it is evident that the aggregate amount of W., instead of being the general cause which determines the rates in particular cases, is merely the result or arithmetical sum of the particular rates added together.

Another reflection which the subject calls for is, that the economic system of modern times must be admitted to have introduced 2 conditions unfavorable to labor, in the great uncertainty and fluctuations in trade, prices, demand for labor, and W. on the one hand, and the disappearance of production on a small scale with the openings it afforded to the majority of workmen to rise to the rank of small capitalists and masters, on the other hand. These drawbacks add greatly to the value of the avenue to independence which the facility of acquiring landed property offers to labor in America. [From *orig. art. in J. S. Univ. Cyc.*, by PROF. T. E. CLIFFE LESLIE, LL.B.]

**Wagner** (WILHELM RICHARD), b. in Leipzig May 22, 1813, son of a police attorney, who died 6 months after his birth; entered, at 9, the Dresden Kreuzschule. His passion for music was awakened by hearing Beethoven's music in Leipzig; but he had no systematic instruction until his 16th yr., and then his impetuous genius disdained rules; he preferred composing music to studying it. One of his boyish overtures was played in the Leipzig theatre. Less than 6

months with Theodor Weinlig, spent in the study of counterpoint, was his first equipment for his extraordinary career. He was then 19. At 21 he abandoned his model, Beethoven, and felt that a new era in music was about to dawn. In 1842 the success of *Rienzi* at Dresden secured his appointment to the post of Kapellmeister at the Dresden opera-house. Here he finished the *Flying Dutchman* and composed *Tannhäuser*. In 1849 his revolutionary enthusiasm forced him to take refuge in Zürich; in 1858 left Zürich, and resided for short periods in Lt., Paris, Vienna, Karlsruhe; attracted the attention of Ludwig, king of Bavaria; established himself in Munich, and entered on his fame. At Munich was laid the plan, so brilliantly carried out at Bayreuth in the summer of 1876, where was produced, under royal patronage and imperial countenance, the threefold opera of the *Nibelungen Ring*, in which his musical theories first found full expression. W.'s musical reform embraces the whole field of conception and expression. Disgusted with the It. and Fr. school of opera, while persuaded more and more that opera was the highest form of musical expression, loathing the silly *libretti* and the practice of making music subservient to the convenience of pet singers, he contended that the theme of opera should be poetic in the deepest sense; that the poetry should be married to fitting music, vocal and instrumental; and that the whole should be associated with the convictions and sympathies of humanity. Hence he took his themes from romance, legend, and popular myths, arranged his *libretti* himself, and in his musical adaptations consulted the intellectual demands of his theme, neglecting and even scorning the popular arts of song and melody which delight the ears of the opera-loving public. The phrase "music of the future," which is applied to his work, was bestowed in derision, though it was warranted by the title of one of his own essays. W. resents the charge that his music is destitute of melody. "The one true form of music," he says, "is melody. Music that has no melody has no inspiration, no power over the feelings, no originality. But melody is something more than the fixed and narrow form that belongs to the childish stage of musical art—the dance form." He is a copious writer; his collected works fill 9 octavo vols., and abound in ingenious ideas. His musical compositions are numerous. A complete list of his works, so far as known, may be found in *Art Life and Theories*, by E. L. Burlingame (New York, 1875). The same vol., which is devoted entirely to W., contains a good sketch of his musical system, taken from his own writings. Wrote the grand march for the American Centennial celebration of 1876. D. Feb. 13, 1883.

**Wag-tail**, the name conferred in Eng. on the species of passerine birds constituting the genera *Motacilla* and *Budytes*; these have the bill slender and conical, with the upper mandible slightly notched at the tip, and the culmen somewhat concave above the front of the nostrils; the wings are long and pointed; the tail is longer than, or equal to, the wings. The name is given in allusion to their habit of "wagging" their tail in a fan-like manner. They are active birds, at home equally in the air and on land; they fly by short undulating courses, and frequently emit, while on the wing, chirping notes; on the ground they run by a rapid succession of steps. The species are quite numerous.

**Waha-bees, or Wahabites**, the name of a modern Mohammedan sect prevailing in Central and E. Ar. It was founded in the middle of the 18th century by Abd-el-Wahab, who converted Saoud, the sultan of Nedjed, and from Derafjeh, the cap. of Nedjed, in which Abd-el-Wahab lived and preached, his ideas spread so rapidly that before his death, in 1787, they predominated in the larger part of the peninsula. It was a moral reformation rather than a religious revival which Abd-el-Wahab preached, and with politics he did not interfere. The differences between the doctrines of the W. and those of the orthodox Mohammedans are comparatively very small, though the W. deny the inspiration of the Koran and the justness of worshipping Mohammed's tomb. A strict observance of all the precepts of the Koran, which had fallen into neglect throughout the whole Mohammedan world, and become very much mixed up with pagan practices among the Bedouins; a return to the old Arab frugality and chastity; a total abstinence from wine, opium, and tobacco; a strict administration of justice; and the renewal of the war against all other religions, were the points most characteristic of the new sect.

**Wahoo**. (1) The *Eurymorus atropurpureus*, a fine ornamental shrub of the U. S. belonging to the order Sapindaceæ, and often called burning bush and spindle tree. Its bark has considerable use in med. as a diuretic, tonic, and alterative, with cathartic powers. (2) The winged elm, *Ulmus alata*, a small tree of S. U. S. Its wood is much valued for timber. Its branches have singular corky wings.

**Wahoo**, city, on R. R., cap. of Saunders co., Neb. Pop. 1880, 1064.

**Wahpeton**, Dak. See APPENDIX.

**Wahsatch Mountains**. See UTAH.

**Wainwright** (JONATHAN MAYHEW), D. D., D. C. L., b. at Liverpool, Eng. Feb. 24, 1792, came with his parents to the U. S. 1809; grad. at Harvard 1812; was tutor there in the U. S. 1813-17; took orders in the P. E. Ch. rhetoric and oratory 1815-17; Hartford, Conn., 1816; 1816; became rector of Christ ch., New York 1819; rector of assistant minister of Trinity ch., Boston, Mass., 1821; New York, 1821, of Trinity ch., New York, 1824, and again assistant minister of Trinity ch., New York, 1828; in 1852 the Univ. of Ox. conferred upon him the doctorate of law; was many yrs. sec. to the House of Bps.; was chosen provisional bp. of N. Y. in Oct., and consecrated Nov. 10, 1852; was a ripe scholar, a fine musician, and an admired pulpit-orator. He pub. *Music of the Ch.*, *The Land of Bondage*, a *Journal of a Tour in Egypt*, etc. D. Sept. 21, 1884.

**Waite** (HENRY MATSON), LL.D., b. at Lyme, Conn., Feb. 9, 1787, grad. at Yale 1809; was admitted to the bar Dec. 1812; practised law at Lyme; was elected to the lower house of the legislature 1815; was a member of the State



senate 1832-33, judge of the superior court and of the supreme court of errors 1834-54, and chief-justice 1854-57. D. Dec. 14, 1869.

**Waite** (HENRY RANDALL), PH. D., b. at Copenhagen, N. Y., Dec. 16, 1846, grad. at Hamilton Coll. 1868; became in that yr. literary editor of the *Utica Daily Herald*; subsequently studied theol. at Union Sem., N. Y., editing at the same time the *Unit. Quarterly Review* and contributing to the press; organized Amer. chapels at Rome and Geneva; became in 1874 ed. of the *New Haven Daily Evening Journal*; in 1875 associate ed. of the *International Review* at New York, lecturer on political science to Univ. of Syracuse, and pres. of the Political Science Association and of the National Reform League. Author of *Carmina Collegensia*, etc.

**Waite** (MORRISON REMICK), LL.D., b. at Lyme, Conn., Nov. 20, 1816, grad. at Yale 1837; studied law; settled at Maumee City, O.; was elected to the O. legislature 1849; removed to Toledo 1850; took a prominent place at the O. bar; declined repeated nominations to Cong. and also a seat on the supreme bench of O.; distinguished himself as U. S. counsel at the Geneva tribunal of arbitration on the Alabama claims 1871; was pres. of the O. constitutional convention 1873, and became chief-justice of the U. S. supreme court Mar. 4, 1874.

**Wake**, in old Eng. usage, is the equivalent of *vigil*, and in most instances where the term occurs in old books it is to be understood in this sense. The *lyke-wake*, in which the neighbors of a deceased person hold a watch over the dead body, is a custom of entirely different character.

**Wake** (WILLIAM), D. D., b. at Blandford, Dorsetshire, Eng., in 1657, grad. at Christ Ch., Ox., 1676; took orders in the Ch. of Eng.; became chaplain to the Eng. embassy in Fr.; had a theological controversy with Bossuet, arising from what he claimed to be a misrepresentation of the doctrine of the Ch. of Eng. 1686-88; became preacher to Gray's Inn, canon of Christ Ch. 1689, chaplain to King William, rector of St. James, Westminster, 1693, dean of Exeter 1701, bp. of Lincoln 1705, abp. of Canterbury 1716, and discussed with Dupin a project for the union of the Eng. and Gallican chs. 1718. D. Jan. 24, 1737.

**Wa Keeney**, Kan. See APPENDIX.

**Wakefield**, R. R. centre, Middlesex co., Mass., 10 m. N. of Boston. Pop. tp. 1870, 4135; 1880, 5547.

**Wakefield** (EDWARD GIBBON), b. in Eng. about 1796, ed. to the business of a land-surveyor; was brought into public notice in 1826 from having eloped to Gretna Green and there married a young heiress of 15; was tried and convicted of forcible abduction, the marriage being declared null by special act of Parl., and imprisoned 3 yrs. in Newgate; turned his experience to advantage by writing a book upon prison management; subsequently made minute inquiries upon the system of colonization by convicts in Australia; pub. *Tracts relating to the Punishment of Death in the Metropolis* and a careful work on *Eng. and Amer., a Comparison of the Social and Political State of the Two Nations, and a View of the Art of Colonization*, in which he promulgated the "new colonization system;" was a director of an association formed upon his system for the colonization of New Zealand and of S. Australia; attacked the system of penal transportation; accompanied the earl of Durham to Canada as his private sec.; moved to New Zealand. D. May 16, 1862.

**Wakeley** (JOSEPH B.). See APPENDIX.

**Wakefield** (ROBERT), b. in the N. of Eng. about 1480, ed. at the Univ. of Cambridge and on the Continent; became "the greatest linguist of his time;" taught Gr., Heb., Chaldaic, and Syriac in Fr. and Ger.; rendered assistance to Henry VIII. in the matter of his divorce from Queen Catharine of Aragon; became lecturer in Gr. at Cambridge 1524, prof. of Heb. at Ox. 1530; was a canon of Wolsey's new coll. 1532. Wrote *Oratio de Laudibus et Utilitate trium Linguarum Arabicę, Chaldaicę, et Hebręicę*, etc. D. Oct. 8, 1537.

**Wakeley** (THOMAS), M. D., b. at Manbury, Devonshire, Eng., in 1795, studied med. and surgery in Lond.; founded the *Lancet*, a weekly med. journal, which he edited nearly 40 yrs., and which was instrumental in promoting many reforms in surgery and med. Dr. W. was coroner for Middlesex 1839-50, and sat in Parl. 1835-52. D. May 2, 1862.

**Wakushu**, a tribe of E. Afr. nomads, inhabiting a terr. near the coast and traversed by the equator. They are heathens, but practise circumcision. Their manner of life is much like that of the Tartars.

**Walbridge** (HIRAM), b. at Ithaca, N. Y., Feb. 22, 1821, grad. at O. Univ. 1841; studied law; was admitted to the bar 1843; became brig.-gen. of O. militia 1844; settled in New York as a merchant 1847; was a Dem. M. C. 1853-55; was an earnest supporter of the war for the Union, advocating early in 1861 the calling out of 600,000 volunteers; was v.-p. of the national commercial convention at Chicago, and pres. of similar bodies convened at Detroit and Louisville, and in 1869 was a national com. to examine and report on the Pacific R. R. D. Dec. 6, 1870.

**Walcheren**, wahl'ker-en, Island of the Netherlands, forming part of the prov. of Zealand, between the E. and W. Scheldt and the N. Sea. It is 11 m. long and 10 m. broad, and has 45,000 inhabs. W. is somewhat famous in military hist. for the disastrous expedition of the Eng. under Lord Chatham and Admiral Strachan in 1809.

**Walden**, N. Y. See APPENDIX.

**Walden**, or **Waldensis** (THOMAS), whose family name was NETTER, b. at Saffron-Walden, Essex, Eng., about 1380, ed. at Ox.; entered the Carmelite order in Lond., and was ordained sub-deacon 1395; was sent by Henry V. as his rep. at the Council of Pisa 1409; became provincial of the Eng. Carmelites 1414; attended in that capacity the Council of Constance 1415; went to Lithuania 1419; founded there several houses of his order, and negotiated a peace between the king of Poland and the Teutonic Knights; was confessor to Henry V.; prominent in persecution of Lollards; accompanied Henry VI. to Fr. Wrote *Doctrinale antiquum Fidei Ecclesie Catholice et De Sacramentis*. D. Nov. 2, 1430.

**Walden'ses**, called also **Vallenses** or **Valdenses** [from *vallis*, "valley"], and **Vaudols** ["men of the valleys"], a Prot. sect and community in It., numbering in 1839 about 20,000, now numbering about 25,000, most of whom are in Piedmont, on the E. slope of the Cottian Alps, from 25 to 40 or more m. S. W. of Turin, occupying a romantic dist. of about 22 by 18 m. From 1686 to 1829 there were 13 parishes—there are now 16—in the 3 valleys of Lucerna, Perosa, and San Martino. The name is probably derived from that of a wealthy merchant of Lyons in Fr., who is called Waldo, Waldus, Waldius, and even Waldensis. The earliest authority for Peter Waldo or Petrus Waldus is a M. S. of 1404 A. D.; the date of his birth is not known. About 1170—some say in 1173—he distributed his property to the poor, and, with several associates of both sexes who had joined him, began to preach in the streets of Lyons and of other places in the neighborhood. His aim was to revive the fervent, simple, self-denying piety of the early Ch. The name *Waldenses* first occurs in 1194 in an edict of Ildephonus, king of Aragon. Waldo was excommunicated by the abp. of Lyons, but appealed to the pope (Alexander III.), and the third Lateran Council, then (1179) in session, failed to brand him as a heretic. Afterward, at Verona, under Lucius III., in 1184, he was condemned and driven into exile. He d. in 1197, possibly in Bohemia, but probably in N. It. His followers multiplied rapidly in several countries, but especially in S. Fr., N. Sp., and N. It., whence, from the latter part of the 13th century, they gradually came together in the valleys of Piedmont and Savoy, and have remained there ever since, in spite of 33 bloody persecutions, some of which are among the bloodiest in history. Since 1848, when for the first time in all their heroic history full liberty of worship was granted them, the W. have greatly flourished. R. D. HITCHCOCK.

**Waldo** (DANIEL), b. at Windham, Conn., Sept. 10, 1762, was a soldier in the Revolution; taken prisoner at Horse-neck and confined in the Sugar-house prison, New York; grad. at Yale Coll. 1788; was a Congl. pastor at W. Suffolk, Conn., 1792-1809; was afterward settled at Cambridgeport and Harvard, Mass., and at Exeter, R. I.; was a home missionary in Pa., N. Y., and R. I.; resided in New York; became chaplain to the House of Reps. 1855. D. July 30, 1864, at the age of 102.

**Waldö** (PETER). See WALDENSES.

**Waldoboro'**, Lincoln co., Me., on R. R., at the head of tidewater on Medomak River. Prin. business, ship-building. Pop. tp. 1870, 4174; 1880, 3758.

**Wales**, wailz, was inhabited by the Cymries, a people of Celtic descent, at the time when the Romans first came to Britain. Conflicts soon arose between the Cymries and the Romans. Against the A.-S. the Cymries succeeded also in vindicating their independence, but at the time of the Dan. conquest of Eng. the Cymries were finally compelled to pay tribute. The tribute, however, was refused to William the Conqueror, and he accordingly invaded the country and conquered it. The Welsh retained their own native princes, but they had to pay tribute. Rebellions and wars ensued until Edward I. united the country with Eng. (1284), and gave his son, afterward Edward II., the title of prince of Wales. Henry VIII. finally merged the country completely into Eng. in 1536.

**Wales, New South.** See NEW SOUTH WALES.

**Wales, Prince of.** See ALBERT EDWARD.

**Walhai'la**, in N. mythology, the name of the magnificent palace, resting on spears and covered with shields, to which the warriors repaired when they fell on the battlefield fighting bravely. Those who were cowards and died in their beds were sent to Nifhelheim, and that place was as dark and silent as W. was bright and stirring with life. Every morning the Einherjars, the inhabs. of W., marched out at cock's crow from its 540 doors. The day they spent in fighting furiously against each other, but toward sunset all the wounds healed up, and home they went to the banquet in Odin's hall, where roast pork, the favorite dish of the old Norsemen, was served, while Freya's maids handed round the strong mead in golden horns.

**Walke** (HENRY), U. S. N., b. in Va. Apr. 26, 1809, entered the navy as mdrpn. Feb. 1, 1827; became lieut. in 1839, commander in 1855, capt. in 1862, com. in 1866, rear-admiral in 1870; retired in 1871. Served with great gallantry during the c. war at Ft. Henry, Ft. Donelson, Island No. 10, Vicksburg, Grand Gulf, Memphis, and various other places on the W. waters.

**Walker**, waw'ker (ABRAHAM JOSEPH), b. in 1818 near Nashville, Tenn., grad. at Nashville Univ. 1838; settled at Jacksonville, Ala., 1842; was a successful lawyer and Dem. legislator; removed in 1852 to Talladega, and in 1854 became one of the State chancellors; was 1856-59 a judge of State supreme court; chief-justice 1859-68. D. Apr. 25, 1872.

**Walker** (AMASA), LL.D., b. at Woodstock, Conn., May 4, 1799, became a merchant at Boston 1825; was a prominent advocate of the construction of the W. R. R., an influential member of the early anti-slavery circles, and a leader in the cause of temperance; visited Europe 1843 and 1849 as delegate to peace conventions; was prof. of political economy at Oberlin Coll., O., 1842-49; was a rep. in the Mass. legislature 1848, member of the State senate 1849 sec. of state 1851-52; was chosen to the State constitutional convention 1853; was M. C. 1862-63, member of the Phila. loyalists' convention 1865, and lecturer on political economy at Amherst Coll. from 1861-66. Wrote *The Science of Wealth*. D. Oct. 29, 1875.

**Walker** (CLEMENT), b. at Cliffe, Dorsetshire, Eng., about 1595, ed. at Christ Ch., Ox., but left without a degree; became usher to the exchequer; was chosen to the Long Parl. for Wells 1640; noted for his violence as a Presb. and promoter of the "Solemn League and Covenant." Wrote *Complete Hist. of Independency*; was imprisoned by Cromwell in the Tower 1649, where he d. Oct. 1651; wrote there *The High Court of Justice, or Cromwell's New Slaughter-house*.



**Walker** (DAWSON A.), b. in Grainger co., Tenn., Dec. 7, 1819, grad. at E. Tenn. Univ. at Knoxville in Aug. 1843; studied law, and was admitted to the bar in Feb. 1845; moved to Ga., and located at Spring Place in Mar. 1845; was appointed by the gov. to fill a vacancy on the bench of the superior courts of the Cherokee circuit in Feb. 1860; was elected to the same place in Jan. 1861; was again appointed to the same position in Mar. 1865; in 1866 was elected by the legislature judge of the supreme court for 6 yrs., but lost this position under the reconstruction laws in 1868. He was appointed by Pres. Grant one of the members of the civil service commission in 1871; in 1872 was candidate of the Rep. party for gov. of the State. D. Feb. 4, 1881.

**Walker** (FRANCIS AMASA), LL.D., son of Amasa, b. at Boston, Mass., July 2, 1840, grad. at Amherst 1860; entered the army 1861 as sergeant-major of Devens's regiment; assistant adjutant-gen. of Couch's brigade Sept. 14, 1861, adjutant-gen. of Couch's division Aug. 11, 1862, lieutenant-col. on the staff of the 2d army corps Jan. 1, 1863, and brevet brig.-gen. 1865; was wounded at Chancellorsville; taken prisoner at Reams's Station, and confined in Libby prison; was a teacher at Williston Sem., Easthampton, Mass., 1866-68; an editor of the Springfield Republican 1869-69; became chief of the bureau of statistics of the treas. dept. at Wash. 1869; was supt. of the U. S. census 1870-80; com. of Indian affairs 1871-72, and became in 1872 prof. of political economy and hist. in the Sheffield Scientific School of Yale Coll. He edited *Census Reports*, compiled a *Statistical Atlas of the U. S.*, and pub. *The Indian Question, The Wages Question, and Political Economy*. He became pres. of Mass. Inst. of Technology in 1881.

**Walker** (FREEMAN), b. Oct. 25, 1780, in Charles City co., Va., went to Ga. in 1797, where he commenced the practice of law in the city of Augusta in 1802; in 1807 was a member of the State legislature, and in 1819 was elected U. S. Senator. D. Sept. 23, 1827.

**Walker** (GEORGE), D. D., b. in co. Tyrone, Ire., about 1650, took orders in the Ch. of Eng.; was rector of Donoughmore, near Londonderry, Ire., when James II. laid siege to that city 1689; defended Londonderry, and held out until the siege was raised, July 30, 1689. He was nominated to the bishopric of Derry by William III., and was killed at the battle of the Boyne, July 1, 1690. He pub. *A True Account of the Siege of Londonderry and a Vindication*.

**Walker** (SIR HOVENDEN), b. in Somersetshire, Eng., about 1660, became a capt. 1692, rear-admiral of the red 1709, and of the white 1710; was knighted by Queen Anne 1711; commanded the unfortunate expedition which sailed from Boston against Canada; lost half his vessels by shipwreck on the Isle aux Enfers; suffered the loss of his ship, the *Edgar*, which blew up at Spithead 1715; subsequently settled in S. C. as a planter, and pub. *A Journal or Full Account of the Late Expedition to Canada*. D. Jan. 1726.

**Walker** (JAMES), D. D., b. at Burlington (then Woburn), Mass., Aug. 16, 1794, grad. at Harvard 1814; studied theol. at Cambridge; was pastor of the Unit. ch. in Charlestown, Mass., 1818-38; ed. of the *Chr. Examiner* 1831-39; Alford prof. of moral and intellectual philos. at Harvard 1838-53, and pres. of Harvard Univ. 1853-60. Author of *Sermons preached in the Chapel of Harvard Coll.*, *Lectures on Natural Religion* and on *Philos. of Religion*, etc. D. Dec. 23, 1874.

**Walker** (JAMES BARR), D. D., b. at Phila. July 29, 1805, studied law at Ravenna, O.; grad. at W. Reserve Coll., Hudson, O., 1831; edited successively the *O. Observer* at Hudson, the *Watchman of the Valley* at Cin., and the *Watchman of the Prairies* at Chicago, all religious newspapers; studied theol., and was licensed to preach 1841, since which time he has resided at Mansfield, O., conducting a private orphan asylum and lecturing on the harmony between science and revealed religion at Oberlin Coll. and Chicago Theological Sem. Author of *The Philos. of the Plan of Salvation*, *God Revealed in Nature and in Christ*, *Philosophy of Scepticism and Ultraism*, etc.

**Walker** (ROBERT JAMES), b. at Northumberland, Pa., July 19, 1801, grad. at the Univ. of Pa. in 1819, and in 1821 was admitted to the bar at Pittsburg; entered upon political life as a Dem.; in 1825 was married to Mary Bahe, a great-granddaughter of Benjamin Franklin; in 1826 removed to Natchez, Miss. He opposed the nullification movements of S. C. (1833), and was in 1836 elected to the U. S. Senate; in 1837 brought forward a bill for the recognition of the independence of Texas. In 1837 he ably advocated the Independent treasury bill; in 1841 originated the Pre-emption act, still unrepealed; in 1843 declined a nomination for the Vice-Presidency of the U. S. He exercised great influence during the Tyler administration, and in 1844 secured the nomination and election of James K. Polk to the Presidency. In 1845 was appointed sec. of the treas. The revenue tariff of 1846, the warehouse-system, the Independent treas., and the establishment of the dept. of the interior were measures proposed by him. In 1857-58 he was gov. of Kansas at a most difficult crisis. On the breaking out of the c. war he most efficiently sustained the Federal gov., and in 1863-64 was financial agent of the U. S. in Europe, negotiating the sale of \$250,000,000 in govt. bonds, and preventing the second \$75,000,000 loan to the Confederacy. He afterward advocated the purchase of Alaska and the Dan. W. I., and opposed the radical party during the reconstruction measures of Cong. under Pres. Johnson's administration. In 1867 he was counsel for the State of Miss., and made a masterly argument before the supreme court in a case brought to restrain the execution of the reconstruction acts. In the latter part of his life he was successfully engaged in the practice of law at Wash., D. C., where he d. Nov. 11, 1890.

**Walker** (TIMOTHY), LL.D., b. at Wilmington, Mass., Dec. 1, 1802, grad. at Harvard 1826; studied at Dane Law School 1829-30; went to Cin., O., 1830; was there admitted to the bar 1831; established in 1833, in connection with Judge John C. Wright, the Cin. Law School, which in 1835 was united with Cin. Coll.; was prof. of law until 1844; was

pres. judge of Hamilton co. court of common pleas 1842-48, and founded the *W. Law Journal* 1843. Wrote *On the Dignity of the Law as a Profession*, *On the Hist. and General Character of the State of O.*, *On the Reform Spirit of the Day*, etc. D. Jan. 15, 1856.

**Walker** (WILLIAM), b. at Nashville, Tenn., May 8, 1824, went to Cal. 1850; organized in July 1853 an expedition for the conquest of N. Mex.; set sail from San Francisco Oct. 15; landed at La Paz, Lower Cal., with a handful of followers, and proclaimed himself pres.; occupied 2 or 3 small towns; issued a proclamation annexing Sonora to his dominions; received early in 1854 a reinforcement, raising his numbers to 100 men, with whom he set out for Sonora overland. The party gradually melted away, and W. thought it expedient to surrender to the officials at San Diego, Cal.; was tried at San Francisco for violation of the neutrality laws, but acquitted May 15, 1854; was induced soon afterward by liberal offers from one of the parties to a c. war in Nicaragua to proceed thither, landing at Realejo with 62 followers June 11, 1855; won 2 sharp battles at Rivas and at Virgin Bay, and after a short siege obtained possession of the city of Granada Oct. 15; made a treaty with Gen. Corral, designating Rivas as pres. and himself as minister of war and gen.-in-chief; quickly discovered, or alleged, a treacherous plot on the part of Corral, whom he tried by court-martial and caused to be shot Nov. 8; had to wage a war with Costa Rica; was defeated near Guanacaste Mar. 20, 1856, but won a battle at Rivas Apr. 11; went through the farce of ordering a presidential election June 25; took possession of the presidency; issued great quantities of worthless currency; re-established slavery by a decree of Sept. 25, but succumbed in the following spring to a general insurrection. After having lost several desperate battles and burned the city of Granada, he surrendered at the port of San Juan del Sur, May 1, 1857; was taken to Panama; went thence to New Orleans; soon organized another party, with which he sailed in the steamer *Fashion* and landed Nov. 25 at Punta Arenas, Nicaragua; was compelled to surrender as a prisoner and taken to New York; was liberated by order of Pres. Buchanan Jan. 1858; made another attempt in Oct. 1858, but was seized on board his steamer at the mouth of the Mississippi River; tried and acquitted in the U. S. court at New Orleans; succeeded in fitting out another expedition, with which he landed at Truxillo, Honduras, June 27, 1860; was captured Sept. 3; tried by court-martial, and shot Sept. 12, 1860.

**Walker** (WILLIAM H. T.), b. in Ga. in 1817, grad. at the U. S. Military Acad. July 1, 1837; ordered at once to the seat of war in Fla., was engaged in the battle of Okeechobee, Dec. 25, 1837, and 3 times wounded; served in the war with Mex. in Gen. Scott's army from Vera Cruz to the battle of Molino del Rey, where so severely wounded as to compel him to remain absent from the army on sick leave for 2 yrs. Returning to duty in 1849, he was forced again to go on sick leave 1850-51. In Dec. 1852 he was appointed deputy-gov. of the E. Pascagoula Branch Military Asylum; transferred to W. Pt. in July 1854 as commandant of cadets. Promoted to a majority in the 10th Inf. in Mar. 1855, he was in 1856 relieved from duty at W. Pt. and ordered to a N. frontier post, but soon after, in the same yr., went on sick leave, and remained absent until Dec. 20, 1860, when he resigned from the army. Entering the Confed. army, he rose to the rank of maj.-gen., serving mostly in the S. and W. In the sortie from Atlanta, Ga., he was killed July 22, 1864.

**Walker's Lake**, in Esmeralda co., Nev., is 45 m. long and 20 m. wide, and has an elevation of 4000 ft. It receives the waters of Walker's River, and has no outlet.

**Walking-Leaf**, the usual name of *Campnosorus rhizophyllus*, formerly classified in the genus *Asplenium*, a curious N. Amer. fern found in the N. and Middle states of the U. S., derives both its common and its scientific name from the peculiarity of propagating by striking the tips of its leaves into the ground, where they take root and give origin to new plants.

**Walking-Stick**, a name given to insects of the family Phasmidae, order Orthoptera. The body is elongated, often linear, and in some resembles a twig or dried stick; the antennae are long, and in some resembles a twig or dried stick; the head is small and oblong; the antennae filiform and moderate; the legs are long, slender, and gressorial, none being adapted for grasping or for leaping; the wings are rudimentary or wanting. The species are sluggish animals. A species (*Diapheromera femoralis*) is not uncommon in portions of the U. S.; its average length is between 3 and 4 inches.

**Walkyries**, from *val*, the "battlefield," and *kjora*, to "choose," in Scandinavian mythology, were beautiful young maids in the service of Odín. Clad in radiant armor, surrounded with the subdued brightness of an aurora borealis, and with light streaming from the points of their lances, they ride through the air, 9 and 3, sent by Odin to attend to battles. Generally they are imagined as hovering over battles, sometimes even as participating in the fight, marking with the point of their lances the heroes who shall die and whom they shall conduct to Walhalla. The W., although superhuman beings, are not goddesses. They fall in love with men, and then they distribute death and victory in battle according to their own passions. Then Odin expels them from Walhalla, dooms them to marriage, or touches them with his magic rod, and drives them into a trance, in which they lie till the warrior comes who knows how to break the spell.

**Wall** (GARRET D.), b. in Monmouth co., N. J., Mar. 10, 1783, was admitted to the bar 1807; was clerk of the supreme court 1812-17; quartermaster-gen. 1815-37; was appointed U. S. dist. atty., and elected gov. by legislature 1829, but declined latter office; was U. S. Senator 1835-41, and judge of court of errors and appeals 1848-50. D. Nov. 22, 1850.

**Wall** (JAMES W.), son of Garret D., b. at Trenton, N. J., in 1830, grad. at Princeton 1839; became a lawyer at Trenton, and subsequently (1847) at Burlington; filled the posts of com. of bankruptcy and of mayor of Burlington; wrote



against the restrictions imposed upon the press at the outbreak of the c. war, for which he was imprisoned some weeks in Ft. Lafayette as a sympathizer with the rebellion; was elected U. S. Senator to fill an unexpired term Jan. 1863, and removed to Elizabeth 1869. D. June 9, 1872.

**Wallaby**, the Australian name applied as an equivalent of the generic name *Halmaturus*. The species so designated are kangaroos (*Macropodidae*), which average next in size to the typical kangaroos of the genus *Macropus*, ranging up to 50 lbs. in weight.

**Wallace** (ALFRED RUSSEL), b. at Usk, Monmouthshire, Eng., Jan. 8, 1822, ed. at the gram. school of Hertford; undertook in 1848 an exploration of N. Brazil; explored the Amazon and Negro rivers; obtained numerous vocabularies of Indian tribes; returned to Eng. 1852; pub. *Travels on the Amazon and Rio Negro, with Remarks on the Vocabularies of the Amazonian Languages, and Palm Trees of the Amazon, and their Uses* (1853); spent 8 yrs. in exploring the vast islands of the E. I., especially the Moluccas, Celebes, and New Guinea; arrived, independently of Mr. Darwin's researches, at a theory of natural selection, which he embodied in a paper *On the Tendency of Varieties to depart indefinitely from the Original Type*; brought from the E. I. in 1862 more than 8000 birds and more than 100,000 entomological specimens; pub. *The Malay Archipelago, the Land of the Orang-utan and the Bird of Paradise, a Narrative of Travel 1854-62, with Studies of Man and Nature*; collected a vol., *Contributions to the Theory of Natural Selection*; noted for his investigations of spiritualism, in which he is a believer, and wrote *Miracles and Modern Spiritualism*; wrote *On the Geographical Distribution of Animals, and Island Life*.

**Wallace** (DAVID), b. at Phila. Apr. 4, 1799, grad. at W. P. 1821; studied law in Brookville, Ind.; was several times elected to the State legislature; was a member of the Ind. constitutional convention; lieutenant-gov. 1834-37; gov. 1837-40, M. C. 1841-43, and judge of common pleas for Marion co. 1856-59. D. Sept. 4, 1859.

**Wallace** (Sir JAMES), b. in G. Brit. about 1730, became post-capt. in the navy 1771, commanded the fleet on the Newport station 1775, and conducted the naval expedition up the Hudson River Oct. 1777; was captured in the Experiment by D'Estaing Sept. 24, 1779; commanded the Warrior in Rodney's victory over De Grasse, Apr. 12, 1782; was gov. of Newfoundland 1793-95; became rear-admiral 1794, vice-admiral 1795, and rear-admiral of the blue Jan. 1, 1801. D. Mar. 6, 1803.

**Wallace** (LEWIS), b. in Fountain co., Ind., about 1828, studied law and was admitted to the bar, but during the war with Mex. served as second lieut. 1st Ind. Volunteers; was for one term a member of the Ind. State senate; early in 1861 became adjutant-gen. of Ind., but in Apr. took command of the 11th Ind. Volunteers, which served in W. Va., being engaged in the capture of Romney, etc.; in 1861 was commissioned brig.-gen. of volunteers, and stationed for a time in Ky. At the capture of Ft. Donelson, where he commanded a division and the centre of the Union lines, he displayed much ability and courage; major-gen. of volunteers 1862. In the succeeding battle of Shiloh he rendered efficient aid in the second day's fighting and subsequent advance upon Corinth; in Nov. 1862 was pres. of the court to inquire into the conduct of Gen. Buell; commanded Middle dept. and 8th corps 1864. Member of commission for trial of persons implicated in murder of Pres. Lincoln and attempted assassination of Mr. Seward. Envoy extraordinary and minister plenipotentiary to Turkey, 1868-69.

**Wallace**, or **Wallies** (Sir WILLIAM), b. in Scot. about 1270; having quarrelled with the son of the Eng. gov. of Dundee Castle while a student at the high school of that city, he stabbed his antagonist, and fled to the S. Highlands; in 1297 leader of a large band of insurgents against the authority of the Eng. king, Edward I.; attacked the town of Seone, where an Eng. justiciary was holding court, killing or taking prisoners many of the Eng. Edward thereupon sent into Scot. a considerable force which repulsed a night-attack made by W. near Lochaber, and drove him back into Ayrshire, and received the submission of most of the Scot. leaders. W. and Murray of Bothwell alone refused to lay down their arms, and withdrew to the N. Highlands. W. advanced to the siege of Dundee, being now recognized as commander-in-chief of the national insurrection. Edward's gen., John de Warrene, earl of Warrone and Surrey, having advanced toward Stirling, W. abandoned the siege and marched against him. Earl Surrey was completely defeated at Cambuskenneth (or Stirling Bridge) Sept. 10, 1297. W. passed the border and ravaged Cumberland and Northumberland. On his return, W. was recognized in Scot. as guardian of the realm. In the following yr. Edward proceeded to Scot., and gained over W. a decisive victory at Falkirk July 22. W. refused to submit, and carried on a guerilla warfare on a small scale for several yrs. He took part in the Scot. revolt of 1303; was declared an outlaw on account of his refusal to respect the treaty between Edward and John Comyn, earl of Badenoch (Feb. 4, 1304); was betrayed by Sir John Menteith into the hands of the Eng. near Glasgow early in 1305; was taken to Lond., tried for treason, condemned Aug. 23, 1305, and hanged, drawn, and quartered at W. Smithfield the following day.

**Wallace** (WILLIAM H. L.), b. at Urbana, O., July 8, 1821, removed to Ill. with his father in 1833; studied law, and was admitted to the bar in 1846, but the war with Mex. occurring, he enlisted in Col. Hardin's 1st Ill. Volunteers, and was engaged in the battle of Buena Vista. In May 1861 he was appointed col. 11th Ill. Volunteers, and at Ft. Donelson (Feb. 1862) commanded a brigade with gallantry and ability; brig.-gen. of volunteers Mar. 1862. In the succeeding battle of Shiloh W. commanded Smith's old division, falling mortally wounded. D. Apr. 10, 1862.

**Wallace** (WILLIAM J.), LL.D. See APPENDIX.

**Wallace** (WILLIAM VINCENT), b. at Waterford, Ire., in 1814, son of a military band-master, from whom he inherited

a genius for music and a taste for roving; visited Australia, New Zealand, and the islands of Oceania; also India, S. Amer., and the U. S.; brought out at Drury Lane his successful opera, *Martina* (1846), which was followed by *Matilda of Hungary*, *Lurline*, *The Amber Witch*, etc., and was author of marches, polkas, fantasias, etc., and of many songs which have become popular. D. Oct. 12, 1865.

**Wallachia**. See ROMANIA.

**Wallack** (JAMES WILLIAM), b. in Lond., Eng., Aug. 24, 1795, made his first appearance on the Lond. stage at the age of 7 yrs.; was engaged by Sheridan at Drury Lane; played with Edmund Kean in Shakspearian dramas; came to the U. S. 1818; appeared as Macbeth at the Park Theatre, New York, Sept. 7, 1818; became stage-manager at Drury Lane 1820; alternated between Eng. and the U. S. for several yrs.; opened in 1837 the National Theatre, New York, burned down in 1839; established in 1852 W.'s Lyceum, afterward W.'s Theatre, on the corner of Broadway and Broome st., rebuilt in 1861 at the corner of Broadway and Thirtieth st., and now located at Broadway and Thirtieth st. He was a superior comedian and manager. D. Dec. 25, 1864.—His son, JOHN LESTER, b. in New York Jan. 1, 1818, known for some time as J. W. LESTER, is now proprietor of the theatre, and maintains its reputation.

**Wallaroo**, a name given to 2 species of kangaroos, constituting a section of the genus *Macropus*—viz. (1) *Macropus antilopinus*, the red W., and (2) *Macropus robustus*, the black W.; the former inhabits the country about Ft. Essington, and the latter the mt.-ranges of coast of New S. Wales.

**Walla Walla**, on R. R., cap. of Walla Walla co., Wash. Terr. Principal business, farming and stock-raising. Pop. 1880, 3588.

**Walenstein**, or **Waldstein, von** (ALBRECHT WENZEL EUSEBIUS), b. on the family estate of Hermanitz, Bohemia, Sept. 14, 1553; he served in Hungary against the Turks in the army of the emp. Rudolf; became one of the largest landed proprietors in Moravia and Bohemia. In 1616 he organized a regiment of dragoons at his own expense, and hastened to the rescue of the city of Gradisca, which was besieged by the Venetians. The emp. now made him a count. When the revolution which opened the Thirty Years' war broke out in Bohemia in 1618, he sided with the emp., saved the imperial treas. from falling into the hands of the insurgents, and bought of the emp. estates to the value of 7,290,228 florins. In 1623 the emp. created him prince, and in the following yr. hereditary duke of Friedland. In 1625, when the Prot. princes of N. Ger., under the leadership of Christian IV. of Den., arose against the emp., W. offered to organize an army of 50,000 men. Apr. 25, 1626, he defeated Count Mansfeld, one of the most famous gens. of the time, at Dessau, and pursued him through Silesia into Hungary, where this part of the war ended. Returning through Silesia, W. occupied Brandenburg and Pomerania, expelled the refractory dukes of Mecklenburg, penetrated through Holstein and Schleswig into Jutland, and compelled Christian IV. to conclude peace. In reward the emp. created him duke of Mecklenburg in 1629. But at this moment the emp. could not fail to observe that such a man at the head of such an army was a great danger. In Sept. 1630 he was dismissed and his army dissolved. Meanwhile, after the defeat of Tilly and the annihilation of his army, when the Saxons invaded Bohemia and the Swedes penetrated into Bavaria, the situation of the emp. became almost desperate, and the reinstatement of W. in power seemed almost the only means of escape. The emp. made the humblest approaches and consented to the most humiliating conditions. W. received the supreme military authority in Ger., the right of appointing his own officers, the rights of confiscation, amnesty, and pardon—yes, even the right of negotiating peace. In the spring of 1632 the Saxons were expelled from Bohemia, and W. occupied a strongly fortified position at Nuremberg in front of the army of Gustavus Adolphus. Both the armies moved into Sax., and on Nov. 16, 1632, the battle of Lutzen took place. Gustavus Adolphus fell, but W. was defeated. He retreated into Bohemia, opened negotiations with the Swedes, the Saxons, and Richelieu. His plan was, by an alliance with these powers to compel the emp. to accept such a peace as they would grant him, and the special goal of his personal ambition seems to have been the acquisition of the Bohemian crown. He failed, however; some of his most important gens. fell from him, and with them the army. On Feb. 23, 1634, he fled from his headquarters at Pilsen to seek rescue and support by the Sw. corps which approached under Duke Bernhard, but 2 days afterward he was assassinated at Eger by one of his own followers, Col. Butler.

**Waller** (EDMUND), b. at Coleshill, Hertfordshire, Eng., Mar. 3, 1666, of an anc. and wealthy family; ed. at Eton and at King's Coll. Cambridge; inherited in boyhood an estate of £3500 a year; was chosen to Parl. for Agmondesham at 19; became noted as a writer of elegant and rhythmical verses; was appointed after the battle of Edgehill (1642) one of the Parliamentary coms. to negotiate with the king at Ox.; was gained over by the royalists, and entered into a conspiracy known as "Waller's plot" for the restoration of royal authority; but the plot having been discovered May 31, 1643, he was imprisoned for a yr., fined £10,000, and banished the kingdom; was allowed to return about 1653, when he became a favorite with Cromwell; celebrated the praises of Cromwell in *A Panegyric to my Lord Protector* (1654), which contains some of his most effective stanzas; lamented his death in another poem, but welcomed the return of Charles II. by some indifferent verses *To the King upon his Majesty's Happy Return* (1660); was a general favorite with all parties on account of his wit and eminent social qualities; pub. a vol. of his poems 1645, and again 1684, which were highly admired and imitated. D. Oct. 21, 1687.

**Waller** (EPWIN), b. in Spottsylvania co., Va., in 1800, became an alcalde in Tex.; was the owner of the Sabine, a vessel which in 1832 sailed past the Mex. post of Velasco,



the Mex. authorities having determined to levy a duty on the exportation of cotton, then a new branch of Tex. commerce. This was the first overt act of resistance to the Mex. exactions in Tex. W. became a leading spirit in the following war; helped form the provisional govt.; was a member of the convention of 1836, and assisted in framing the const. of that yr.; selected Austin as the cap. 1839; was pres. of the board of land coms.; was the first mayor of Austin; P. M. gen. of Tex.; was long chief-justice of Austin co.; was the first to sign the ordinance of secession in 1861.

**Waller** (ELWYN). See APPENDIX.

**Waller** (Sir WILLIAM), b. in Kent, Eng., in 1597, ed. at Magdalen Coll. and Hart Hall, Ox., and at Paris; was elected by the town of Andover to the Long Parl. (1640), in which he was a zealous member of the Presb. party; was appointed gen. and second in command of the Parliamentary forces under the earl of Essex 1642; took a leading part in the reduction of Portsmouth in that yr.; was defeated by the royalists at Lansdowne, near Bath, July 5, 1643, and again at Roundway Down, near Devizes, July 13, but gained a signal victory over Sir Ralph Hopton at Cheriton (or Cherrytown) Down, Alresford, near Winchester, Mar. 29, 1644; was defeated by Charles I. in person at Cropredy Bridge, near Banbury, Oxfordshire, July 29; joined the earl of Manchester in his march against Ox., and took part in the indecisive engagement at Newbury, Berkshire, Oct. 27; was deprived of his military command Apr. 1645, but continued to be a leader of the Presbs. in Parl.; was one of the 11 members of Parl. who were impeached of high treason by the army, June 1647; remained in retirement until the Restoration, when he sat as a member of the council of state Feb. 1660, and of the Convention Parl. Apr. to Dec. 1660. D. Sept. 19, 1688.

**Wall-flower**, the *Cheiranthus cheiri*, a European half-shrubby cruciferous plant, often growing on old walls, whence the name. It is a popular garden-flower, having blossoms single or double, of varied colors and of a rich fragrance. The Western W.-f., or "yellow phlox" of the U. S., is *Erysimum asperum*, var. *Arkanseanum*, a fine cruciferous plant.

**Wallingford**, on R. R., New Haven co., Conn., 12 m. from New Haven, has manufactures of britannia and silver ware, etc. The Wallingford Community, a branch of Oneida Community, founded in 1850 by John H. Noyes and Henry Allen, the original proprietor, is located here. Their prin. business is agriculture, horticulture, job printing, and book-making. Pop. tp. 1870, 3676; 1880, 4686, including 3017 in v.

**Waller's** (JOHN), D. D., F. R. S., b. at Ashford, Kent, Eng., Nov. 23, 1616, ed. at Felsted School and at Emmanuel Coll., Cambridge, where he grad. about 1636; took orders in the Ch. of Eng. 1640; became an expert in discovering the keys to MSS. written in cipher, and was employed for that purpose by the Long Parl.; obtained the living of St. Gabriel, Fenchurch st., Lond., which he exchanged for St. Martin's 1643; became Savilian prof. of geom. at Ox. 1648, and keeper of the archives at Ox. 1658; was one of the founders of the Royal Society 1662; attracted notice by his success in teaching a deaf and dumb child to speak; was one of the revisers of the Book of Common Prayer 1661; maintained theological controversies with the Arians, Baps., and Sabatarians. Author of *Arithmetica Infinitorum*, *Mathesis Universalis*, etc. D. Oct. 28, 1703.

**Walloons** [Dut. *Walen*], a name applied to the inhabs. of certain provs. of Belg. and Holl.—viz. Artois, Hainault, Namur, a part of Flanders, Brabant, the country of Liege, Limburg, and Luxemburg. These speak the W. lang. oranc. Fr., which has Gaulish, Lat., and Teutonic elements.

**Wall-Papers**. See PAPER-HANGINGS.

**Walnut**, la. See APPENDIX.

**Walnut** [signifying "foreign nut,"] it was introduced into Europe from the East, the common name of trees and their fruit of the genus *Juglans* (order Juglandaceæ). The Eng. W. or madeira-nut of the shops is the fruit of *Juglans regia*, a stately tree producing excellent timber. The nuts are very good eating, and the kernels yield a fixed drying-oil much prized by artists and makers of varnishes. In the U. S. we have the black W., *J. nigra*, which produces a very valuable dark-colored timber and a strong and very oily nut. The white W., *J. cinerea*, called also oilnut and butter-nut, produces a useful timber and more palatable nuts.

**Walpole**, Mass. See APPENDIX.

**Walpole**, on R. R., Cheshire co., N. H. Pop. tp. 1870, 1830; 1880, 2018.

**Walpole** (HORACE), FOURTH EARL OF ORFORD, third son of Sir Robert, b. in Lond., Eng., Oct. 5, 1717, will be best remembered by his voluminous and interesting letters. His *Entire Correspondence* was edited by Peter Cunningham. D. Mar. 2, 1797.

**Walpole** (Sir ROBERT), EARL OF ORFORD, b. at Houghton, Norfolk, Eng., Aug. 26, 1676, ed. at Eton and at King's Coll., Cambridge, was elected to Parl. for Castle Rising 1700, and for King's Lynn 1702; became sec. at war 1707, and treas. of the navy 1709; managed as leader of the Whigs the parliamentary proceedings against Dr. Sacheverell 1710; was found guilty by the House of Commons of "a high breach of trust and notorious corruption;" was expelled the House and sent to the Tower Jan. 17, 1712; was soon released and re-elected to Parl.; became a privy councillor on the accession of George I.; procured the impeachment of Bolingbroke and the late Tory sept. 1714, chancellor of the exchequer and first lord of the treas.; resigned office in consequence of the intrigues of Sunderland Apr. 10, 1717; was the determined enemy of the S. Sea scheme; became again paymaster-gen. June 1720; returned to power as prime minister and first lord of the treas. Apr. 4, 1721, and was the virtual ruler of Eng. until Feb. 1742. D. Mar. 18, 1745.

**Walpole** (SPENCER HORATIO), D. C. L., b. in Surrey, Eng., in 1806, is a great-grandson of Sir Robert; was educated at

Eton and at Trinity Coll., Cambridge; was called to the bar at Lincoln's Inn 1831; became a bencher there, a successful practitioner in the chancery courts, and a Q. C. 1846; sat in Parl. for Midhurst as a Conservative 1846-56; has represented the Univ. of Cambridge since 1856; was sec. of state for the home dept. in Lord Derby's 3 administrations, 1852, 1858-59, and 1866-67.

**Walpurge's-Night**, the evening before the first of May, the vigil of the old festival of St. Walpurge, or Walburga, who d. in 778. She was an Englishwoman of the royal blood of Wessex, the first abbess of Heldenheim, and a sister of SS. Willibald and Wunnibald. W. N. is celebrated as the season of the supposed annual celebration of the "witches' sabbath" on Blocksberg in the Hartz.

**Walrus** [Norse, *hval*, "whale," and *ros*, "horse"], the common Eng. name of the species of *Marinus*.

**Walsh** (ROBERT), LL.D., b. at Baltimore, Md., in 1784, ed. in the R. Cath. coll. at Baltimore and the Jesuit coll. at Georgetown, D. C.; spent several yrs. in Europe; became a writer for Dennie's *Portfolio*; pub. *A Letter on the Genius and Disposition of the Fr. Govt., including a View of the Tardation of the Fr. Empire*; conducted from 1811 to 1813 the first quarterly treatise in Amer., *The Amer. Review of Hist. and Politics*; issued an *Essay on the Future State of Europe* (1813); wrote *An Appeal from the Judgments of G. Brit. respecting the U. S. of Amer.*; conducted *The Amer. Register, The Museum of Foreign Lit. and Science, The Amer. Quarterly Review*, etc. In 1837 he became U. S. consul at Paris, where he resided until his death, Feb. 7, 1859.

**Walsingham** (Sir FRANCIS), b. at Chiselmhurst, Kent, Eng., about 1586, studied at King's Coll., Cambridge; travelled on the Continent; was sent 8 times on missions to the court of Fr., where he resided 1570-73; was knighted, sworn of the privy council, and made one of the prin. secs. of state 1573; was sent on important embassies to the Netherlands 1578, to Fr. 1581, and to Scot. 1583; was said to have had in his pay in foreign countries 53 agents and 18 spies, through whom he was quickly informed of the secrets even of hostile courts; was a political adversary of Mary Queen of Scots, whom for yrs. he surrounded with spies and informers; had in his pay a servant of the Fr. ambassador Castelnau, and Gray, the envoy of the duke of Guise to the Scot. court, who was employed in managing the correspondence of Mary and James with their friends in Fr., thus discovering the so-called "Babington's plot" 1586; was a member of the commission for the trial of the queen of Scots at Fotheringay Oct. 1586; was made chancellor of the duchy of Lancaster, and soon afterward withdrew from the management of public affairs. D. Apr. 6, 1590.

**Walsingham** (THOMAS), a native of Walsingham, Norfolk, Eng., was about 1440 a monk of the Benedictine abbey of St. Alban's, and afterward prior of Wymondham, Norfolk. He was author of 2 valuable Lat. chronicles, *Historia Brevis ab Eduardo Primo ad Henricum Quintum*, and *Ypodigma Neustria vel Normannia ab Ingulpho Normannorum usque ad Annum sextum Regni Henrici Quinti*.

**Wal'ter** (JOHN), b. in Eng. in 1739, became a printer in Lond.; bought in 1780 two patents for "logography, or the art of using entire words, their radices, and terminations, instead of single letters, in arranging and composing for printing;" endeavored to introduce that invention by the establishment of a newspaper, *The Lond. Daily Universal Register*, of which the first number appeared Jan. 18, 1785. Though the system of printing proved a comparative failure, the newspaper prospered, especially after a change of title was made to *The Times* (Jan. 1, 1788). D. Nov. 16, 1812.

**Walter** (JOHN), son of the above, b. in Lond., Eng., in 1784, became joint proprietor and sole manager of the *Times* 1809; raised its circulation in 10 yrs. from 1000 to 5000 copies; introduced improvements in the printing-press, including the use of steam-power, first practically employed Nov. 27, 1814; sat in Parl. for Berkshire 1832-37, and was elected for Nottingham 1841. D. July 28, 1847.

**Walter** (JOHN), son of the above, b. in Lond., Eng., Oct. 8, 1818, ed. at Eton and at Exeter Coll., Ox.; studied law; was called to the bar at Lincoln's Inn 1847; was an unsuccessful candidate for Parl. in the so-called "Liberal-Conservative interest" 1843, but was returned for that borough Aug. 1847; represented it until 1859, when he was elected for the co. of Berkshire; was defeated in the election of 1865, but again chosen for that co. in 1868 and 1874; proprietor of the *Lond. Times*.

**Walter** (THOMAS USTICK), LL.D., b. at Phila. Sept. 4, 1804, received a good education; became prof. of arch. in the Franklin Inst., Phila.; designed the Phila. co. prison (1831), Girard Coll. (1833), the U. S. capitol extension (1891-65), the new treas. building and the govt. hospital for the insane at Wash.

**Wal'tham**, R. R. centre, Middlesex co., Mass., on both sides of Charles River, 9 m. W. of Boston. The first cotton-mill on an extensive scale was erected here in 1814, and with its later additions of a bleachery and hosiery dept. is still in successful operation. The Amer. Watch Co.'s factory situated here is the largest of the kind in the country, and it was here that watchmaking by machinery was first thoroughly introduced. It has abundant water-power. Pop. tp. 1870, 9005; 1880, 11,712.

**Wal'ton**, N. Y. See APPENDIX.

**Walton** (BRIAN), D. D., b. at Seymour, in Cleveland, Yorkshire, Eng., ed. at Magdalen Coll. and Peterhouse, Cambridge, where he grad. 1619; took orders in the Ch. of Eng.; was a curate in Suffolk and in Lond.; was successively rector of St. Martin's, Omgar, Lond., of Sandon, Essex, and of St. Giles-in-the-Fields, Lond.; became prebendary of St. Paul's and chaplain to Charles I. 1639; espoused the side of the clergy in the Lond. tithe dispute, publishing a *Treatise on the Payment of Tithes and Oblations in Lond.* (1641); became thereby obnoxious to the Puritans, during whose ascendancy he was summoned before Parl. placed in custody, and his livings sequestered (1642). He



was forced to flee to Ox., where he devoted himself to the preparation of his great work, the *Biblia Sacra Polyglotta*, including the Heb. original of the O. T., the Samaritan Pentateuch, the Chaldee, Syriac, Arabic, Per., and Lat. Vulgate, with various readings, notes, etc. W. became chaplain to Charles II. at the Restoration, was consecrated bp. of Chester Dec. 2, 1660, and took part in the Savoy Conferences 1661. D. in Lond. Nov. 39, 1661.

**Walton** (GEORGE), b. in Frederick co., Va., in 1740, was apprenticed to a carpenter; acquired a tolerable education by private study; was admitted to the bar and settled in Savannah, Ga., 1774; was one of the 4 persons who called the first public meeting at Savannah (July 27, 1774) to concert measures for the defence of that colony; drew up the resolutions passed on that occasion; was a delegate to the Continental Cong. 1766-81, and signed the Dec. of Ind. and Articles of Confederation; was col. of militia in the defence of Savannah Dec. 1778, when he was dangerously wounded, and was a prisoner until Sept. 1779; was chosen gov. of Ga. in Oct. 1779, and again 1789; became chief-justice of Ga. 1789, and judge of the State supreme court 1793; appointed delegate to Phila. convention for remodelling the Articles of Confederation and the formation of the present const., but declined; was U. S. Senator 1795-96. D. Feb. 2, 1804.

**Walton** (ISAAC), b. at Stafford, Eng., Aug. 9, 1598, became a linen-draper in Fleet st., Lond., 1624, in which business he acquired a competency, upon which he retired in 1644; sympathized with the royalist cause in the great rebellion, and from that time "lived mostly in the families of eminent clergymen of Eng., of whom he was much beloved," devoting himself to lit., the contemplation of nature, and the pleasures of the fishing-rod. Wrote *Walton's Lives, The Complete Angler, or the Contemplative Man's Recreation*, and various minor productions. D. Dec. 15, 1683.

**Walworth** (REUBEN HYDE), LL.D., b. at Bozrah, Conn., Oct. 26, 1789, studied law at Troy; was admitted to the bar 1809; settled at Plattsburg; was an officer of volunteers 1812, and acting adjutant-gen. of N. Y. militia during the Brit. campaign against Plattsburg 1814; became master in chancery and co. judge 1811; was M. C. 1821-23, a circuit judge 1823-28, chancellor of N. Y. 1828-48; was prominent in connection with the temperance cause, and a v.-p. of the Bible and Tract societies. Author of *Rules and Orders of the Court of Chancery of the State of N. Y.* and *The Hyde Genealogy, or the Descendants, in the Female as well as in the Male Line, from William Hyde of Norwich*. D. Nov. 21, 1867.

**Wamego**, on R. R., Pottawattamie co., Kan., 100 m. W. of Kansas City. A fine iron bridge, 960 ft. long, spans Kansas River here. Pop. tp. 1880, 1783.

**Wampum** [from an Algonkin root signifying "white"], the strings and belts of beads used as money by some tribes of N. Amer. Indians. The shells of *Venus mercenaria*, the round clam, or quahaug, were the favorite material. These were drilled lengthwise and strung upon a thread.

**Wandering Jew, The**, is the hero of a legend which first appeared in the middle of the 13th century in the chronicle of Matthew of Paris. According to this version, he was a servant in the house of Pilate, by the name of Cartaphilus, and gave Christ a blow when he was dragged out of the palace to be executed. According to another version, he was a shoemaker by the name of Ahasuerus, and refused Christ permission to sit down and rest when, on his way to Golgotha, he passed by his house. All versions, however, agree with respect to the verdict of Christ, that he should remain wandering on the earth until the second coming.

**Wanderoo**. 1. The common name of a monkey of the coast of Malabar—the *Macacus silenus* of authors—distinguished by its long hair and venerable appearance; whence it has been also called *Silenus venter*. The head is oblong and the face rather produced; the hair on each side of the face and on the neck and chest is elongated and forms a sort of ruff round the face, and is of a gray or whitish color; the face about the eyes is naked and flesh-colored; the snout black; the fur is mostly black on the back and sides, and whitish beneath and inside the limbs; the tail is rather short and tufted; it is chiefly brown, but its tuft is whitish. The species lives in the depth of the forests, and its appearance has given rise to several legends, and to the idea that it is the lord of the monkey race. 2. The name is also given to, and in fact appears to have been primarily employed for, species of the genus *Semnopithecus*, and especially for the *S. leucoprymnus* of Ceylon.

**Wanika**, a Kafir race of E. Afr., numbering perhaps 50,000 people. They are indolent and morally corrupt, and are worshippers of fetiches and spirits, but have in part imbibed Mohammedan ideas.

**Wapakone'ta**, on R. R., cap. of Auglaize co., O., 121 m. N. of Cin. and 84 m. S. of Toledo. The town was laid out in 1833, and was previously an anc. Indian capital. Pop. 1870, 2150; 1880, 2765.

**Wap'ti**, a name of the *Cervus canadensis*, or large deer of the N. U. S. and Brit. provs. It is more generally called elk, but very improperly, inasmuch as that name belongs by right to the *Alces malehis*, otherwise called moose. The W. is very closely related to the common red deer or stag of Europe, but is a still larger and more noble-looking beast, attaining the dimensions of a moderate-sized horse.

**Wappers** (GUSTAVE), b. at Antwerp in 1803, studied painting in his native city and in Paris, and attracted general attention in 1830 by his *Devotions of the Burgomasters of Leyden*; became the first representative and the founder of the romantic school of painting in Belg., and was made director of the Acad. of Antwerp in 1840, and a baron in 1847. In 1853 he resigned his position in the acad., and in 1855 removed to Paris, where he d. Dec. 6, 1874. Painted *Charles I. taking Leave of his Children*, *Charles IX. on the Night of St. Bartholomew*, *Execution of Anne Boleyn*, etc.

**Wappinger's Falls**, Duchess co., N. Y., 7 m. S. of Poughkeepsie, has print-works, cotton-mills, etc., and is a summer resort. Pop. Wappinger tp. 1880, 4961.

**War'beck** (PERKIN), a pretender to the crown of Eng., who personated Richard, duke of York, younger brother of Edward V., with whom he is supposed to have been murdered in the Tower in 1483. He was said to have been the son of a Jew of Tournay, where he went in the above yr. In 1490 he appeared at the court of Burgundy, where an extraordinary resemblance to Edward IV. was noted. In 1492 he landed at Cork, Ire., and was joined by numerous partisans, but was soon obliged to fly to Fr., where he was acknowledged by Charles VIII. After the peace of Etaples, however, he had to leave Fr.; repaired again to Flanders, 1493, where he was recognized by Margaret, the duchess-dowager. After being repulsed from the coast of Kent July 1495, and from Ire. 1496, proceeded to Scot.; was acknowledged by James IV.; invaded Eng. with Scot. forces Oct. 1496, and again in the spring of 1497; landed in Ire. July 30 of that yr.; proceeded thence to Cornwall, landing at Bodmin Sept. 7; assumed the title of Richard IV.; being hard pressed by the royal forces, he took sanctuary in Beaulieu Abbey, Hampshire; was induced to give himself up by the promise of a pardon; was committed to the Tower; was hanged, drawn, and quartered at Tyburn Nov. 23, 1499.

**Warburton** (ELIOT BARTHOLOMEW GEORGE), b. at Aghrim, near Tullamore, co. Galway, Ire., in 1810, educated at Queen's and Trinity colls., Cambridge; was called to the Irish bar, but soon relinquished that profession to devote himself to the care of his Irish estates, to country sports, lit., and foreign travel; was a genial member of society, and proved himself a generous landlord during the famine of 1846-47. He travelled in the East in 1843; settled in Lond. 1844; pub. *Memoirs of Prince Rupert and the Cavaliers*, *Reginald Hastings*, a novel of the great rebellion; *Memoirs of Horace Walpole and his Contemporaries*, etc. D. Jan. 4, 1852.

**Warburton** (WILLIAM), D. D., b. Dec. 24, 1698, at Newark-upon-Trent, where his father was an atty. and town-clerk; attended school at Newark and Oakham; in 1719 began the practice of law at Newark, but in 1723 abandoned the law and took deacon's orders; in 1726 was ordained priest, and made vicar of Gryesly, Nottinghamshire; became rector of Brant Broughton, Lincolnshire, 1728; preacher to the society of Lincoln's Inn 1746, prebend of Gloucester 1753, king's chaplain in ordinary 1754, prebend of Durham 1755, dean of Bristol 1757, and in 1760 bp. of Gloucester, where he d. June 7, 1779. He pub. *An Inquiry into the Causes of Predigions and Miracles*, *Alliance between Ch. and State*, *Divine Legislation of Moses*, etc.

**Ward**, in feudal law, means the help of the king's tenant in capite during his nonage, but in general lang. the term is applied to all infants under the power of guardians. The guardian may now be said, on the father's death, to belong to one of the following 5 classes: (1) testamentary, or appointed by will; (2) customary, or appointed by local usage; (3) *ad item*, or appointed by a court in order to conduct legal proceedings; (4) by appointment of chancery; and (5) in tort, or by intrusion, as when a person wrongfully intrudes in the management of an infant's estate, he must account in chancery as if he had been a guardian.

**Ward** (ARTEMAS), b. at Shrewsbury, Mass., Nov. 27, 1727, grad. at Harvard 1748; took part in the campaigns against the Fr. near Lake Champlain; represented Shrewsbury in the legislature; was appointed a general officer by the Mass. provincial cong. Oct. 27, 1774, and commander-in-chief of Mass. forces May 19, 1775; was in nominal command at the battle of Bunker Hill, though he remained at headquarters at Cambridge; was in command of the forces besieging Boston until the arrival of Gen. Washington, after which he was second in command, with headquarters at Roxbury; was chief-justice of common pleas for Worcester co. 1776; pres. of the Mass. executive council 1777; member of legislature 16 yrs.; was speaker of that body 1785, and M. C. 1791-95. D. Oct. 27, 1800.

**Ward** (ARTEMUS). See BROWNE (CHARLES FARRAR).

**Ward** (EDWARD MATTHEW), R. A., b. at Lond., Eng., in 1816, became in 1834 an art-student at the Royal Acad.; studied at Rome 1836-39; pursued a course of fresco-painting under Cornelius at Munich; exhibited his first picture at the Royal Acad. 1839; was brought into favorable notice by his *Dr. Johnson reading the MS. of the Vicar of Wakefield*, *Goldsmith as a Wandering Musician*, and *Dr. Johnson in the Anteroom of Lord Chesterfield*; was commissioned to paint 8 pictures in oil for the corridor of the House of Commons 1852, 3 of which have been reproduced in fresco and 2 in water-glass; became an academicien 1856. D. Jan. 15, 1879.

**Ward** (HENRY AUGUSTUS), b. at Rochester, N. Y., Mar. 9, 1834, ed. at Williams College and at the Lawrence Scientific School of Harvard Univ.; studied zoology at Paris, and mineralogy at Freiberg; travelled in Pal., Ar., Egypt, Nubia, and the W. coast of Afr., ascending the Niger; subsequently visited the W. I., Central Amer., and the W. Tiers. of the U. S. as a mining engineer; was prof. of natural sciences at Rochester Univ. 1861-66; established there a laboratory for the production of fac-similes of rare fossils; made an extensive collection of modern zoology, and was naturalist to the U. S. expedition to Santo Domingo 1871.

**Ward** (JOHN ELLIOTT), b. in Sunbury, Liberty co., Ga., Oct. 2, 1814, studied law in the office of Hon. Matthew Hall McAllister in Savannah, and was admitted to the bar in Jan. 1835; after this, before beginning practice, he attended law lectures at Dane Law School, Cambridge, Mass. In 1836 he opened an office in Savannah, and was soon appointed solicitor-gen. of the E. judicial circuit of Ga. He became U. S. dist. atty. for Ga. in 1838. This position he resigned in 1839, and became a member of the State legislature. In 1854 he was speaker of the House; was afterward mayor of the city of Savannah, and in 1857-58 was State senator from Chatham co. During this term he was pres. of the senate, and thereby lieut.-gov. of the State. He was also pres. of the Cin. Dem. Presidential convention in 1856. In 1858, while pres. of the State senate, he was appointed U. S. minister to China, and was occupying this



position when Ga. passed her ordinance of secession in 1861. On the receipt of this intelligence he resigned and returned to his home in Savannah. After the war he moved to New York, where he opened a law-office.

**Ward** (JOHN QUINCY ADAMS), b. at Urbana, O., June 29, 1850; was engaged in the studio of H. K. Brown, the sculptor, 1850-56; settled in New York 1861; gained a high reputation by his bas-reliefs and groups; executed in bronze for the Central Park the famous *Indian Hunter*, the *Shakspeare*, and the *Private of the Seventh Regiment*.

**Ward** (JOSEPH), b. at Newton, Mass., July 2, 1737, taught school in Boston and other places; was a vigorous advocate of the independence of the colonies; joined the patriot army at Lexington; distinguished himself at Bunker Hill; was commissary-gen., with rank of col., till 1780, when he returned to business in Boston. D. Feb. 14, 1812.

**Ward** (LESTER FRANK). See *APPENDIX*.

**Ward** (NATHANIEL), b. at Haverhill, Suffolk, Eng., about 1570, grad. at Emmanuel Coll., Cambridge, 1603; was for some yrs. a lawyer; travelled on the Continent upon commercial business; studied theol.; became preacher at St. James's, Duke's Place, Lond., and afterward rector of Standon Massaye, Essex; became connected with the Mass. Co., 1630; was brought before Bp. Laud for nonconformity 1631; was silenced 1633; sailed for Mass. Apr. 1634; immediately became pastor at Agawam or Ipswich; resigned his charge on account of ill-health Feb. 1637; took part in the settlement of Haverhill May 1640; was the author of the *Body of Liberties* adopted Dec. 1641; was a member of a committee appointed to draw up new laws 1645; returned to Eng. 1646; preached before the House of Commons June 30, 1647; took part as a pamphleteer in the great political struggle then going on; became pastor of Shenfield, Essex, 1648, and d. there in 1653.

**Ward** (ROBERT PLUMER), b. in Lond., Eng., Mar. 19, 1765, ed. at Walthamstow and at Christ Ch., Ox.; was called to the bar at the Inner Temple 1790; was brought into favorable notice as a juriconsult by his works written at the instance of Lord Eldon, *An Enquiry into the Foundation and Hist. of the Law of Nations in Europe, from the Time of the Grs. and Roms. to the Age of Grotius*; *A Treatise of the Relative Rights and Duties of Belligerent and Neutral Powers in Maritime Affairs*, etc., and *An Essay on Contraband*; M. P. for Cockermouth 1802-03; was frequently employed in cases before the privy council; became under-sec. of foreign affairs 1805; retired from office on the death of Pitt 1806; was M. P. for Haslemere 1807-20; became lord of the admiralty in the Portland administration 1807; was clerk of the ordinance from 1811-23, and auditor of the civil list from 1823 to 1831. Wrote *Tremaine, or the Man of Refinement*, *De Vere, or the Man of Independence*, *De Clifford*, etc. D. Aug. 13, 1846.

**Ward** (SAMUEL), b. at Newport, R. I., May 27, 1725, became a wealthy farmer at Westerly; was delegate to the Hartford military convention 1758; chief-justice of R. I. 1761; gov. 1762 and 1765-67; was one of the founders of R. I. Coll. (1764), afterward Brown Univ.; a delegate to the Continental Cong. 1774-76, and several times presided over it when in committee of the whole. D. Mar. 26, 1776.

**Ward** (WILLIAM HAYES), D. D., b. at Abington, Mass., June 25, 1835, grad. at Amherst Coll. 1856, at Andover Theological Sem. 1859, ordained in 1859, and became acting pastor of the Congl. chs. of Oskaloosa and Grasshopper Falls, Kan.; in 1857-58 taught the natural sciences in Beloit Coll.; in 1862 became teacher of sciences in the Utica Free Acad.; 1865-68 prof. of Lat. in Ripon Coll., Wis.; entered in 1868 the editorial staff of the New York *Independent*, of which he became superintending ed. in 1870.

**Wardian Case** [named from W. B. Ward, its inventor, an Englishman], a box whose sides and top are of glass, containing at the bottom a layer of earth, and used for growing ferns and other plants in parlor-culture.

**Ware**, Hampshire co., Mass., on R. R. and Ware River, 25 m. N. E. of Springfield, contains a public library of 2000 vols., extensive cotton and woollen factories, and a beautiful cemetery. Pop. tp. 1870, 4259; 1880, 4817.

**Ware** (ASHUR), b. at Sherburne, Mass., Feb. 10, 1782, grad. at Harvard in 1804, where he was engaged as tutor 1807-11, and prof. of Gr. 1811-15; practised law at Boston, and ed. of *Boston Yankee* 1816; removed to Portland, Me., in 1817; was the first sec. of state for that State on its separation in 1820; judge of U. S. dist. court of Me. 1822-66. Author of *Reports of Cases U. S. Dist. Court of Me.*

**Ware** (HENRY), D. D., b. at Sherburne, Mass., Apr. 1, 1764, grad. at Harvard 1785; taught the town school at Cambridge while pursuing the study of theol. 1785-87; was ordained pastor of the first ch. at Hingham, Mass., Oct. 24, 1787; was a leader in the direction of Unit. opinions; precipitated the theological crisis by his acceptance of the Hollis professorship of divinity in Harvard Univ. 1805; pub. *Letters to Trinitarians and Unitarians, occasioned by Dr. Wood's Letters to Unitarians*, followed by *An Answer to Dr. Wood's Reply and A Postscript to an Answer*, etc.; issued in 1842 one of his courses of theological lectures with the title *An Inquiry into the Foundation, Evidences, and Truth of Religion*. In addition to his professorship, which he resigned 1840, he had charge of the Harvard Divinity School from its foundation in 1826 to his death, July 12, 1845. He had been totally blind for nearly 18 yrs.

**Ware** (HENRY), JR., D. D., son of the preceding, b. at Hingham, Mass., Apr. 21, 1794, grad. at Harvard 1812; was ordained pastor of the Second ch. (Unit.) at Boston Jan. 1, 1817; took an active part in the formal organization of the Unit. body, editing its organ, the *Christian Disciple*, afterward the *Christian Examiner*; resigned his pastorate on account of ill-health 1830, and filled the Parkman professorship of pulpit eloquence in the Divinity School of Harvard Univ. 1830-42. Wrote *Hints on Extemporaneous Preaching*, *Recollections of Jotham Anderson, Minister of the Gospel, On the Formation of the Chr. Character*. D. Sept. 22, 1843.

**Ware** (Sir JAMES), LL.D., b. at Dublin, Ire., Nov. 26, 1594,

ed. at Dublin Coll.; was knighted 1629; auditor-gen. of Ire. 1632; became an eminent antiquarian; distinguished himself by his zeal in defence of the earl of Strafford; was deprived of his offices and committed to the Tower by the Parliamentary party; recovered the auditorship at the Restoration, when he was chosen a member of the Irish Parl. for the Univ. of Dublin. Wrote *De Scripturis Hibernicis*, *De Hibernia et Antiquitatibus ejus Disquisitiones*, *Hibernia Sacra*, etc. D. Dec. 1, 1668.

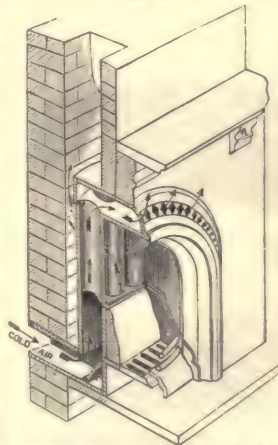
**Ware** (WILLIAM), son of Dr. Henry, Sr., b. at Hingham, Mass., Aug. 3, 1707, grad. at Harvard 1816; studied theol., graduating at Cambridge 1819; preached successfully at Northborough, Mass., Brookline, Conn., and Burlington, Vt.; was pastor of the First Unit. ch. in New York from Dec. 18, 1821, to Oct. 19, 1836; preached at Brookline, Mass., 1836-37, at Waltham 1837-38; settled without pastoral charge at Jamaica Plains 1838, and at Cambridge 1839; was ed. and proprietor of the *Chr. Examiner* 1839-44; was pastor of a ch. at W. Cambridge 1844-45; resigned on account of ill-health; settled again at Cambridge, where he occasionally preached. Wrote *Letters from Palmyra, Probus, or Rome in the Third Century*; *Julian, or Scenes in Judea*, etc. D. Feb. 19, 1852.

**Warham** (WILLIAM), D. D., LL.D., b. at Okely, Hampshire, Eng., about 1450, ed. at Winchester School and at New Coll., Oxford, of which he became fellow 1475; was ordained priest; was a joint envoy to the duchess of Burgundy to complain of her countenance to the pretender Perkin Warbeck 1493; was master of the rolls 1494-1502; joint envoy to Maximilian of Burgundy 1501-02; became keeper of the great seal Aug. 11, 1502; lord chancellor Jan. 1, 1503, bp. of Lond. 1503, abp. of Canterbury Mar. 9, 1504, chancellor of Ox. Univ. soon after; opposed the marriage of Henry VIII. with Catharine of Aragon, but officiated at the ceremony June 1509; resigned the great seal to Wolsey Dec. 22, 1515. D. Aug. 23, 1532.

**Warming and Ventilation of Buildings.** When a building or room exposed to outside cooling influences has once attained the proper temperature, it is only necessary, in order to maintain its warmth, to furnish sufficient heat to replace the continual loss by transmission through the walls, window-glass, and roof, in addition to what is needed for warming to the temperature of the room all the cold air that may enter. When the heating apparatus is outside the apartments, sufficient air must be admitted to convey the heat generated by the heater into the rooms; and this air may be more than is required for ventilation. The transmission of heat is in direct proportion to the difference between the temperature of the air outside and inside the walls. It is customary in designing a heating apparatus for any building to make the heating surface proportional to the cubic contents of the apartments; but as the cooling of the rooms does not depend on their capacity, but on the quantity of cold air supplied to them, and on the extent and character of their walls, no general rules can be useful which do not take these details into account.

Although the open grate is the most popular device for warming apartments in dwellings, it cannot be depended on in its common forms as the only source of heat in a cold climate. The large volume of air which passes into the open chimney-throat must be replaced by out-door air, which flows into the room through the crevices of the doors and

FIG. 1.



windows and produces uncomfortable and dangerous draughts. The grate is never economical, and, in view of the other defects, cannot be pronounced desirable as the only means of warming a room. Yet certain advantages are recognized universally. The genial effect of the luminous rays striking directly on the person, and the benefit of inhaling cool air while the surrounding objects are warmed sufficiently to prevent undue abstraction of heat by radiation from the body, cannot be overlooked. These render the open fire a delightful source of heat when used in connection with a hot-air furnace, which introduces into the room the supply of air demanded by the chimney warmed to a comfortable temperature, and prevents an inflow at doors and windows by supplying the demand through the registers. The ventilating power of the open chimney, then, becomes an invaluable means of changing the air of an apartment and maintaining a healthful atmosphere. The advantages secured also from "ventilating fireplaces" and from "ventilating stoves," of which the original Franklin stove is an example, are shown in Fig. 1. It is virtually a double-cased open stove set in the chimney. The gases of combustion pass into the chimney-flue between the pipes which connect the upper and lower portions of the double case at the back. Fresh out-door air is admitted inside the double case, and, after being warmed by contact with the extensive surface afforded by the back of the grate and the inside of the pipes, the air enters the room through openings in the front piece which has the appearance of the usual ornamental mantel setting.



An excellent open-grate ventilating stove, called "the fire on the hearth," was exhibited in the U. S. section of the Exposition. A sectional view is given in Fig. 2. This is a double-cased open stove, intended to stand out in the room. The space between the 2 cases is open at the bottom, and forms a channel through which the air of the room or fresh air from out doors can circulate and become heated, after which it issues into the room through the perforated top. The course of the hot gases in the stove and of the air between the cases is shown in the figure by arrows. The cast-iron base of the stove, arranged to take fresh out-door air from a cold air-box beneath the floor, is represented in Fig. 3. To secure a uniform temperature at different heights in the room, it is desirable that a portion of the air-supply to the case shall flow from the bottom of the room, and space is left for this purpose around the fresh-air pipe, which, as Fig. 3 shows, does not fill the opening in the base.

Steam is the most convenient medium for conveying heat to a distance from its source, and on this account it is generally used in factories and public buildings. Two systems of steam-heating are employed. In the first or direct method the heater stands in the room which is to be warmed, while in the indirect method it is placed in the cellar and basement, and warms the out-door air which is led into the room. In indirect heaters some kinds of extended surface are peculiarly valuable. Several forms of these heaters are illustrated. Fig. 4 shows a cluster of

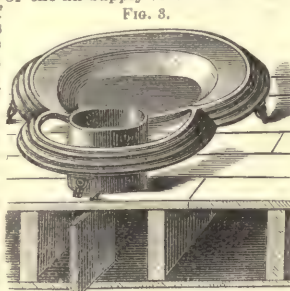
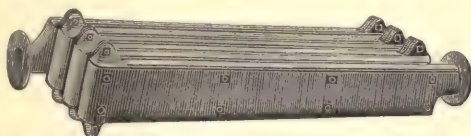
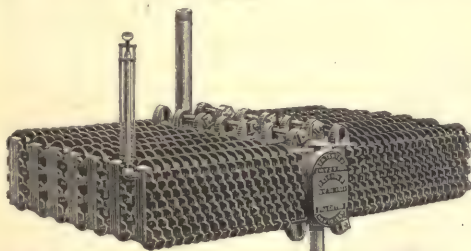


FIG. 3.



plain, flat pipes set on edge, through which steam circulates, and between and around which the fresh air passes on its way to the room. A similar cluster of steam-boxes, whose

FIG. 5.



outside is provided with extended surface formed by thin projecting gills arranged in rows with the gills over one another, is shown in Fig. 5, while a single element of a

FIG. 6.



cluster is represented in Fig. 6. In this last, however, the extended surface consists of projecting conical spurs, which are in quincunx order, by which is meant that the spurs in one row stand over the spaces in the next. This difference of arrangement has an important effect on the heating efficiency of the surface. The air may lose its heat rapidly after leaving the heater, and if led through exposed pipes its temperature may become reduced many degrees before entering the room. In order that all the interior surface of the heater may continue to have the hot steam in contact with it, the water resulting from condensation must be removed as fast as it is formed. When the heaters are placed above the level of the boiler, and the steam-pressure in them is nearly as great as in the boiler, the removal of the water may be accomplished by allowing it to drain into the boiler through a special return-pipe which enters the boiler below the water-line. Should it be impracticable to return the water of condensation directly to the boiler, it must be blown out by the steam-pressure into the open air; but an automatic device is then necessary to prevent waste of heat

by the steam following the water when the latter has been discharged. Such contrivances are called *steam-traps*.

**VENTILATION.**—The atmosphere is never found in its natural purity in densely inhabited places nor in occupied apartments; the act of respiration and emanations from the person, which are constantly taking place, vitiate it in various ways. The vapor which escapes from even the healthy human system contains volatile substances and effete matter, which it is one of the functions of breathing and perspiration to remove from the body as injurious, and which it is evident should not be again taken into the system. These last impurities when present in comparatively small quantities render air unfit to support life, and when habitually breathed are insidious, and often unsuspected, causes of gradual deterioration of vigor and health. It has been estimated that at least 40 per cent. of all fatal diseases are indirectly due to impure air.

To permit the proper distribution of fresh air in an apartment, and to provide for a temporary suspension of ventilation, the capacity of a room should be not less than 600 to 1000 cubic ft. for each adult occupant, nor the floor-space less than 60 square ft. for each, while for hospitals 100 square ft. of floor-space and 1500 or 1800 cubic ft. of capacity should be allowed for each bed. The problem of introducing into a room the large quantities of properly warmed air required for ventilation without producing draughts upon the occupants, and of distributing it thoroughly through the room, is a difficult one. Fortunately, during cold weather a spontaneous ventilation, amounting to more than is generally suspected, occurs through the apparently solid walls of our dwellings when these are of dry, unpainted brick or stone.

A reliable natural ventilation cannot be obtained, except when a difference of temperature exists between the indoor and out-door air. Hence, open windows cannot be depended on to effect a proper change of air, unless the room be kept either warmer or cooler than the atmosphere outside. The open fireplace and the open stove are efficient artificial ventilators in winter if suitable fresh-air inlets be provided, but the chimney-flues must be heated in summer also or they will then cease to act. A gaslight in the flue affords the most convenient source of heat, and it may be so placed as to be accessible through an opening over the mantel, which may be hidden by a movable picture or other ornament. (See *Smithsonian Reports* (1873-74) and *LEEDS'S Lectures on Ventilation*.) [From orig. art. in *J.'s Univ. Cyc.*, by C. B. RICHARDS, C. E.]

**Warner** (CHARLES DUDLEY), b. at Plainfield, Mass., Sept. 12, 1829, grad. at Hamilton Coll. 1851; was a member of a surveying party in Mo.; studied law in New York; was admitted to the bar in Phila. 1856; practised in Chicago until 1860; became ed. of the *Hartford Press and Courier*, and twice travelled in Europe and the East as correspondent of several Amer. newspapers. He has contributed to the *Atlantic* and other magazines, and wrote *My Summer in a Garden*, *Switzerland*, *Back-Log Studies*, etc.

**Warner** (HIRAM), b. in Hampshire co., Mass., Oct. 29, 1802, moved to Ga. in 1819, and taught school for 3 yrs. Before leaving his native State he had acquired a pretty good common-school education, with some knowledge of the classics, and he was therefore well qualified to teach a Ga. country school at that time. With his earnings as teacher he laid up sufficient funds to enable him to study law, and was admitted to the bar in 1825, and opened an office first at Knoxville, Crawford co. From 1828 to 1831 he was a member of the general assembly of the State; in 1833 was elected by the legislature one of the judges of the superior courts of the State, and in 1836 was re-elected to the same position for another term of 4 yrs. In 1845, upon the organization of the supreme court of the State, he was elected one of its 3 judges, which position he held for 8 yrs.; then resigned, and was elected to Cong. in 1853, but declined a re-election to the same body in 1857. In 1860 he was a member of the celebrated Charleston convention, where he exerted his utmost powers against the secession movement. In 1861 he was a member of the Ga. secession convention. He opposed the ordinance, but after it was passed pledged himself to sustain the cause of the State. After the war he accepted the situation, and sustained the first Reconstruction act of Cong., and was again, on the reorganization of the judiciary under the new const., appointed to the bench of the supreme court of the State, and in 1872 became chief-justice of that court; resigned 1880. D. June 30, 1881.

**Warner** (SERU), b. at Roxbury, Conn., May 17, 1743, settled at Bennington, Vt., 1765; was a leader of the "Green Mountain Boys" in the conflicts of jurisdiction with the N. Y. authorities, by whom he was outlawed; was second in command to Ethan Allen at the capture of Ticonderoga and Crown Point 1775; was chosen col. of Vt. troops July 27, 1775; took part in Montgomery's campaign in Canada; rendered good service in the retreat to Ticonderoga May 1776; commanded in a sharp engagement at Hubbardston July 7, 1777; participated in the battle of Bennington, and continued in the service until 1782, when he returned to Roxbury, Conn., where he d. Dec. 26, 1784.

**Warner** (SUSAN), b. in New York in 1818, daughter of Henry W. Warner (d. 1875), wrote *The Wide, Wide World*, a novel which had great success both in Eng. and the U. S.; *Queechy*, *Wyck Hazel*, etc. D. Mar. 17, 1885.

**War of Succession.** See **SUCCESSION WARS**.

**Warranty** (in law). This name is given to a class of agreements which are always based upon and collateral to some other and principal contracts. There are 3 distinct species in common use to which the term is applied.

**Warranty on the Sale of Land.**—This is an express covenant contained in a deed of conveyance, whereby the grantor binds himself and his representatives to warrant and defend the grantee, his heirs and assigns, in the quiet and peaceable possession of the land conveyed against any one claiming the same by a title paramount to that of the



grantor. Another form protects the grantee against persons only claiming under the grantor himself.

**Warranty on the Sale of Chattels.**—This is a collateral agreement by the vendor on the sale of chattels or other kinds of personal property, based upon the same consideration as the principal contract, and stipulating either as to the good quality and condition of the articles, or that the title of the seller is perfect. It may be either express or implied. If express, the agreement is made by the lang. employed by the parties; if implied, it is inferred by the law from the fact of the sale without any express words to that effect.

**Warranties in Policies of Insurance.**—These are stipulations by the assured which constitute the conditions upon which the policy is issued. They are express when incorporated into the instrument; implied when inferred by the law from the very contract of insurance, as, for example, in a marine policy, that the vessel shall be seaworthy at the commencement of the voyage. All such W. must be literally complied with, or else the policy is avoided, although perhaps the risk may not have been increased, because the parties have expressly made these stipulations to be the conditions upon which the validity of the entire contract is rested.

JOHN NANTON POMEROY.

**Warren, R. R. June.**, Jo Daviess co., Ill. Prin. business, grain and stock raising. Pop. tp. 1870, 1786; 1880, 1897.

**Warren**, on R. R., Worcester co., Mass. Pop. tp. 1870, 2625; 1880, 3889.

**Warren**, city and R. R. centre, cap. of Trumbull co., O. It is contiguous to an extensive coal and iron dist., and has foundries, rolling-mills, etc. Pop. 1870, 3457; 1880, 4428.

**Warren**, R. R. centre, cap. of Warren co., Pa. Pop. 1870, 2014; 1880, 2810.

**Warren**, R. R. centre, Bristol co., R. I. Pop. tp. 1870, 3008; 1880, 4007.

**Warren** (GOUVERNEUR KEMBLE), b. at Cold Spring, N. Y., Jan. 8, 1830, grad. at the U. S. Military Acad. July 1, 1850; was employed on surveys of the delta of the Miss. River 1850-53; topographical engineer of Sioux expedition 1855; aided in Pacific R. R. explorations; in charge of surveys of Dak. and Neb. Terrs. 1855-59; assistant prof. of math. at W. Pt. 1859-61; participated in the action at Big Bethel June 10, 1861; served in the construction of the defences of Baltimore. In the Va. Peninsular campaign of 1862 he commanded a brigade in Sykes's division of the 5th (Porter's) corps, and was brevetted lieut.-col. for gallantry at Gaines's Mill, where he was wounded. In the battle of Manassas his command was hotly engaged on Aug. 30, and participated in the battle of Antietam. He was commissioned brig.-gen. of volunteers on Sept. 26, 1862, and continued to command a brigade in the 5th corps in the battle of Fredericksburg; chief engineer of the Army of the Potomac. At the battle of Gettysburg he rendered conspicuous aid; gained a marked advantage over the enemy at Bristoe Station, Oct. 14. In Mar. 1864 the 1st corps was united with the 5th corps, and W. assigned to this command by the Pres., which he held through the campaign of 1864, and until the close of the battle of Five Forks, Apr. 1, 1865; was assigned, Apr. 2 to the command of the troops between the Appomattox and James, and Apr. 3 placed in command of Petersburg. Ordered to command the dept. of the Miss. May 14, he held this till May 27, when the enemy having all laid down their arms, he resigned his volunteer commission; was brevetted major-gen.; had charge of various harbor and river improvements, etc. D. Aug. 8, 1882.

**Warren** (HENRY W.), D. D., b. in Mass. in 1835, grad. at Wesleyan Univ., Middletown, Conn., in 1858; was 2 yrs. prof. of anc. langs. at Wilbraham Acad., Mass.; joined the N. Eng. Conference of the M. E. Ch. in 1858, and was pastor of various chs. in N. Eng.; pastor of Arch st. ch. in Phila. 1871-74; from there he was sent to St. John's ch., Brooklyn, N. Y., and in 1877 again became pastor of Arch st. ch.; was afterward appointed to Spring Garden ch. in same city; was elected bp. May 12, 1880.

**Warren** (JAMES), b. at Plymouth, Mass., Sept. 28, 1726, grad. at Harvard 1745; became a wealthy merchant at Plymouth; was high sheriff of the co. 1755-75; became a member of the general court 1766; procured the appointment of committees of correspondence 1772; pres. of the provincial cong. 1775; was paymaster-gen. of the army before Boston 1775-76; subsequently maj.-gen. of militia, speaker of the Mass. house of reps. several yrs., and member of the navy board, and declined the offices of lieut.-gen. and judge of the supreme court. D. Nov. 27, 1808.

**Warren** (JOHN), M. D., brother of Gen. Joseph, b. at Roxbury, Mass., July 27, 1753, grad. at Harvard 1771; studied med.; became in June 1775 senior surgeon to the military hospital at Cambridge; served in the campaigns of N. Y. and N. J. 1776-77, being present at the battles of Trenton and Princeton; was in charge of the military hospitals in Boston until the close of the war; accompanied Gen. Greene's expedition to R. I. 1778, and the campaign against the Shays insurrection 1786; gave a course of dissections to his surgical colleagues 1780; became prof. of anat. and surgery in the med. school in connection with Harvard Univ. 1783; was grand master of the Freemasons, pres. of the agricultural and humane societies and of the Mass. Med. Society from 1804 to his death, Apr. 4, 1815.

**Warren** (JOHN COLLINS), M. D., son of Dr. John, b. at Boston, Mass., Aug. 1, 1778, grad. at Harvard 1797; studied med. with his father, also at Edinburgh and in the hospitals of Lond. and Paris; began practice at Boston 1802; was assistant prof. of anat. and surgery in the Harvard Med. School 1806-15, prof. 1815-47, and emeritus prof. 1847-56; was one of the founders of the Mass. General Hospital 1820, and of the McLean Asylum for the Insane, pres. of the Mass. Med. Society 1832-36; pres. for many yrs. of the Nat. Temperance Society and of the Boston Society of Nat. Hist.; visited Europe 1837 and 1852; carried into effect (1846) the successful application of ether in a surgical operation at Mass. General Hospital, of which he was prin. surgeon.

He contributed largely to med. and scientific journals, and pub. many professional monographs. D. May 4, 1886.

**Warren** (JOSEPH), b. at Roxbury, Mass., June 11, 1741, grad. at Hartford 1759; studied med., began practice at Boston 1762; was a member of the provincial committee of correspondence 1772; pres. of the Mass. cong. and chairman of its committee of public safety 1774; was efficient in organizing the volunteers after the battle of Lexington; was chosen maj.-gen. by the provincial cong. June 14, and took an active part as a volunteer, declining the command, at battle of Bunker Hill, where he was killed June 17, 1775.

**Warren** (SIR PETER), b. in Eng. in 1703, entered the navy 1727; was com. of the squadron which conveyed Sir William Pepperell's expedition against Louisburg 1745; was made rear-admiral the same yr., and vice-admiral 1747, when with Anson he defeated a Fr. fleet off Cape Finisterre; was elected to Parl. for Westminster 1747; married Miss Susan de Lancey of New York, daughter of Stephen, and acquired a vast estate in the Mohawk Valley. D. July 29, 1752.

**Warren** (SAMUEL), D. C. L., b. at Racra, Denbighshire, Wales, May 28, 1807, ed. at Univ. of Edinburgh; commenced the study of med., but soon abandoned it for that of the law; contributed to *Blackwood's Magazine*, *Poems from the Diary of a Late Physician*; wrote several legal works; became queen's counsel 1831; was recorder of Hull 1854-74; sat in Parl. as a Conservative 1856-59, and was appointed master in lunacy Feb. 1859. He wrote *Ten Thousand a Year*, a successful novel, etc. D. July 31, 1877.

**Warren** (WILLIAM FAIRFIELD), S. T. D., LL.D., b. at Williamsburg, Mass., Mar. 13, 1833, grad. at Wesleyan Univ., Middletown, Conn., 1853; became a preacher in N. E. Meth. conference 1855; studied theol. at Andover, Berlin, and Halle; was prof. of systematic theol. in Meth. missionary inst. at Bremen, Ger., 1861-66; acting pres. of Boston Theological Sem. from 1866 until chosen pres. of Boston Univ. 1873. Author of numerous works, among them *True Key to Ancient Cosmology and Mythical Geography*.

**Warrensburg**, on R. R., cap. of Johnson co., Mo., 217 m. W. of St. Louis, contains the State normal school, and has celebrated sandstone quarries. Pop. 1870, 2945; 1880, 4049.

**Warrenton**, on R. R., cap. of Fauquier co., Va. Pop. 1870, 1256; 1880, 1464.

**Warrington** (LEWIS), b. at Williamsburg, Va., Nov. 3, 1782, grad. at William and Mary Coll. 1798; became a mdpn. in the navy 1800; served under Preble in the war with Tripoli; was a lieut. on the Chesapeake in her engagement with the Leopard 1807; became master-commandant of the Peacock, and captured the sloop of war Epervier; took 14 Brit. merchantmen 1814; captured the Nautilus in the Strait of Sunda June 30, 1815; was a member of the board of navy coms. 1827-30 and 1840-42, and chief of the bureau of ordnance from Sept. 1842 until his death, Oct. 12, 1851.

**Warsaw** [Polish, *Warszawa*; Ger. *Warschau*; Fr. *Varsovie*], the fortified cap. of the former kingdom of Poland, is on the left bank of the Vistula, on a hill which gradually loses itself in a vast flat plain, and consists of the old town, the new town, and several suburbs, of which the most important is Praga, on the right bank of the river, and connected with the city proper by an iron bridge. The city is the entrepot of the products of N. Rus. and Siberia, which hence reach W. Europe, and the opening of the Chi. and E. I. traffic, given it an opportunity of grasping the Nizhnee-Novgorod and Kiachta, and of making itself the centre of the European Asiatic commerce. In architectural respects it still bears the character of being the cap. of a country which is governed despotically, small and miserable huts alternating with large and magnificent palaces; but this contrast is diminishing every yr., and the more recent parts of the city have a decidedly modern character. The scientific insts. of the city suffer very much because the Rus. govt. suppresses all that has a national Polish character; thus, the largest part of the library of the univ., founded in 1816, has been carried to St. Petersburg. There exist, however, good zoological and mineralogical collections, a botanical garden, an observatory, a picture-gallery, etc. The educational and benevolent insts. are numerous, and manufacturing industry is flourishing, including cloths, carpets, woollen, cotton and silk fabrics, hats, gloves, saddlery, gold and silver ware, carriages, furniture, etc. In the vicinity of W. are several beautiful palaces, such as the Wilanow, built in the 17th century in Fr. style, the Krokilarnia, with a park, a menagerie, etc., the Marynout, and others. Pop. 406,261.

**Warsaw**, Hancock co., Ill., on R. R. and Miss. River, 5 m. below the lower rapids. Pop. 1870, 3593; 1880, 3105.

**Warsaw**, city and R. R. centre, cap. of Kosciuszko co., Ind., 109 m. E. of Chicago. Pop. 1870, 2206; 1880, 3123.

**Warsaw**, on R. R., cap. of Wyoming co., N. Y., 45 m. E. of Buffalo, in the beautiful Wyoming Valley. Pop. 1870, 1631; 1880, 1910.

**Wartburg**, a castle situated in the heart of the Thuringian Forest, was founded in 1067 by Ludwig the Leaper, ruler of Thuringia, and was for several centuries the residence of his successors, who at times held a brilliant and widely renowned court here. After passing through many vicissitudes, it was restored by Charles Alexander, duke of Saxe-Weimar. It exercises, however, a much greater attraction by its historical remembrances than by its architectural merits. Here the famous contest between the Minnesingers took place in the time of Landgrave Hermann I., about 1206; here lived Elizabeth of Hungary (1207-31), the wife of Landgrave Louis II., and afterward one of the most renowned saints of the R. Cath. Ch.; and here Luther was kept concealed May 4, 1521-Mar. 6, 1522, finishing his most renowned saints of the R. Cath. Ch.; and here Luther was kept concealed May 4, 1521-Mar. 6, 1522, finishing his translation of the Bible. On Oct. 18, 1817, delegates from all the Prot. univs. of Ger. assembled here to celebrate the third centenary yr. of the Ref. and the recent liberation of the country from the Fr. yoke.

**Warton** (THOMAS), F. S. A., b. at Basingstoke, Hampshire, Eng., in 1728, grad. at Trinity Coll., Ox., about 1747;



became a fellow there 1751; took orders in the Ch. of Eng. 1755; was prof. of poetry in the univ. 1757-67; became Camden prof. of anc. hist. and poet-laureate 1785, and obtained the livings of Kiddington 1771 and Mill Farrance 1782. Author of *Observations on the Faerie Queene of Spenser*, *The Life of Sir Thomas Pope*, and of a valuable *Hist. of Eng. Poetry*. D. May 21, 1790.

**Warts**, or **Verrucae** [Lat. *verruca*, a "wart"], are developed by hypertrophy, abnormal growth, of the papillae of the skin. W. occur chiefly in children, between the 2d and 14th yr.; their cause is uncertain; their duration is indefinite; they sometimes disappear suddenly. When they are kept free from handling or irritation, the diet is corrected, and alteratives are given, they may slowly disappear. The common treatment is to snip them off and touch the base with nitric acid, glacial acetic acid, or lunar caustic; saturation with tincture of thuja or thuja (arbor-vitae) daily has the effect to speedily remove them in many cases.

**Warville, de** (BRISSET). See BRISSET DE WARVILLE.

**Warwick**, on R. R., Orange co., N. Y., has Seward and Warwick insts., a public library, and iron and other mines. Pop. 1870, 938; 1880, 1043.

**Warwick**, wor'rik (GUY), EARL OF, a legendary Sax. hero who figures largely in early Eng. metrical romances as a champion against the Danes, and especially noted for his victory over the giant Colbrand. He is usually assigned to the period of King Athelstan. *The Booke of the most victorious Prince Guy of Warwick* was printed before 1567, and a prose Fr. romance on the same subject in 1535.

**Warwick** (HENRY DE BEAUCHAMP), DUKE OF, and king of the Isle of Wight, son of Richard, b. at Hanley Castle, Warwickshire, Eng., Mar. 22, 1424, distinguished himself in the defence of Normandy 1424-44; was created duke of Warwick, to rank next the duke of Norfolk and before the duke of Buckingham; received from Henry VI., who had been his companion in childhood, many honors, the most extraordinary being that he was crowned by that monarch as vassal king of the Isle of Wight early in 1445. He survived his advancement but a few months, dying without issue June 11, 1445.

**Warwick** (RICHARD DE BEAUCHAMP), TWELFTH EARL OF, b. at Salwarpe, Worcestershire, Jan. 28, 1381, was made a knight of the Bath at the coronation of Henry IV. (1399); fought against Owen Glendower 1401-02, and against the Percies 1403, taking part in the battle of Shrewsbury; made a pilgrimage to the Holy Sepulchre 1408; was lord high steward at the coronation of Henry V. (1413), and in the same year com. to negotiate peace with Fr.; headed an embassy to the Council of Constance 1414; was an energetic opponent of the Lollards or followers of Wycliffe; became in 1415 capt. of Calais; aided in the siege and capture of Caen 1417; was ambassador to the duke of Burgundy 1418; was created about that period earl of Aumerle; attended Henry V. on his death-bed (1422); was regent of Fr. 1425-28; directed for 9 yrs. the education of the young king, Henry VI., and was again regent or lieutenant-gen. of Fr. and Normandy from 1437 to his death, Apr. 30, 1439.

**Warwick** (RICHARD NEVILLE), EARL OF, known as the "king-maker," b. in Eng., about 1430 (or 1428), the most wealthy and powerful nobleman of the kingdom; fought in the "war of the Roses"; bore a leading part in the battle of St. Alban's, 1455, which he decided in favor of the Yorkists by a daring charge into the town; was rewarded with the post of capt. of Calais; fought in May 1455 a successful naval battle with a Lubek fleet of 28 vessels, of which he captured 6; joined his father, the earl of Salisbury, at Ludlow Castle on the renewal of the c. war 1459; escaped to Calais with his cousin, the earl of March, afterward Edward IV., on the dispersion of the Yorkists, Oct. 1459; was deprived of his naval command, but retained Calais by force of arms; marched upon and entered Lond., which opened its gates without a battle; defeated the queen's army near Northampton July 10, capturing the imbecile king, Henry VI., after which the Duke of York laid formal claim and was recognized as heir to the throne Nov. 1. At the disastrous battle of Wakefield, however, Dec. 30, the pretender was killed. W. suffered another defeat at Bernard's Heath, near St. Alban's, Feb. 17, but rallied his forces and marched upon Lond., where the duke was proclaimed king Mar. 4 under the title of Edward IV. W. next defeated the Lancastrians at the battle of Towton (or Ferrybridge), near the city of York, 1461, and again at Hexham 1464; captured the deposed king, Henry VI., 1465, and led him as a public spectacle through Cheapside, Lond., to the Tower; June 1465; was appointed to the offices of high admiral, warden of the W. Marches, lord-chamberlain, lord lieut. of Ire., and gov. of Dover and Calais. He now displayed a regal magnificence, and was employed on missions to Fr., Burgundy, and Brittany, and took such deep offence at the king's marriage with Elizabeth Woodville (1464), while he was engaged in negotiating for him the hand of a Fr. princess, that he began to be disaffected; gave his daughter in marriage to Edward's brother, George, duke of Clarence, without the royal permission, 1469, and, taking advantage of an insurrection against certain taxes in Yorkshire, placed himself, with Clarence, at the head of the rebellion; defeated the royal forces at Edgecote July 26, 1469; had a brief reconciliation with the king; was again in arms against him in the following yr. (1470); was forced to flee to Fr.; made at Amboise (July 15, 1470) a treaty with Queen Margaret for the restoration of Henry VI., the marriage of Prince Edward of Lancaster to his daughter Anna (August), and the recognition of his son-in-law Clarence as heir-presumptive to the latter. By this double marriage the crown seemed now assured to the descendants of W., who, aided by Louis XI., landed with a body of exiles at Plymouth and Dartmouth Sept. 13, 1470, successfully marched upon Lond., restored Henry VI., and was reinstated in all his offices, with the addition of that of lord high admiral. The Lancastrian restoration, however, had lasted barely 6 months before

Edward IV. obtained the aid of Charles the Bold, duke of Burgundy; landed at Ravenspur, near Hull, with 2000 men, Eng., Dutch, and Flemings, and W. was defeated and killed at the battle of Barnet, Apr. 14, 1471. PORTER C. BLISS.

**Warwick** (ROBERT RICH), EARL OF, b. in Eng. about 1590, became a prominent leader of the Puritan party; took an active part in promoting the colonization of N. Eng., especially of R. I.; was an intimate friend and protector of Thomas Hooker, the founder of Conn.; adhered to the cause of Parl. during the great rebellion; became lieut. of the fleet under the earl of Northumberland 1642, and was a prominent supporter of Cromwell as Protector, and was appointed to bear the sword of state in the latter's presence 1657, D. in 1658.

**Wasatch** (or **Wahsatch**) **Mountains**. See UTAH. **Waseca**, city and R. R. centre, cap. of Waseca co., Minn. Pop. 1870, 551; 1880, 1708.

**Washburn** (CADWALLADER COLDEN), LL.D., son of Israel Washburn, Sr., b. in Livermore, Me., Apr. 26, 1818, settled at Mineral Point, Wis., in 1841, as a lawyer, and had a large practice as counsel for the early settlers in securing their homes. In 1854 he was elected M. C., and was twice re-elected, and at the breaking out of the c. war entered as col. of 2d Wis. Cav. in 1861; was commissioned brig.-gen. by Pres. Lincoln in June 1862, and was engaged in the Ark. campaign during that yr.; commissioned maj.-gen. in Nov. 1862; engaged in the siege of Vicksburg, and at its close was ordered to the dept. of the Gulf in command of the 13th corps; was ordered to Tex. in Nov. 1863, with a portion of the 13th corps, and captured Ft. Esperanza; in Apr. 1864 relieved Gen. S. A. Hurlbut in command at Memphis of the dist. of W. Tenn. This command he held with a short interruption till the close of the war; resigned his commission as maj.-gen. June 1, 1865. In 1867 he was again elected to Cong., and re-elected in 1869; in Nov. 1871 he was elected gov. of Wis. for 2 yrs. D. May 14, 1882.

**Washburn** (CHARLES AMES), son of Israel Washburn, Sr., b. at Livermore, Me., Mar. 16, 1822, grad. at Bowdoin Coll. 1845; went to Cal. in the spring of 1850; ed. and proprietor of the *Alta California*; took an active part in the organization of the Rep. party there: from 1855 to 1861 was ed. and proprietor of the *San Francisco Daily Times*; was chosen an elector at large 1860, and the next yr. was appointed minister to Paraguay, where he remained for 7 yrs. His *History of Paraguay, with Notes of Personal Observations and Reminiscences of Diplomacy under Difficulties*, gives a startling account of a strange people. Was involved in an accusation of complicity with the pretended "conspiracy" which gave occasion to the massacre of nearly all the Paraguayan and foreign residents above the humblest social position. His disinterested course under these unparalleled circumstances brought him into collision with several high officers of the U. S. N., and led to an investigation of the circumstances by the committee of foreign affairs of the House of Reps., which resulted completely in his favor. He wrote several novels, and invented the "typograph" and other ingenious machines.

**Washburn** (EDWARD ABIEL), D. D., b. at Boston, Mass., Apr. 16, 1819, grad. at Harvard 1838; studied divinity at Andover and New Haven; was rector of St. Paul's (Epis.) ch., Newburyport, Mass., 1844-51; rector of St. John's, Hartford, Conn., 1853-62, and at the same time prof. of ch. polity in the Berkeley Divinity School, Middletown; was rector of St. Mark's, Phila., 1862-65, when he succeeded Bp. Cox as rector of Calvary ch., New York. Pub. *The Social Law of God*, etc. D. Feb. 2, 1881.

**Washburn** (EMORY), LL.D., b. at Leicester, Mass., Feb. 14, 1800, entered Williams Coll. at 13, grad. in 1817; was admitted to the bar, and commenced practice at Charlestown, Mass.; afterward removed to his native town of Leicester, and in 1828 settled in Worcester. In 1825 and 1826 he represented Leicester in Mass. gen. court, and Worcester in 1838. In 1841 and 1842 was a member of the State senate for Worcester co.; in 1844 was appointed a judge of the court of common pleas, which office he resigned in 1847. In 1852 he was elected gov. of Mass., and was re-elected the ensuing yr. He removed to Cambridge in 1856, having been appointed prof. of law in the Harvard Law School, which position he held for 20 yrs., resigning Sept. 1, 1876. His *Lectures on the Study and Practice of the Law*, his work on *Easements and Servitudes*, and on *The Law of Real Property*, are regarded as the highest standard authorities both in the law schools and the courts throughout the country. D. Mar. 17, 1877.

**Washburn** (ISRAEL, Sr.), b. in Raynham, Mass., Nov. 18, 1784, moved in 1806 to Me., and in 1808, in company with Barzillai White, established himself at a point on the Kennebec River then called White's Landing, now Richmond, where he engaged in ship-building. In 1809 he established a trading-post at Livermore, Me., at what is now called The Norlands, and soon after moved there, where he settled and had a large family of children, some of whom have held high positions under the national gov., and by election of the people of their respective States. D. Sept. 1, 1876.

**Washburn** (ISRAEL JR.), LL.D., son of the preceding, b. at The Norlands, Livermore, Me., June 6, 1813, studied for the bar, to which he was admitted Oct. 1834; settled in Dec. of that yr. at Orono, Penobscot co., where he soon had a large practice, which continued till his election to Cong. in 1850. In 1860 he was elected gov. of Me.; re-elected in 1861; was in 1863 appointed collector of customs for the port of Portland. He was pres. of the trustees of Tufts Coll., Mass., a member of several historical and genealogical societies, and pub. *Notes, Historical, Descriptive, and Personal, of Livermore, Me.* D. May 12, 1883.

**Washburn** (PETER THACHER), b. at Lynn, Mass., Sept. 7, 1814, grad. at Dartmouth Coll. 1835; reporter of the supreme court of Vt.; author of *Vt. Digest* and other legal publications; col. of Vt. militia; represented Woodstock in the State legislature in 1854; chairman of Vt. delegation to the Chicago Convention of 1860; lieut.-colonel, and after-



ward acting col. of the 1st Vt. Volunteers; commanded the Vt. and Mass. troops at the battle of Big Bethel; adjutant and inspector-gen. of Vt.; elected gov. of Vt. and died in office, Feb. 7, 1870.

**Washburn** (WILLIAM BERRITT), LL.D., b. at Winchendon, Mass., Jan. 31, 1820, grad. at Yale 1844; engaged in manufacturing in Greenfield, Mass.; was in 1839 chosen pres. of the Bank of Greenfield; was elected to the Mass. State senate 1850, and a member of the house of reps. 1854. He was elected as the Rep. candidate for Cong. for his dist. in 1862; in 1871 was elected gov. of Mass.; resigned his seat in the 42d Cong. Jan. 1, 1871, to be inaugurated as gov.; was re-elected gov. in 1873, which office he resigned Apr. 1874, having been elected U. S. Senator. His term as Senator expired Mar. 3, 1875. He became pres. of First National Bank in Greenfield, one of the trustees of Yale Coll. and of Mass. Agricultural Coll.; also a trustee of Smith Coll. at Northampton, Mass., for education of females, and a member of board of overseers of charity fund of Amherst Coll.

**Washburne** (ELIHU BENJAMIN), b. at Livermore, Me., Sept. 23, 1816, the third son of Israel Washburn, Sr.; pursued the study of the classics at the acad. at Kent's Hill, Readfield, Me.; afterward studied law in Hallowell and Boston and at the Harvard Law School; in 1840 went West, and settled in Galena, Ill., where he commenced the practice of law; in 1852 was elected to Cong., and continued to represent his dist. till Mar. 1869. On the accession of Gen. Grant to the Presidency he was appointed sec. of state, but soon after resigned that position to accept that of minister plenipotentiary to Fr. He was serving in this capacity at the outbreak of the war between Fr. and Prus., and remained at his post during the siege of Paris and the reign of the Commune. His firmness in protecting unfortunate Gers. who were unable to leave Paris won general admiration.

**Washing of Feet**, in supposed accordance with the Lord's example and mandate (John xiii. 5-14), is a practice insisted on by some Prot. Chrs. In the R. Cath. Ch. the pope himself and the bps. and priests of certain dioceses wash the feet of 12 pilgrims once a yr. on Maunday Thursday.

**Washington, Ga.** See APPENDIX.

**Washington, R. R. Junc.**, Tazewell co., Ill., 12 m. E. of Peoria. Pop. 1870, 1607; 1880, 1397.

**Washington**, city, on R. R., cap. of Davies co., Ind., equidistant from Cin. and St. Louis. There are 7 extensive coal-mines worked here, and large quantities of cannel and bituminous coal, flour, and small grains, beside many cattle, horses, and hogs, are shipped from this point. Pop. 1870, 2901; 1880, 4323.

**Washington**, city and R. R. centre, cap. of Washington co., Ia.; has an acad., flouring-mills, foundries, etc. Business, chiefly agriculture. Pop. 1870, 2575; 1880, 2949.

**Washington**, city, on R. R., cap. of Washington co., Kan. Pop. 1870, 1238; 1880, 1836, including 675 in city.

**Washington**, Franklin co., Mo., on R. R. and S. bank of Mo. River, 54 m. W. of St. Louis. A steam-ferry plies across the Mo. River daily. There are 2 inextinguishable clay-banks adjoining the town, of fire and potter's clay, large quantities of which are shipped to St. Louis. It has a large trade in produce. In 1873 part of the tp. was annexed to St. John's tp. Pop. 1870, 5614; 1880, 2421.

**Washington**, R. R. centre, Warren co., N. J. Pop. 1870, 1880; 1880, 2142.

**Washington**, N. C. See APPENDIX.

**Washington**, R. R. centre, cap. of Washington co., Pa., on Chartiers Creek, has iron-foundries, woollen and other factories, a female sem., and is the seat of Washington and Jefferson Colls. Pop. 1870, 3571; 1880, 4292.

**Washington** (BUSHROD), LL.D., nephew of Gen. George, b. in Westmoreland co., Va., June 5, 1762, grad. at William and Mary Coll. 1778; studied law; commenced practice in his native co. 1780; served as a private soldier at Yorktown 1781; was a member of the Va. house of delegates 1787, of the Va. convention to ratify the U. S. const. 1788; afterward practised law at Alexandria and at Richmond; associate justice of the U. S. supreme court Dec. 20, 1793; inherited the Mt. Vernon estate 1799, and was the first pres. of the Amer. Colonization Society. D. Nov. 23, 1829.

**Washington** (GEORGE), first Pres. of the U. S., was b. in Westmoreland co., Va., Feb. 22 (O. S. 11th), 1732, being the son of Augustine Washington by his second wife, Mary Ball, daughter of Col. Ball of Lancaster co., Va. Of W.'s Eng. ancestry, though much has been written, nothing is known with certainty, since recent researches have proved the defectiveness of the genealogies which were formerly thought to trace his lineal descent from the anc. family of the name at Washington Manor, Durham, or that at Sulgrave, Northampton. The first Amer. ancestor, John Washington, came to Va. about 1657, and became a prosperous planter in the "Northern Neck," or district between the Potomac and Rappahannock rivers. He served as a col. in expeditions against the Indians, and married Ann Pope of the family which gave name to Pope's Creek, by whom he had 2 sons, Lawrence and John. Lawrence married Mildred Warner of Gloucester co., by whom he had 3 children, John, Augustine, and Mildred. Augustine first married Jane Butler, who bore him 4 children, of whom 2 sons, Lawrence and Augustine, reached maturity. Of 6 children by the second marriage, George was the eldest. Little is known of the early yrs. of W., beyond the fact that the house in which he was born was burned during his early childhood, and that his father thereupon removed to another farm, inherited from his paternal ancestors, situated in Stafford co., on the N. bank of the Rappahannock, nearly opposite Fredericksburg, where he acted as agent of the Principe Iron-works in the immediate vicinity, and d. there in 1743. George Washington was left an orphan at 12, and inherited the paternal residence, while his elder half brother, Lawrence, inherited the large estate on Hunting Creek, afterward known as Mt. Vernon. His early education was limited: he had a taste, however, for math. and engineering. His first business was that

of a land-surveyor. When the Indian hostilities broke out, he exhibited considerable military talent. In the Fr. war he became aide to Gen. Braddock, and was with him at the time of his defeat. In the controversy between the Brit. Parl. and the colonies, W. espoused the cause of the colonies with great zeal. He was a member of the house of burgesses in Va., and was sent a delegate to the first colonial cong. that assembled in Phila. in 1774; was a member of the second cong., and when hostilities commenced he was chosen commander-in-chief of all the colonial forces. He continued to hold this position until the proclamation of peace. There was little fighting after his capture of Lord Cornwallis and his entire army at Yorktown, Oct. 19, 1781. Upon the closing of a federal convention to meet in Phila. in 1787 to revise the Articles of Confederation, so as to better perfect the federal Union, W. was chosen as a delegate from Va. to that convention, and was by unanimous choice selected as the pres. of that body. After the new const. was submitted to the States and ratified by a sufficient number for it to go into operation, according to its terms, between those who should so ratify it, W. was unanimously chosen as the first Pres. under the new const. Under his wise counsels the new organization was brought into most successful operation. At the expiration of 4 yrs. he was again unanimously chosen Pres., and at the expiration of his second term he positively refused to serve any longer. He retired, leaving the country in a prosperous and happy condition. His *Farewell Address* is a rich legacy to his countrymen. Space, in this work, will not allow any elaboration upon the life and acts, military or civil, of this most illustrious warrior and statesman. Suffice it to say, he has no parallel in history. In the manifold details of his civil administration, as previously in the direction of military operations, W. proved himself equal to the requirements of his position. His administration of the new system for 2 terms had been successful beyond the expectation and hopes of even the most sanguine of its friends. The finances of the country were no longer in an embarrassed condition, the public credit was fully restored, life was given to every dept. of industry, the workings of the new system in allowing Cong. to raise revenue from duties on imports proved to be not only harmonious in its federal action, but astonishing in its results upon the trade and commerce of all the States. The exports from the Union increased from \$19,000,000 to over \$56,000,000 per annum, while the imports increased in about the same proportion. Three new members had been added to the Union; the progress of the States in their new career under their new organization thus far was exceedingly encouraging, not only to the friends of liberty within their own limits, but to their sympathizing allies in all climes and countries. Of the call again made on this illustrious chief to quit his repose of Mt. Vernon and take command of all U. S. forces, with the rank of lieutenant-gen., when war was threatening with Fr. in 1798, nothing need here be stated, except to note the fact as an unmistakable testimonial of the high regard in which he was still held by his countrymen of all shades of political opinion. He patriotically accepted this trust, but a treaty of peace put a stop to all action under it. He d. at Mt. Vernon, his home, after a short illness, Dec. 14, 1799. No one was ever, before or since, so mourned by the masses of the people throughout the country as he was. Men of all parties and politics, and of all creeds in religion, united with Cong. in paying honor to the memory of the man "first in war, first in peace, and first in the hearts of his countrymen."

ALEXANDER H. STEPHENS.

**Washington** (WILLIAM AUGUSTINE), b. in Stafford co., Va., Feb. 28, 1752, became a capt. under Mercer in the Va. line; fought at the battles of L. I., Trenton, and Princeton; became lieutenant-col. of Baylor's dragoons 1778; commanded a light corps of cav. in the campaign of the Carolinas 1779-81; settled at Charleston, S. C.; was a member of the legislature, and became a brig.-gen. and aide-de-camp to Gen. George Washington about 1798. D. Mar. 6, 1810.

**Washington and Jefferson College**, Washington, Pa., is the result of the union of Washington Coll. and Jefferson Coll., located respectively at Washington and Canonsburg, 2 v. 7 m. apart in Washington co., Pa. Jefferson Coll. grew out of Canonsburg Acad., which was organized in 1791, and by act of the legislature in 1802 received coll. privileges under the name of Jefferson Coll. Until 1852 no funds were collected except for buildings and appliances, such as libraries and apparatus. In that yr. a plan of endowment was adopted by the trustees, under which \$60,000 were raised, and the inst. began operating under the system of giving free tuition to scholarship holders and supporting its faculty on the income of its endowment. Washington Coll. grew out of an acad., and received its charter in 1806. In 1853 a contract was made with the synod of Wheeling (O. S.) that on condition that they endowed it they should have the right to its trustees and faculty. This agreement took effect with the coll. yr. 1853-54. Through nearly the whole hist. of these insts. plans for uniting them were proposed. The trustees of both insts. accepted the offer of Rev. C. C. Beatty, D. D., LL.D., of Steubenville, O., of \$50,000 if they would unite, and in 1865 the enabling act passed the legislature. The whole inst. is at Washington, Pa.

**Washington and Lee University**, an inst. of learning at Lexington, Va., derived its origin from the Augusta Acad. at Greenville, which in 1776 took the name of Liberty Hall; was chartered in 1782; was removed to the vicinity of Lexington in 1785, and to its present grounds in 1808. It received from Gen. Washington, in 1796, 100 shares of stock in the James River Canal Co., which was commuted by the legislature to an interest-bearing fund of \$50,000, and the name was changed to Washington Coll. It received in 1803 a fund of \$25,000 from the Cincinnati Society, and in 1836 a bequest of \$40,000 from Mr. John Robinson. On the death of Gen. Robert E. Lee in 1870 the name was changed to its present form. The inst. resembles in plan of organization the Univ. of Va.



**Washington City**, in the DISTRICT OF COLUMBIA, the capital of the U. S. of Amer., and seat of the Federal govt. since 1800, is on the E. bank of Potomac River, 106 m. above its mouth, and 105 m. in a straight line W. of the Atlantic Ocean, in  $38^{\circ} 53' 39''$  N. lat. and  $77^{\circ} 2' 48''$  lon. W. of Greenwich. The pop. was, by the census of 1800, 3210; 1810, 8308; 1820, 13,247; 1830, 18,826; 1840, 23,364; 1850, 40,001; 1860, 61,122; 1870, 109,199; 1880, 147,293. Pop. of the Dist. in 1880, 177,624. The true pop. of the capital, including George-

town (now W. Washington) was 159,871 in 1880. The Dist. of Columbia is bounded N., N. W., E., and S. E. by Md., and W. and S. W. by the Potomac River and Va. Area, 64 sq. m. Originally its area was 100 m., consisting of a tract lying on both sides of the Potomac 10 m. square, ceded to the U. S. by Md. and Va. in 1788-89. In 1846 the Va. portion, with the city of Alexandria, was retroceded to Va. by Cong.

The soil of the Dist. is a light sandy loam, well watered in most parts. It belongs geologically to the cretaceous



The Capitol.

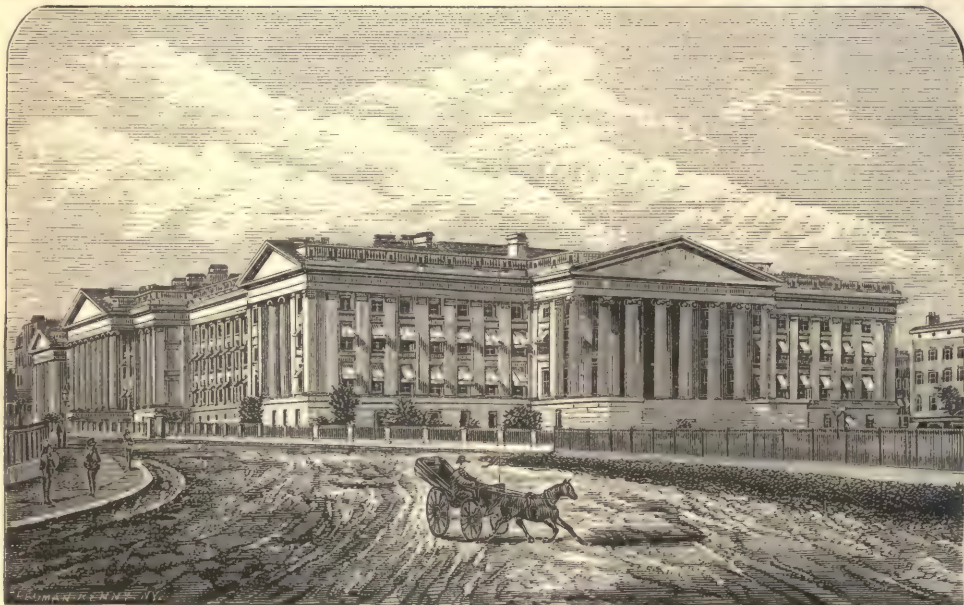
formation, with deposits of marl underlaid by gneiss, the surface exhibiting sandstone, limestone, pebbles, clay, gravel, sand, and loam.

**Climate.**—The temperature has a wide range, suddenly rising or falling many degrees, but the climate is as equable as is common in the Atlantic States, and generally healthy, though miasma prevails near the Potomac flats. The mean temperature of summer is  $76^{\circ}$ , of winter  $36^{\circ}$ , and of the whole year  $56^{\circ}$ . Average rainfall, 90 inches a year. The snows of winter rarely lie long on the ground.

**Farms and Products.**—In 1880 the number of farms in the Dist. was 435, comprising 12,632 acres, valued at \$3,632,403, or nearly \$800 an acre on the average. Value of farm products sold or consumed, \$514,441.

**Manufactures** are limited, numbering 971 establishments in 1880, with cap. of \$5,552,526, employing 7146 hands, receiving \$3,924,612 in wages; total value of products, \$11,882,316.

**Finances.**—The assessed valuation of property in the Dist. in 1880 was—real estate, \$87,980,356; personal property, \$11,421,431. Beside this, the value of U. S. govt. property



Treasury Department.

(exempt from taxation) was estimated at about \$110,000,000. The amount raised by taxation ( $1\frac{1}{2}$  per cent.) was \$1,469,254 in 1880. By law one half the total expenditure for the Dist. of Columbia is borne by the gen. govt., the other half being taxed on property. The net public and private debt of the Dist. was \$22,675,450.

The commerce of the Dist. is trifling, though Georgetown is a port of entry, and the Potomac is navigable for large vessels to the navy-yard on the E. branch, and to the head of tidewater at Georgetown.

**Banks, Etc.**—In 1881 there was 1 national bank and 6 private bankers, with cap. of \$616,000; circulation, \$307,600; and deposits, \$4,732,027. There are 8 fire insurance cos., cap., \$800,500; assets, \$1,601,233; also 1 life insurance co., with \$1,000,000 cap.; net assets, \$865,452.

There was a protracted conflict in Cong. over the claims of rival localities for the seat of govt., and the present site was finally selected as a compromise, and Philadelphia was made the capital for 10 yrs., while after 1800 it was to be established on the Potomac. After the cession to the U. S.



by Md. and Va. of a Federal dist., the site of the city and the location of the public squares and buildings were selected by Pres. Washington on the Md. side of the Potomac, in accordance with the act of Cong. of Mar. 30, 1791. At the time of this location the city was in the geographical centre between the N. and S. limits of the U. Apr. 15, 1791, the corner-stone of the Federal terr. was laid by 3 coms. appointed by the Pres. It was called "the Federal City" by Washington and in the records of the time until Sept. 9,

1791, when the coms. directed that the Federal dist. should be called "the Territory of Columbia," and the Federal city "the city of Washington." Major L'Enfant, a Fr. engineer, prepared the topographical plan of W. City under the direction of Pres. Washington and Thomas Jefferson, sec. of state. L'Enfant took as a basis for his design the topography of Versailles, the seat of the govt. of Fr.

*Streets and Avenues.*—The streets were laid out of the width of 160 ft. down to 70 ft. The length of the streets



New State, War, and Navy Departments.

and avenues is 264 m., and they are wider than those of any other city. There are 21 avenues, bearing the names of various States in the U. Pa. avenue is a broad thoroughfare 160 ft. wide, paved with smooth concrete, constituting a splendid and attractive driveway. Mass. avenue is over 4½ m. long. E. Capitol st., 160 ft. wide, extending from the E. front of the Capitol to Lincoln Park, has become one of the most attractive streets. K st., 148 ft. wide, extending from Rock Creek, the Georgetown boundary, to the Anacostia,

is one of the most splendid thoroughfares of the city. Sixteenth st., 160 ft. wide, runs from La Fayette Square, opposite the President's House, due N. to the boundary, where it climbs the heights toward Columbian Coll.

*Government.*—The govt. of W. was strictly municipal until 1871, when Cong. created a Territorial govt. for D. C., repealing the charters of the cities of W. and Georgetown, and merging them into the same govt. This was abolished in 1874, and the affairs of D. C., including those of W., are



Interior Department (Patent Office).

now managed by 3 coms. under the direct legislation of Cong. for the levying and disbursement of taxes and for all public improvements. The citizens have no vote, either in Dist. or national affairs. Justice is administered by a supreme court of D. C., having 6 judges, and by a police court, presided over by a single judge.

The city is 4½ m. by about 2½ m., and its circumference is

14 m., having a water-front on the Potomac of 4 m., and on the Anacostia of 3¼ m. The city proper covers 6111 acres, of which the govt. reservations comprise 541 acres, while the avenues and streets embrace 2534 acres, leaving only 306 acres to the squares on which private residences are built, which greatly conduces to the public health by the large open spaces and abundant ventilation in every quarter.



The Capitol, the most conspicuous object in W., is constructed in the purely classic style, with a centre and 2 projecting wings of great extent, and ornamented on the E. front with 68 Corinthian columns. The length of the Capitol is 751 ft. 4 inches; breadth, 121 to 324 ft., covering  $3\frac{1}{2}$  acres. From the central building springs a lofty iron dome 135½ ft. in diameter, and containing 8,009,200 lbs. of cast and wrought iron. The apex of the dome is surmounted by a lantern 15 ft. in diameter and 50 ft. high, crowned by a

bronze statue of Liberty, the height of which is  $19\frac{1}{4}$  ft. The total height from the base of the Capitol to the crest of the statue is 285½ ft. The advantageous position, great architectural mass, and harmonious and imposing effect of the Capitol from most points of view have secured for it the almost unanimous praise of the best judges of all countries as the most impressive modern edifice in the world. The material of the central building is Va. freestone; that of the wings is white marble from Mass., while the fluted

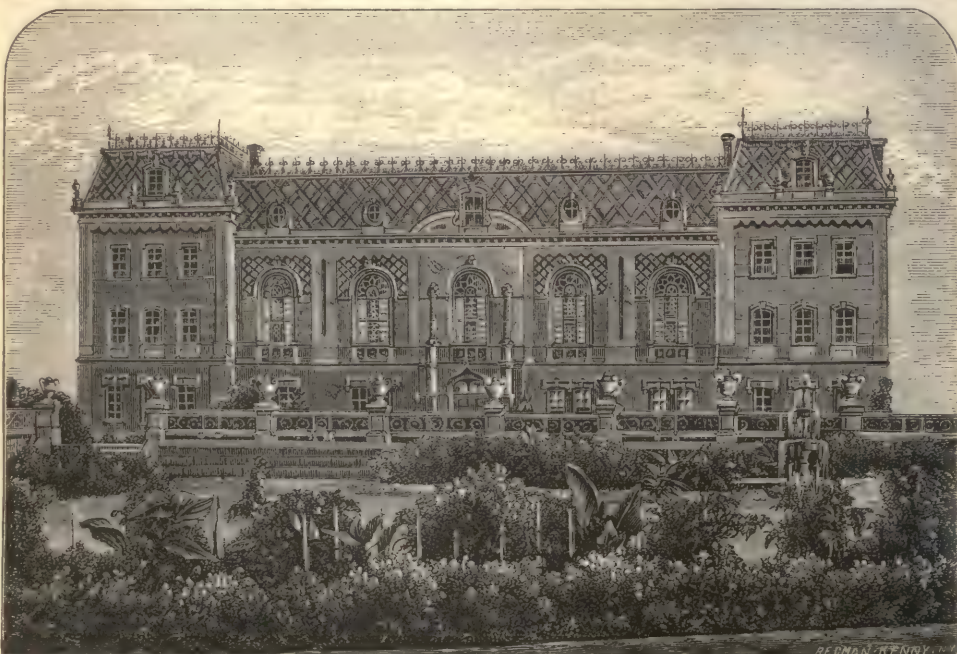


Post-Office Department.

marble columns are from Md. The total expenditure upon the Capitol for erection, extension, and repairs has been a little over \$13,000,000. The first Capitol was erected on the same site, the corner-stone laid by George Washington Sept. 18, 1793, 7 yrs. before the removal of Cong. to W. Before its completion the whole was destroyed by the Brit. at the invasion of W., Aug. 1814. The present central structure dates from 1818 (completed 1827), and the extension or wings from 1851. The corner-stone of the Capitol extension was laid July 4, 1851, and the new Hall of Reps. in S. wing was

occupied in 1857, and the Senate Chamber in 1859. The work was continuously prosecuted during the c. war, until the statue of Liberty crowned the summit on Dec. 12, 1863.

The rotunda is the central attraction of the Capitol, and is 96 ft. in diameter by 180 ft. in height to the canopy above, on the concave interior of which is a mammoth fresco by Brumidi, representing allegorical and historical subjects. The 8 panels surrounding the rotunda are adorned by historical paintings. The best embodiment of the sculptor's art in the external decorations of the Capitol is the group



Agricultural Department.

by Thomas Crawford on the E. front of the Senate wing. This represents the progress of civilization in the U. S. The great bronze doors by Randolph Rogers, which adorn the E. front entrance of the Capitol, represent in sculptured *alto-relievo* events in the discovery of Amer. and life of Columbus, while the similar doors in bronze, the main entrance to the Senate wing, designed by Thomas Crawford, represent Revolutionary battles and prominent civic events in the hist. of the country. The Senate Chamber, in the N. wing, is 118 by 81 ft., with seats for 76 Senators, the galleries

furnishing room for 1000 spectators. The grand staircases of white marble, ascending from the basement to the Senate galleries, present one of the finest gems of interior arch. The long apartment in the rear of the Senate Chamber known as the Marble Room is constructed wholly of marble, the ceiling resting upon 4 Corinthian columns of It. marble, while the walls are of variegated Tenn. marble highly polished. Adjoining the Marble Room is the President's Room. The S. wing of the Capitol is occupied by the House of Reps. and its offices. This is the largest legis-



lative chamber in the world, 139 ft. by 93 ft. The galleries accommodate about 1500 persons, while the floor affords ample space for 333 members, each provided with a writing-desk. The Library of Cong. occupies the W. projection of the central building, and embraces over 500,000 vols. The law dept. of the library is in the basement of the Capitol. It has 55,000 vols. The supreme court room and offices occupy the old Senate Chamber in the central building and rooms adjacent. The old Hall of the House of Reps. is in the form of a semicircle, surrounded by columns of variegated marble. This hall was devoted in 1864 to the purposes of a national memorial hall, each State to contribute statues of 2 of its most distinguished citizens.

*The Treasury Department*, at 15th st. and Pa. avenue, is an imposing edifice in Ionic style, 468 ft. by 264, and cost \$6,000,000.

*The great building of the State, War, and Navy Departments* is a massive piece of granite arch, in It. Renaissance style, 567 by 471 ft., and with 4 façades, looking to the E., W., N., and S. respectively. The total cost of the building will approach \$11,000,000.

*The Department of the Interior*, best known as the Patent Office building, occupies the entire square between F and G sts., from 7th to 9th. This splendid building is of severely simple though massive proportions, the arch. being pure Doric, modelled after the Parthenon, 453 by 331 ft., with an elevation of 75 ft. In it are located, beside the patent office, which occupies the larger portion of its 191 rooms, the Indian office and the office of the public lands, together with the offices of the sec. of the interior. Cost, \$2,700,000.

*The building of the Post-Office Department* is immediately

opposite the patent office. It is of Md. marble, 300 ft. long by 204 wide, in pure Corinthian arch. Cost, \$1,700,000.

*The Department of Agriculture* occupies a large brick building with brown-stone trimmings, in Renaissance style, 170 by 61 ft., adjoining the Smithsonian Inst.

*The U. S. Naval Observatory* is on the Potomac, but is to be removed to Georgetown Heights. The great equatorial telescope, with an object-glass of 23 inches, cost \$47,000, and is one of the largest refractors in the world.

*The Army Medical Museum*, on 10th st., contains the hospital records of the U. S. army in over 10,000 MS. vols. and a vast assemblage of curious and instructive specimens representing the effects upon the human body of wounds, morbid conditions, surgical operations, etc. The library of the surgeon-gen.'s office, here deposited, about 40,000 vols., is by far the most complete med. collection in the U. S.

*The Government Printing-Office and Book-Bindery* occupy a plain brick building 300 by 175 ft.

*The Washington Navy-Yard*, established 1804, occupies 27 acres on the Anacostia River at foot of 8th st., about 1 m. S. E. of the Capitol. This yard, though practically disused for the construction of naval vessels, is an important depot for the manufacture of naval supplies.

*The President's House*, known also as the Executive Mansion, and popularly called the White House, is on Pa. avenue, midway between the treasury and the depts. of state, war, and navy. It is a plain edifice of freestone painted white, 170 by 86 ft., with a colonnade of 8 Ionic columns.

*The Fine Arts*.—H. K. Brown's fine equestrian statue of Gen. Winfield Scott in bronze, erected in 1874, occupies the circle at the intersection of Mass. and R. I. avenues



Executive Mansion (White House).

on 16th st. Ball's bronze statue, emblematic of Emancipation, represents Abraham Lincoln freeing a slave in chains. Greenough's marble statue of Washington, classical in style and colossal in size, is immediately before E. front of the Capitol. The only public inst. devoted exclusively to the fine arts is the Corcoran Gallery of Art, on Pa. avenue and 17th st., opened with a collection of paintings, statuary, bronzes, and casts from the antique in 1873. It was founded by the liberality of W. W. Corcoran of W., and is open to the public free during 3 days of the week.

*The Washington National Monument* was commenced in 1848 by an association incorporated by Cong. After an expenditure of \$230,000, raised by voluntary subscription, the monument came to a standstill for 20 yrs. It was finished in 1885 in accordance with act of Cong. passed in 1876, and is a plain obelisk, 70 ft. square at the base and 555 ft. high, the loftiest structure erected on the globe. It is built of great blocks of crystal Md. marble lined with blue gneiss. See WASHINGTON MONUMENT in APPENDIX.

*The cemeteries of W.* are not numerous. The Congressional Cemetery, on the Anacostia 1 m. E. from the Capitol, embraces 30 acres. Oak Hill Cemetery, on Georgetown Heights, is the most beautiful, and is thickly planted with noble forest trees and shrubbery. Glenwood, Rock Creek, and Mount Olivet are the other prin. cemeteries.

*The Soldiers' Home*, a national inst. for invalid soldiers of the regular army, was established in 1851. The buildings are handsome and costly, and the grounds (500 acres), laid out in meadows, groves, and lakes, afford 7 m. of beautiful drives, serving as a free public park for the city of W.

*The water-supply of W.* is brought by a capacious aqueduct from the Great Falls of the Potomac, 10 m. above. It affords 80,000,000 gals. daily, and cost \$3,500,000.

*Newspapers*.—Five daily newspapers and 23 weekly periodicals, with 15 monthlies, are issued.

*Education*.—The public schools of the Dist. have an enrol-

ment of 27,299 pupils, out of a pop. of 43,558 children of the school age (6 to 17 yrs.), with average attendance of 20,730. Amount expended for free schools, 1881, \$527,312, of which \$295,668 was for teachers' salaries. Private schools for both sexes are numerous and well attended. There are 5 sems. and colls., with 52 instructors and 581 students. Value of coll. grounds, buildings, and equipment, \$900,000. Georgetown Coll., founded 1789 (R. Cath.); Columbian Univ. (1814), and Howard Univ. (colored) have each law, med., and collegiate depts. The SMITHSONIAN INST. (which see) and the NATIONAL MUSEUM, which occupies a large edifice erected in 1880 specially for exhibition purposes, are free public insts., amply endowed, and afford the means of scientific culture through their extensive collections in zoology, antiquities, geology, ethnology, and nat. hist. generally.

*Churches*.—Of these there are 172 in the Dist., the Meths. having 54 chs., 12,182 members; Baps., 40 chs., 10,042 members; Presbs., 18 chs., 3618 members; Lutherans, 10 chs., 2100 members; Epis., 22 chs.; R. Caths., 13 chs.; Congls., 4; Jewish, 2; and Christian Disciples, Units., Ger. Reformed, Friends, Swedenborgians, and Univts., 1 each.

As the political cap. of the U. S., W. enjoys a distinction to which no other metropolis can lay claim. The vast and varied interests connected with the legislation for a people of 55,000,000, now embracing 38 States and 10 Terr., draw to W. an annually increasing number of citizens, while its mild and salubrious climate in the winter renders it an attractive resort. The number of officers and clerks in govt. employ is nearly 5000. During the c. war of 1861-65 W. was the centre of prodigious military operations. The city was fortified soon after the outbreak of hostilities by a cordon of strong earthworks or forts, 68 in number, and it constituted a great depot for military supplies. The environs of W. abound in natural beauties.

A. R. Spofford.  
**Washington C. H.**, R. R. centre, cap. of Fayette co., O. Pop. 1870, 2117; 1880, 3798.



**Washington Territory**, a portion of the Pacific domain of the U. S. lying between 45° 32' and 49° N. lat., and 117° and 124° 28' W. lon. It is bounded on the N. and N. W. by Brit. Columbia, on the E. by Id. Terr., on the S. by Or., and W. by the Pacific Ocean. Its greatest length from E. to W. is about 360 m., its greatest breadth from N. to S. about 400. Its area is 69,180 sq. m. or 44,275,200 acres.

**Topography.**—The Terr. is divided by the Cascade Mts. and the Columbia River into W. W., W. of the Cascade Mts.; Central W., between the Cascade Mts. and the Columbia River; and E. W., E. of the Columbia. W. W., beside the Cascade Mts., has the Coast Range, extending in somewhat disorderly masses from the Coast Mts. of Or., and finally terminating in the headlands of Cape Flattery. The Pacific coast is generally abrupt and forbidding except the 2 harbors of Shoalwater Bay and Gray's Harbor, but the Straits of San Juan and the extensive inland sea known by the general name of Puget's Sound have some of the best harbors and roadsteads in the world. Puget's Sound, with its bays and inlets, covers 2000 sq. m., and receives numerous rivers. The Columbia River has several small tributaries in W. W. This W. division of the Terr. is much broken, but it is well watered and most of it very fertile, while the fine harbors and bays of its central valley make it readily accessible to commerce. Central W. comprises the summits of the Cascade Mts., the valley of the Yakima, and the plateau stretching to the Columbia River. Stretching eastward toward the Columbia River is a lofty plateau channelled by the valleys of the Yakima, Methow, Okinapum, and Neholotupum rivers and their tributaries. Its lands are barren, sterile, and dry; the river-valleys are very fertile. Much of the plateau is scantily wooded. E. W. comprises the valley of the Columbia and its great affluents, the Clarke's, Spokane, and Lewis (or Snake) rivers, and the Spokane plains or plateau—the latter elevated and sterile, and without forests; the former well watered, fertile, and containing a sufficiency of timber. Columbia River rises in Brit. Columbia, and pursues a very devious course, receiving Clarke's River just as it enters the Terr., running S. to the mouth of the Spokane, thence W. to the point where it receives the Okinikane, when it flows S. E. to the Or. line, receiving the Yakima on one side and Snake River with its tributaries on the other; a few miles below it turns sharply to the W. and forms the boundary between Or. and W. for almost 300 m. There are many lakes in W., some of them very beautiful.

**Minerals.**—Coal of excellent quality has been mined near Bellingham Bay and Lake Whatcom, also back of Seattle, on Lake Washington, and in the Coast Range. It is mostly bituminous. Gold has been found in the N. E., near the Columbia River. Iron is plentiful of different ores.

**Zoology.**—The wild animals are the same as are found in Or. Salmon are nearly as abundant as in Or.

**Soil, Vegetation, and Botany.**—The white, red, and yellow pine, the red, black, and yellow fir, and the Or. cedar, are from 175 to 350 ft. in height and from 8 to 15 ft. in diameter. The deciduous trees are principally maple, ash, laurel, and alder. There is less timber in Central and E. W., but wherever there is sufficient water the plains yield immense crops. In Walla Walla, Whitman, and Stevens cos. large tracts have yielded 85 bushels of wheat to the acre. Flax, sugar-beets, hops, and fruit of most kinds are raised in large quantities. The nutritious bunch-grass is abundant, and most of Central and E. W. is admirably adapted for grazing. In the N. the nights are too cool for Indian corn.

**Climate.**—W. W. has a climate similar to that of Or. The winters are mild, without much snow or ice. The summers are delightful, the temperature seldom rising above 80°, and the nights cool and agreeable. The mean difference between the hottest and coldest month is but 26°. The mean annual temperature is 52°. In E. and Central W. the winter corresponds with that of Pa.; the summers are dry and hot. The rainfall near the Cascade Mts. is 36 inches; on and near the coast, from 100 to 130 inches; in E. W., 12 to 14 inches on the plains, and from 20 to 24 in the more elevated dists.

**Agricultural Productions.**—Wheat and oats are the prin. crops. The census of 1880 showed 1,921,322 bushels of wheat, 1,571,706 bushels of oats, 566,537 bushels of barley, 39,183 bushels of corn (for which the climate seems too cold), 7124 bushels of rye, and 2498 bushels of buckwheat. The wool clip of 1880 was 1,389,123 lbs.

**Farm Animals.**—The census of 1880 reported 45,848 horses, 134,554 cattle, 292,883 sheep, and 46,828 swine.

**Manufactures and Mining.**—In 1880 W. T. had 261 manufacturing establishments, with \$3,202,497 capital, employing 1147 hands; wages, \$532,236; total value of products, \$3,250,134. The lumber interest is a great industry, nearly 300,000,000 ft. being cut annually, and the forests are almost inexhaustible. 175,000 tons of coal were mined in 1881.

**Fisheries.**—Salmon abounds in the Columbia River, and is becoming an important export. Other food-fishes are also abundant in the fresh and salt waters of the Terr.

**Railroads, Etc.**—In Jan. 1882 there were 480 m. of R. R. in operation, of which the N. Pacific, W. Division, which runs 335 m. in this Terr., is the prin. The Or. R. and Navigation Co. does an extensive business within its limits.

**Finances.**—The assessed value of property for taxation in 1881 was \$25,796,457. There was no Territorial debt, but the co. and local indebtedness in 1880 was \$239,311. Aggregate taxation, Territorial and local, was \$505,417 in 1880.

**Commerce.**—The shipping in 1882 comprised 123 vessels; total, 37,073 tons. There are no ports of entry except Puget Sound, where exports amounted to \$446,795 in 1881, and imports to about \$32,000. The internal commerce by river and R. R. is considerable.

**Banks, Etc.**—There were, in Oct. 1881, 2 national banks, with \$300,000 capital, \$117,000 circulation, \$130,000 U. S. bonds to secure circulation, and \$456,042 aggregate deposits. There were also 9 private bankers, with \$657,015 capital. Insurance losses amounting to \$67,400 were paid in 1881.

**Education.**—The number of children of school age (5-21 yrs.) was 24,223 in 1879; in 1880, 14,780 were enrolled in public schools, with average daily attendance of 16,546. Total expenditure for public schools, \$112,615, of which \$95,582 was for teachers' salaries. Number of school-houses, 487. There are 2 colls., with 13 instructors and 200 students, receiving as tuition fees \$2500. The Territorial univ. at Seattle is the prin.

**Churches.**—There are about 90 chs. in the Terr., of which the M. E., Bap., and Presb. have the largest number of ministers and members.

**Population.**—In 1870, 23,955; 1880, 75,116 (white 67,199, colored 7917, including 3186 Chi., 1 Japanese, and 4405 Indians).

**Principal Cities and Towns, Pop. 1880.**—Walla Walla, 3588; Seattle, 3533; Vancouver, 1722; Olympia (cap.), 1232; Tacoma, 1098; Dayton, 996; Port Townsend, 917; Colfax, 444.

COUNTIES.	Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
*Adams.....	4-E	....	....	Ritzville.....	....
*Asotin.....	5-F	....	....	Asotin.....	....
Chehalis.....	4-A	401	691	Montesano.....	....
Challam.....	3-A	408	928	New Dugene.....	....
Clarke.....	5-B	3,081	5,490	Vancouver.....	1,722
Columbia.....	5-E	....	7,103	Dayton.....	996
Cowlitz.....	5-B	730	2,062	Kalama.....	129
*Douglas.....	3-D	....	....	*Kanogan.....	....
*Franklin.....	4-E	....	....	Alnsworth.....	....
*Garfield.....	5-E	....	....	Pomroy.....	....
Island.....	3-B	....	1,087	Coupeville.....	80
Jefferson.....	3-A	1,268	1,712	Port Townsend.....	917
King.....	3-B	2,120	6,910	Seattle.....	3,533
Klickitat.....	3-B	866	1,738	Port Madison.....	....
*Kittitas.....	4-C	....	....	Ellensburg.....	545
Klikitat.....	5-C	329	4,055	Goldendale.....	....
Lewis.....	4-B	888	2,600	Chehalis.....	....
*Lincoln.....	3-E	....	....	Davenport.....	....
Yakima.....	4-B	289	639	Oakland.....	....
Pacific.....	4-A	738	1,645	Oysterville.....	125
Pierce.....	4-B	1,409	3,319	Tacoma.....	....
*San Juan.....	2-B	....	948	Friday Harbor.....	....
*Skagit.....	3-B	....	....	La Conner.....	....
Skaunania.....	5-C	133	809	Cascades.....	149
Snohomish.....	3-B	599	1,387	Snohomish.....	149
Spokane.....	3-D	....	4,262	Cheney.....	....
Stevens.....	3-D	734	1,245	Colville.....	67
Thurston.....	4-B	2,246	3,270	Olympia.....	1,232
Wahkiakum.....	5-B	270	1,598	Cathlamet.....	133
Walla Walla.....	4-E	5,300	8,716	Walla Walla.....	3,588
Whatcom.....	2-B	534	3,137	Whitcom.....	....
Whitman.....	4-E	....	7,014	Colfax.....	444
Yakima.....	4-C	432	2,811	Yakima.....	267
Disputed Islands.....	2-B	554	....	....	....
Total.....		23,955	75,116		

\* Formed since census of 1880.

† Formed in 1873 from the "Disputed Islands."

‡ Reference for location of counties. See map of W. T.

**History.**—The region about Puget Sound was a favorite resort for the Indian tribes for centuries. The Strait of San Juan de Fuca was first entered in 1592 by a Gr. navigator of that name in the Sp. service. An Amer., Capt. Gray, discovered Gray's Harbor in 1791, and Lewis and Clarke penetrated to it in 1815. The Hudson's Bay Co. attempted to take possession of it from 1828 to 1841, but the U. S. claimed it, and Amer. settlers occupied it from 1845. After a long controversy the Amer. claims were admitted, but the islands in the Gulf of Georgia were not adjudged to them till 1873. The Terr. was organized in 1853, had a severe Indian war in 1855; comprised most of Id. Terr. from 1859 to 1863.

#### Governors.

Isaac I. Stevens.....	1853-57	Edward S. Salomon.....	1870-71
J. Patton Anderson.....	1857	James F. Legate.....	1871-72
Fayette McMullen.....	1857-61	Elisha P. Ferry.....	1872-80
Richard D. Gholson.....	1861	William A. Newell.....	1880-84
William H. Wallace.....	1861	Watson C. Squire.....	1884-88
William Pickering.....	1861-67		
Marshall F. Moore.....	1867-69		
Alvin Flanders.....	1869-70		

REVISED BY A. R. SPOFFORD.

**Washington Territory, University of**, was chartered in 1860, when most of the lands granted by Cong. were sold to prepare the grounds in Seattle, King co., and to erect buildings. The school was first organized as a graded school with regular courses of study in the autumn of 1872, by Pres. E. K. Hill. The courses of study include a preparatory dept. and an academic dept., containing academical, classical, scientific, and Eng. courses of 4 yrs. each.

**Washita** (wosh'-e-taw) **River** (frequently spelled **Onachita**) rises by its Brushy Fork in Polk co., Ark., and flows first E. and then S., crossing the La. State line, and finally discharges its waters into Red River. It is navigable by steamboats throughout the yr. to Camden, Ark., and for ½ of the yr. to Arkadelphia, Ark. It is 600 m. long.

**Wasp** [A. S. *wasp*; Lat. *vespa*], a name popularly applied to hymenopterous insects of the families Vespidae, Crabronidae, Nyssonidae, Larridae, Sphegidae, and Pompilidae, which essentially agree in form, but properly applicable to the Vespidae alone as a family designation. This family is typified by the paper-wasp and hornet, and the physiognomy in all is nearly alike; the abdomen is terminated by a retractile sting. The species are numerous. The N. Amer. representatives are many. The species differ considerably in habits. The social W. are the ones most generally known, and to this category belong the common species framing papery cells, the hornet, and the species which form the silky nests, with the mouths of the cells downward, which are found attached to bushes, etc. The typical W. are omnivorous in their diet. In their assaults on insects they use almost solely their jaws, and not their stings. The common honey-bees frequently fall victims to their rapacity.

**Watches**, woch'z. It is only a little more than 400 yrs. since Peter Helz, a clockmaker of Nuremberg, Ger., after a yr.'s labor, produced a pocket clock, or, as he named it, "the Nuremberg animated egg," the first pocket time-











piece ever constructed. It was egg-shaped, and about the size of a goose-egg. It required to be wound up twice a day, and its variations from the true time were nearly an hour a day. The price put upon these Nuremberg eggs was equal to \$1500 of our money. This timepiece had not many original features about it. The escapement was substantially that of Vick, invented in 1379, a hundred yrs. before; the mainspring had been invented and coiled in a metallic box yrs. before, but Helé had reduced its size; the hairspring was not invented until almost 200 yrs. later. But the fusee, a conical wheel whose pinion was armed with teeth, and to the base of which the outer end of the mainspring was attached; and the fusee-chain, a catgut cord which was wound upon the conical wheel by the uncoiling of the mainspring—the conical shape of the wheel enabling the fusee-chain to regulate the relaxation of the spring to some extent, and produce an approximate uniformity of motion in the other wheels of the watch—were undoubtedly Helé's invention. For 125 yrs. or more this catgut fusee-chain (a material peculiarly subject to atmospheric changes) continued in use, and rendered the W. unreliable as a time-keeper. Not long after 1600 it gave place to the metallic fusee-chain, composed of minute links of highly finished steel. The escapement was still that of Vick, but it was unsatisfactory. The application of the coiled hairspring to the balance, and the discovery that within certain limits the vibrations of this spring are isochronous, were the next important changes in the W. About 1700 the use of jewels—of ruby, sapphire, chrysolite, garnet, or aquamarine—for the bearings of pivots, was introduced. In 1707 the compensating balance was invented, to equalize any influence exerted by variations of temperature, to which the 2 metals, of which it was composed, might be subjected. With these improvements the Eng. W. attained its highest development. It was thick and clumsy; the best grades were fair timekeepers, seldom varying more than 2 or 3 minutes in a week, but it was necessarily high priced. The adjusting of the parts to each other being a difficult work, and being performed in the larger shops by men who had devoted their lives to it, if one of the important pieces was broken or injured, it was always doubtful whether it could be replaced. When one of these W. had passed the careful inspection of the manager, the name of Reid, Arnold, Earnshaw, Tobias, or Frodsham was engraved upon it, and these names doubled its price, which, even for a silver W., ranged from \$300 to \$500. In the latter part of the 18th century the Fr. and Swiss began to manufacture W. in large quantities. They at once abandoned the fusee and chain and the vertical escapement as unnecessary, and adding to the cost and fragility of the W. In their W. the great wheel which had been attached to the base of the fusee was transferred to the base of the barrel which held the mainspring, and set in motion the centre wheel and pinion, which in turn imparted motion to the third wheel and pinion, and this to the contrate-wheel and pinion, thus connecting directly with the balance and escapement, which, by their alternate motions regulated and compelled uniform action in the uncoiling of the mainspring, and were aided in this work by the action of the hairspring, which made the isochronism very nearly perfect. The Swiss watchmakers carried the division of labor much farther than the Eng. More than 50 different trades, and often from 150 to 200 persons, were employed in the production of a W. Most of the pieces were made wholly by hand, and workmen working at their own homes passed their whole lives in making duplicates of the same piece. Wages were very low—so low that for many yrs. past most Eng. W. have been made up with movements imported from Switz, and stamped with Eng. names.

It is only about 30 yrs. (1858) since the manufacture of W. began in the U. S. Mr. A. L. Dennison of Boston is the father of the W. manufacture in this country. He conceived the idea of making all the parts of the W. under one roof, operating the tools already in use in Switz, by steam or water power, and supplementing them by other machines of Amer. invention. With considerable difficulty he persuaded 3 gentlemen—Edward Howard, David P. Davis, and Samuel Curtis—to join him in erecting a W. factory at Roxbury, Mass. Difficulties of all sorts surrounded them. After a yr. of hard and perplexing labor they completed their first W. in 1853. It was, and is, an excellent time-keeper. But the location of their factory was found unsuitable, the fine impalpable clay dust being fatal to the delicate operations of watchmaking. They removed to Waltham; other partners came in; they organized at first as the Boston Watch Co., and some yrs. later, after some financial troubles, as the American Watch Co. of Waltham, Mass. Since 1860 their growth has been very rapid. They now have a capital of \$1,500,000, a manufactory covering nearly 2 acres, and when running at full time employ about 2800 hands,  $\frac{1}{2}$  of them women; the wages of the women average \$1.40 a day, those of the men \$2.75 per day. They can turn out from 1000 to 1500 W. movements a day, their present actual production being about 400,000 W. a yr. They also make many thousand silver W. cases at the Waltham factory, and nearly 50,000 gold cases and many thousand silver dust-proof cases at the Waltham building in New York. Their dust-proof cases are impervious to water as well as dust. Their W. bear the highest reputation for accuracy and durability, running with a variation in the higher grades of not more than 10 or 15 seconds a month, and of the commonest grades of less than 2 minutes a month. They have a very large trade in Eng. and on the Continent, in India, Australia, etc. There are now 10 or 12 other W. factories in the U. S. The oldest is that of Howard & Co., the founder of which, Mr. Edward Howard, was one of Mr. Dennison's associates at Roxbury. Their W. are of excellent quality and high reputation. The Elgin National Watch Co. of Elgin, Ill., founded in 1864, is, after the Waltham, the largest in the U. S. They have \$1,300,000 capital, and turn out 180,000 to 200,000 W. a yr. Their W. are of excellent quality, and

many of them of very low price. The other cos., 7 or 8 in number, are mostly small establishments, but some of them produce very good watches. L. P. BROCKETT.

**Water**, waw'ter, hydrogen oxide or protoxide.

**Occurrence.**—In the liquid form it constitutes the ocean, seas, lakes, rivers, springs, etc., covering  $\frac{3}{4}$  of the earth's surface. It also occurs disseminated throughout the rocky strata which constitute the earth's crust. In the solid state it covers the polar regions and high mountainous dists. permanently, and the temperate regions periodically, appearing as snow, ice, glacier, and iceberg. In the state of vapor it is always contained in the atmosphere, and gives rise to clouds, fog, mist, rain, dew, snow, hail, etc. It is a constituent of many minerals, as W. of crystallization. It occurs in all plants. In animals it is always present in considerable quantities.

**Composition.**—The ratio of its constituents, hydrogen and oxygen, is as 2:1, the ratio by weight as 1:8. 1 U. S. gal. (231 cubic inches) of W. contains about 820 gals. of oxygen and 1240 of hydrogen.

**Formation.**—W. is formed whenever hydrogen or combustible bodies containing hydrogen are burned in oxygen, atmospheric air, or any gas capable of supplying oxygen.

**Properties.**—Between 32° and 212° F., under the ordinary atmospheric pressure, W. is a limpid liquid. When pure, it is entirely free from smell and taste, and has neither an acid nor an alkaline reaction. It is colorless in small quantities, blue when viewed in mass. The impurities in large bodies of W. often produce decided colors, as the mud in rivers, the red microscopic plants seen at times in the Red Sea, etc. The density of W. in the liquid state is about 770 times that of the atmosphere, and is greatest at about 4° C. (39.2° F.). The density of W. is always taken as the standard unit for comparing the densities of all other liquids and of solids. Its density or specific gravity is therefore 1.000. Water is slightly elastic. The specific heat of W. is greater than that of any other substance—that is, it requires more heat to raise a given weight a given number of degrees in temperature. Its specific heat is taken as the standard of unity. It is a very poor conductor of heat and of electricity. At 32° F. or 0° C. water becomes solid, freezes, crystallizes, expanding considerably at the same time. Pressure lowers the freezing-point. Ice is colorless, or in masses blue when

FIG. 1.



Snow-Crystals.

pure. Its density is less than that of W. at 32° F. (0° C.), being about 0.920. Ice always floats on the surface of W. W. evaporates at all temperatures when in contact with air or other gases. The higher the temperature, the drier the air, and the more rapid the air-currents, the greater will be the evaporation. Water boils at 212° F. (100° C.) under the ordinary atmospheric pressure. When the pressure is reduced, the boiling-point is lowered. Vapor of W. is colorless and transparent, and becomes visible only when partially condensed, as when steam escapes into the air.

**NATURAL WATERS.**—W., being a great solvent, dissolves to some extent whatever it comes into contact with.

**I. ATMOSPHERIC WATERS.**—Even atmospheric W., the rain and melted snow, are not pure. Rain, as it falls through the air, washes out the solid particles of dust and the germs of animals and plants. In addition to these, it dissolves the oxygen, nitrogen, carbonic acid, and ammonia of the atmosphere, but a greater proportion of the oxygen than of the nitrogen. W. which is collected from roofs in the city is never pure. It contains gases which are only developed in cities, sulphur compounds, products of the combustion of coal. After thunderstorms the rain-W. is always found to contain minute quantities of nitric acid, produced by the electric sparks, which cause the oxygen and nitrogen of the air to unite. Rain-W. almost always contains a little organic matter, causing it to become putrid when kept for some time.

**II. SPRING WATER.**—Terrestrial W. are always impure. Rain falling upon the earth's surface is absorbed by the porous soil, and the materials of which the soil is composed, being to a greater or less extent soluble, the W. becomes contaminated with mineral matter. The character of spring W., therefore, depends upon the character of the soil through which it has passed before it issues as a spring. Spring W. is generally very clear, although it may be quite impure. It holds its impurities in solution. The soil through which it has passed, although it has conferred upon it its impurities, has at the same time filtered it, and thus rendered it clear and sparkling. As it comes from below the surface, it is generally cool.

**Artesian Wells.**—Occasionally wells are sunk to great depths by boring. Such wells are called artesian wells, from the dist. in Fr. where they were first bored. (See ARTESIAN WELLS.)

**Ordinary Spring-Waters** (fresh W., as they are generally called) contain salts of the alkalies and alkaline earths—chlorides, sulphates, and bicarbonates of potassa, soda, lime, and magnesia. The most common salts are the chlorides of potassium and sodium, the sulphates of soda and lime, and the bicarbonates of lime and magnesia. Beside these alkaline and earthy salts, we almost invariably find silica, the substance of quartz, to the amount of a grain or less in a gal. In wells which receive drainage-W. in the neighborhood of dwellings we generally find nitrates, nitrites, and ammonia salts, derived from decomposing animal matter in the soil.



**Hard and Soft Waters.**—Lime salts in water are the cause of what is called *hardness*. They decompose the soap used in washing, forming a flocculent insoluble compound and destroying its detergent properties. Soap is an excellent reagent for testing W. As bicarbonate of lime is destroyed by boiling, with the formation of insoluble carbonate of lime, which does not act on soap, it is said to produce *temporary hardness*, while sulphate of lime, which is not affected by boiling, produces *permanent hardness*.

**Organic matters** of various kinds are always present in natural W. They are derived from the decomposition of plants and animals, chiefly the former. They are both nitrogenous (*albuminoid*) and non-nitrogenous.

**Pond, lake, and river waters** are generally purer than spring W., for the reason that while those bodies of W. receive the W. of springs, they also receive a considerable quantity of W. which has simply run over the surface of the earth. When a shower comes up, a portion of the W. goes through the soil and issues as a spring, but a large portion of it runs over the soil, and goes into the lakes and rivers without taking with it much mineral matter. Rivers are more likely to be charged with *suspended impurities*, for the reason that their W., which have not been filtered through the soil, carry with them a certain quantity of mud and organic matter. When W. flows into lakes and the sediment subsides, it becomes clear; but in streams where the W. runs rapidly it has no opportunity to deposit its sediments, and it often appears very turbid. Rivers flowing through populous dists. and receiving the drainage of the towns on their banks often become contaminated with sewage to such a degree as to make them positively offensive, and dangerous to those who drink their W. The W. of ponds are more largely supplied by springs; they are generally clearer than those of rivers, as the suspended impurities subside. They often exhibit more or less color, due to peaty matters held in solution.

**Living Organisms in Water.**—In addition to the soluble and suspended impurities already mentioned, we find living organisms in W.—animals and plants. These animals when magnified by the microscope are very frightful in their appearance and motions, but they are not really objectionable. The plants even exercise a purifying influence on the water.

**III. SEA-WATER.**—The ocean is the great and final receptacle of all W. which escape evaporation, and it consequently receives the mineral and other impurities which the rivers and smaller streams carry along in solution or suspension. From the surface of the ocean the W. evaporates, rising into the atmosphere to fall again in the form of rain. Entering the soil, it again issues in the form of springs, with a fresh quantity of dissolved mineral matters, which it bears onward to the ocean. Thus, again and again, the rain-drops have performed the voyage to the sea, each time laden with the little cargo of dissolved salts. In this manner the ocean has become very saline; it is the receptacle for the soluble matters which are washed out of the earth's crust. In addition to the substances already mentioned, sea-W. contains about .3 grm. per litre of *bromine*, and very minute amounts of *iodine* and *fluorine*; also *silica*, *phosphoric acid*, *calcic* and *magnesian carbonates* in small proportions. *Silver*, *lead*, *copper*, and *arsenic* have been detected either in sea-W., the ashes of marine plants or animals, or in the deposit formed inside the boilers of ocean steamers. In fact, since the ocean is the common recipient of by far the greater part of the W. discharged from springs and constituting rivers, most of the material abstracted by their W. from the interior and surface of the earth passes into it, and all substances which exist in spring-W. may be expected to exist, to some extent, in sea-W. The gaseous contents of sea-W. are nitrogen, oxygen, and carbonic anhydride, amounting altogether to from 10 to 30 c. c. per litre, according to different observers.

**Inland Seas.**—Where evaporation is rapid, inland seas and lakes which drain considerable areas become even more salt than the ocean. The Dead Sea and the Great Salt Lake are examples.

**IV. MINERAL WATERS.**—W. which contain unusually large quantities of any of the ordinary impurities, or which are characterized by unusual constituents, are known as mineral W. Such W. may be valuable for their medicinal properties or as sources of the special substances they contain.

**Sulphur Waters.**—W. containing sulphuretted hydrogen gas are found in many parts of the world. Those of Harrogate, Croft, and Aix-la-Chapelle are renowned in Europe, while we have in the U. S. numerous examples, among which are the White, Red, and Salt Sulphur springs of Va., the White Sulphur springs of O., and the Richfield, Sharon, Chittenango, and Florida springs of N. Y. State. The sulphuretted hydrogen gives these W. a sweet taste and a very peculiar odor, which some consider offensive. These W. have the property of blackening silver.

**Saline Waters.**—The chlorides of sodium, calcium, and magnesium often occur in spring W. in such quantities as to cause a decided saline taste. Sulphate of soda (Glauber salt) or of magnesia (Epsom salt) may also be the cause of a saline taste. Brines, which are important sources of national wealth, belong to the first-mentioned class.

**Acidulous Springs.**—W. charged with such quantities of carbonic acid as to cause them to sparkle and effervesce as they flow from the spring are called *acidulous*. Owing to the solvent power of this acid upon limestones and some other rocks, such W. generally hold considerable quantities of lime, magnesia, and iron in solution in the form of bicarbonates; when the latter is present in quantities of a grain or more to the gal., the spring is called a *chalybeate*, from the name of an anc. people who worked in iron at an early day, the *Chalybes*. These W. often contain considerable quantities of chloride of sodium, and frequently bromide and iodide of sodium, as well as bicarbonates of soda and lithia. Such is the character of the most celebrated mineral W. in this country, the well-known springs of Saratoga and Ballston in N. Y.

**Chalybeates.**—Almost all natural W. contain minute quantities of iron, generally in the form of bicarbonate. All these W. are therefore *chalybeates*, but the properties of the iron are masked to a greater or less extent by the much larger quantities of other materials. These ferruginous W. are characterized by a styptic or inky taste, due to the iron which they contain.

**Acid Waters.**—It occasionally happens that springs are characterized by the presence of free mineral acids, such as sulphuric and hydrochloric.

**Alum Waters.**—In several localities W. occur charged to a greater or less extent with alum, which is a double sulphate of alumina and potassa. These W. frequently contain free sulphuric acid.

**Silicious Waters.**—Almost all natural W. contain small quantities of silica, in the neighborhood of 1 grain in a gal.; but the W. of hot springs, especially those which contain alkaline carbonates, are largely charged with silica, and in the neighborhood of their outlets large masses of silicious tufa are formed.

**Borax Waters.**—Minute quantities of borax (biboate of soda) are found in many mineral W.—as, for instance, the W. of Saratoga—but in a few localities W. occur so heavily charged with this salt as to make it worth while to extract it for manufacturing purposes. For many yrs. considerable quantities of borax, called *tinca*, were brought from a salt lake in Thibet. More recently Cal. has been found to contain borax lakes of great size.

**V. WATER FOR MANUFACTURING PURPOSES.**—For manufacturing purposes pond or river W. is generally selected, not only because it can generally be obtained in unlimited quantities, but also because it is generally softer than spring-W. For many purposes the impurities of W. are often seriously objectionable. When used in stationary or locomotive boilers, impure W. produces incrustations which often form a complete lining. These incrustations are very poor conductors of heat. Their presence in boilers causes, therefore, a great waste of fuel. The incrustations vary somewhat in character with the impurities of the W. by which they are produced. Their chief constituents are carbonate of lime, carbonate of magnesia, and sulphate of lime. Various substances are employed to prevent the formation of these incrustations in boilers, some of which are very effective. Amylaceous, saccharine, and extractive matters tend to prevent the carbonates of lime and magnesia from forming a hard scale, causing them to separate as a loose mud, which can be easily washed from the boiler at convenient intervals. Potatoes, molasses, extractive matters, or substances which yield them, as logwood sawdust, are consequently employed with varying success. Astringent substances, which contain tannic acid, have a similar action. To this class belong catechu extract, oak sawdust, tan-bark, etc. Solid particles, as sawdust, clay, chopped straw, etc., serve to diminish the formation of hard scale by presenting nuclei upon which the earthy carbonates are deposited. For the decomposition of sulphate of lime, carbonate of soda or chloride of barium is employed. Sal-ammoniac is sometimes employed to convert the carbonate of lime into soluble chloride of calcium, and thereby prevent its being deposited. Often for washing or for cleaning cotton, wool, or other fabrics the impurities of W. are a great objection; they destroy soap, and affect colors in dyeing; for sugar-refineries and in brewing the character of the W. is of great importance. In fact, the highly prized flavor of some of the Eng. ales is attributed facetiously to the impurities in the W. used.

**Filtering Water.**—Filtration is one of the simplest methods for purifying W.; its action is limited to the suspended impurities, such as mud, animal and vegetable substances, etc. Any porous material may be employed in the construction of a filter, the selection being generally governed by the magnitude of the operation. For city supplies, reservoirs are constructed which are provided with porous partitions, or so arranged that the water is obliged to percolate through beds of sand and gravel. In many European cities filtering basins of great size are employed for filtering the entire W.-supply. Filtering beds are constructed many feet thick, consisting of layers of large stones at the bottom, smaller stones above, and finally coarse sand at the top. Galleries arched with brick serve to receive the filtered W.

**Boiling Water.**—Impurities of animal and vegetable origin are often rendered inert and harmless by simple boiling, and travellers in malarious countries consider this simple precaution a very efficient protection against some of the diseases peculiar to the localities.

**Distillation.**—Distillation is really the most effective method for purifying W., but it is only applicable in special cases. The analytical chemist, the photographer, and sometimes the pharmacist, are compelled to resort to distillation to obtain water sufficiently pure for certain of the operations incident to their respective professions. Almost all vessels are now provided with an apparatus by which sea-W. may be distilled for drinking purposes in case of a long voyage and deficient supply of fresh W. Distilled W. must be thoroughly aerated to render it palatable and wholesome.

**Other Methods of Purifying Water.**—Charcoal has the property of purifying W. contaminated by organic matters. Permanganate of potassa, commonly called chameleon salt, is very effective in destroying organic matters in W. Travellers are advised to carry with them a small vial of the crystallized salt. A small particle added to a glass of W. renders it pure. Running streams undergo purification by the oxygen which they absorb from the air. Very impure W. when placed in casks on shipboard, frequently undergo a kind of fermentation by which the impurities are worked off and the W. rendered sweet and wholesome. Contact with iron, as when W. is stored in iron tanks, effects a speedy purification. Filtration over magnetic oxide of iron is said to purify W. very rapidly.



**VI. WATER FOR DOMESTIC PURPOSES.**—For domestic purposes the W. of springs is generally selected, because it is cool and clear, having undergone a natural underground filtration; but, as already shown, spring W. generally contains a larger quantity of dissolved impurities, hence it is generally harder than river or pond W. Ordinarily, wells receive their supply of W. partly from springs and partly by drainage. They are therefore very liable to be contaminated with the soluble impurities of sewage, and frequently serve to disseminate special diseases, such as cholera and typhoid fever. Deep artesian wells, which bring W. from deep-lying strata supplied from a distance, are free from organic impurities, though they often contain so much mineral matter as to give them medicinal qualities.

**Characteristics of a Good Drinking Water.**—The characteristics of a good drinking W. may be enumerated as follows: Its temperature should be at least  $10^{\circ}$  lower than the temperature of the atmosphere, but it should not be much lower than  $45^{\circ}$  F. It should be free from taste, except, perhaps, a slight pungency from oxygen and carbonic acid, which is an advantage. A third requirement is freedom from smell. It should be transparent, though it is not necessarily injurious if not transparent.

**EFFECT OF THE IMPURITIES CONTAINED IN WATER.**—(1) **Mineral Impurities.**—The quality of the impurities is more important than the quantity. It is found that 5 or 6 grains of lime or magnesia render W. unfit for the cooking of leguminous vegetables. On the other hand, it is a great advantage in making tea or coffee to use water of about 5 degrees of hardness—that is, containing about 5 grains of carbonate of lime or its equivalent in the gal. Magnesia in large quantities is objectionable, as are also lime salts. They are liable to cause dyspepsia. It is said that horses acquire a rough coat if supplied with water containing a large quantity of sulphate of lime. Goitre and cretinism are attributed to these impurities in the W.

(2) **Organic Matter.**—The organic matter of a purely vegetable origin, such as occurs to the extent of 1, 2, or 3 grains per gal. in country springs and wells or in ponds and rivers, even when it contributes a tint of yellow to the W., is entirely harmless and unobjectionable. The nitrates, nitrites, and ammonia salts found in wells in densely peopled towns are themselves harmless, but their presence proves the contamination of the W. with the products of decomposition of animal refuse.

(3) **Animal Excreta.**—The product of the decomposition of animal matter in W. is by far the most objectionable impurity. Organic matters, produced by the decomposition of vegetable substances, are not especially dangerous, but the products of decomposing animal substances are highly dangerous, even when in minute quantities. Many diseases of the most fatal character (especially cholera and typhoid fever) are now traced to the use of W. poisoned with the soakage from soils charged with sewage and excremental matters. Sudden outbreaks of disease of a dysenteric character are often caused by an irruption of sewage into wells. Such contamination of the W. is not indicated by any perceptible change in the appearance of the W. The filtered sewage, clear and transparent, carries with it the germs of the disease.

**THE SPONTANEOUS PURIFICATION OF RIVER WATER.**—While the animal matters which find their way into wells from cesspools and privies are capable of producing the fatal results to which we have called attention, it is now well settled that such matters are speedily oxidized and destroyed, and thus rendered harmless, when they flow into running streams, by the oxygen held in solution in the W. Sewage which would poison an ordinary well becomes harmless in the running stream; and while the well is always open to suspicion, the river, though it drain populous dists., will nevertheless supply wholesome W.

**THE POLLUTION OF STREAMS BY THE REFUSE FROM FACTORIES.**—It is often suggested that the W. of our rivers are liable to become polluted to a dangerous degree by refuse chemicals from paper-factories, woolen-mills, print-works, and chemical works. While this may undoubtedly be true in some densely populated portions of Eng., where the factories are numerous and the streams very small, it is not probable that for yrs. to come this source of pollution need be feared in this country. Our rivers are too large and our factories too much scattered, and the importance of turning all waste products to account is made imperatively necessary by the sharp competition which prevails among manufacturers. This latter point is well illustrated by our gas cos., who now derive an important revenue from the sale of their coal-tar and ammonia-W., offensive products which they formerly allowed to run to waste. The waste products of our most important industries are entirely harmless when diluted with large volumes of water. They consist chiefly of sulphuric and hydrochloric acids, lime, potash, soda, iron and alumina salts, chloride of lime, exhausted dyewoods, and soapsuds used in scouring wool. The more powerful form, when mingled, harmless salts, carbonates, sulphates, and chlorides, which are normal constituents of all river W. The action of many of these products, if appreciable at all, will be to purify the W. by oxidizing or precipitating the matters derived from sewage. Salts of iron and alumina are especially efficacious in purifying W. Alum is often used in the W. for clarifying the muddy W. of the streams, a pinch being added to a barrel of the water, which in a few hours becomes clear and limpid. The possibility of objectionable pollution will depend upon the ratio of the refuse matters to the quantity of W. in the stream.

**METALLIC IMPREGNATIONS.**—W. is frequently rendered impure by the metallic tubes used to conduct it. Organic matter, nitrates, nitrites, chlorides, etc., and in some cases even pure W., attack certain metals, dissolving them.

**Copper.**—Cases of sickness have occurred caused by W. drawn through copper pumps, copper having been actually detected in the W.

**Lead.**—Lead is by far the most common material used in the construction of service-pipes for W., and this metal is the one which is the most easily dissolved by W., and at the same time most poisonous in minute quantities, being a cumulative poison. As little as  $\frac{1}{100}$  of a grain of lead to the gal. has been known to produce palsy in persons who habitually drank it. It is a great pity that the peculiar advantages of lead as a material for the manufacture of W.-pipes are more than counterbalanced by the danger of lead-poisoning.

**Substitutes for Lead.**—The problem is to provide a pipe which shall possess all the good qualities of lead, and be free from the one great objection—namely, the danger of lead-poisoning from its use. This has been achieved by the invention of the *lead-lined pipe* or *tin-lined lead pipe*. This is essentially a pipe of pure tin surrounded by a lead pipe, to which it is firmly and perfectly united by an intervening alloy or solder composed of the 2 metals. The W. comes in contact with the pure tin surface only, and cannot therefore be contaminated with lead. That tin is harmless it is hardly necessary to argue, as vessels covered with this metal are extensively used for culinary purposes throughout the civilized world. It has been argued that commercial tin contains arsenic; but if we can consume daily, with impunity, food which has been boiled and stewed in tin pans, notwithstanding the arsenic contained in the tin coating, we need have little fear of poisoning from the trace of arsenic which may possibly be present in the tin lining of this sanitary pipe. The tin-lined pipe fully realizes all that is desired as a service pipe for aqueduct W. Tested side by side with ordinary lead pipe, W. which take up from  $\frac{1}{10}$  to  $\frac{2}{10}$  of a grain of lead per gal. from the lead pipe are not perceptibly affected by remaining for considerable lengths of time in the tin-lined pipe. C. F. CHANDLER.

**Water, Arrangement of, on the Earth's Surface.** See CATARACTS, EARTH, LAKE, AND RIVERS.

**Water-Bed,** a device invented by Neil Arnott, M. D., F. R. S., phys. extraordinary to Queen Victoria, for the prevention of bed-sores upon the persons of bed-ridden patients. It is an ordinary bed, resting upon an under-bed of India-rubber cloth filled with water.

**Water-Beetle,** a name given to the representatives of 2 families of beetles which live in fresh waters—the Dytiscidae and Gyrinidae. These 2 families are very distinct from each other, and agree chiefly in that they have the body oval and depressed, the first ventral segments visible only at the sides, the legs of the second and third pairs flattened and fitted for swimming.

**Water-Buck,** the *Kobus dipsospyrmonus*, a large and handsome antelope of S. Afr., always found near rivers. It is a good swimmer and is exceedingly timid. It emits an intolerable odor, and its flesh is uneatable.

**Water-Bug,** the popular name of insects of the order Hemiptera. (1) The common water-boatman, noted for its habit of lying on the back and propelling itself by means of the hind legs, which are very long, and with the extremities expanded and fringed with stiff hairs so as to resemble and do the duty of oars. These insects are powerful on the wing, and fly by night. (2) The scorpion-bug, a very flat and leaf-like insect, adapted for seizing prey with the fore legs, which flex upon themselves and thus act as pincers. (3) The water-measurers, found on the water, over the surface of which they move with a gliding motion.

**Waterbury,** city and R. R. centre, New Haven co., Conn., about 88 m. N. E. of New York. It is mostly built in a valley, through which flow Naugatuck and Mad rivers and several smaller streams, which furnish a large and well-developed water-power. Although a marketing centre for a great part of the surrounding country, a large portion of its capital is invested in manufacturing. Large quantities of rolled and sheet brass, tubing, lamp-burners and trimmings, silver-plated ware, pins, and almost every variety of article manufactured from metals, are produced here; has a free public library containing 18,000 vols., a handsome park, and a beautiful cemetery (Riverside), located on the banks of the Naugatuck River about 1 m. from the city. Among the schools are St. Margaret's (a diocesan school for young ladies), the Acad. of Notre Dame (convent school), and the Waterbury Eng. and Classical School for boys. Pop. 1870, 10,826; 1880, 17,806.

**Waterbury,** on R. R., Washington co., Vt. Pop. tp. 1870, 2693; 1880, 2297.

**Water-Chestnut and Water Chinquapin,** names for the singhara nut and for seeds of other species of *Trapa*; also for the tubers of *Scirpus tuberosus*, a club-rush (Cyperaceae) of China; also for the nut-like seeds of the *Nelumbium*.

**Water-Clock.** See CLEPSYDRA.

**Water-Color Painting.** The substitution of water for oil as a medium of applying color to surfaces is not a modern discovery. In modern W.-C. the ordinary white drawing-paper is used, without chemical or other preparation. The pigments are the same as are employed in oil-painting, and are prepared in the same manner, only they are more manageable, and are capable, in some instances, of being made more effective: indigo and gamboge, for instance, being more brilliant and permanent under the water treatment. The use of moist colors, and of "Chinese white" as an opaque body-color, marks the chief difference between the older and the newer schools. The light is due to the whiteness of the paper, which, shining through the transparency of the color, produces a mild brilliancy of effect. The parent colors, produces a mild brilliancy of effect. The artist in W.-C. needs in every respect the same training as the artist in oil, the only difference between them being that one uses water, the other oil, as a vehicle. In fact, the artist in W.-C. requires greater swiftness and certainty of touch, for the water dries immediately, and mistakes in drawing cannot be corrected or covered over, as on canvas: the lines and processes stand revealed. The artist is unable to slight or slur his work. The ease with which the painter in W.-C. throws off sketches and produces startling effects



with a few masses of light and shade, or a few bold gradations of tone, deludes many into the belief that this is a light and trifling branch of art. But finished painting in W.-C. demands skill of a very high order; great works come only from masters. There is no reason to doubt that in course of time, with proper study, W.-C. painting will be held equally in esteem with oil. Its permanency seems to be unquestionable. The darkening of the paper on long exposure to the air may be avoided by protecting the surface with glass. This danger being averted, the colors in other respects may be trusted to hold their own with even more certainty than is the case with canvas painting. The liability of paper to be torn renders the W.-C. painting less durable than the work on canvas, but this disadvantage reflects no disparagement on the method of applying color. The work that Vibert, Meissonier, and Fortuny do on paper will acquire additional value from the circumstance that it must be tenderly kept, and cannot be rolled up like canvas and thrown into a lumber-room. The process of W.-C. is in common use by sketchers, whose finished works are in oil. But as the capacities of it are understood, it is preferred by artists to oil-painting, many feeling what Michael Angelo expressed in regard to fresco-painting, that in comparison with oil-painting was work for women and children. Societies of artists in W.-C. hold now a distinguished place among the schools of painting. The Belgian association, under the patronage of the king, is by some ranked first. In Eng. there are two. The Society of Painters in Water-Colors, instituted in 1804, gave its 86th exhibition in 1876. Its president is Sir John Gilbert, A. R. A.; among its honorary members are W. E. Gladstone and John Ruskin; its membership includes names famous in oil-painting, and in the list of its associate exhibitors is Holman Hunt. The Institute of Painters in Water-Colors gave the same yr. its 42d exhibition. Its membership comprises artists of distinguished merit; in the number of its honorary members we find Rosa Bonheur and John Millais, both of whom have done work, though not eminent, in W.-C.; of the 13 lady members, one, Mrs. E. Murray, is well known here by her Sp. subjects, and Miss Elizabeth Thompson is famous as the painter of the *Charge at Balaklava* and *Quatre-Bras*. The variety in the subjects presented at the latest exhibitions demonstrates the capacity of the style. The Fr. have paid less attention to W.-C. than the Eng., though individual artists owe their fame to it—Vibert and Detaille, for example. Artists of the Sp. school find it admirably adapted to produce the gorgeous effects they aim at. In New York the Amer. Society of Painters in Water-Colors was formed in 1867, and is an established inst. O. B. FROTHINGHAM.

**Water-Colors.** See PAINT.

**Water-Cure.** See HYDROPATHY.

**Waterfall.** See CATARACTS AND RAPIDS.

**Water-Flea,** a name given sometimes to species of ENTOMOSTRACA (which see).

**Waterford,** R. R. centre, Saratoga co., N. Y., at the junction of Mohawk and Hudson rivers, on Champlain Canal, connects with Troy, 4 m. distant, by horse R. R. and steam-ferry, and with Lake Champlain, 63 m. distant, by State canal. It has abundant water-power, and is a manufacturing point of some note. Pop. 1870, 3071; 1880, 1822.

**Water-Gas** is a term applied to the mixture of *hydrogen, carbonic oxide, and carbonic acid* gases, which is produced by the contact of water or steam with carbon at the temperature of incandescence, or higher. It has been considered preferable, in practice, to heat the steam itself to as high a temperature as practicable, before contact with the carbon, by passing it through some superheating apparatus. The general result of this is to produce a mixed gas containing more carbonic oxide and less carbonic acid, the last gas being not only a useless but a detrimental constituent, as involving the consumption of lime in its removal from the gaseous mixture. It would appear that no temperature, however high, altogether prevents the formation of carbonic acid; but the process has been conducted with such success as to involve the formation of but little, if any, more carbonic acid than occurs in ordinary illuminating gas from gas-coal.

**Water-Glass,** the soluble silicate of soda or of potash, or of both, prepared for use by boiling silica with a caustic alkali under great pressure. It is used in fresco-painting, in dyeing cloth, and in making certain kinds of artificial stone and cement.

**Water-Hog.** See CAPYBARA.

**Waterhouse** (BENJAMIN), M. D., b. at Newport, R. I., Mar. 4, 1754, studied med. at Lond., Edinburgh, and Leyden, where he grad. 1780; began practice as a phys. at Newport; was prof. of the theory and practice of phys. at Harvard 1789-1812; was at the same time prof. of nat. hist. at Brown Univ., Providence; from 1784 was the first lecturer on nat. hist. in an Amer. coll.; also introduced the study of mineralogy; tested in his own family as early as 1799 Dr. Jenner's discovery of vaccination; was a frequent writer for the press in support of the doctrines of Jefferson; was appointed hospital surgeon U. S. A. June 29, 1813; became post surgeon 1818, and was med. supervisor of the U. S. military posts in N. Eng. 1812-25. Wrote *Lectures on the Theory and Practice of Med., Lectures on Nat. Hist.*, etc. D. Oct. 2, 1846.

**Waterland** (DANIEL), D. D., b. at Wasely, Lincolnshire, Eng., Feb. 14, 1683, grad. at Magdalen College, Cambridge, about 1703; became a fellow (1704) and master (1713) of that coll.; took orders in the Ch. of Eng.; was appointed chaplain to George I. 1714; preached the Lady Moyer lectures at St. Paul's, Lond., 1720; became rector of Ellingham 1713, and of the united parishes of St. Austin and St. Faith, Lond., 1720; chancellor of York 1723; canon of Windsor 1727; vicar of Twickenham and archdeacon of Middlesex 1730; was highly distinguished as a Trinitarian controversialist. He has been called "the last of the great patristic scholars of England." Wrote several treatises on the *Divinity of Christ*. D. Dec. 23, 1740.

**Water-Lily,** a name appropriate to the beautiful blossoms of the water-plants of the genus *Nymphaea*, and also extended to *Nuphar* and *Nelumbium*. One of the finest anywhere is the *Nymphaea odorata* of the U. S., often called pond lily.

**Waterloo**, v. of Belg., prov. of S. Brabant, on the road from Charleroi to Brussels, at the S. outskirts of the Forest of Soignies, with 2935 inhabs. Here and in the vicinity was fought, on June 18, 1815 (Wellington and his army having fallen back from Quatre-Bras), the battle between the Fr. under Nap. on one side, and on the other an allied Eng.-Dutch-Ger. army under Wellington and a Prus. army under Blücher, the loss of which battle finally broke Nap.'s power.

**Waterloo,** R. R. June, De Kalb co., Ind., 28 m. N. E. of Ft. Wayne, has an elegant school building and fine fair grounds. Pop. 1870, 1259; 1880, 1376.

**Waterloo,** city and R. R. centre, on Cedar River, cap. of Black Hawk co., Ia., 93 m. W. of Dubuque, has excellent water-power, flouring-mills, etc. Pop. 1870, 4337; 1880, 5630.

**Waterloo,** on R. R., Seneca co., N. Y., on both sides of Cayuga and Seneca Canal, 58 m. E. of Rochester. Pop. 1870, 4086; 1880, 3893.

**Water'melon,** the fruit of *Citrullus vulgaris*, a trailing annual vine of the order Cucurbitaceae, a native of Asia and Afr., extensively found wild on the plains of the latter continent, where some varieties or specimens of its fruit are bitter and poisonous. W. are largely grown in the U. S. for their cooling, watery pulp; many varieties are known. In warm climates sugar has been profitably made from W.

**Water-Mole,** a name given by the Australian colonists to the ORNITHORHYNCHIDÆ (which see).

**Water-Ouzel,** a name given to birds of the genus *Cinclus*, family Cinclidae, formerly classed as Turdidae or thrushes, and often called dippers. The European W.-O. is *C. aquaticus* (or *Hydrobatas cinclus*). N. Amer. affords a species, *C. mexicanus*, found chiefly in the Rocky Mts. These remarkable little birds are excellent divers, and feed at the bottom of streams. It is commonly said that they have the power of walking upon the bottom of streams under water, but some good observers state that they do not in fact walk, but swim under water.

**Water on the Brain.** See HYDROCEPHALUS.

**Water Plants.** See AQUATIC PLANTS.

**Waterproofing,** the art of rendering textile fabrics, paper, and other substances impervious to water. This result is usually obtained either by applying an insoluble coating upon the surface, or by causing the formation of a compound that exerts a repellent action toward water in the pores of the article, often by means of double decomposition. The application of oil to leather and cloth, and of tar to tarpaulins, are familiar examples of waterproofing. One of the most important branches of this art is the application of India-rubber in the preparation of "mackintoshes" and other waterproof wearing apparel, in the manufacture of which a thick solution is made by treating the caoutchouc with spirits of turpentine, coal-tar, benzole, bisulphide of carbon, etc., which is spread out upon the fabric, and the whole passed between rollers, the coating and pressing being repeated until a layer of proper thickness and uniformity is obtained. In double waterproof fabrics 2 pieces of the cloth that has been treated in this manner are cemented together by passing them face to face between wooden rollers. A mixture of the flock of silk, cotton, or wool with liquefied caoutchouc is also applied to cloth that had previously been saturated with an ordinary waterproofing solution.

**Water-Ram.** See HYDRAULIC RAM.

**Water-Rat, or Beaver-Rat,** the common name of the *Hydromys chrysogaster* of Tasmania, an animal resembling the muskrat in many particulars, and deriving its scientific name from the golden-yellow color of its belly, while the back is of a dark rich brown. It is an expert swimmer, frequents both salt and fresh water, is nocturnal in habit.

**Water-Rice.** See RICE, INDIAN.

**Water-Spaniel,** a name given to several breeds of the spaniel, distinguished by fondness for swimming. W.-S. have rather long, curled hair, which has an oily feel and turns water very well. They have often a peculiarly strong, unpleasant odor. They are extremely intelligent and affectionate, but are often slow and inactive, except when at work.

**Waterspout.** See STORMS, by PROF. A. GUYOT, LL.D.

**Watertown,** Dak. See APPENDIX.

**Watertown,** Middlesex co., Mass., on R. R. and Charles River, about 6 m. W. of Boston, contains a free public library, an iron-foundry, etc. Mt. Auburn Cemetery is partly located within the limits of the town, and here is also an important U. S. arsenal. Pop. tp. 1870, 4326; 1880, 5426.

**Watertown,** city and R. R. centre, cap. of Jefferson co., N. Y., on Black River, a few miles from its entrance into Black River Bay in Lake Ontario. The river has here a fall of 24 ft., with a succession of rapids below, affording immense water-power. The city has a U. S. arsenal and extensive manufactures. Pop. 1870, 9336; 1880, 10,697.

**Watertown,** city and R. R. centre, on Rock River, Jefferson co., Wis., was first settled in Dec. 1836. It has extensive water-power and manufactures, and its educational facilities are among the best and most liberal in the State. Here is located the N. W. Univ., a Lutheran inst., and the Coll. of our Lady of the Sacred Heart, a R. Cath. sem. Pop. 1870, 5364; 1880, 5791.

**Water Valley,** on R. R., Yalabusha co., Miss. Pop. 1880, 2220.

**Waterville,** city, Marshall co., Kan., on R. R. and S. bank of Blue River, 100 m. W. of Mo. River, has fine water-power. Pop. tp. 1870, 1584; 1880, 2094, including 615 in city.

**Waterville,** R. R. centre, Kennebec co., Me., on Kennebec River, 18 m. above Augusta, has a coll. and a classical inst. In 1873 part of it was annexed to W. Waterville. Pop. tp. 1870, 4852; 1880, 4672.



**Waterville**, on R. R., Oneida co., N. Y. Pop. 1870, 1182; 1880, not given in census.

**Waterworks.**—To obtain more than the minimum flow of a stream, storage reservoirs must be constructed of a capacity proportioned to the quantity desired. To ascertain the capacity of the reservoirs, it is desirable to have a record of the rainfall at the locality, embracing a long series of yrs. Then, having ascertained what portion of the rainfall may be expected to reach the streams, we can compute the total yield of the drainage-basin for each yr., and, deducting the quantity to be consumed, we find the greatest quantity that must be in store at any time in order that there may be no deficiency in the driest seasons. It is ordinarily attempted to utilize a quantity equal to the average flow of the driest yr. Experience has shown that to accomplish this the reservoirs must be capable of containing about 4 months' supply. That is, suppose we find the minimum yield for a sufficiently long series of yrs. to be 14.68 inches of water, which is equivalent to about 700,000 gals. per day per sq. m., the reservoirs should be sufficient to deliver 700,000 gals. per day for each sq. m. of drainage-ground during a period of about 5 months. This is a reservoir capacity of 85,000,000 gals. per sq. m. of drainage-ground.

**Consumption.**—The purpose to which the water-supply of towns is applied may be embraced under 3 general heads—viz. (1) Watering, including the sprinkling of streets and grounds, the extinguishing of fires, and the flushing of sewers where this is practised; (2) manufactures; (3) domestic uses. In large cities the first item rarely amounts to more than 5 per cent. of the total consumption. It is greater in suburban dists., being sometimes as high as 20 per cent. during the hot weather. The second item is from 5 to 20 per cent. of the total in commercial cities, and may be as much as 33 per cent. in towns devoted mainly to manufacturing. The third division embraces the manifold uses and waste of water in the dwellings of the people.

**Constructions.**—The multifarious applications of water in a city require considerable pressure in the distributing pipes. This is secured in 2 ways: (1) by adopting a natural source of water at a sufficient elevation; (2) by pumping. The most obvious classification of the systems of water-supply is that of gravitation systems and pumping systems. The prin. elements of a gravitation system are—(1) the drainage-grounds; (2) the storage reservoirs; (3) the conduits; (4) the distributing or service reservoirs; (5) the distributing pipes. The pumping system commonly lacks the feature of storage reservoirs, and has in addition the pumping establishment and force main, and ordinarily arrangements for filtering or otherwise purifying the water. The conduit or aqueduct conveys the water from the source to the distributing reservoir in or near the city. In extensive works it is ordinarily of masonry, not being intended to be entirely filled. It is built to a nearly level grade, having only sufficient inclination to give motion to the water. Intervening ridges are cut down or pierced by tunnels. Valleys are crossed by embankments of earth or earth and masonry combined, or by rows of arches. In crossing deep valleys or rivers the masonry of the aqueduct is sometimes interrupted, and the water flows in iron pipes, which descend into the valley and rise and re-enter the aqueduct on the opposite side.

A pumping system usually has a conduit, not essentially different in construction from that required in a gravitation supply, though it ordinarily forms a much less important feature of the system. Its purpose is to convey the water from the source to the pump-well, which can usually be located so as not to require a great length of conduit. In W. for cities located on the shores of the great lakes, and drawing their supply therefrom, the conduit forms a very important feature. The water cannot be taken from any point near the shore, as it is there liable to be contaminated by sewage and turbid from the action of waves. To procure water free from the latter source of impurity, the conduit must extend a long distance into the lake, as it is only in water of considerable depth that the waves cease to act upon the bottom. A solid structure built into the lake would require the strength and solidity of a breakwater, and even in that case would not be sufficiently permanent and free from settlement to serve as the foundation of an aqueduct. The method adopted at Chicago and other lake cities has been to extend a tunnel under the bottom of the lake to the desired point. (See TUNNEL, CHICAGO.) The tunnel for the supply of Cleveland, O., is 6660 ft. long and about 5 ft. diameter inside. It has a lining of brick about 8 inches thick. It extends from a shaft 67 ft. deep sunk at the margin of the lake to a shaft 90 ft. deep, from the surface of the water, at a point in the lake where the water is about 36 ft. deep. In order to sink the latter shaft, an enormous crib of timber was floated into the proper position, and sunk upon the bottom by loading it with stone. The crib was of pentagonal form, measuring 54 ft. on each side, and rising about 12 ft. above the surface of the water. It is surmounted by a beacon and a keeper's dwelling. Through an opening in the centre of this crib a large iron tube was let down, and its extremity forced into the bottom. The water was then pumped from the tube, and the earth excavated from the inside, the tube being sunk or extended as the work proceeded. From the bottom of this shaft the tunnel was commenced, and continued toward the shore till it met a similar tunnel excavated from the shore shaft.

**Distributing or Service Reservoirs.**—It is always considered judicious, where the topographical conformation admits of it, to provide a reservoir at an elevation corresponding to the pressure required in the distributing pipes. At this reservoir the works of supply terminate and the works of distribution commence. Its contents constitute a reserve to be drawn upon in the event of an interruption of the supply from accident or for repairs. An elevation of from 100 to 150 ft. is usually sufficient for all purposes of domestic supply; and a greater height than 150 ft. is not desirable. Where fire-engines are to be dispensed with, a greater ele-

vation is necessary. Many towns situated on undulating ground have more than one reservoir—a low one for the lower dists., and a high one for the higher. In localities where land is not too expensive, reservoirs are usually built entirely of earth. The most suitable site for the construction of a reservoir is an eminence composed of gravel containing such a proportion of clay as to admit of being consolidated by pressure. The embankments forming the sides of the reservoir are formed of this material very carefully compacted by heavy rollers and by the wheels of vehicles. Such embankments ought to have a slope of 2 base to 1 perpendicular. They are further secured from filtration by a central core or an inner lining of puddle, which is an artificially prepared mixture of clay and gravel in such proportions as to be impermeable to water without being liable to crack when dry. The rock should always be covered with a thick layer of puddle. The inner slopes of the embankments are usually paved with heavy stone resting on a layer of pebbles or broken stone. Reservoirs in thickly settled parts of towns are generally built of masonry, and are sometimes covered to prevent contamination of the water by dust and smoke. In open reservoirs the water should not be less than 20 ft. deep, when full, as vegetation is active at a depth much less than this when exposed to the sun. They should also be so arranged that the water will have a circulation through the whole extent of the reservoir, the outlet being at the opposite side from the inlet. In a pumping system the pipe leading from the pumps to the reservoir is called the force-main. It is usually made a little stronger than other pipes sustaining the same pressure, under the impression that it is liable to greater shocks from the pulsations due to the action of the pumps. Where, from lack of a suitable eminence or from economical considerations, no reservoir is constructed and the water passes from the pump directly into the distributing pipes, a stand-pipe is often employed to prevent the pulsations due to the action of the pumps from extending to all parts of the distributing system. A stand-pipe is simply a vertical pipe communicating with the force-main, and rising to a height greater than that corresponding to the pressure in the distributing pipes. To support the pipe and protect it from frost, a tower of masonry is constructed, which forms usually a very striking feature of the works. The tower sometimes serves also as the chimney of the engine-house.

**The distributing system** embraces the network of pipes through which the water is conveyed from the reservoir or other central point to all parts of the town. The pipes lying in the common streets and thoroughfares are called mains; those leading from the latter to the premises of consumers are called service-pipes. Distributing mains of wood, lead, stone, earthenware, and asphaltum have been used at various times. Wooden pipes, formed of the trunks of straight trees, bored through from end to end, are still employed for conveying water under slight pressure, as in the supply of farm-buildings. A pipe of sheet iron, coated internally and externally with hydraulic cement, has been extensively used in Amer. within the last 15 yrs. The cement, while it remains intact, preserves the iron very effectually from rusting. These pipes are joined together by means of sleeves of the same material, the void spaces being filled with cement. The cement used in these joints gives such a degree of rigidity to the line of pipes that any settlement of the ground causes cracks. The separation of the cement from the iron at any point is followed by a rapid corrosion of the pipe. This kind of pipe has, in many cases, given satisfaction, though it cannot be said to have justified the expectations once entertained of it. Cast iron, notwithstanding grave defects, is by far the most reliable and satisfactory material for distributing mains. The most serious defect of cast-iron pipe is the facility with which the metal is acted on by water. Wrought-iron is attacked more energetically than cast. The gray variety of cast iron is more readily oxidized than the white. A large proportion of carbon or graphite in the iron accelerates the action. The development of tubercles proceeds most rapidly in the softest and purest waters. No method of preventing this action has been discovered.

For conveying the water from the mains to the premises of consumers another order of pipes is required, called service-pipes. These are generally from  $\frac{1}{2}$  to  $\frac{1}{4}$  inches in diameter. They are most commonly composed of lead, or of wrought iron prepared in various ways to resist corrosion. In a mechanical point of view lead pipe has peculiar fitness for this use. It is procurable in any desired length, easily attached to mains and fittings, easily divided and bent to suit the various situations. These advantages have led to its employment for service-pipes more than any other material. The most important precaution to be observed in the introduction of service-pipes is to secure protection from frost. The pipe usually passes from the main directly into the cellar. In houses having open areas, it is hardly possible to secure sufficient depth. The pipe is usually provided with a cock just inside the cellar wall, by which the water can be shut off and discharged from the portion within the cellar, as city cellars are rarely frost-proof. Freezing usually takes place at or near the cellar wall. For this reason the pipe is often so made that it can be separated at this point and thawed out by injecting hot water through a long small pipe. A service-pipe should, by preference, enter at the sunny side of a house, as the ground freezes less deeply there. [From orig. art. in *J. S. Univ. Cyc.*, by Prof. J. P. FRIZELL.]

**Watkin** (Sir EDWARD WILLIAM), b. at Manchester, Eng., about 1815, was one of the directors of the Manchester Athenaeum 1839–40, and organized its celebrated literary soirees in Free Trade Hall; was one of the founders of the Manchester *Examiner* 1845; became director and manager of several important R. Rs., especially the Intercolonial of Canada; visited the U. S. and Canada on railway business



1851 and 1861; became pres. of the Grand Trunk Railway of Canada; was influential in securing the confederation of Brit. N. Amer., for which he was knighted 1868, and has been prominent in Parl. as a supporter of reforms in financial legislation.

**Watkins**, R. R. centre, cap. of Schuyler co., N. Y., at the head of Seneca Lake, 22 m. N. of Elmira, has an acad. and 2 public libraries. It is chiefly noted for its famous Watkins Glen. It has also fine mineral springs. Pop. 1870, 2639; 1880, 2716.

**Watkins** (TOBIAS), M. D., b. in Md. in 1780, grad. at St. John's Coll. 1798, and at the Phila. Med. Coll. 1802; commenced practice at Havre de Grace, Md.; removed to Baltimore, where he ed. the *Med. and Phys. Recorder* 1809; was surgeon in the army during the war of 1812-15; edited at Phila., with his brother-in-law, Stephen Simpson, the *Portico*; was assistant surgeon-gen. of the U. S. 1818-21, and fourth auditor of the treas. 1824-29. D. Nov. 14, 1855.

**Watkins** (WILLIAM BROWN), D. D., born May 2, 1834, in Bridgeport, Belmont co., O., began the study of law, but abandoned it in 1856 to enter the Pittsburg conference of the M. E. Ch. He has been some yrs. presiding elder of the Steubenville (O.) dist., and has been twice appointed to chs. in the city of Pittsburg; has lectured very extensively on philological and educational subjects, and prepared a *Graded Spelling-book*, a *Cyc. of Methodism*, and an *Etymological Dict. of Anc. and Modern Geographical Names*.

**Watkins Glen**, one of the most picturesque spots in Amer., is a ravine extending several m. S. W. from the head of Seneca Lake, in the tp. of Dix, Schuyler co., N. Y. It is bordered by perpendicular rocks from 200 to 300 ft. high, through which a small stream has formed its channel, falling over several lofty and wildly beautiful cascades.

**Watseka**, city and R. R. Junc., cap. of Iroquois co., Ill. 82 m. S. of Chicago. Pop. 1870, 1551; 1880, 1507.

**Watson** (ELKANAH), b. at Plymouth, Mass., Jan. 22, 1758, was apprenticed to John Brown of Providence, by whom he was sent to Cambridge in 1775 with a supply of powder for the Amer. army; was intrusted in 1777 with a considerable sum of money to be invested in the S. States in cargoes for European markets; went to Fr., Aug. 1779, as bearer of despatches to Franklin; opened a commercial house at Nantes; lost most of his property 1782; passed 4 yrs. in N. C., and settled at Albany, N. Y., in 1789; was an active promoter of education, agriculture, and the improvement of the Hudson navigation; conceived the project of the interior canals of N. Y.; resided at Pittsfield, Mass., 1807-16; founded there the Berkshire Agricultural Society; returned to Albany 1816, in which yr. he organized the first agricultural society in N. Y.; settled in 1828 at Port Kent, Essex co., where he d. Dec. 5, 1842. Wrote *A Tour in Hol.* in 1784. *Hist. of the Rise, Progress, and Existing Condition of the W. Canals in the State of N. Y.*, Sept. 1788-1819, etc.

**Watson** (HENRY COOP), b. in Lond., Eng., in 1816, displayed as a child great musical ability; made his debut at the first performance of Weber's opera *Oberon* at the Covent Garden Theatre in Nov. 1829; came to the U. S. 1840; became art-critic on the staff of the *New World*; became connected with the *Musical Chronicle* 1843; contributed to the *Ladies' Glee-Book* and the *Masonic Manual*; became art and musical critic to the *New York Albion* 1844; was associated with Charles F. Briggs and Edgar A. Poe, in founding the *Broadway Journal* 1845; was the chief founder of the New York Philharmonic Society, of the Amer. Musical Fund Association, and of the Vocal Society, afterward called the Mendelssohn Union; was associated, with William Vincent Wallace and Carlos D. Stuart, in organizing the famous Mendelssohn concert at Castle Garden; wrote the libretto for Wallace's opera *Lurline* (1854); started in 1855 *The Musical Guest*, a monthly magazine; was for several yrs. previous to 1861 ed.-in-chief of Frank Leslie's *Illustrated Newspaper* and *Ladies' Magazine*; founded in 1862 the *Art Journal*, and became in 1863 the successor of William Henry Fry as musical critic of New York *Tribune*. D. Dec. 2, 1875.

**Watson** (HEWETT COTTRELL), b. in Eng. in May 1804, ed. at the Univ. of Edinburgh; edited for several yrs. the *Phrenological Journal*, and subsequently devoted himself to Brit. bot. In an early pamphlet, *The Statistics of Phrenology*, he substantially anticipated Darwin's theory of the origin of species. Author of *Outlines of the Geographical Distribution of Brit. Plants*, *Cybele Britannica*, or *Brit. Plants and their Geographical Relations*, etc.

**Watson** (JAMES CRAIG), LL.D., b. in Elgin co., C. W. Jan. 28, 1838, of Amer. parents, who soon afterward settled in Mich.; grad. at the Univ. of Mich. 1857; became teacher of math. there, and assistant at the observatory; was appointed prof. of astron. 1859, of physics and math. 1860; director of the observatory since 1863; has discovered 18 asteroids; went to Ia. 1869, and to Sic. 1870, to observe eclipses of the sun, and in 1874 was the head of the very successful Amer. expedition which observed the transit of Venus at Peking, China. He contributed to many scientific journals, and prepared various astronomical charts, etc. D. Nov. 28, 1880.

**Watson** (RICHARD), D. D., F. R. S., b. at Heversham, near Kendal, Westmoreland, Eng., in Aug. 1737, grad. at Trinity Coll., Cambridge, 1759; obtained a fellowship there 1760; took orders in the Ch. of Eng.; became prof. of chem. 1764; one of the head-tutors of Trinity 1767; regius prof. of divinity at Cambridge, and rector of Somersham 1771; prebendary of Ely 1774; archdeacon of Ely and rector of Northwold, Norfolk, 1780; rector of Knaptoft, Leicestershire, and bp. of Llandaff 1782. Wrote *An Apology for Christianity*, *An Apology for the Bible*, *Chemical Essays*, etc. D. July 4, 1816.

**Watson** (ROBERT), LL.D., b. at St. Andrew's, Scot., about 1730, ed. at the univs. of St. Andrew's, Glasgow, and Edinburgh; became a minister of the Ch. of Scot.; prof. of logic, rhetoric, and belles-lettres in the coll. of St. Salvador at St. Andrew's, and in Nov. 1777 prin. of united coll. of St. Leonard and St. Salvador, and minister of ch. and parish

of St. Leonard's. Wrote *Hist. of the Reign of Philip II., King of Sp.*, *Hist. of the Reign of Philip III.* D. Mar. 31, 1781.

**Watson** (THOMAS), D. D., b. in Eng. about 1520, ed. at St. John's Coll., Cambridge, of which he became fellow and master 1553; took orders in the Ch. of Eng.; was appointed dean of Durham 1553, and bp. of Lincoln 1557; was preacher to Queen Mary; refused to take the oath of supremacy to Elizabeth, identifying himself therefor with the Ch. of Rome, and was imprisoned many yrs. until his death, at Wisbeach Castle Sept. 25, 1582.

**Watson** (THOMAS), b. in Lond., Eng., about 1557, ed. at Ox. Univ., where he was distinguished for his Lat. and Eng. verses; studied law in Lond.; settled there, and acquired a high reputation by his pastoral and amatory poems, and was a favorite with the aristocratic literary circles around Queen Elizabeth. Author of a translation of Sophocles' *Antigone* into Lat., *Ekatonpathia*, or *Passionate Centurie of Love*; *Melibeus*, sive *Ecloga in Obitum Domini Francisci Walsinghami*, etc. D. 1592.

**Watson** (SIR WILLIAM), M. D., F. R. S., b. in Lond., Eng., in 1715, ed. at Merchant Taylors' School; was apprenticed to an apothecary; became eminent for his attainments in bot., physics, and chem., and especially for his researches upon electricity; was chosen one of the phys. of the Foundling Hospital 1762, and was knighted 1786. He pub. *Experiments and Observations on Electricity*, *Electricity applied to Tetanus*, etc. D. May 10, 1787.

**Watsonville**, Pa. See APPENDIX.

**Watsonville**, on R. R., Santa Cruz co., Cal. Pop. 1870, 1151; 1880, 1799.

**Watt** (GREGORY), son of James, b. at Birmingham, Eng., in 1777, ed. at the Univ. of Glasgow; was engaged in scientific researches on the Continent 1801-02, and pub. an account of his remarkable experiments upon the laws of crystallization as exemplified in the cooling of 700 lbs. of melted basalt. D. Oct. 16, 1804.

**Watt** (JAMES), LL.D., F. R. S., b. at Greenock, Scot., Jan. 19, 1736, constructed an electrical machine at 14; spent some time at Glasgow 1754-55, learning to make mathematical instruments; was appointed instrument-maker to the univ.; began about 1758 a series of experiments on steam as a motive-power; constructed a model high-pressure steam-engine 1761, a second much-improved model 1765, a third 1768; took out a patent Jan. 1769; occupied himself for some yrs. with land-surveying, the engineering of the Forth and Clyde and the Caledonian canals, building bridges, improving the navigation of the Clyde and the harbors of Glasgow and Greenock; became in 1773 a partner with Matthew Boulton, founder of the famous Soho works, near Birmingham, where in 1775 they began the manufacture of steam-engines which were rapidly improved by the addition of new features; invented also a micrometer, the copying-press, and a method of warming houses by steam; purchased an estate at Heathfield 1790; retired from business 1800; invented a flexible iron pipe for carrying water across the Clyde. D. Aug. 25, 1819.

**Watt** (ROBERT), M. D., b. in Ayrshire, Scot., May 1774, was in early life a farm-laborer and cabinetmaker; studied at Glasgow Univ. 1793-97; was licensed to practise surgery and pharmacy 1799; resided as a surgeon at Paisley 1799-1810; removed to Glasgow in the latter yr., and lectured there on surgery with great success, becoming phys. to the Glasgow Infirmary and pres. of the faculty of phys. and surgeons of that city. Wrote *Bibliotheca Britannica*, or *a General Index to Brit. and Foreign Lit.* D. Mar. 12, 1819.

**Watteau**, van-ty' (ANTOINE), b. in Valenciennes in 1684, was roused to emulation by paintings by Rubens in the Luxembourg; attempted historical art, but was soon led by natural genius to the field where he made himself distinguished. He described court and popular life in the reign of Louis XIV., balls, masquerades, *fêtes champêtres*, pastoral scenes, with landscapes, gardens, groups of people and animals, with freshness, brilliancy, and point. D. 1721.

**Waterson** (HENRY), b. in Washington, D. C., Feb. 16, 1840, began his journalistic career at a very early age as a dramatic and musical critic; in 1858 became ed. of the *Democratic Review*, and at the same time contributed to the *States*, a journal of liberal opinions pub. at Washington; went in 1861 to Tenn., and drifted into the rebellion; when the war closed, edited the Nashville *Banner* until a yr. later, when he became ed. of the Louisville *Journal*; in 1868 the *Journal* was consolidated with 2 other newspapers, and became the *Courier-Journal*, of which he was ed.-in-chief. He was elected to Cong. in 1876.

**Wattle-Bird**, the *Anthochaera carunculata*, so named from the large wattles on its neck. It is a honey-eater of S. Australia, of large size and bold, active habits, living on the honey and insects it obtains from the flowers of the *Banksias*, which cover the waste lands of that region. It has a loud, disagreeable note. The yellow W.-B., *A. inauris*, is a gregarious bird of that continent, of some importance for the excellent oil which it abundantly affords.

**Wattle-Turkey**, a name sometimes applied to the brush-turkey or *Tallegalla Lathamii* of Australia.

**Watts** (FREDERICK), b. at Carlisle, Pa., May 9, 1801, grad. at Dickinson Coll. 1819; was admitted to the bar 1824; was reporter of the supreme court of Pa. 1831-45; became pres. of the Cumberland Valley R. R. 1845; was appointed pres. judge of the 9th dist. 1849; was a noted scientific farmer, one of the projectors of the Agricultural Coll. of Pa., pres. of its first board of trustees 1854, and became in 1871 com. of dept. of agriculture at Wash.

**Watts** (GEORGE FREDERICK), R. A., b. in Lond., Eng., in 1820, early achieved considerable success as a portrait and historical painter; gained at the Westminster Hall competition of 1843 one of the 3 highest prizes of £900 by his cartoon of *Caractacus*; obtained in the Westminster Hall competition of 1845 a prize of £500 for his *Echo and Alfred the Great*, which were purchased for the new Houses of Parl., in which he was subsequently commissioned to execute the



fresco *St. George overcoming the Dragon*, from Spenser; painted at the W. end of the new hall at Lincoln's Inn a large design in fresco representing the great lawgivers of anc. and modern times.

**Watts** (ISAAC), D. D., b. at Southampton, Eng., July 14, 1674, studied at the Southampton free school and at Rev. Thomas Rowe's dissenting acad. in Lond.; became a private tutor at Stoke Newington 1696; was assistant minister 1698 and pastor 1702 of the Mark Lane Independent congregation, Lond.; was forced by ill-health in 1712 to retire from the active work of the ministry. Author of *Logic*, or *The Right Use of Reason in the Inquiry after Truth*, and *The Improvement of the Mind*, etc., but is best remembered by his *Psalms and Hymns*, D. Nov. 25, 1748.

**Watts** (JOHN), b. in New York in 1749, was the last royal recorder of New York city; was 3 times speaker of the N. Y. assembly; M. C. 1793-96; judge of Westchester co. 1802-08; was the chief founder of the Leake and Watts Orphan House, New York, to which he made a munificent donation. D. Sept. 3, 1836.

**Watts** (JOHN S.), b. in Boone co., Ky., Jan. 19, 1816, grad. at Ind. Univ.; studied law, and was admitted to the bar in Ind.; was twice elected a prosecuting atty.; served in the legislature; associate justice of N. M.; elected a delegate in Cong. 1860; took an active part in raising troops for the Union armies, and was appointed in 1868 chief-justice of the supreme court of N. M.

**Watts** (ROBERT), M. D., b. at Fordham, N. Y., in 1812, grad. at Columbia Coll. 1831, and in med. at the New York Coll. of Phys. and Surgeons 1835; was appointed, while still an undergraduate, lecturer on anat. at the Vt. Med. Coll.; became in 1838 prof. of anat. there, and also in the med. coll. at Pittsfield, Mass.; occupied the chair of anat. in the New York Coll. of Phys. and Surgeons from 1839 until his death; was one of the founders of the New York Pathological Society, and for several yrs. its presiding officer, and was from 1859 an attending phys. of the Nursery and Child's Hospital. D. Sept. 8, 1867.

**Watts** (THOMAS HILL), b. in Butler co., Ala., about 1820, was member of the State legislature 1842-45, and was opposed to the policy of secession, but when Ala. passed her ordinance withdrawing from the Union, he cast his fortunes with her people; first entered the Confed. military service as col. of a regiment, but after the battle of Shiloh (Apr. 1862) resigned to take the position of atty.-gen. in Pres. Davis's cabinet. In 1863 he was elected gov. of his State, but was deposed from this office under the Reconstruction policy of the Federal gov't.

**Waukegan**, city, on R. R., cap. of Lake co., Ill., 35 m. N. of Chicago, on a bluff 80 ft. above and overlooking Lake Mich., with a wide beach separating the town from the lake. W. is the location of valuable mineral springs. The lumber, brick, tanning, flour, and fishing interests are considerable. It has a commercial coll., St. Albertus Acad., and a public park. W. was settled in 1838. Pop. 1870, 4507; 1880, 4012.

**Waukegan**, on R. R., cap. of Waukesha co., Wis., 20 m. W. of Milwaukee, is prin. watering-place in Wis., and is noted for the efficacy of its springs for kidney and liver complaints. W. contains Wis. State industrial school for boys, also Carroll Coll. Pop. 1870, 2933; 1880, 2969.

**Waukon**, on R. R., cap. of Allamakee co., Ia., 18 m. from Miss. River. Prin. business, farming and trade in agricultural machinery. Pop. 1870, 809; 1880, 1350.

**Waupaca**, city, on R. R., cap. of Waupaca co., Wis., 135 m. S. W. of Milwaukee; city chartered in 1875. Pop. up. 1870, 2042; 1880, 841, with 1392 additional in city.

**Wau-pun**, on R. R., Fond du Lac co., Wis., 68 m. N. W. of Milwaukee. It is partly in Dodge co. Pop. 1870, 1935; 1880, 2353.

**Wausau**, city and R. R. centre, cap. of Marathon co., Wis., on Wis. River. Prin. business, lumbering and farming. Pop. 1870, 1349; 1880, 4277.

**Wau-seon**, on R. R., cap. of Fulton co., O. Pop. 1870, 1474; 1880, 1905.

**Wavellite**, an interesting mineral species, a *hydric alumina phosphate*. It occurs near Bellows Falls, N. H., at the Washington Mine, Davidson co., N. C., and in York and Chester cos., Pa. It is found usually in radiated spheroidal masses; of white or light colors; translucent.

**Waverly**, Ill. See APPENDIX.

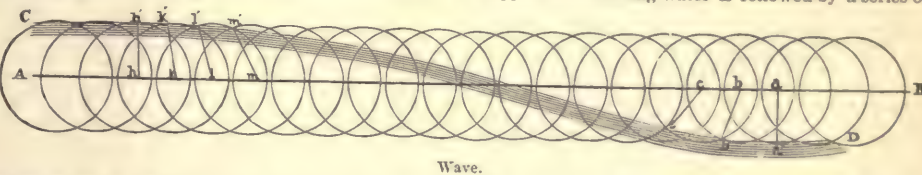
**Waverly**, city and R. R. centre, cap. of Bremer co., Ia. Pop. 1870, 2291; 1880, 2345.

**Waverly**, R. R. centre, Tloga co., N. Y., 256 m. W. of New York. Large quantities of butter and grain are marketed here. Pop. 1870, 2239; 1880, 2767.

**Waverly**, O. See APPENDIX.

**Waves**. Water is distinguished from solid bodies by its mobility—that is, by the freedom with which its elementary particles move with reference to one another. It results from this mobility that a disturbance communicated to particles of water at any point becomes the occasion of disturbance to contiguous particles, and through these to particles more remote, propagating itself in this manner to great distances in oscillatory movements called *waves*.

The physical characters of W. are familiar to all. A stone dropped into standing water is followed by a series of cir-



Wave.

cular ridges, spreading till they reach the shore or become so indistinct as to escape observation. We never remain long near any extended body of water without observing its surface ruffled by a series of ridges and furrows in rapid motion, usually toward the shore. Upon the great ocean the phenomenon presents itself on a grander scale. The crests of the W. attain at times a height of 30 ft., and thus move with the velocity of a R. R. passenger train. In a body of water the movement of any particle is controlled by the proximity of other particles. No particle can move without occasioning a movement of other particles, and it can only move in such a manner as is consistent with the movement of the entire mass. This condition determines the path in which each particle moves. It moves in a closed orbit around its position of rest, returning to the same position at regular intervals. The figure above shows how the circular movements of the different particles of water conspire to produce the undulations of the surface which we call W. A B is the surface of the water when at rest. The circles are the orbits of the particles at the surface, which are supposed to be in motion in a direction opposite that of the hands of a clock. The particle *h'*, whose position of rest is *h*, is at the highest point of its orbit; the next particle to the right, *k'*, whose position of rest is *k*, is slightly past the summit of its orbit, and farther to the right each particle is in a little more advanced position than the one preceding. The particle *a'*, whose position of rest is *a*, is at the lowest point of its orbit. The surface of the water at the instant under consideration is represented by the curved line C D, *h'* being the highest point or crest of W., *a'*, the lowest point or trough of the W. The motion continuing, the crest advances toward the left, and when the particle *h'* has reached the lowest point of its orbit, that point becomes the trough of the W., and *a'*, having then reached the highest point of its orbit, is the crest of the succeeding W. The horizontal distance between the crests of 2 consecutive W. is called the length of the W. If we consider the particles of water which, when at rest, lie all in the same vertical line, constituting a vertical filament of water, these all arrive, during wave-motion, at the summits of their orbits at the same instant. The orbits diminish in diameter downward, so that at a depth of a few hundred feet the movement practically ceases. The lower part of the filament remains immovable, and its upper part bends under the action of the wind. When the crest of the W. coincides with the filament, the latter is erect and elongated. It then bends in the direction of the W.'s motion, and returns to its erect position when the trough of the W. passes. It is then shortened and thickened. It then bends in the direction opposite to that of the W.'s motion, and so on.

The form of the W. is cycloid, but it is not the common cycloid, which is a curve traced by a point on the circumference of a circle rolling upon a straight line. There is not necessarily any definite relation between the height and length of the W. In the same system of W. we always find the same relation between the height and the length. But a slight change in the direction or intensity of the wind causes a different system in which a different relation exists.

The velocity of a W. depends upon its length. To find this velocity when the length is known, we first find the radius of a circle whose circumference is the length of the W. Designate this radius by *r*, the velocity is the same that a heavy body would acquire in falling freely through a height equal to one half *r*. To find the radius of the orbit of a particle at a given depth below the surface, divide the given depth by *r*, and find the number of which this quotient is the natural logarithm. Divide *r* by this number, and the quotient will be the radius sought. W. in deep water usually arise from the action of the wind, and their motion when unobstructed is in the same direction as the wind to which they owe their origin.

The tendency of W. is to form in long lines at right angles to the direction of the wind. This tendency is the more marked in proportion as the expanse of water is unlimited and the wind unvarying in force and direction. The movements of the elementary particles in shallow water were very attentively studied by Hayen. He used for this purpose a trough about 4 inches in width and height and 12 ft. long. He inserted glass plates in the sides to enable him to observe the movements of small visible particles suspended in the water. The W. were created by the movement of a metallic plate nearly equal in size to the cross-section of the trough, placed at one end of the latter and moved by clock-work. It was adjusted so that the movement of the top could be greater than that of the bottom in any desired proportion, from the case in which the bottom was stationary to that in which it had the same movement as the top. He found that whatever movement was communicated to the water, no difference was discernible between the horizontal movements of the particles at the top and those at the bottom at a distance of 4 ft. from the plate. The most important difference between W. in infinite depth and those in finite depth is, that in the former the velocity with which the W. travels appears to have no relation to the depth, depending solely upon the magnitude of the wave; whereas, in the latter the velocity depends upon the depth, being, by the most trustworthy observations, equal to that velocity which a heavy body acquires by falling freely to a height equal to half the depth, measured from the top of the W.

The breaking of a W. occurs when the conditions under



which it finds itself do not admit of the necessary movements of the fluid particles. When a W. originating in deep water rolls toward a shoaling beach, the water constituting the top of the W. is moving at any given instant, toward the shore—that at the bottom in the opposite direction. This results from the circular movement of the fluid particles. This movement ceases at the instant of breaking, and the upper part of the W. moves forward toward the shore, while the lower part moves backward. This movement extends nearly to the shore. W. always approach the shore in a direction nearly at right angles to the general line of the shore, whatever be the direction of the wind. This arises from the fact that if the W. approach in a direction inclined to the shore, the end nearest to the shore moving in shallow water is retarded, tending to swing the W. round into a direction at right angles to the shore. When the shore rises perpendicularly out of deep water, the W. do not break. They simply oscillate, rising a little higher at the shore than elsewhere, and are reflected, forming a new system of W. running in the opposite direction. It is said that vessels can lie off such a shore in the heaviest storms without danger. This fact is sometimes turned to account in the construction of breakwaters, which have latterly been made as perpendicular walls. Earthquakes are sometimes accompanied by W. of formidable proportions, inundating shores ordinarily high above the reach of the tide. The force of W. as they break upon a shelving beach, and the circular movement of the water is transformed into a forward movement, is terrific. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. J. P. FAIZELL.]

**Wax** (Ger. *Wachs*; Fr. *cire*; Lat. *cera*). Wax is a generic term given to several substances chemically unlike, but resembling each other in the physical properties so familiar in the wax of bees. We speak of animal wax, vegetable wax, and mineral wax. The animal kingdom furnishes (1) the typical beeswax; (2) a kind of insect wax from the Orinoco and Amazon valleys, known as Andaquies wax; (3) Chi. wax formerly supposed of vegetable origin; and (4) spermaceti.

**Beeswax.**—This is the wax of which bees form their cells. It is an animal secretion, formed by bees even when confined to a diet of pure sugar. Common beeswax is of a yellow color, has an agreeable and peculiar smell, feels a little greasy, but more sticky, and moulds readily under the warmth of the fingers. Light bleaches it if exposed in thin sheets. It then becomes white wax, and is somewhat less fusible than before. Beeswax is formed from honey and adhering impurities by melting and stirring with water, which dissolves the traces of honey; the heavy solids fall to the bottom, and the wax forms a cake on the top of the water. Bleached wax fuses at about 145° F. It is insoluble in water, but dissolves readily in oils, fats, and essences. It consists essentially of 3 substances, separable from each other by alcohol—(1) *myricine*, insoluble in boiling alcohol, and consisting chiefly of myricyl palmitate; (2) *cerotic acid*, which is dissolved by boiling alcohol, but crystallizes out again on cooling; (3) *caroline*, which remains in solution in cold alcohol. The proportions of myricine and cerotic acid differ considerably in wax from different places. The uses for wax are numerous and important. Its property of preserving tissues and preventing mould or mildew were well known to the ancients. Wax candles and tapers play an important part in the processions and ceremonies of the R. Cath. Ch. Wax is used by the manufacturers of glazed ornamental and wall papers and on paper collars and cuffs for polishing the surfaces. It is used in varnishes and paints, and for the "stuffing" of wood which is to be polished, as for pianos, coach-work, fine furniture, and parquette floors. Electrotypes and plasterers use wax in forming their moulds. Wax is an important ingredient in preparations for covering surfaces of polished iron and steel to prevent rust. Combined with tallow, it forms the coating of canvas and cordage to prevent mildew, as in sails, awnings, etc. Artificial flowers consume much wax, and, despite the introduction of paraffine, ceresine, and mineral wax, its use appears to be extending.

**Andaquies Wax** (*cera de los Andaquies*) is a peculiar wax produced by a little bee called *caceja* by the Tamas Indians, of the Rio Coquette on the plains of Oronoco, above the Magdalena River. These insects build on the same tree numerous combs, each of which yields from 100 to 250 grams of yellow wax, about 3 to 8 ounces troy, which, purified by boiling water, has a slightly yellowish color.

**Vegetable Wax.**—The most familiar body of this class is the "bayberry wax," so called, from *Myrica cerifera*, a very abundant Amer. species, the wax of which was carefully investigated by Moore. Other species of *Myrica* or *Myricetia* furnish like products—e. g. in Fr. *Guiana* the *M. cocoba*, *M. officinalis*, and *M. sebifera* furnish the *ocoba wax*, which grows on a fruit the size of a musket-ball, the nut covered with a thick crimson skin which dyes water of a fine purple. The wax is separated by boiling water, and swims on the surface. It is used for candles.

**Carmahub Wax** is the product of a palm (*Corypha cerifera*) growing in N. Brazil, and especially in the prov. of Ceara, forming a thin layer on the surface of the leaves. It scales off easily from the cut leaves when dried in the shade, and is readily fused and moulded into candles. It is soluble in boiling alcohol and in ether, and on cooling shows a crystalline structure. It melts at 185° F., and is very brittle and readily powdered.

**Fossil Wax (Ceresine).**—Under the so called "fossil wax" are several distinct mineral hydrocarbons, one especially of which (ozocerite) has lately assumed considerable economic importance as a substitute for beeswax. The fossil paraffines are—(1) *Urpethite*, from Urpeth colliery, melting at 103° F., sp. gr. 0.885, and soluble in cold ether. (2) *Hatchettite*, from Scot., a soft wax, sp. gr. 916-983, pearly, glistening, yellowish in color, greasy to the feel; melts at 115° F., dissolves very sparingly in cold ether and boiling alcohol,

crystallizing as it cools from the hot ethereal solution. (3) *Ozocerite* (ozokerite); the original mineral was from Slanik in Moldavia, and was wholly soluble in ether; that from Boryslav in Galicia is insoluble in cold ether, but largely so in hot ether. Its sp. gr. is 0.944, and melting-point 140° F. (4) *Zietrisika*, like the last named in nearly all physical characters, as hard as beeswax or harder; melts at 194° F., has a density of 0.9-0.946, and is distinctly separated from ozocerite by its almost complete insolubility in ether. It occurs at Zietrisika in Moldavia in large masses. It is asserted by some chemists that this series of fossil waxes does not afford paraffine, as found in nature, but that this body is a product of transformation of the native hydrocarbons in the process of manufacture. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. B. SILLIMAN, M. D.]

**Waxahachle**, on R. R., cap. of Ellis co., Tex. Pop. 1880, 1354.

**Wax-Myrtle.** See **BAYBERRY**.

**Wax-Palm**, a name given to various wax-producing palms, especially to *Copernicia cerifera* and *Ceroxylon andicola* of the Andes.

**Wax-Plant**, the popular name of *Hoya Carnosa*, a climbing greenhouse shrub of the Asclepiadaceæ or milk-weed family, a native of the East Indies.

**Wax-wing**, an Eng. name for the species of the genus *Ampelis*, and so applied because the wings have their tertial and secondary feathers provided with small plummet-like red appendages simulating red sealing-wax. The genus belongs to the great passerine group. Three species are known—(1) the *Ampelis garrulus* of the N. parts of both continents; (2) the *Ampelis cedrorum*, of the U. S. and N. Amer. generally; and (3) the *Ampelis phoenicepterus*, of N. E. Asia. The species appear to prefer as food berries of various kinds, but they also devour worms and insects.

**Wayland** (FRANCIS), D. D., LL.D., b. in New York Mar. 11, 1796, of Eng. parents, grad. at Union Coll. 1813; studied med. and commenced practice at Troy, but having joined the Bap. ch. 1816, devoted himself to the ministry; studied theol. 1 yr. at Andover; was tutor in Union Coll. 1817-21; pastor of the First Bap. ch. at Boston, Mass., 1821-26; became pres. of Brown Univ. Feb. 1827, having previously filled for some months the professorship of math. and nat. hist. in Union Coll.; retired from the presidency 1855, and was for 15 months (1857-58) acting pastor of the First Bap. ch. at Providence, and was highly distinguished as a pulpit orator. Wrote *Elements of Moral Science*, *Elements of Political Economy*, *Limitations of Human Reason*, *Christianity and Slavery*, etc. D. Sept. 30, 1865.

**Wayne** (ANTHONY), b. at East Town, Chester co., Pa., Jan. 1, 1745, became a surveyor; was agent of a land co. in N. S. 1765-66; settled on a farm in Chester co. 1767; was elected to various co. offices; was a member of the Pa. convention and of the legislature of 1774; served on the committee of safety 1775; raised a regiment, with which he took part in the campaign against Canada; became col. Jan. 3, 1776; was wounded at the battle of Trois Rivières; was afterward in command of the fortresses of Ticonderoga and Mount Independence until May 1777; was commissioned brig.-gen. Feb. 21, 1777; joined Washington in N. J.; commanded a division at the battle of Brandywine Sept. 11; was surprised at Paoli (close to his own homestead) by superior numbers on the night of Sept. 30, and lost 53 men; led the Amer. right wing at the battle of Germantown Oct. 4; contributed to the victory of Monmouth June 28, 1778; led the attack at the storming of Stony Point on the night of July 15-16, 1779; became the favorite popular hero; exhibited much address in suppressing a mutiny of the Pa. line at Morristown Jan. 1781; joined La Fayette in Va. Jan. 7; made with a part of a brigade a daring attack upon the whole Brit. army at Green Spring or Jamestown Ford July 6, and by a bayonet-charge disconcerted a projected manoeuvre against La Fayette; was present at the surrender of Cornwallis; defeated the Brit. and Indians in Ga. May and June 1782; took possession of Charleston, S. C., after its evacuation Dec. 14; retired to his farm in Pa. after the war; served in the Pa. assembly 1784-85, and in the convention that ratified the U. S. const.; was appointed maj.-gen. Apr. 2, 1792, and took command of an expedition against the W. Indians, whom he defeated at Fallen Timbers, or Maumee Rapids, Aug. 30, 1794; concluded with them the Treaty of Greenville 1795. D. Dec. 15, 1796.

**Wayne** (JAMES MOORE), LL.D., b. at Savannah, Ga., in 1790, grad. at Princeton 1808; became a lawyer and politician at Savannah; sat in the legislature; presided over 2 constitutional conventions; was mayor of that city 1823, judge of the superior court of Ga. 1824-29, M. C. 1829-35; was an efficient debater, an advocate of free trade, and an active supporter of the policy of Pres. Jackson, by whom he was appointed an associate justice of the supreme court of the U. S. Jan. 9, 1835. D. July 5, 1867.

**Waynesboro'**, R. R. centre, Franklin co., Pa., about 50 m. S. W. of Harrisburg. Pop. 1870, 1345; 1880, 1888.

**Waynesburg**, on R. R., cap. of Greene co., Pa., 45 m. S. of Pittsburg. The town was laid out in 1796. Pop. 1870, 1272; 1880, 1208.

**Waynflete, or Wainfleet** (WILLIAM OF), otherwise called **William Patten or Barbour**, b. at Waynflete, Lincolnshire, Eng., about 1405, ed. at Winchester and at Ox. Univ.; became head-master of Wykeham's school at Winchester 1429; was appointed by King Henry VI. first master of his newly founded coll. at Eton 1442; became provost of Eton Dec. 1443; succeeded Cardinal Beaufort in the bishopric of Winchester 1447; founded Magdalen Hall, Ox., 1448; was lord high chancellor to Henry VI. during the disastrous yrs. 1456-60. D. Aug. 11, 1466.

**Weak-Fish**, a name given to the *Cynoscion regalis*, one of the most common fishes along the eastern coast of the United States. It belongs to the family Sciaenidae. Like the other species it has elongated subfusiform shape, a prominent lower jaw, and an armature of the upper one



with canine teeth; the dorsal fin has 9 or 10 spines, and the anal fin 1 small spine. The W.-F. is distinguished by its color, which above is pale-brownish, with a decided greenish tinge, and grading below into silvery. It generally averages between 1 and 2 ft. in length. It confines its habitat to the sea, and does not ascend into the fresh waters. It is rather a voracious fish.

**Wealth** [A.-S. *weald*; Ger. *Wohl*; Dan. *vel*, supposed by some to have the same root with Lat. *valere*, to "be strong"], a collective term for riches, material possessions in all their variety. As a technical term of science, W. embraces all and only such objects as both have utility—i. e. fitness to gratify human desire—and can be appropriated in exclusive possession, and therefore exchanged; in other words, all objects of *value*. (See *VALUE*.) It was formerly a popular notion that only money is real W. Money, though it measures all values, forms but a small part of the sum of W., and is desirable not for itself, but for the W. in other forms which it can purchase. The term *wealth* does not properly include human beings, nor their capacities and qualities, such as strength, skill, genius, judgment, fidelity, etc. These are of highest consequence as means for the production and security of W., but it is only the products of their active employment which can be counted in the category of W. Nor does the term, in its generic sense, properly include evidences of debt, such as mortgages, bonds, stocks, etc. These things only indicate a title to possession and a mode in which real W. is distributed. They are always symbols, not substance.

W. is produced only through the development of the resources of nature by human labor. The prime source of all utilities is the free bounty of God in nature, and the basis of the right of possession is the labor put forth to bring out the properties of nature in form and place to meet the desires of man. *Industry and frugality* are the indispensable conditions of the production and increase of W. These are characteristics which distinguish civilized from savage men, and thus W. becomes a sign of civilization. A. L. CHAPIN.

**Weare**, wair (MESHECH), b. at Hampton, N. H., June 16, 1713, grad. at Harvard 1735; studied and practised law; sat several yrs. in the legislature; was speaker 1752; com. to the colonial cong. at Albany 1754; became a justice of the supreme court and chief-justice 1777; was councillor from Rockingham co. and chairman of the committee of safety 1775; was chosen pres. of the State 1776, and annually re-elected during the war, in which he rendered great services to the defence of the N. colonies from Burgoyne's invasion, raising and equipping the forces sent to the frontier under Gen. Stark; and was again chosen pres. under the new const. 1784. D. Jan. 14, 1786.

**Weasel**, wē'z'l [A.-S. *weole*], a name employed for representatives of the family Mustelidæ and the sub-family Mustelinæ, and more especially restricted to the species of the genus *Putorius*. These are especially distinguished by the small number of molars, there being only 34 teeth in all; the body is very slender and elongated, especially in the small species, and so much so as to have obtained the name *vermiform*; the tail is moderate; the feet are essentially digitigrade. The species are among the boldest and most bloodthirsty of carnivorous animals, and are mostly confined to cold and temperate regions, although a few extend into tropical countries.

**Weath'er** [A.-S. *weder*], the condition of the atmosphere prevailing at any moment over any region of the earth. This term is therefore to be carefully distinguished from *climate*, since the latter refers to the average condition of the W. for a considerable period. The W. is in most portions of the earth exceedingly variable, but the climate is sensibly constant. The terms applied to the different sorts of W. are also applicable to climate; thus, the combination of hot, moist air without wind forms sultry W.; cold, moist air with wind forms raw W. The terms *damp* and *dry* have somewhat different significations in various parts of the world, but usually when the relative humidity is above 90 per cent. the air is called damp, while a humidity of 60 per cent. or less is dry W.; at 30 or 40 per cent. the air becomes very dry, and at less than 20 uncomfortable except to those who are accustomed to the very dry air of the interior of the continents, where relative humidities of 10 and 20 per cent. frequently occur. The expression *dull* W. applies when the sun is obscured by cloud or fog and haze, so that a twilight darkness seems to brood over the earth.

**Weather Predictions.**—The rapid changes in the W. of the countries beyond the tropics have from time immemorial made it desirable to know the probable character of the W. a few days in advance. The predictions depend generally on local rules founded upon personal experience or tradition. Many of these are of the value of myths. Others of these rules have a foundation in a more correct philosophy: thus, the colors of the sky at sunset and sunrise depend on the moisture then present, and give a hint as to the prospect of cloudy or clear W.; thus, also, the behavior of plants and hygroscopic substances depends on the quantity of moisture, and shows whether the air is dry or nearly saturated; the aspects of the clouds, the direction of the wind, the audibility of distant sounds, etc. are all indications of the W. that is to be experienced within a few hours. Those predictions of the W. that are based upon astronomical phenomena must be looked upon as the outgrowth of anc. systems of astrology. Some meteorologists have, however, compiled for certain localities tables for W. prediction founded on the assumed natural constancy of climates, and which may be illustrated by an example. Thus, if 100 yrs. of observation at New York show that during the first 10 days of Sept. only 1 is rainy and only 3 cloudy, then the prediction "clear weather" for any one of those days would have been verified 7 times out of 10. Another interesting question is as to the chance of a change in the W. from day to day. Thus, the permanency of the W. in a portion of the U. S. is such that if we should always predict

for to-morrow the same W. that we are experiencing to-day, we should come out right in about 6 cases out of 10; on the Pacific coast we should come out right in about 9 cases out of 10. In predictions pub. by the meteorological offices of many civilized nations, among which is the U. S., certain fundamental physical laws are applied to the condition of the atmosphere at any moment as given by observations and W.-charts. It is essential to the successful application of this mode of prediction that the W.-charts should cover a large extent of terr.; and again, the region for which predictions are to be made should be centrally located with reference to the surrounding stations, since the winds, moisture, and barometric pressure, etc. are liable to advance from the N., S., or E., although most frequently coming from the W. So extensive are these changes that we must view the atmosphere as a whole; and it will readily be granted that only by the study of W.-maps of the entire globe can deductive meteorology attain the completeness toward which it must ever approach. The progress already made, however, warrants the conclusion that a few inexorable laws are at work producing their results with unerring certainty, and without any of that mysterious chance which is so often spoken of as characteristic of the W. (See *METEOROLOGY and SIGNAL SERVICE*.) [From *orig. art. in J. S. Univ. Cyc.*, by C. ABBE.]

**Weath'ersford**, city, on R. R., cap. of Parker co., Tex. Pop. 1880, 2046.

**Weather-glass.** See *BAROMETER and HYGROMETRY*.

**Weather-glass, Poor Man's.** See *PIMPERNEL*.

**Weaver-bird**, a common name for the Ploceina, a sub-family of the finches, remarkable for their curious nests, constructed so as to protect the eggs and young from snakes and monkeys.

**Weaving.** See *LOOM*.

**Webb** (ALEXANDER S.), son of James Watson, b. in New York Feb. 15, 1835, grad. at W. Pt. July 1855; served with his regiment in Fla. and on frontier duty 1855-57; as assistant prof. of math. at W. Pt. 1857-61; in the defence of Ft. Pickens Apr.-July 1861; engaged in the battle of Bull Run July 21; served in the defences of Wash. Sept. 1861 Apr. 1862, and with the Army of the Potomac in the Va. Peninsular campaign Apr.-Aug. 1862; served as assistant inspector-gen. 5th corps until June 23, when appointed a brig.-gen. of volunteers and assigned to the 2d corps. At Gettysburg his brigade met the assault of the third day, where Gen. W. was wounded. In the subsequent operations of the campaign he commanded a division (2d corps), gaining the brevet of lieutenant-col. for gallantry at Bristol Station Oct. 11, 1863. In the Richmond campaign of 1864 he led a brigade in the battles of the Wilderness and Spotsylvania; served as chief of staff to Gen. Meade, commanding the Army of the Potomac, during the remainder of the campaign resulting in the surrender of Gen. Lee. In 1871 he accepted the presidency of Coll. of City of New York.

**Webb** (GEORGE JAMES), b. in Mass. about 1805, was many yrs. prof. in the Boston Acad. of Music; prepared, with T. B. Hayward, *The Musical Cabinet* (1832), with William Mason *The Melodist*; contributed to William Russell's *Orthophony*, and wrote *The Amer. Glee-Book, The Common-School Songster, The Vocal Class-Book for Schools*, etc.

**Webb** (JAMES WATSON), son of Gen. Samuel B., b. at Claverack, N. Y., Feb. 8, 1802, entered the U. S. A. as 2d lieutenant of art. Aug. 1819; became adjutant 3d Inf. 1825; was stationed in 1820 at Chicago, 12 years before even the first house was erected where that flourishing city now exists; was promoted to a first lieutenancy in 1828; in 1827 resigned his commission and took charge of the *Morning Courier*; in 1829 purchased the *Enquirer*, and united the 2 under the name of *The Morning Courier and New York Enquirer*. In 1851 Gov. Hunt of N. Y. appointed him an engineer-in-chief of the State, with the rank of brig.-gen. In 1849 he was appointed minister to Aus., and to Constantinople in 1861. The same year he was appointed by Pres. Lincoln envoy extraordinary and minister to Brazil, where he served 2 terms of 4 yrs. each. Being in Paris in 1865, he negotiated a secret treaty with the emp. Nap. for the removal of the Fr. troops from Mex.

**Webb** (SAMUEL BLATCHLEY), b. at Wethersfield, Conn., Dec. 15, 1753, took part at an early age in the movements preliminary to Amer. independence; in the battle of Bunker Hill, where he was wounded; was soon appointed aide-de-camp to Gen. Putnam; became private sec. and aide-de-camp to Gen. Washington, with the rank of lieutenant-col. June 21, 1776; was the writer of the order for promulgating the Dec. of Ind. in New York July 9, 1776; was engaged in the battle of L. I.; was wounded at White Plains and at Trenton; was engaged at Brandywine; raised, and organized almost entirely with his own funds, the 3d Conn. regiment, of which he took command 1777; was captured with his regiment by the Brit. fleet in Gen. Parsons's unfortunate expedition to L. I., Dec. 16, 1777, and not exchanged until 1780, when he succeeded Baron Steuben in the command of the re-light inf., with the brevet rank of brig.-gen.; arranged, by request, the meeting between Washington and Count Rochambeau in the house in which he was born, at Wethersfield, Conn., May 19, 1781; was an intimate and trusted friend of Washington throughout the war, and subsequently was one of the 16 officers who founded the Society of Cincinnati at Newburg-on-the-Hudson June 19, 1783. D. Dec. 3, 1807.

**Weber**, wē'ber, von (KARL MARIA FRIEDRICH ERNST), BARON, b. at Eutin, near Lubeck, Dec. 18, 1786, showed very early great talent for art, especially for music, and wrote his first opera, *Die Macht der Liebe und des Weins*, in 1798. In 1803 he went to Vienna, where he studied under the celebrated Abbé Vogler, and by his recommendation he received in 1804 a place as director of a great opera, *Rübezahl*, which he never finished, and of which only the overture exists in a much altered form, *Zum Beherrscher der Geister*. He possessed great ability as an operatic manager.



and his music to Körner's war-songs, among which were *Lützow's wilde Jagd*, *Schwertlied*, etc., and his great cantata *Kampf und Sieg* after the battle of Waterloo, were true revelations of his genius, and spread his fame all over Ger. In 1816 he went to Dresden as director of the royal opera, and here he remained till his death. Not one of his great operas was first brought on the stage in Dresden. *Preciosa* and *Freischütz* were first performed at Berlin Mar. 15 and June 18, 1821, *Euryanthe* at Vienna Oct. 25, 1823, and *Oberon* at Lond. Apr. 12, 1826. W. conducted in person the first performance of *Oberon*, and d. shortly after, June 5, 1826.

**Webster**, R. R. junc., Worcester co., Mass., 16 m. S. of Worcester; tp. was named in honor of Daniel Webster, and incorporated in 1832. Pop. tp. 1870, 4763; 1880, 5096.

**Webster** (DANIEL), LL.D., b. at Salisbury (now Franklin), N. H., Jan. 18, 1782, the second son of Ebenezer Webster; entered Dartmouth College in 1797, grad. 1801; entered the law-office of Hon. Thomas W. Thompson at Salisbury; continued his legal studies in 1802 at Fryeburg, Me., where he was prin. of the acad.; completed his studies in the office of Christopher Gore, Boston, 1804-05; was admitted to the Suffolk bar in the spring of 1805; commenced practice at Boscaawen, N. H.; removed to Portsmouth 1807; became known as a decided Federalist, but did not at first court political honors; attracted notice by his eloquence in opposing the declaration of war against G. Brit.; was consequently nominated and elected to Cong. by the Federalists 1812; took his seat in the special session of May, 1813; was appointed to the committee on foreign affairs; effected the defeat of the proposal for a new U. S. bank by means of a speech exhibiting great mastery of economical subjects; was re-elected 1814; supported the charter of the bank of the U. S. Apr. 1816, and secured the passage of a resolution for a return to specie payments at the Federal custom-houses; was admitted to practice at the bar of the supreme court at Washington; removed to Boston, Mass., 1816; gained by his argument in the celebrated Dartmouth Coll. case a rank among the most distinguished jurists of the country (Mar. 10, 1819); was chosen in 1820 a member of the convention for revising the const. of Mass.; delivered at Plymouth, Dec. 22, 1820, his celebrated discourse on the 20th anniversary of the landing of the Pilgrims; was elected a Rep. in Cong. from Boston 1822; took his seat Dec. 1823; made early in the session (Jan. 1824) his celebrated speech on the Gr. revolution; opposed the increase of protective duties; reported and carried through a complete revision of the laws of the U. S.; was almost unanimously re-elected in the autumn of 1824, when he supported the candidacy of John Quincy Adams; added to his fame as a popular orator by his magnificent address at the laying of the corner-stone of Bunker Hill Monument June 17, 1825, and by his eulogy of Adams and Jefferson delivered at Faneuil Hall, Boston, Aug. 1826; was transferred to the Senate in 1827 to fill the unexpired term of Elijah H. Mills; retained his seat in that body by successive re-elections until 1841; made his début in the Senate by an elaborate argument in favor of moderation in the proposed augmentation of the duties on foreign woollens, but, nevertheless, gave his vote for the protective tariff of 1828; made what is generally regarded as the ablest of his parliamentary efforts in his second speech (Jan. 26-27, 1830) in reply to Robert Y. Hayne of S. C. who in the famous debate which incidentally arose upon a resolution offered by Senator Foot of Conn., in relation to a survey of the public lands, had bitterly attacked the E. States, and had affirmed for the first time the doctrine of nullification; and, though opposed to the financial policy of Gen. Jackson, gave him a cordial support in his measures for the defence of the Union against the anarchical policy proclaimed by John C. Calhoun; supported Henry Clay for the Presidency in that yr., but opposed his Compromise tariff bill, and voted for the "Force bill" of the administration in the great nullification crisis of 1833, when he victoriously measured his forces in debate with Calhoun; united with him, nevertheless, in securing the passage of the famous resolutions condemning Jackson's course on the removal of the deposits Sept. 1833; was recognized as the chief N. leader of the Whig party, organized about 1834; opposed the Sub-Treasury bill in Sept. 1837, in a speech reputed the most effective of all his arguments on the subject of finance; took an active part in the Presidential campaign of 1840 in favor of Gen. Harrison; was appointed sec. of state by Pres. Harrison Mar. 1841, and continued in office by Pres. Tyler; displayed consummate diplomatic ability in the negotiation of the "Ashburton treaty" of Aug. 9, 1842, which terminated in a favorable manner long-pending questions upon the impressment of seamen and the N. E. boundary of the U. S.; resigned his post May 1843; delivered a splendid oration on the completion of the Bunker Hill Monument 1843; resumed his seat in the Senate as the successor of Rufus Choate Dec. 1845; combated the admission of Tex. as a slave State and the prosecution of the Mex. war; contributed in an unofficial way to the solution of the Or. question with Gr. Brit. 1847; was induced to support Clay's "Compromise measures," including the Fugitive Slave law, in a famous speech of Mar. 7, 1850, which lost him the confidence and support of the majority of the Whig party, and thereby contributed to its disorganization and extinction; became sec. of state under Pres. Fillmore on the death of Gen. Taylor, July 1850; displayed all his wonted energy and ability in the famous correspondence with Chevalier Hulsemann, the Aus. minister (Dec. 1850), upon the reception accorded to Kossuth and the Hungarian exiles; in the measures taken to repress filibustering expeditions against Cuba, and afterward to obtain the pardon of the followers of Narciso Lopez, who had been deported to Sp.; in the collision with Brit. pretensions relative to Central Amer. and to the fisheries; and in negotiation of a reciprocity treaty with Canadian prov.; delivered a grand address at laying of corner-stone of Capitol extension at Wash., July 4, 1851. D. Oct. 24, 1852. [From orig. art. in *J.'s Univ. Cyc.*, by CHARLES LANMAN.]

**Webster** (EBENEZER), father of Daniel, b. at Kingston, N. H., in 1739, served under Gen. Jeffrey Amherst in the Fr. war; was one of the original settlers of Salisbury (now Franklin), N. H., 1761; kept a country inn; was capt. of the Salisbury militia at the siege of Boston 1775; served at White Plains and at Bennington; attained the rank of col. of militia; sat in both branches of the State legislature; was judge of common pleas of Hillsborough co. from 1791 until his death in 1806.

**Webster** (EZEKIEL), brother of Daniel, b. at Salisbury, N. H., Mar. 11, 1780, grad. at Dartmouth Coll. 1804; studied law; attained considerable eminence at the N. H. bar, and served in the State legislature. D. Apr. 10, 1829.

**Webster** (HORACE), b. in Hartford, Vt., Sept. 21, 1794, grad. at the U. S. Military Acad. July 1818; retained at W. Pt. as assistant prof. of math. until Oct. 1825; accepted the appointment of prof. of math. and philos. in Geneva (now Hobart) Coll. In 1848 was appointed prin. of the Free Acad. then organizing in New York. From 1852, in addition to his duties as pres., he was also prof. of moral, intellectual, and political philos. until 1869. D. July 12, 1871.

**Webster** (JOSEPH DANA), b. at Hampton, N. H., Aug. 25, 1811, grad. at Dartmouth Coll. in 1832; removed to Chicago, where he was pres. of the commission on sewerage which perfected the remarkable system of sewerage for that city; also planned and executed the raising of the grade of Chicago. In the c. war he became col. 1st Ill. Heavy Artl.; was Gen. Grant's chief of staff at the battle of Shiloh. Commissioned brig-gen. Nov. 29, 1862, and for a time military gov. of Memphis; chief of staff to Gen. Grant during the Vicksburg campaign, and to Gen. Sherman from 1864 to close of the war. Assessor of internal revenue at Chicago 1869-72; assistant U. S. treas. at Chicago until July 1872, when appointed collector U. S. revenue. D. Mar. 12, 1876.

**Webster** (NOAH), LL.D., b. at W. Hartford, Conn., Oct. 16, 1758, grad. at Yale 1778; was admitted to the bar 1781; taught a classical school at Goshen, Orange co., N. Y., 1782-83; prepared there his spelling-book, grammar, and reader, printed under the title *A Grammatical Institute of the Eng. Lang.*, etc., in Three Parts; wrote political articles for the *Hartford Courant* 1784; pub. *Sketches of Amer. Policy* (1785), advocating the formation of a Federal const.; delivered a course of lectures on the Eng. lang. in the prin. Atlantic cities 1786; taught an Epis. acad. at Phila. 1787, in which yr. he issued a pamphlet, *An Examination of the Leading Principles of the Federal Const.*; practised law at Hartford 1789-93; settled in New Haven 1798; pub. *A Brief Hist. of Epidemics, Rights of Neutral Nations in Time of War, a Compendious Dict. of the Eng. Lang.*, and a *Philosophical and Practical Gram. of the Eng. Lang.* (1807); devoted himself thenceforth to the great labor of his life, the preparation of the *Amer. Dict. of the Eng. Lang.*; resided at Amherst, Mass., 1812-22; was influential in the establishment of Amherst Coll., and was pres. of its first board of trustees. He was for several yrs. a member of the legislatures of Mass. and Conn., and judge of one of the State courts of Conn. D. May 28, 1843.

**Webster City**, R. R. junc., cap. of Hamilton co., Ia. Pop. 1870, 1339; 1880, 1848.

**Weddahs** (*Veddahs*), the name of a primitive hill-tribe in Ceylon. They are confined to Ceylon, and occupy a small terr., 90 m. long, 40 broad. Some are jungle W., and some are half civilized. The latter live in rude v. The former, living in the highlands of Uva and Medamahanu-wara, are wilder, and shift their habitations. They clear out a piece of jungle and plant such roots as tapoca upon it, feed on honey and fruits, and monkeys, etc. shot by their arrows, and after a yr.'s sojourn in small reed huts constructed by their clearings, they remove to another locality, and open out more jungle to cultivate the virgin soil. The v. W. are more settled, but the instinct of the whole tribe is nomadic. There are not more than 1000 primitive, pure-blooded W. living now. They appear to have no religion. They do not even know of the name of the being so peculiar in the worship of Ceylon—*Boddha*. Attempts have recently been made to Christianize the tribe, but this is difficult, as few of the primitive and pure W. can even count above 16. Each W. is his own doctor; his only meds. and surgical instruments are green ginger, castor-oil berries, and sharp arrow-heads of flint or of steel. When a wife is confined, the husband attends her. The dead of the W. are buried; deer-skin, if obtainable, is used as the coffin. At burials no females are present. The general belief of W. is, that departed spirits become devils and must be propitiated; so offerings are nearly always made after funerals to the ghost of the departed. The lang. of the people seems to be one of the roughest of Aryan dialects.

**Wedgwood** (JOSIAH), F. R. S., b. at Burslem, Staffordshire, Eng., July 12, 1730, worked at the potter's wheel several yrs.; was lame from his 16th yr. as the result of a severe attack of smallpox; was thus led to devote himself rather to the artistic development than to the manual operations of his profession; entered into business in 1752, manufacturing the ordinary cheap wares then in demand, to which, however, his careful superintendence gave an artistic finish previously unknown; invented a new green "tortoise-shell" earthenware, having the smoothness and brilliant appearance of glass, from which he made toilet vessels, services of dessert, knife-handles, and articles of *virtu*, which were highly appreciated by the jewellers of Lond. and Bath; perfected in 1761 a fine cream-colored ware; was the most efficient promoter of Brindley's Grand Trunk Canal, to which he subscribed £1000, and for which he cut the first sod at Burslem July 26, 1766; adapted the engine-lathe to the uses of his art; produced in 1766 his fine black "basaltes" or "Egyptian" ware, and shortly afterward his celebrated jasper-ware; began building the celebrated establishment which he named Etruria in 1767; made experiments in the qualities of many kinds of clays, importing from Ayoree in the Cherokee dist. of S. C. a fine



porcelain clay; began about this time to produce beautiful copies of classical vases and other ancient masterpieces; opened in Lond. a salesroom of his own, which became a fashionable resort of the nobility; received orders of immense amount from the Continent, especially from Queen Catharine II. of Rus.; invented the pyrometer, and was regarded as the father of his art in modern times. D. at Ettruria Jan. 3, 1795.

**Wedgwood Ware.** See POTTERY AND PORCELAIN MANUFACTURE.

**Wednesday**, wenz'dy ["Odin's day;" Ger. *Mittwoch*, "mid-week;" Fr. *Mercrèdi*; Late Lat. *dies Mercurii*, "Mercury's day"], the 4th day of the week, so named in consequence of an identification of the N. god Odin with the Rom. Mercurius.

**Weed** (THURLOW), LL.D., b. at Cairo, Greene co., N. Y., Nov. 15, 1797, was a volunteer on the N. frontier of N. Y. in the war of 1812-15; established in 1818 the *Agriculturist* newspaper at Norwich, Chenango co., N. Y.; edited several other papers during the ensuing 10 yrs.; was twice elected to the N. Y. assembly 1826-30; contributed largely to the election of De Witt Clinton as gov. 1836; settled at Albany in 1830; founded there the *Evening Journal*; was an original leader of the Whig party; contributed largely to the election of Gov. Seward in 1838 and 1840, to the nomination of Harrison in 1836 and 1840, and to his election on the latter occasion; was active in promoting the nomination of Gen. Taylor in 1848 and of Gen. Scott in 1852; exerted his influence in 1856 and 1860 in favor of the nomination of William H. Seward, but rendered cordial support to Fremont and Lincoln; was an advocate of the energetic prosecution of the war 1861-65; withdrew from the *Evening Journal* in 1862; settled in New York 1865, and was for some time ed. of the *Commercial Advertiser*; retired from active journalism in 1868, but continued to exert a powerful influence upon the counsels of his party. He pub. *Letters from Europe and the W. I.*, etc. D. Nov. 22, 1882.

**Weedsport**, R. R. June, Cayuga co., N. Y., upon Erie Canal. Pop. 1870, 1348; 1880, 1411.

**Weehawken**, on Hudson River, Hudson co., N. J., W. of New York. Pop. pt. 1870, 597; 1880, 1102.

**Week** [A.-S. *weoc*], a period of 7 days, forming a subdivision of the lunar month, corresponding to the 4 quarters of the moon, or about 7 $\frac{1}{2}$  days. It was in common use among the anc. Hebs., who in Ex. xx. 11 referred its origin to the creation of the world, and in Deut. v. 15 to the exodus from Egypt. It was not a Heb. invention, however. It was found as a civil inst. in the very earliest times among the Hindoos, Pers., Assyrians, and Egyptians. But the Jews were the only nation with which the W. had a religious significance. The Grs. divided the month into 3 periods of 10 days (*decades*), and the Roms. gathered the days into periods of 8 days (*undine*). The period of 7 days, the W. proper, was introduced to the Roms. and Grs. partly by Christianity, partly by the Egyptian astron. and astrology. It recommended itself to the practical Roms. as peculiarly convenient by its relation to the lunar month and solar yr.

**Weeks, Feast of.** See PENTECOST and EASTER.

**Weeping** [A.-S. *weþan*] is an emotional expression, usually of painful or distressing feelings, though frequently of excessive joy, characterized by a quick, full inspiration and a slow, prolonged expiration, often broken or tremulous (sobbing), or varied by vocal sounds (screaming, moaning), frequently accompanied by bowing of the head and body forward (action of the flexor muscles), and principally characterized by a flow of tears, together with facial contractions, particularly marked in children, in which the muscles that close the eyes are contracted, while the elevators and depressors of the angles of the mouth act, holding the mouth squarely and widely open. With adults, facial expression in W. is less marked than with children; being oftener the expression of mental sorrow or pleasurable emotions than of physical pain.

W. R. BIRDSALL.

**Weeping Water**, Neb. See APPENDIX.

**Weevil** [A.-S. *wēfel*], a term which, when compounded with some other word, is properly applied to many snout-beetles (Curculionidae), but more particularly to the insects belonging to the genus *Bruchus* of Linnaeus, a family (Bruchidae) which connects the snout-beetles with the leaf-beetles (Chrysomelidae), and has greatest affinities with these last. The snout-beetles are characterized by the extension of the head into a snout or proboscis, at the tip of which the jaws are placed. By means of this snout the eggs are inserted where the larva is destined to live. Their larvae are, with few exceptions, footless, clumsy grubs, with a horny head, and live within the blossoms, fruits, seeds, stems, or roots of plants. Some few even live within leaves. There are over 400 described N. Amer. species of the Curculionidae proper, distributed among nearly 100 genera. The Bruchidae, or W. proper, mostly breed in the seeds of leguminous plants; their larvae are fat, clumsy, wrinkled grubs, and in some instances are provided with short legs. Their eggs are not inserted in the pods, as has been heretofore asserted by authorities, but are invariably glued to the outside of the pod; they are elongate, generally smooth, but sometimes beautifully reticulate. The new-born larva eats directly through

the pod and into the seed, the hole of entrance effectually closing up if the pod is yet green.

Though the term "weevil," when used alone, is often very loosely and incorrectly applied by farmers to several insects that affect wheat, it strictly belongs to the grain-W. (*Sitophilus granarius*, L.), which is the greatest pest to stored grain, and frequently reduces a lot of wheat to mere husks before its presence is noticed. The beetle is about  $\frac{1}{4}$  of an inch long, of a deep chestnut-brown color, with 9 deeply punctured striae along each elytron, and without wings. The female with her snout makes an oblique puncture just under the skin of the stored grain, and lays an egg therein, from which egg there hatches a whitish grub that devours the substance of the kernel and undergoes its transformations within the hull. In from 40 to 50 days from hatching the perfect W. eats its way out. Several generations are produced each yr., and when the species is established it increases at an alarming rate, particularly in warm climates. [From orig. art. in *J. s. Univ. Cyc.*, by C. V. RILEY, M. D.]

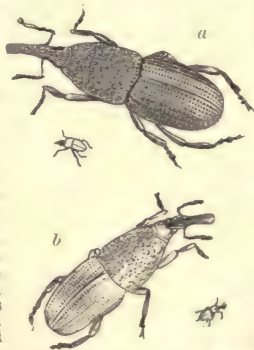
**Wel'gel** (VALENTINE), a remarkable mystic and theosophist, b. at Hayn, Saxony, in 1533. D. June 10, 1588.

**Weigela**, a shrub found in China, was introduced into Eng. and named *W. rosea*, but afterward found to be identical with *Dierilla*, a genus introduced into Europe from Canada in the 18th century. In the U. S., where there are 2 species, it is known as "bush honeysuckle."

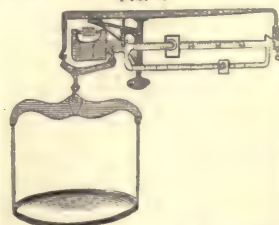
**Weighing-Machines.** Weighing is the direct and accurate comparison of a body, the potential gravity of which is known, with another body the gravity of which has been previously ascertained, and which is taken as a standard. The oldest form of W.-M., the common balance, is simply a lever having its fulcrum in the centre and its arms of equal weight and length. The standard weight being placed at one end of the lever, and the article to be weighed at the opposite end, and equidistant from the fulcrum or point of suspension, the lever will be horizontal or balanced when the article to be weighed is brought exactly to the same weight as the standard of weight. The term "balance" is therefore applied to this variety of weighing apparatus. If, instead of having the arms of the lever of equal length, we make one of the arms 2, 3, 4, or more times the length of the other, it follows that one unit of the standard weight on the long arm will balance 2, 3, 4, or more units, as the case may be, on the short arm, and the calculation as to the weight on the latter is therefore readily made. This last-indicated apparatus is the common steelyard, the standard weight being adjustable at any required point along the length of the long arm of the lever, which arm is marked with a scale or index to indicate the distance from the fulcrum at which the movable weight will counterbalance the body attached to the short arm. Although this scale in reality indicates the relative distance from the fulcrum of the standard weight and the body weighed, these distances are commonly marked in the units of weight. If we vary the construction, and instead of causing the body to be weighed to bear against the known potential gravity of another or standard weight, we substitute in place of the latter a spring, the power to compress which to any requisite degree is known, we have the same result; for the resistance of the spring to compression up to a certain point being equal, say to 1, 5, or 10 lbs., a body applied to the spring weighing 1, 5, or 10 lbs. will of course compress it; and this degree of compression in proportion to the weight being marked upon a scale, the force or potential gravity exerted upon the article weighed is ascertained in the same manner as if the scale was applied to a lever indicating the position at which the movable or standard weight would balance a body having a certain ratio to such standard weight. If in place of the spring we substitute any other means of exerting a force that is measured and known, we can in like manner ascertain the weight or potential gravity of the body placed to bear in opposition to it. The production of accurate weighing apparatus, however, is beset with many difficulties in practice. To avoid friction, to reduce the construction to the simplest form consistent with perfect utility, and to adapt the apparatus to the myriad uses to which it is applied in arts, industry, and scientific research, are problems that have only been approximately solved. The most delicate and perfectly constructed weighing apparatus are those which are employed by chemists.

One curious and very old form of balance depends for its utility upon the increasing resistance of a body swung from a vertical to a horizontal position. In this the article to be weighed is suspended from the upper short arm of a lever, while the long arm, loaded to the requisite degree, swings along an index or scale formed on an arc attached to the standard to which the lever is pivoted; only a small weight is required to move the long arm in the lower part of the arc or scale, but the resistance of the long arm increases in proportion as it is moved upward, its place in relation to the scale of course indicating the potential gravity of the article suspended from the short arm.

The Boston market scale operates on much the principle of the steelyard, but with greater accuracy; the heavier weights being indicated on a major scale, and the smaller ones on a minor scale, both forming parts of the same beam. The pan which holds the article to be weighed, instead of being attached directly to the short arm of the lever, is connected by a secondary lever, an adjust-



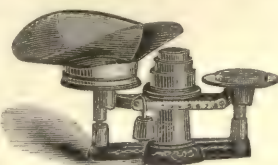
a, *Calandra granaria*; b, *C. oryzae*. (The small outlines show the natural size.)



Boston Market Scale.



ble counterpoise being arranged to balance the weight of the beam or long arm of the lever. The common balance for weighing small quantities is provided at one end with a pan for holding the article, and the other with a plate for holding the various weights. These are technically termed "even balances," and sometimes have, beside the weight, a scale or side beam attached to the lever or beam, and are sometimes constructed to be used either with weights on one end of the beam, or with a supplemental beam having an adjustable poise.

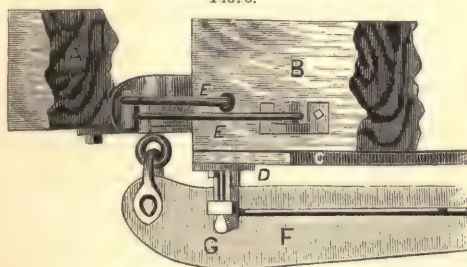


Even Balance, with side scale or beam.

If, instead of suspending the body to be weighed directly to one arm of the lever, we extend a rod from the one arm downward to a frame capable of a downward movement by weight or pressure applied thereto, we have the same relation of the article weighed to the beam carrying the standard weight. By this means the apparatus is rendered capable of use under many circumstances where the simpler balances or steelyards could not be employed. This arrangement is in fact that of a common platform scale. Sometimes these platform scales are made so small as to be used on counters in retail grocery stores and markets; sometimes of a size sufficient to weigh a loaded R. R. car.

There is of course a vast difference between this initial machine of 100 years ago and the apparatus of the present day. The most approved mechanism for weighing heavy bodies is of Amer. invention and manufacture. The pioneer in this movement was Thaddeus Fairbanks, who 50 yrs. ago (June 13, 1831), in conjunction with E. Fairbanks, secured a patent on apparatus for weighing heavy bodies; the next year the same parties obtained another patent in the same class, and 3 yrs. later 2 more; and afterward (Feb. 10, 1837) 5 others. Fairbanks's scales were a great advance upon others previously in use, although since excelled by more recent inventions and improvements. The arrangement of the levers underneath the platform, and the manner in which they are suspended and arranged in the old-fashioned type of large scales—for example, the 4-ton scale—is illustrated in the figure of Fairbanks's platform bearings. Each lever *F* is provided at its extremity with knife-edged bearings placed in a stirrup depending from the fixed frame timber *A* surrounding the pit in which the platform and its adjuncts are arranged. At a suitable distance from the just-mentioned extremity of the lever are knife-edged bearings *G*; an iron casting *D* extends downward from the platform *B*, and, passing astride of the lever *F*, rests on the knife-edges *G* at each side of said lever. If, now, the load to be weighed could be dropped vertically upon the platform *B*, this arrangement would be sufficient; but in practice the load is drawn in wagons or cars, as the case may be, upon the platform, and on striking the edge of the latter gives it a positive lateral movement, which tends to make the casting *D* scrape upon the knife-edges *G*; and this dulls the knife-

Fig. 3.



Fairbanks Platform Bearing.

edges and impairs the accuracy of the apparatus. In order to prevent this lateral movement of the platform *B*, check-rods *E* are extended from the fixed frame timber *A* to the platform, and are designed to resist the lateral strain exerted thereon by the passage of the load thereto. If these check-rods by the swelling of the timber or the rusting of the rods themselves should be deranged in any way, they are liable to bind and impair the reliability of the scale. In the Howe scale the check-rods are dispensed with, and perfect freedom secured to the platform without involving the frictional movement or scraping of the casting *D* upon the knife-edge. The modifications of weighing apparatus are very many. Among them is the weighmaster's frame, in which an ordinary scale or steelyard is suspended on a portable frame from the short arm of a lever, by which the scale can be lowered bodily for adjustment to a cask or other article to be weighed, and then lifted clear of the floor to permit the weighing operation. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. JAMES A. WHITNEY, LL.B.]

**Weights and Measures.** Instrumental means employed for the exact determination of quantities. Such instrumentalities are indispensable in science, in mechanical and ornamental art, and in all the variety of exchanges which constitute commerce. And as the usefulness of a system of *W.* and *M.* to those who employ it depends on the unvarying identity of its determinations, it has been a part of the public policy of every organized community, from the earliest period of civilization, to regulate such systems by law. The misfortune has been that, in past centuries, this kind of legislation has been left almost wholly in the

hands of local magistracies, who have proceeded without any attempt at concert; so that in Europe, previously to 1800, scarcely a town of any commercial importance could be found which had not its independent system of *W.* and *M.* It is a rather curious fact that, while the mediæval systems of European *W.* and *M.* are so almost endlessly various, the similarity of their nomenclature throughout would seem to indicate a common origin. All the way from Nor. to the Mediterranean islands, we find the unit of length called everywhere the foot, and the unit of weight the pound; and these terms we find to have been in use for more than 2000 yrs. The word "pound" is simply the Rom. *pondus*, a "weight;" the word "foot" points at once to an original prototype in nature.

The foot, as a measure of length, made its first appearance in Gr. Tradition asserts that the Olympic foot was derived from the foot of Hercules—this is to say that, at some time, a unit of length of determinate value was adopted for general use, in order to remove the uncertainties which existed when the human foot was the measure, and every man was at liberty to use his own. After the adoption of this determinate standard it became practically arbitrary, and the unit of length could no longer have been a dimension of the human person, but must have had for its representative an invariable bar of wood or metal. In this example of the Gr. foot we have an illustration of the manner in which all units of measure originated. They were not the creation of legislation. Legislative authorities have only interposed to secure uniformity in systems already in existence. These systems have grown up in the rudest stages of society by a sort of social necessity. Without some standard of measurement, however imperfect, there can be no exchange of commodities founded on the idea of equivalence of value. And even in isolation, the uncultivated savage will have need of measures in providing for his immediate personal wants—in the construction of his rude dwelling, his garments, his implements of labor, etc. These must, of course, bear some convenient proportion to the dimensions of the person whose use they are designed to subserve; and nothing is more natural than that the person itself, or some of its members, should be directly employed as instruments of measurement in their construction. The probability that units of length originated in the manner here suggested is strengthened by the consideration that the idea of a scale for the measurement of dimensions involves processes of reflection and abstraction which men in a state of nature have not learned to employ; while the person, with its several members, is always present, so that the same standards of measurement which are employed in satisfying its exigencies are naturally applied to other objects between which similar comparisons become necessary.

In regard to measurements of distance, another idea suggests itself. Before man had learned to subjugate animals to his service, his only means of locomotion were such as he possessed in common with these; and in estimating the moderate distances from his dwelling to which his daily walks might extend, no expedient would be more likely to suggest itself than to count his steps. Thus arose the fundamental unit of itinerary measure, which is still more or less employed for rude determinations—*i. e.* the pace. The Romans employed this measure, and when the distances to be measured were such as to require a larger unit, they used its third decimal multiple, *mille passuum*, 1000 paces, from which has been derived the "mile" of the present day. The foot is a unit of comparatively modern origin. Long before Gr. made any figure in hist., the Egyptians, the Assyrians, the Babylonians and the Israelites monopolized whatever of science and cultivation the world then possessed; and among these the cubit, derived from the length of the forearm, of which it is the name, was the unit of linear measure. The cubit, the unit of the O. T. was that of Cheops when he built the first pyramid and of Ninus when he laid the foundation of the Assyrian capital. With the Israelites all the subdivisions of this unit purported to be dimensions of the person. The cubit contained 2 spans; the span, 3 palms; the palm, 4 digits.

Other measures derived from the person, of which the origin or date is unknown, are the *ell* (*ulna*), derived, like the cubit, from the forearm; the It. *braccio*, the Port. *braça*, the Swiss *brache*, and the S. Amer. *brazo*, all signifying the length of the arm; the Eng. yard, from the Sax. *gyrdan*, to "gird," as signifying the girdle or measure of the body's circumference; the Eng. fathom, also from the Sax. *fadhm*, "embrace," the length of 2 arms; to which may be added the hand, and perhaps the nail, in Eng., the *pouce*, or thumb's breadth, in Fr., and the *pulgada* in Sp., and *pollegada* in Port., meaning the same thing. For standards larger than the person affords, the names of measures early introduced indicate an equal indefiniteness. The Israelites had the reed—probably the average length of a reed of the Nile; the Romans, the *pertica*, a "pole;" the modern Its., the *canna*, which may mean either "cane" or "reed;" the Gers., the *stab*, a "staff;" the Aus., the *ruthe*; the Dutch, the *roede*, and the Eng., the *rod*, all being different forms of the same word; and finally, the Fr. have the *toise*, from the Lat. *tens* (*tendere, tensus*), signifying "stretching," which indicates that the earliest toise was a flexible measure.

It is only for measures of length that the dimensions of the human person can furnish prototypes. Measures of capacity may have been derived from the content of some natural vessel, as, for instance, a gourd or the shell of a coconut. The smallest measure of capacity among the Hebs.—*viz.* the *log*—was estimated by the rabbins to be equal in volume to 6 hen's eggs, a quantity ascertained by measuring the water they displaced. The *homer* or *chomer*, a measure of dry capacity among the same people, signified a "heap," and the *omer*, a diminutive of this, and the hundredth part of a *chomer*, signified a heap also. These names indicate that the estimate of quantity must have been made by the eye alone, and must have been vague in the extreme.



Some of the capacity-measures in use among the Grs. and Roms. bear names no less significant. The *cyathus* of the Roms. or *κύαθος* of the Grs. is derived from *κύα*, a "hollow," and one of its meanings is "the hollow of the hand." It was equal as a measure to 2 *κόρυθα*, "mussel-shells," among the Grs., or 2 *cochlearia*, "spoonfuls," (from *cochlea*, a "snail-shell"), among the Roms. The *cyathus* of the Roms. was also defined to be as much as one could swallow at a gulp.

The use of weights implies some acquaintance with the balance, and therefore some degree of advancement in the arts of industry. Weights were therefore not introduced till some time after measures of length, capacity, and probably surface, had become familiar. Measures of surface were naturally derived from those of length. These 4 classes—viz. measures of length, of surface, of volume, and of weight—are all that are commonly understood in speaking of W. and M. But more or less intimately connected with these is the measure of value (treated under MONEY and COINAGE); TIME (treated under that title and under CALENDAR); TEMPERATURE (treated under HEAT, THERMOMETRY, and PYROMETER), and angular quantity (treated under TRIGONOMETRY). Though the descriptions of quantity to be measured requiring consideration here are only the 4 first above enumerated, yet the numbers of systems of measurement which have been simultaneously in use in the same country and among the same peoples have been usually much greater, and in our own country are even so still. Thus, of measures of length there are at present among us one unit for carpentry and mechanics, the foot; another for textile fabrics, the yard; another for field-surveying, the chain; and another for road-measure, the mile. The foot is subdivided into inches and lines, or inches and binary sub-multiples; the yard, to quarters and nails; the chain, to links and decimals; and the mile, to furlongs and rods. The superficial measures, which are the squares of these units, are equally diverse, with the addition of the agrarian dimension of the acre. Of capacity-measures, there are, for liquids, the gallon, quart, pint, and gill; for cereals and other dry substances, the bushel and peck; for firewood, the cord; for coal, the chaldron; and for engineering, the cubic perch. Of weights, there are, for ordinary commerce, the avoirdupois pound, with its sexdecimal subdivisions, and for large masses its irregular multiples of the quarter, hundred, and ton; for bullion, plate, and coin, the pound troy, irregularly subdivided; for drugs and medicines, the apothecaries' pound, equal to the troy pound, but differently subdivided; and for gems, the carat. When the necessities of organized society demanded that W. and M. should be regulated by law, the rude natural standards previously in use were of course abandoned. Attempts were also made to connect the measures of capacity with those of length, by prescribing their linear dimensions: and weights were connected with measures of capacity, by taking as a unit the quantity by weight of water, wine, or some cereal grains which would fill a given measure. Or this latter process was reversed, and weights were employed to determine measures of capacity—a method which in modern times is of universal acceptance.

The W. and M. in use in the U. S. have been derived from G. Brit. The earliest legislation of G. Brit., however, relating to this subject, which is contained in the 25th chapter of the reaffirmation of the Great Charter under Henry III., throws no light upon the origin of the Brit. W. and M., but only declares that they shall be uniform throughout the realm. A later statute of 1266 founded measures of weight upon determinate numbers of wheat-corns. Moreover, in this early period, as among the ancients, the units of commercial weight were also units of coin-weight. Thus, the statute referred to provided that "an English penny, called a *sterling*, round and without any clipping, shall weigh 32 wheat-corns in the midst of the ear, and 20 pence do make an ounce, and 12 ounces 1 pound, and 8 pounds do make a gallon of wine, and 8 gallons of wine do make a London bushel, which is the eighth part of a quarter." The lb. thus determined, known as the tower lb., or the sterling or east-ling lb., continued to regulate the metrological system of England down to 1496, when it was superseded for this purpose by the troy lb. It was a lb. of 15 ounces, each ounce being equal to 360 troy grains, or to  $\frac{3}{4}$  of a troy ounce; whence the weight of the penny sterling was only 224 grains troy. The east-ling lb. was the lb. of the E. nations of Europe, and was introduced into Eng. in the time of Richard Cœur de Lion. It is matter of controversy at what period the troy and avoirdupois lbs. were introduced into England. The earliest statute in which the troy lb. is mentioned is one of 1414, intended to regulate the charges of goldsmiths for gilding silver plate. In 1496, however, it was by statute substituted for the sterling lb. for the regulation of measures of capacity, the sterling lb. continuing to be used at the mint; but by a subsequent statute of 1527, this last was definitely abolished. As to the name of the lb. troy, the parliamentary cons. were of opinion that it refers to the monkish name of *Troy Novant* given to Lond., and therefore means simply Lond. weight. The same cons. suppose the name avoirdupois, which is that of the weight by which heavy or bulky goods have been weighed in Eng. time out of mind, to have been derived from *avoir* (averion, "havings") the anc. name for portable property or chattels, and *poids*, "weight."

The earliest legislation in regard to measures of length found in the Brit. statute-book is of date 1324, and provides that the inch shall have the length of 3 barley-corns, round and dry, laid end to end; that 12 inches shall make a foot, and 3 feet a yard. This form of words, "round and dry," was intended to indicate that the seeds should be fully developed, perfect, and well-seasoned.

During the eighteenth century legislation was proposed aiming at an exactness before unattained. Careful comparisons of the Brit., Fr., and Rom. standards appear in the *Transactions of the Royal Society* for 1736, 1742, and 1743,

Graham, the eminent horologist, prepared for the society a standard yard in 1742. In 1818 a royal commission was appointed which recommended the adoption of certain specific provisions of law for the construction, verification, and preservation of the public standards of W. and M.; and, in regard to measures of capacity, the abolition of the existing system and the adoption of an entirely new one. The recommendations of the commission were embodied in a bill introduced into the House of Commons in 1822, and finally passed June 17, 1824, to go into operation Jan. 1, 1826. This bill enacted that "the straight line or distance between the centres of the two points in the gold studs in the straight brass rod now in the custody of the clerk of the House of Commons, whereon the words and figures 'Standard Yard, 1760,' are engraved, shall be, and the same is hereby declared to be, the original and genuine standard of that measure of length or linear extension called a yard;" and that the same distance, "the brass being at the temperature of 62 degrees by Fahrenheit's thermometer, shall be, and is hereby denominated, the 'Imperial Standard Yard,' and shall be, and is hereby declared to be, the unit, or only measure of extension wherefrom or whereby all other measures of extension whatsoever, whether the same be linear, superficial, or solid, shall be derived, computed, and ascertained." The bill then proceeded to provide that, in case such standard should be "lost, destroyed, defaced or otherwise injured," it should be restored by reference to the length of "the pendulum vibrating seconds of mean time in the lat. of Lond. in a vacuum at the level of the sea;" which length was declared to be 39.1393 inches. In regard to weights, it declared a brass one-pound weight made in the year 1758, then in the custody of the clerk of the House of Commons, to be authentic, and to be "the original and genuine standard measure of weight;" and proceeded to say that "such brass weight shall be, and is hereby denominated the 'Imperial Standard Troy Pound,' and shall be, and is hereby declared to be, the unit, or only standard measure of weight from which all other measures of weight shall be derived, computed, and ascertained." It further declared that the said standard pound shall contain 12 ounces of 20 pennyweights, each pennyweight containing 24 grains, "so that 5760 such grains shall be a troy pound; and that 7000 such grains shall be, and are hereby declared to be, a pound avoirdupois." For the case in which such pound should be "lost, destroyed, defaced or otherwise injured," provision was made for its restoration by reference to the weight of a cubic inch of water, which, as weighed in a vacuum, "by brass weights also in a vacuum, at the temperature of 62° of Fahrenheit's thermometer," was declared to be "equal to 252.724 grains, of which, as aforesaid, the imperial standard troy pound contains 5760. As to measures of capacity, it was enacted that the standard measure, whether for liquids or for dry goods, should be the gallon, containing, at the temperature of 62° F., with the barometer at 30 inches, 10 pounds avoirdupois weight of distilled water weighed in the air; and the construction of such a measure of brass was ordered, which was to be called the "Imperial Standard Gallon." It is further declared that the standard gallon ascertained by this act is equal in bulk to 277.274 cubic inches at the temperature of 62° F. Before the final passage of this bill, in 1824, the weight of the cubic inch of water weighed by brass weights in air (declared to be 252.458 grs. at 62° F. and 30 inches barometric pressure) was substituted for the weight *in vacuo* above given.

Early in the colonial history of the U. S. the British exchequer standards of W. and M. had been legalized by many of the colonial legislatures. Thus, in Va., by an act of Feb. 23, 1681-82, it was ordained "that a barrel of corn should be accounted 5 bushels of Winchester measure," which was then the Brit. bushel; and another act, of Oct. 5, 1646, provided that "no merchant or trader, whether Eng. or Dutch, shall trade with other weights and measures than according to the statute of Parl. in such cases provided." In Mass. also, in 1730, a set of brass and copper avoirdupois W. and M. was imported from the Brit. exchequer, and in 1765 the treas. was required to procure a balance and a nest of troy weights. After the Revolution, by act of Feb. 26, 1800, the prin. provisions of the colonial statutes in regard to W. and M. were confirmed. In Conn., after the Revolution, it was enacted (Oct. 1800) "that the brass measures, the property of this State, kept at the treasury—that is to say, a half-bushel measure, containing 1099 cubic inches, very near, a peck measure, and a half-peck measure, when reduced to a just proportion—be the standard of the corn-measures of this State which are called by those names respectively; that the brass measures ordered to be provided by this assembly—one of the capacity of 224 cubic inches, and the other of the capacity of 282 cubic inches—shall be, when procured, the first of them the standard of a wine-gallon, and the other the standard of the ale or beer gallon in this State; that the iron or brass rod or plate ordered by this assembly to be provided—of one yard in length, to be divided into 3 equal parts for feet, in length, and one of those parts to be subdivided into 12 equal parts for inches—shall be the standard of those measures respectively; and that the brass weights, the property of the State, kept at the treasury—of 1, 2, 4, 7, 14, 28, and 56 pounds—shall be the standard of avoirdupois weight in this State." By the colonial laws of the same State, it appears that there were public standards provided as early as 1670, and in 1732 the gal. of 231 cubic inches had been established. The earliest legislation sanctioned the Lond. assize of casks. N. Y., which was early occupied by the Dutch, fell into the hands of the Brit. near the close of the 17th century, and on June 19, 1708, an act of the provincial legislature established all the Brit. W. and M. for the prov., "according to the standards in the exchequer." In 1829, however, in a revision of the statutes, a provision was embodied adopting the then recently introduced Brit. imperial bushel, and a gallon measure capable of containing 8



lbs. of distilled water at maximum density. In the same code it was also provided that the standard yard should bear to the pendulum beating seconds at Columbia Coll., New York, *in vacuo*, at the level of the sea, the proportion of 1,000,000 to 1,086,141. In the revised statutes of 1851, however, these provisions were abolished, and the standards furnished by the bureau of W. and M. of the treas. dept. at Wash. were made the standards for the State. N. J., in Aug. 1725, adopted the exchequer standards of Eng. The same was done in Pa. in 1700, in Del. in 1705, and in Md. in 1671. N. C. prohibited, between 1734 and 1753, the use of any W. and M. but such as should be constructed "according to the standard in the Eng. exchequer." S. C., in 1768, passed an act requiring the public treas. to procure avoirdupois W. of brass or other metal, and also a bushel and other M. of capacity, "according to the standard of London." The case of La. was peculiar. Before the acquisition of that terr. by the U. S. the W. and M. used in the prov. were those of the old standard of Paris. An act of the legislature of Dec. 21, 1814, required the gov. to procure, at the expense of the State, W. and M. corresponding with those used by the revenue officers of the U. S., to be deposited with the sec. of state, and to serve as the general standard for the State.

The origin of the standards now in actual use in the U. S. has been sufficiently explained in the article GALLON, to which the reader is referred. There is no act of Cong. on the statute-book directly establishing any standard, whether of length or weight or capacity (except for coinage purposes the troy pound). But Cong. has provided by law that copies of the standards constructed by executive authority in the treas. dept., which are identical with the Brit. as to length and weight, and which represent as to capacity the wine-gal. of Queen Anne (of 231 cubic inches) and the Winchester bushel (of 2150.42 cubic inches), shall be presented to the govts. of all the States. A similar distribution has also been ordered of metric standards.

If we are to suppose that our present system of W. and M. will be permanently maintained, and that Eng. will maintain hers also, it must be always a subject of regret that the capacity measures of the U. S. were regulated upon patterns which G. Brit. had, only a few yrs. previously, definitely discarded. Early after the adoption of the Federal const., the desirability of a uniform system of W., M., and moneys for all the States seems to have presented itself to the minds of many leading Amer. statesmen. So far as money is concerned, the object was very early accomplished, by the adoption, in 1792, of the dollar for a monetary unit, with decimal multiples and subdivisions. Nevertheless, the spectacle of a great metrological reform then going on in Fr., and promising to become continental, could not fail to attract attention on this side of the Atlantic; and there were not a few who believed that it would be an act of the highest political wisdom to introduce here the simple and beautiful decimal system founded on the metre. This feeling found expression in a resolution of the House of Reps. adopted Dec. 14, 1819, calling on the sec. of state—at that time Mr. John Quincy Adams—to report to the House "a statement relative to the regulations and standards for W. and M. in the several States, and relative to proceedings in foreign countries for establishing uniformity of W. and M., together with such a plan for fixing the standard of W. and M. for the U. S. as he might deem most proper for their adoption." An opportunity was here presented, such as rarely occurs to a statesman, of rendering his country a service destined to be memorable for all time; and Mr. Adams missed the opportunity. His report, made in 1821, was altogether discouraging to the friends of metrological reform. It was, moreover, so far from being a model of logical method as utterly to bewilder the most attentive reader, and to make it difficult clearly to state its points so that they might be met with argument. But no further argument was attempted. The fog of the report enveloped the whole subject, and it was lost to sight for nearly half a century. Five yrs. after this report was rendered, Eng. abolished her whole system of measures of capacity, from which ours were derived, and replaced it by the imperial measures, which she still maintains. Yet only 6 yrs. later, these same measures, discredited and abandoned in the land of their birth, by the action of one of the executive depts. at Wash., and without any legislation by Cong., were fastened upon us; and the uniformity between ourselves and the mother-country, was, in this part of our system, lost forever.

Nothing has been said, except incidentally, in this article in regard to the hist. of the metric system of W. and M., now so widely prevalent throughout the world. The use of this system has been made legal, though not compulsory, in the U. S. One remark may be added, before concluding, as to the mode of adjusting or verifying standard W. and M. The adjustment of W. requires no explanation, except to remark that neither the W. under trial nor the prototype standards must be touched by the hand, as any moisture or oxidation would vitiate the result. They must be moved by instruments constructed for the purpose, which, to prevent abrasion, are armed with buckskin. The verification of measures of length is made by means of what is called a comparator, a piece of mechanism upon which the bar to be verified may be placed and determined in length by closely divided scales and verniers with microscopic observation, or by micrometers with finely divided screws, and large screw-heads, divided on their circumferences to one or more hundred parts. If the bar is an end-measure, or one in which the distance between the terminal surfaces gives the dimension required, the comparator is furnished with levers called *palpi*, touching the extremities of the bar by one end, while the other and longer arm traverses a divided arc. If it is a line measure, or one in which the required dimension is the distance between 2 lines delicately traced on one side, micrometer-microscopes are used to observe these lines, and the bar is not touched. Measurements may thus be made to fractions almost incredibly

minute—less than a quarter of a *mikron* (the  $\frac{1}{1000}$  part of a millimetre), say the  $\frac{1}{1000000}$  of an inch. To secure uniformity of temperature, the whole apparatus is immersed in a bath of pulverized ice.

Measures of capacity are verified by ascertaining the weight of pure water they will contain at the temperature of maximum density (3.945° C. or 39.101° F.). During the process of weighing, the measure is closed by means of a plate of glass ground truly plane, the upper edge or rim of the measure being similarly ground. It would not, of course, be possible, by any exercise of dexterity, to fill an open vessel exactly full of liquid, and no more; nor, supposing that condition reached, could it be verified by simple observation. Should any air-bubbles be inclosed within the covering, they are brought by management to the centre of the plate, where there is a small perforation through which the deficiency of fluid may be supplied. The filling having been perfectly accomplished, the exterior of the vessel and the cover are then carefully dried before weighing. Though the requisition is that the standard shall contain a certain amount of water at maximum density, and under a barometric pressure of 30 inches, yet the actual weighings are made at the ordinary temperature and in any state of the barometer; the test-weight which the vessel is to contain being that which the expansion of the material from the standard temperature to the temperature of observation would adapt it to hold, of the liquid which also expands simultaneously.

The standards now used as prototypes in the bureau of W. and M. of the U. S. are, for length, a copy of the Brit. imperial yard, obtained in 1856; and for weight, a copy of the Brit. imperial troy lb., obtained in 1827, and made by act of Cong. of the following yr. the standard for the coinage. It is deposited at the prin. mint in Phila. (For information in regard to particular W. and M., see their several titles.)

F. A. P. BARNARD.

**Weights, Measures, and Moneys, Metric System of.** See METRIC SYSTEM, by PRES. F. A. P. BARNARD.

**Welmar**, wî'mar, town of Ger., cap. of the grand duchy of Saxe-Welmar, on the Ilm, is a quiet, neat, and friendly place, though rather indifferently built. The whole atmosphere is impregnated with the remembrance of Goethe, Schiller, Herder, and Wieland, and the life the town witnessed when these men resided here. Pop. 19,944.

**Welmar**, DUKE OF. See BERNHARD.

**Welr**, weîr (ROBERT WALTER), b. at New Rochelle, N. Y., June 18, 1803, became a successful painter at 19; studied 3 yrs. in It., returning 1827; was prof. of perspective in the National Acad. of Design 1830-34; succeeded Charles R. Leslie as instructor in drawing at W. Pt. 1834, and became full prof. there in 1846. Among his best-known works are the *Embarkation of the Pilgrims*, in the rotunda of the Capitol at Wash.; *Indian Captives*, in Boston Athenæum, and *The Landing of Hendrick Hudson*.

**Weiss**, wîss (JOHN), b. in Boston, Mass., June 28, 1818, grad. from Harvard in 1837; entered the Cambridge Divinity School in 1840; grad. from the Divinity School, and settled in Watertown in 1843; withdrew on account of strong anti-slavery opinions, and went in 1847 to New Bedford; left soon by reason of ill-health; spent some yrs. in repose, quiet study, and travel; was minister again in Watertown 1859-70; retired in order to devote himself to lit.; pub. *Life and Correspondence of Theodore Parker, Amer. Religion*, etc. Mr. W. was a leading disciple of the Transcendental philos., an ardent abolitionist in the days of slavery, a zealous champion in the cause of woman's political emancipation, and an apostle of rationalism in religion. D. Mar. 9, 1879.

**Weltzel**, wî'tsel (GODFREY), b. at Cin., O., Nov. 1, 1835, grad. at the U. S. Military Acad., July 1855; employed in construction of fortifications about New Orleans until 1859, when transferred to W. Pt. as assistant prof. of engineering; in Jan. 1861 was ordered to duty with Co. A, Engineers; served in the defence of Ft. Pickens Apr.-Sept. 1861; was chief engineer dept. of the O. Oct.-Dec. 1861. In the organization of Gen. Butler's expedition to New Orleans, W. was selected as chief engineer. Commissioned brig.-gen. of volunteers Sept. 16, 1862, he cleared the enemy from the La Fourche dist., the battle of Labadieville occurring Oct. 27. Remained in possession of the dist. until Apr. 1863, when, dispersing the enemy, he joined his force to that besieging Port Hudson, and during the siege was in command of a division, and upon its surrender was placed in command of the 1st division of the 19th corps and ordered to Donaldsonville; engaged in the expedition to Sabine Pass. In Apr. 1864 he was ordered to Va., and made chief engineer of the Army of the James, and in command of 2d division of 18th corps was engaged in the various operations of that army, including the actions near Drury's Bluff; in command of 18th corps in the repulse of the enemy at Ft. Harrison. In Nov. 1864 was promoted to maj.-gen., and in Dec. placed in command of 25th corps. The troops N. of the Appomattox were assigned to his command in Mar. 1865, and on the morning of Apr. 3 he took possession of the city of Richmond. Commanded a military dist. in Tex. Apr. 1865 to Mar. 1866, when mustered out of the volunteer service. He became lieut.-col. of engineers, 1882. D. Mar. 19, 1884.

**Welck**, wêl'k (FRIEDRICH GOTTLIEB), b. at Grünberg, Hesse, Nov. 4, 1784, was appointed prof. of archaeology at Glessen in 1809; volunteered in the Fr. campaigns 1814-16; became prof. at Göttingen in 1816, and at Bonn in 1819. He exercised great influence on the study of Gr. lit. and art, both by his lectures and by his numerous writings, of which the prin. are *Die Ezechyische Trilogie*, *Die griechischen Tragödien mit Rücksicht auf den epischen Cyklus*, *Griechische Götterlehre*, etc. D. Dec. 17, 1868.

**Weld**, wôld, or **Dyer's Weed** [Lat. *Reseda luteola*; Fr. *gande*; Ger. *Gelbkraut* or *Wau*], an annual herbaceous plant, often growing wild, which is a native of the S. parts of Europe, but has been naturalized in the U. S. It contains a yellow coloring-matter termed luteoline, which is highly



esteemed for its durability, and ranks among the vegetable dyes next to the Per. berry.

**Weld** (THEODORE DWIGHT), b. at Hampton, Conn., Nov. 3, 1803, ed. at Hamilton Coll.; studied theol. at Lane Sem., Cin., O.; headed the secession of most of the students of that inst. to Oberlin on account of the suppression of an anti-slavery society by the board of trustees; became an anti-slavery lecturer; took the post of ed. of the publications of the Amer. Anti-slavery Society; wrote *The Bible against Slavery, Slavery as it is, and The Power of Cong. over the Dist. of Columbia*; spent several sessions at Wash. 1841-43, working with anti-slavery members of Cong.; established in 1854 a school of a high class at Eagleswood, N. J., in which colored pupils received especial attention.

**Welde** (THOMAS), b. in Eng. about 1590, grad. at Trinity Coll., Cambridge, 1613; took orders in the Ch. of Eng.; emigrated to N. Eng.; arrived at Boston June 5, 1632; was ordained the following month as first minister of the ch. of Roxbury; received in Nov. as a colleague the celebrated John Eliot; took a prominent part at the trial of Mrs. Anne Hutchinson as an opponent of her peculiar doctrines 1637; was associated with Eliot and Richard Mather in 1639 in making the translation of the Psalms known as the "Bay Psalm-book" (*The Whole Book of Psalms faithfully translated into Eng. Metre*, Cambridge, 1640); was sent with Hugh Peters to Eng. in 1641 as agent for the colony; remained in Eng.; was afterward pastor of a ch. at Gateshead, near Newcastle-upon-Tyne; accompanied Lord Forbes to Ire., and resided there some time; subsequently returned to Eng., and was ejected from his living for nonconformity 1662. Wrote *A Short Story of the Rise, Reign, and Ruin of the Antinomians, Familists, and Libertines, that infected the Chs. of N. Eng.*, etc. D. Mar. 23, 1662.

**Weld'ing**, a term applied to a phenomenon exhibited by iron, platinum, and probably some other metals, consisting in the assumption at a certain temperature of a glutinous cohesion between surfaces, accompanied, in the case of iron, with a considerable degree of plasticity and viscosity. It is one of the most important properties, in a practical sense, of both iron and platinum, for without it neither of these valuable metals could be readily or cheaply obtained in large homogeneous masses.

**Welhaven** (JOHAN SEBASTIAN CAMMERMEIER), b. at Bergen, Nor., Dec. 22, 1807, studied at the Univ. of Christiania; began to lecture on philos. in 1840; was appointed prof. in 1846. In 1832 he pub. *Henrik Wergeland's Digtekonst og Character*, and thereby opened that memorable controversy which forms the introduction to the Nor. lit. In 1834 he pub. that book which became the centre of the whole contest, *Norges Dæmring*. D. Nov. 8, 1872.

**Welker** (MARTIN), b. in KNOX CO., O., Apr. 25, 1819, was admitted to the bar 1840; was clerk of Holmes co. court 1846-51 and judge of common pleas for the 6th dist. 1851-56; settled at Wooster, and was elected lieut.-gov. as a Rep. 1857; served in the early part of the c. war as judge-advocate; was assistant adjutant-gen. of O. 1862, and superintended the draft in that State; delegate to Phila. Loyalists' convention 1866; sat in Cong. 1865-71, and was appointed in 1873 U. S. judge for N. dist. of O.

**Well** [A.-S. *wealdan*, to "gush out"]. Well, like the Ger. *Brunnen*, originally signified a natural flowing spring, and some mineral springs are still called wells. Living springs were the only sources of drinkable water known to primitive man, and though excavated wells are among the most anc. of human permanent constructions, they are too laborious, too costly, and require too great an amount of mechanical skill to have been executed until the arts had made a considerable progress. In pastoral life water is the first requisite for the establishment of a camp. The nomad Bedouins now rarely if ever dig wells. For their small herds the slender threads of living water found here and there in the desert suffice. Anc. writers speak of wells in the N. Afr. desert several hundred ft. deep, and their accounts have been confirmed by modern travellers; but in a large part of that waste a continuous sheet of water exists at depths so moderate as to be easily reached by cutting through the bed of indurated sand which overlies it. The wells of the Sahara are square excavations, not walled up with stone, but lined with a framework of palm-trunks. In the East, wells are generally round, but sometimes square, and when not cut through solid rock are generally stoned, as in Europe. In their present condition they are usually without a curb, the orifice being closed by a flat stone, and they are unprovided with any apparatus for raising the water, the traveller being expected to furnish his own rope and bucket.

In Europe, several apartments, sometimes 15 or more, in different stories in the same house, often draw water from a common well in the court by the aid of an ingenious mechanical contrivance. Over the centre of the well, and 2 or 3 ft. above it, a stout iron ring, of a diameter considerably smaller than the orifice of the well, is suspended by strong wires running from the ring to a window in each apartment to be supplied. A bucket is attached to a double pulley or block running on the wire, which carries it down to the ring, whence it is lowered into the water by slackening, and drawn up by hauling in the rope over the lower sheave, with very little labor.

The economical and sanitary value of water, and the frequent difficulty and expense of procuring it, gave wells great importance in the eyes of the anc. world, and those distinguished for purity or abundance of water were regarded with almost idolatrous reverence. Hence great care was bestowed upon their construction and preservation, and they were often sumptuously decorated and provided with many useful as well as ornamental accessories. Many anc. well-curbs of fine material and workmanship are found in museums of anc. art, and some of those in the Vatican—are particularly one of marble, thought to be Etruscan—are among the most admirable works of sculpture in that great museum.

Persons of acute observation acquire by long practice a wonderful skill in detecting the *indica* which point to the existence of water at accessible depths beneath the surface of the earth. Paramelle, a Fr. priest of the last generation, claims to have discovered and revealed more than 10,000 subterranean fountains in the course of a few years. The ingenious and simple method of obtaining water by driving a small iron tube, provided with a perforated hollow conical point of steel, a few feet into the ground and applying a hand-pump to the orifice, deserves special notice as an economical and speedy process.

**Weller** (JOHN B.), b. in O. about 1812, was a Dem. M. C. 1839-45; was lieut.-col. of Morgan's O. regiment in the Mex. war, and became its commander on the death of Col. Morgan at the battle of Monterey; was the first com. to Mex. under the Treaty of Guadalupe Hidalgo 1848; settled in Cal. 1849; was U. S. Senator 1851-57, gov. of Cal. 1858-60, minister to Mex. 1860-61, and delegate to the national Dem. convention at Chicago 1864. D. Aug. 17, 1875.

**Welles** (EDWARD R.), D. D., b. at Waterloo, N. Y., about 1834, grad. at Hobart College; studied theol. under Rev. Dr. Wilson; took orders in the P. E. Ch. about 1857; was many yrs. minister of the Epis. ch. at Red Wing, Minn.; was consecrated bp. of Wis. Oct. 25, 1874.

**Welles** (GIDEON), b. at Glastonbury, Conn., July 1, 1802, ed. at the Epis. acad. at Cheshire and at Norwich Univ.; studied law; ed. and proprietor of the *Hartford Times*, a Dem. paper, 1826-37; was a member of the legislature 1827-35, P. M. of Hartford 1836-41, State comptroller 1842-46, and chief of a bureau in the navy dept. 1846-49; was an original member of the Rep. party, and chairman of the Conn. delegation at the Chicago convention, where he was influential in securing the nomination of Lincoln for the Presidency; was sec. of the navy through administrations of Lincoln and Johnson; wrote largely for the press. D. Feb. 11, 1878.

**Wellesley**, welz'le, on R. R. N. Norfolk co., Mass., 15 m. W. by S. of Boston. Pop. not in census. Contains WELLESLEY COLLEGE; see APPENDIX.

**Wellesley** (ARTHUR). See WELLINGTON.

**Wellesley** (RICHARD COLLEY), MARQUIS WELLESLEY, K. G., D. C. L., and earl of Mornington, brother of the first duke of Wellington, b. at Dublin, Ire., June 30, 1760, ed. at Eton and at Christ Ch., Ox.; in 1781 took his seat in the Irish House of Peers; advocated the restriction of the powers of the regency debate of 1789, the restriction of the powers of the prince during the malady of the king; was made one of the lords of the treas., a member of the Irish, and subsequently (1793) of the Brit. privy council; gave especial attention to the affairs of India; appointed gov.-gen. of India Oct. 4, 1797; arrived at Calcutta May 1798; found the native powers of India ripe for a struggle against Brit. ascendancy, to which they were incited by Bonaparte, who was then in possession of Egypt, was meditating an expedition to Ind., and had formed an alliance with the celebrated Tipoo, sultan of Mysore; sent a small Brit. force into the territory of the nizam, ordering him to disband his levies and to surrender 124 Fr. officers; despatched Gen. Harris with an army of only 20,000 men against the cap. of Mysore Feb. 3, 1799, coming himself to Madras to superintend the operations, which resulted in the storming of Seringapatam and the death of Tipoo, May 4; divided the terms of Mysore with the nizam, and made his brother, Col. Arthur Wellesley, gov. of Seringapatam, July 1799; was created Marquis Wellesley in the peerage of Ire. Dec. 2, 1799; directed his attention with great success to the commercial interests and the internal organization of the Brit. empire in India; concluded a treaty with the shah of Per., which resulted in the fall of the celebrated Afghan conqueror Zemaun Shah, who had for yrs. disturbed the W. of India by his formidable hordes; sent in 1801 a force of 7000 men, under Gen. Baird, up the Red Sea to co-operate with Gen. Sir Ralph Abercromby against the Fr. in Egypt; engaged in a desperate but brilliant and victorious struggle with the Mahrattas 1803-05; built the viceregal palace at Calcutta; founded a coll. for the cultivation of Indian lit.; inaugurated surveys of the country upon a vast scale and effected great financial reforms, making his administration the most memorable in Anglo-Indian hist.; returned to England Aug. 1805; was ambassador in Sp. 1808-09; sec. of state from Dec. 1809 to Jan. 1812; accepted the office of lord lieut. of Ire. under Canning Dec. 1821; was an advocate of conciliation, but was claims, and attempted a policy of conciliation, but was obliged to have recourse to energetic measures to repress his violent outbreaks; was recalled on the accession of his brother to the premiership 1828, owing to a difference of opinion between them on the "Catholic question;" lord steward of household under the Liberal govt. of Earl Grey 1830-31; a second time lord lieut. of Ire. 1833-34, and lord chamberlain 1835. D. Sept. 26, 1842.

**Well'ing** (JAMES C.), LL.D., b. at Trenton, N. J., July 14, 1825, grad. at Princeton 1844; settled in New York 1848; was for some yrs. correspondent and literary ed. of the *National Intelligencer*, its associate ed. 1855-65, and its prin. conductor during the war; visited Europe for his health 1866; was pres. of St. John's Coll., Annapolis, Md., 1867-70, prof. of belles-lettres at Princeton 1870-71, and became pres. of Columbian Coll., Wash., D. C., Nov. 6, 1871.

**Wellington**, city of New Zealand, cap. of the prov. of the same name, and since 1865 of the whole colony, is on an inlet of Cook's Strait, has an excellent harbor, and is connected by R. R. with Upper Hutt. It is well built, carries on a considerable trade, exporting wool, tallow, and gum. Pop. 1881, 20,563.

**Wellington**, city and R. R. centre, cap. of Sumner co., Kan., on the N. bank of Slate Creek, 12 m. W. of Ark. River. It was laid out in 1871. Pop. 1880, 2694.

**Wellington**, R. R. centre, Lorain co., O., 35 m. S. of Cleveland, is one of the prin. markets for dairy products in O., the shipment of cheese alone amounting to 10,000,000 lbs. annually. Pop. 1870, 1281; 1880, 1811.



**Wellington** (ARTHUR Wellesley), K. G., DUKE OF, b. at Dangan Castle, co. Meath, Ire., in Apr. 1769, educated at Eton College and the military sem. at Angers, Fr., entered the army as ensign of the 73d Foot Mar. 7, 1787; was appointed lieutenant in the 76th Dec. 25, capt. of the 58th Foot June 30, 1791, exchanged into the 18th Light Dragoons Oct. 1792, promoted to major Apr. 30, and lieutenant-col. of the 33d Foot Sept. 30, 1793; was elected to the Irish Parl. in 1790; appointed aide-de-camp to the earl of Westmoreland, lord lieut. of Ire., 1791; saw his first field service under the duke of York in the Netherlands in 1794; commanded 3 battalions during the disastrous retreat of the Brit. army through Hol. Jan. 1795; embarked for India with his regiment the same yr., arriving at Calcutta Feb. 1797; was placed in command of the subsidiary forces furnished by the nizam for the campaign against Tippoo Sultan 1799; commanded the reserves in the trenches at the assault and capture of Seringapatam May 4; was appointed gov. of Mysore; waged a campaign against a celebrated Mahratta freebooter, Dhondia Waugh, self-styled "the king of the two worlds," whom he defeated and killed Sept. 10, 1800; became maj.-gen. Apr. 1802; commanded the expedition against the Mahrattas, and restored the peishwa Apr.-May 1803; besieged and took Ahmednuggur Aug. 8-12; entered Aurangabad Aug. 29; defeated Scindia at the decisive battle of Assaye Sept. 23, and again at Argaum Nov. 29; took the great fort of Gawilghur in Dec.; concluded a treaty with Scindia Dec. 30, imposing upon him stringent conditions; was knighted and received the thanks of the king and Parl. 1804; arrived in Eng. Sept. 1805; became chief sec. for Ire. under the duke of Richmond Apr. 1807; had a command under Lord Cathcart in the expedition against Copenhagen, and negotiated the capitulation of that city Sept. 7, 1807; became lieutenant-gen. Apr. 25, 1808, and commander-in-chief of the forces sent to the Peninsula in June; defeated Gen. Laborde at Rolica Aug. 17; gained over Junot the brilliant victory of Vimiera Aug. 21; signed the armistice which led to the convention of Cintra Aug. 31; resumed his seat in Parl. Jan. 1809; was again appointed to the chief command of the army in the Peninsula on the death of Sir John Moore, and arrived at Lisbon Apr. 22, 1809; succeeded in passing the Douro in the face of the Fr. army, and entered Oporto May 12; was appointed by the prince regent marshal-gen. of the Port. army the same month; defeated the Fr. in the great battle of Talavera, July 27-28, but was compelled to fall back on Badajoz, crossing the Tagus at Arzobispo Aug. 4; fortified his famous triple lines of intrenchments, 30 m. in length, between the Tagus and the Atlantic, at Torres Vedras; repulsed Marshal Massena at Busaco Sept. 27, 1810; again occupied the lines of Torres Vedras Oct. 10; pursued the Fr. along the line of the Mondego in their retreat upon Santarem; gained the victory of Fuentes de Onoro May 8-5; took Al. Almeida and invested Badajoz May 19; carried Ciudad Rodrigo by assault Jan. 19, 1812; reinvaded Badajoz Mar. 15; took it by storm Apr. 6; routed Marshal Marmont with great slaughter at Salamanca July 22, and occupied Madrid Aug. 12; was made generalissimo of the Sp. armies, and created marquis of Wellington; obtained a signal victory over King Joseph and Marshal Jourdan at Vittoria June 21, capturing 150 cannon and driving the Fr. into the Pyrenees; gained a series of battles in the Pyrenees July 27-31; carried San Sebastian by assault Aug. 31; crossed the river Bidassoa into Fr. Oct. 7; received the capitulation of Pamplona Oct. 31; took up his head-quarters at St. Jean de Luz Nov. 10; crossed the Nivelle and the Nive, and repulsed Marshal Soult Dec. 10-18; left 2 divisions to blockade Bayonne, and pursued Soult, whom he defeated at Orthez Feb. 27, 1814, and at Toulouse Apr. 10, and occupied that city Apr. 12; was made marquis of Douro and duke of Wellington May 11; arrived at Lond. June 23, and took his seat for the first time in the House of Lords June 28; went to Paris as ambassador to the restored monarch, Louis XVIII., in Aug.; attended the Cong. of Vienna Jan. 1815; repulsed Marshal Ney at Quatre Bras June 16; gained, with the Prus. marshal Blücher, the decisive battle of Waterloo June 18; crossed the Fr. frontier and marched upon Paris June 21; was commander-in-chief of the allied army of occupation in Fr. 1815 to Nov. 1818; attended the Cong. of Aix-la-Chapelle for the evacuation of Fr.; attended the Cong. of Verona 1822; was ambassador to Rus., and appointed constable of the Tower 1826; became commander-in-chief Jan. 1827, gov. of Dover castle and lord warden of the Cinque Ports Jan. 1829; was prime minister in the Tory interest from Jan. 8, 1828, to Nov. 15, 1830; was appointed chancellor of Ox. Univ. Jan. 29, 1834; was sec. of state for foreign affairs Dec. 1834 to Apr. 8, 1835; became a member of the cabinet without a portfolio 1841; was a second time appointed commander-in-chief Dec. 1842; gave a reluctant support to the free-trade measures of Sir Robert Peel, and was pres. of the privy council 1845-46, after which he declined further political honors on account of advanced age. D. Sept. 22, 1852.

PORTER C. BLISS.

**Wellingtonia Gigantea.** See SEQUOIA.

**Wells.** See ARTESIAN WELLS, GAS-WELLS IN GAS-LIGHTING, OIL-WELLS IN PETROLEUM, AND PETROLEUM, GEOLOGY OF.

**Wells** (CHARLES), b. in Eng. about 1798, was an early and intimate friend of the poet Keats, who introduced his name in one of his best-known sonnets; pub. anonymously a prose volume of *Stories after Nature* (1822) and *Joseph and his Brethren, a Scriptural Drama* (1824). Swinburne and the Rossettis pronounced his poem second in dramatic merit to Shakespeare alone.

**Wells** (DAVID AMES), D. C. L., b. at Springfield, Mass., June 17, 1828, grad. at Williams Coll. 1847, and at the Lawrence Scientific School, Cambridge, 1851; was assistant prof. there 1851-52; patented in 1856 several improvements in bleaching; was associate ed. of the *Springfield Republican* 1858; settled at Norwich, Conn.; visited Europe on commissions of the U. S. govt. 1862 and 1867; was U. S. special com. on revenue 1866-70; produced on that subject

15 important reports; became univ. lecturer on political economy at Yale 1872; visited Europe 1873; delivered in that yr. an address before the Cobden Club in Lond.; was chosen a foreign associate of the Fr. Acad. of Political Sciences, in the place of John Stuart Mill, deceased, 1874; received in the same yr. the degree of D. C. L. from Ox. Univ.; has been since 1867 a strong advocate of free trade; has taken considerable part in recent efforts for civil-service reform, and was an unsuccessful Dem. candidate for Cong. at the special election of Apr. 1876. He edited the *Annual of Scientific Discovery*, Charles Knight's *Knowledge is Power*, Timbs's *Things not Generally Known*, etc.

**Wells** (HENRY H.), b. at Rochester, N. Y., Sept. 17, 1823, ed. at the Romeo Acad., Mich.; studied and practised law at Detroit; sat in the legislature 1854-56; served in the war, attaining the rank of brig.-gen. of volunteers; settled in Va. 1865; was military gov. of Va. 1868-69; was the Rep. candidate for gov. of Va. at its reorganization in 1869, but was defeated; was U. S. dist. atty. for Va. 1869-72, and appointed dist. atty. for D. C. Sept. 1875.

**Wells** (HORACE), b. in Hartford, Windsor co., Vt., Jan. 21, 1815, received a good Eng. education; at 19 (1834) began the study of dentistry in Boston, and in 1836 opened an office in Hartford, Conn., to practise his profession. D. Jan. 14, 1848. (See ANÆSTHESIA.)

**Wells** (SAMUEL ROBERTS), b. at W. Hartford, Conn., Apr. 4, 1820, became a partner in the publishing-house of Fowler & Wells, New York, 1844; travelled extensively in the U. S., Canada, and Europe, lecturing on phrenology; edited the *Water-Cure Journal*, *Phrenological Journal*, *Illustrated Annual of Phrenology and Physiognomy*, etc. D. Apr. 13, 1875.

**Wells** (WILLIAM HARVEY), b. at Tolland, Conn., in 1812, was prin. of the Mass. Normal School at Westfield for some yrs., and subsequently supt. of public schools at Chicago, Ill. He was one of the original eds. of the *Mass. Teacher*; was author of a *Gram. of the Eng. Lang.*, etc. D. Jan. 22, 1885.

**Wellsboro'**, on R. R., cap. of Tioga co., Pa. Pop. 1870, 1465; 1880, 2228.

**Wellsburg**, W. Va. See APPENDIX.

**Wellsville**, R. R. centre, Allegany co., N. Y. Pop. 1870, 2034; 1880, 2049.

**Wellsville**, on R. R., Columbiana co., O. Pop. 1870, 2313; 1880, 3377.

**Wellwood** (Sir HENRY Moncreiff), BART., D. D., b. at Blackford, Perthshire, Scot., Feb. 6, 1750, being eldest son of Rev. Sir William Moncreiff; ed. at Glasgow and Edinburgh univs.; was ordained a minister of the Ch. of Scot. 1771; became pastor of St. Cuthbert's, Edinburgh, 1775, and moderator of the General Assembly 1785; was a popular preacher; "succeeded Dr. John Erskine in the chieftainship of the Whig party in the Kirk of Scot.;" took an active part in ecclesiastical controversies, and late in life assumed the name of WELLWOOD. Wrote *Discourses on the Evidence of the Jewish and Chr. Revelations and An Account of the Life and Writings of John Erskine*, D. D. D. June 14, 1827.

**Welsh** (DAVID), D. D., b. at Moffat, Dumfriesshire, Scot., Dec. 11, 1798, ed. at the High School and Univ. of Edinburgh; became minister of the parish of Crossmuir 1821, and of St. David's, Glasgow, 1827; was prof. of ch. history in the Univ. of Edinburgh 1831-43; visited Ger. 1834; was associated with the foundation of the Free Church of Scot., of whose General Assembly he was the first moderator, thereby sacrificing his professorship and the secretaryship of the Bible Board; prof. of ecclesiastical hist. in new coll. of the Free Ch., and was founder and first ed. of *N. Brit. Review* 1844. Wrote *Elements of Ch. Hist.*, etc. D. Apr. 24, 1845.

**Welsh, or Welsh** (JOHN), b. in Scot. about 1568, grad. at the Univ. of Edinburgh 1588; became parish minister of Selkirk 1589, of Ayr 1590, and of Kirkeudbright 1594; was noted as a pulpit-orator; preached before the General Assembly (1596) a sermon which was adverse to the royal project of suppressing the general assemblies; settled at Ayr 1600; was imprisoned for opposition to royal dictation in ecclesiastical affairs, tried for high treason, and sentenced to exile Jan. 1606; went to Fr., and there labored many yrs., at St. Jean d'Angely, among the Huguenots. His wife was the youngest daughter of John Knox. D. Mar. 1622.

**Welsh** (WILLIAM), b. in Phila. about 1810, became a prominent merchant of that city, where he has filled many public posts, including the presidency of the board of trusts, and is widely known as a philanthropist, especially in connection with the Indian peace commission. He is a director of Girard Coll.; was for some yrs. proprietor of the *North American* and of *Phila. Gazette*. Wrote *Lay Co-operation in St. Mark's Ch.*, *Letters on the Home Missionary Work of the P. E. Ch.*, *The Bp. Potter Memorial Home*, etc.

**Welsh Language and Literature.** The W. lang., historically considered, may be parcelled out as follows:

(1) *Pre-historic Welsh*, ranging from the time when the ancestors of the Welsh and the Irish ceased to form one nation, or to speak one and the same lang., to the subjugation of the Britons by Julius Agricola. (2) *Early Welsh*, from the time of the Rom. occupation down to the departure of the Romans in the beginning of the 5th century. (3) *Early Welsh*, of what is called the Brit-Welsh period, from that time to the 8th century. (4) *Old Welsh*, from then to the coming of the Normans into Wales, in the latter part of the 11th century. (5) *Medieval Welsh*, thence to the Ref. (6) *Modern Welsh*, from that epoch to the present day.

It will be preferable here to proceed backward, from the known to the less known. Modern W., accordingly, takes the lead, and of this 2 kinds may be distinguished—namely, biblical and journalistic W., whereof the latter is the vernacular of the W. of the present day, and is to be met with in W. periodicals and newspapers. Journalistic W. is characterized, as might be expected, by a growing tendency to copy Eng. idioms, which is the result, no doubt, of continual contact with that lang. and of frequently translating from it. Biblical W., as the term indicates, is the lang. of the W. translations of the Bible and a number of other books,



mostly theological, of time of Ref. and later. This is still the lang. of best authors, and the supposed model of all.

Passing beyond the time of the Ref., we come to the Mediæval W. of the *Bruts* or chronicles, so called from their commonly beginning with an account of Brutus, or Brytus, a fictitious personage postulated as the first colonizer of Albion for the sake of accounting for its being called Britain. He was held to be a son of Æneas, and so were the W. made out to be of Trojan descent. The same kind of W. also prevails in the romances called the *Mabinogion*, which consists mostly of tales about Arthur and the Knights of the Round Table. In point of quaintness of style, vividness of description, and comic exaggeration they are not surpassed by any other lit. of the same kind and date; nor is there any other which can boast of having directly or indirectly exercised so much influence on European thought in the Middle Ages. To the earlier part of this period belong also the *Laws of Wales*. The form in which they are known to us dates from the reign of Howell the Good, in the 10th century, but in point of substance they are the growth of laws and customs which were the common inheritance of all the Aryan nations, modified, of course, by the coloring which the special hist. and surroundings of the W. could not help giving them. The mediæval period was highly productive of W. poetry; among the leading W. poets of the time may be mentioned Dafydd ab Gwilym, who lived in the 14th century. But more interesting, however, to the philologist are the contents of a MS. called the *Black Book of Carmarthen*, which dates from the 12th century, and has been pub. in Skene's *Four Anc. Books of Wales*. It contains the oldest version extant of a considerable portion of the poems, which it has been the habit of some writers to attribute to the 6th century. As to the lang. of these poems, it is hardly older, on the whole, than the MS. containing them. Thus far, the student of W. has abundance of lit. at his command; but when he passes the threshold of the 12th century it ceases to be so, his only materials for the study of Old W. being inscriptions and glosses, together with a few other scraps in the blank spaces of Lat. MS. The inscriptions of this period are written in letters which archaeologists are wont to term Hiberno-Saxon, and are far less numerous than those of an earlier period, owing, probably, to their having become, in consequence of the prayers in them, objects of the iconoclastic rage of later times.

The next step backward lands us in the Brit.-W. period of the lang., for the study of which our materials are very slender. They may be said to be of 2 kinds—namely, inscrip-tional and MS. Those of the former kind consist mostly of very simple epithaphs written in Lat., but containing Kymric names. Somewhat over 100 such inscriptions, by far the greater number of which still exist, are known, scattered over Wales, Devonshire, and Cornwall, not to mention a few in Scot. from Luce Bay to Edinburgh. They are written in Rom. capitals more or less debased; toward the end of the period the capitals are found interspersed with minuscules of the Hiberno-Saxon type, so called, owing to the fact that it is customary to write and print Irish in this character, and that it was also the character used formerly by the Eng. More correctly speaking, letters of this kind are neither Irish nor Eng., but Kymric or W., and the inscriptions in question supply all the successive gradations whereby Roman capitals assumed this form, of which the modern Irish alphabet will serve as a specimen. However, both the Irish and the W. had an alphabet of their own of a very peculiar nature, known as the Ogam or Ogham, from its Irish inventor, a mythical personage called *Oghma*, nearly related, probably, to Ogmios, the Hercules of the Gauls. Most of the early monuments of Ire. are written in Ogam, and over 20 of those of Wales, Devonshire, and Cornwall are partly, and one or two wholly, in Ogam; they cover the country from Ruthin in Denbighshire to S. Devonshire. In Wales the Ogam grew out of use as early as the 8th or 9th century, whereas in Ire. it has come down in MS.—a fact which has not left room for genius to distinguish itself by discovering the key to it. As to the early W. of the time of the Rom. occupation, we have still less to go upon: there are a few inscriptions of the period containing Celtic names, which are presumably of Kymric origin. Beside these, a few names of men and places are handed down in the writings of Tacitus, Ptolemy, and others. Beyond this lies the pre-historic period of the lang. What it was then like is entirely a matter of inference.

**Race and Language.**—The Celtic langs. still spoken are W., Breton, Gaelic in Ire. and the Scotch Highlands, and Manx in the interior of the Isle of Man. Among the dead ones are Old Cornish, which lingered on into the last century, Pictish, and Gaulish. Of these, Cornish has left behind it a considerable quantity of lit., while the Pictish words extant may perhaps be counted on one's fingers; the Gauls have left us a number of monuments, from which, together with other sources, a fair number of their proper names and a few other specimens of their vocabulary have been collected—enough, in fact, to enable one to assign the Gauls their proper place in the Celtic family. Now, as to the modern Celts of the Brit. Isles and Brittany, all are agreed that they divide themselves naturally into 2 branches, the one Kymric and the other Goidelic. To the latter belong the Irish and the Gaels of Scot., together with the Manx; to the former, the W., the Cornish, and the Bretons. Then as to the anc. Gaels, it is usual to range them with the Kymric nations, so that the entire Celtic family is commonly spoken of as consisting of Goidelic nations on the one hand, and Gallo-Brit. ones on the other. [From orig. art. in *J.'s Unit. Cyc.*, by JOHN RHYDS.]

**Welwitsch** (FREDERICK), M. D., b. in Hol. about 1810. In 1863 he discovered at Mossamedes, W. Afr., a remarkable plant which was named *Welwitschia mirabilis*. It is placed among the Gnetaceæ, a family nearly allied to the conifers; is never above a foot high, though its trunk is sometimes 6 ft. in diameter; is found only in an elevated rainless, stony

plateau; attains an estimated age of above a century; produces flower-stalks 12 inches high, cones 2 inches long, and cotyledons 6 ft. long, which extend in all directions. D. Oct. 30, 1872.

**Wel'wood** (JAMES), M. D., b. near Edinburgh, Scot., in 1652, ed. at the univs. of Glasgow and Leyden; accompanied William III. to Eng. 1689; became one of the royal phys. for Scot., and practised with great reputation at Edinburgh. Wrote *Vindication of the Revolution in Eng. and Memoirs of the Most Material Transactions in Eng. for the Hundred Yrs. preceding the Revolution*. D. 1716.

**Wen** (A.-S. *wenn*), a cystic tumor occurring upon the surface of the body, especially frequent on the scalp. It originates by the occlusion of a follicle of the skin or scalp, and the subsequent slow accumulation of sebaceous matter secreted by the lining of the steadily increasing cyst. Whether single or in large numbers, its removal is easy and harmless. Once properly removed, it cannot return.

**Wen'ceslas, or Wenzel**, emp. of Ger. (1378-1400), b. at Nuremberg Feb. 26, 1361, a son of the emp. Charles IV., of the house of Luxemburg. He was weak, violent, and cruel, spending most of his time in dissipation. In 1393 the Bohemian nobles, who hated him for the partiality he showed toward the Gers., formed a conspiracy against him, headed by his own brother, Sigismund, king of Hungary, seized him, and held him a prisoner at Prague for a long time. In Ger., where his influence never had been great, he finally lost all authority, and when he allied himself with Fr. for the purpose of ending the papal schism by deposing both Boniface IX. and Benedict XIII., the electors of Mentz, Cologne, Treves, and the Palatinate assembled at Oberlahnstein and deposed him (Aug. 30, 1400.). D. Aug. 16, 1419.

**Wends, or Vends** (i. e. "wanderers"), a Slavic race of Ger., considered by some as identical in race with the Vandals (who are generally thought to have been of Teutonic stock), and, with more probability, considered by others as the same as the Venedi, or old Venetians. At present the number of W. (i. e. people speaking the Wendish lang., exclusive of the large numbers who are Germanized) is put at 140,000, of whom 85,000 are in Prus. (Liegnitz and Frankfort), and Sax. (the kingdom) has 52,097 W., mostly in the dist. of Bautzen. It is to be noted that the Sloventzi of Aus. (1,250,000 in number) are called Vinds also, and their lang. is called the Vindish.

**We'ner, Lake**, the largest lake of the Scandinavian peninsula, in the S. part of Swe., 30 m. from the Cattegat, at an elevation of 105 ft., covers an area of 3005 sq. m. It receives the Clara-elv, and sends its waters to the Cattegat through the Götha-elv.

**Weno'na**, city and R. R. Junc., Marshall co., Ill., 100 m. S. W. of Chicago. The Wenona Union fair is held here, and is second in importance only to the State fair. Pop. 1870, 879; 1880, 911.

**Went'eltrap** (Ger. *Wendeltreppe*, "winding stair"), a popular name for the shells of the gasteropods of the genus *Scaloria*, family Turritellidæ. There are about 100 living and as many extinct species. The finest are from the warm seas. They emit a purple juice, like many other shell-fish.

**Went'worth** (BENNING), b. at Portsmouth, N. H., July 24, 1696, grad. at Harvard 1715; became a merchant; was frequently elected to the assembly; was appointed a member of the council 1734; was royal gov. from 1734 to 1767; made grants of land in S. Vt., causing a famous conflict with N. Y. concerning jurisdiction, and gave to Dartmouth Coll. 500 acres of land, on which its buildings were erected. Bennington, Vt., was named in his honor. D. Oct. 14, 1770.

**Wentworth** (CHARLES WATSON). See ROCKINGHAM, MARQUIS OF.

**Wentworth** (JOHN), grandson of William, b. at Portsmouth, N. H., Jan. 16, 1671, became a capt. in the merchant marine; was appointed by Queen Anne a councillor for N. H. 1711; became justice of common pleas 1713, and lieutenant-gov. of N. H. 1717, the prov. being then dependent on Mass. D. Dec. 12, 1730.

**Wentworth** (JOHN), b. at Dover, N. H., Mar. 30, 1719, became a lawyer and a col. of N. H. militia; was a member of the legislature 1768-73, and speaker 1771; was chairman of the Revolutionary committee of correspondence and pres. of the first convention 1774, state councillor 1778-81, judge of common pleas for Strafford co. 1773-76, and judge of the supreme court 1776-81. D. May 17, 1781.

**Wentworth** (SIR JOHN), BART., LL.D., nephew of Gov. Benning, b. at Portsmouth, N. H., Aug. 9, 1737, grad. at Harvard 1755; went to Eng. as agent of the prov. 1765; appointed surveyor of the king's woods in Amer. and gov. of N. H., which office he held from 1767 to 1775; gave its charter to Dartmouth Coll.; went to Eng. at the outbreak of the Revolution (1775); was lieutenant-gov. of N. H. 1790-1808, and was created a baronet 1795. D. Apr. 8, 1820.

**Wentworth** (JOHN), son of Col. John (1719-81), b. at Dover July 17, 1745, grad. at Harvard 1768; was a member of the committee of safety during the Revolution; sat in the legislature 1776-80; was a delegate to Continental Cong. 1778-79, and a signer of Articles of Confederation; councillor 1780-84, and State senator 1784-87. D. Jan. 10, 1787.

**Wentworth** (JOHN), LL.D., grandson of John Jr. (1745-87), b. at Sandwich, N. H., Mar. 5, 1815, grad. at Dartmouth Coll. 1836; settled in Ill. 1836; studied law at Cambridge Law School, and was admitted to the bar 1841; sat in Cong. as a Dem. 1843-51 and 1853-55, and as a Rep. 1865-67; was mayor of Chicago 1857; took a leading part in the Ill. constitutional convention of 1861, and edited the *Chicago Democrat* for many yrs. previous to 1861. Wrote *History of the Family of Wentworth*.

**Wentworth** (THOMAS). See STRAFFORD, EARL OF.

**Wentworth** (WILLIAM), b. at Alford, Lincolnshire, Eng., in 1615, came to Mass. in 1636; took part in the settlement of Exeter, N. H., 1639; removed thence to Wells, Me., and ultimately settled at Dover, N. H., where he was a ruling elder in the ch. and often preached. In 1689 he was in-



strumental in saving Heard's garrison from destruction by the Indians. D. at Dover Mar. 16, 1697. From him are descended all persons of the name in the U. S.

**Werder, von** (August), b. Sept. 12, 1808, entered the Prus. army in 1825; took part in the Rus. campaigns in the Caucasus in 1842-43, and was severely wounded; became lieutenant-gen., and led his division with distinction in the campaign against Aus. in 1866. In the war against Fr. in 1870 he was a member of the staff of the crown prince, but soon received the command of the Baden-Württemberg army corps, which he led at Wörth, Aug. 6, 1870. He conducted the siege of Strasbourg; was made a gen. of inf. after capitulation of fortress, and repulsed victoriously (Jan. 15-17, 1871) the attack of Bourbaki at Belfort.

**Wergeland** (HENRIK ARNOLD), b. at Christiansand, Nor., June 17, 1808, studied theol. at the Univ. of Christiania; received in 1836 an appointment at the library; became keeper of the archives of the state in 1840. The best of his productions are his lyrical poems and fairy-tales. His influence, however, on Nor. lit. and civilization can by no means be measured by the aesthetic worth of his works. D. Aug. 12, 1845.

**Werner** (ABRAHAM GOTTLÖB), b. Sept. 25, 1750, at Wehrau, Upper Lusatia, where his father was director of smelting-works; studied at the mining acad. of Freiberg and at the Univ. of Leipzig, and became prof. of mineralogy in 1815 at Freiberg. His theory, the so called Neptunian, forms a most important chapter in the hist. of geol. D. June 30, 1817.

**Werner** (FRIEDRICH LUDWIG ZACHARIAS), b. at Königsberg Nov. 18, 1768, studied law at the Univ. of his native city, and entered the Prus. civil service in 1793, holding office first in Warsaw till 1805, then in Berlin. While in Warsaw he wrote in 1800 his first drama, *Söhne des Thals*, inspired by his enthusiasm for the Freemasons, and in 1804, the *Kreuz an der Ostsee*, to which Hoffmann composed the music. In Berlin he wrote *Martin Luther oder die Weihe der Kraft*, and *Der 24ste Februar*. In 1807 he resigned his office in the Prus. service; joined the R. Cath. Ch. Apr. 19, 1811; was ordained a priest in 1814; preached in Vienna during the Cong., and made an enormous sensation by the peculiar blending, in his sermons, of coarseness and real power. D. Jan. 18, 1823.

**Wesley** (CHARLES), M. A., youngest son of the Rev. Samuel Wesley, rector of Epworth, and Susannah Wesley, b. at Epworth Dec. 18, 1708, O. S. (Dec. 29, N. S.). In 1716 he was sent to Westminster School, under his elder brother, Samuel Wesley. In 1721 Charles was admitted king's scholar at St. Peter's Coll., Westminster; in 1728 was elected to Christ Ch. Coll., Ox. While there he became so serious, devout, and zealous that the wits at Ox. called him and his godly companions "Methodists"—a title which had been given derisively to rigidly religious persons a century before. In 1735 he embarked for Amer. After preaching with little success in Frederica, Ga., he returned to Eng., reaching his native land Dec. 3, 1736. On Whitsunday, May 21, 1737, he experienced the "witness of adoption," by which he was raised to a higher plane in the divine life. Being excluded from the chs. of the Establishment because of his "Methodism," despite his High-Church proclivities, he began at once to co-operate with his brother in his great work of evangelization. As far as his health and family circumstances would admit, he travelled extensively in Eng. and Wales, and was very successful as a preacher. But he is chiefly renowned as "the poet of Methodism." He wrote thousands of hymns on every religious theme. His hymns are the staple of the Meth. hymnals. D. Mar. 29, 1788.

**Wesley** (JOHN), son of Bartholomew Wesley (or Westley), and grandfather of the founder of Methodism, b. about 1696, ed. at New Inn Hall, Ox. After taking his degree, he became a member of a "particular ch. at Melcombe in Dorsetshire," by which he was sent to preach among the seamen and at Radipole, near Weymouth, as a kind of lay-preacher. In 1658 he became the minister of Winterborne Whitchurch, Dorset. He was twice imprisoned, and after the passage of the Bartholomew act in 1661 ejected from his living, and persecuted from place to place, till finally he found shelter in Preston. D. about 1670.

**Wesley** (JOHN), A. M., son of the Rev. Samuel Wesley and Susannah Wesley, b. at Epworth, Lincolnshire, Eng., June 17, 1703, O. S. (June 28, N. S.). He received his early training principally from his mother. At 11 he was sent to the Charter-house School, Lond., where he made great attainments; at 16 was elected to Christ Ch., Ox.; was ordained deacon Sept. 19, 1725, and presbyter Sept. 22, 1728; obtained a fellowship in Lincoln Coll., Ox., Mar. 17, 1728; was made Gr. lecturer and moderator of the classics Nov. 7, 1728; took his M. A. degree in Feb. 1727; became the head of the society at Ox. composed of Charles Wesley, Mr. Morgan, and Mr. Kirkman, who were derisively called "Methodists" because they were so methodical in their lives and strict in the performance of religious duties. Messrs. Ingham, Broughton, Clayton, Hervey, Whitefield, and others subsequently joined their society. In 1735 the 2 brothers accompanied Oglethorpe to Ga.—John to be a missionary to the Indians, and Charles to be sec. to the gov. and a clergyman in the colony. The way was not opened for the mission to the Indians; and as the colonists would not endure the rigid, ascetic discipline which the Wesleys wished to enforce (being then of the extreme High-Church party), they returned to Eng., Charles in 1736, and John in 1738. May 1, 1738, he formed the first Meth. "society," in Fetter Lane, Lond. The following summer he visited Count Zinzendorf and the Moravians in Ger. to study their discipline and to intensify his spiritual life. The foundation-stone of his first chapel was laid in Bristol May 12, 1739. An old foundry in Moorfields, Lond., was purchased, and opened for preaching Nov. 11, 1739. In 1742 W. instituted *class-meetings*, which became an important and permanent feature of Methodism. He held his first conference at the Foundry in Lond. June 25, 1744. In Aug. 1744 he preached his last

sermon before the Univ. of Ox. The third conference was held at Bristol May 12, 1746. The work was then systematically arranged and divided into "circuits"—7 in Eng. and Wales, none as yet in Scot. and Ire.—and the call and qualifications of preachers were defined substantially as in the present Meth. Discipline. Twelve "assistants" were then recognized. Thus originated the great Wesleyan system of *itinerancy*. In June 1748 he opened Kingswood School, near Bristol, an inst. designed for the education of preachers' sons and others. This was the nucleus of the vast system of literary and theological insts. which now obtains among the Meths. At the 27th conference, held Aug. 7, 1770, "minutes" were adopted which led to a more formal and permanent separation from the Calvinistic Meths. A sharp and prolonged controversy took place. The Wesleyan Meths. have never since "leaned toward Calvinism." When he was fourscore years of age, naturally looking forward to his death, and being desirous to perpetuate the work of God wrought through his instrumentality, he had "the Deed of Declaration" executed, Feb. 24, 1784, by which the gov. of the connection was assigned legally to the conference, consisting of 100 preachers and their successors forever. In 1766, 2 Irish local preachers, Embury and Strawbridge, began to preach in N. Y. and Md.; and at the conference in 1769 W. sent to Amer. 2 travelling preachers, Boardman and Pilmoor, to take charge of the societies they had formed. In 1770 he set down in the appointments, "No. 50, America." He ordained Richard Whatcoat and Thomas Vasey as elders, or presbyters, and the Rev. Thomas Coke, L.L.D., a clergyman of the Ch. of Eng., as supt. or bp. At a conference in Baltimore Dec. 1784, Bp. Coke, assisted by the Rev. Mr. Otterbein of the Ger. Reformed Ch., and others, consecrated Francis Asbury bp., and ordained others as elders, or presbyters, and deacons. Thus originated Meth. *episcopacy*. W. abridged and modified the liturgy, offices, ordinal, and Articles of the Ch. of Eng. for the M. E. Ch. in Amer., as, with some changes, they are used by that Ch. to this day. This was the crowning act of his life. D. Mar. 2, 1791. (See *Life of John Wesley*, by John Hampson, by Dr. Coke and Henry Moore, Dr. John Whitehead, Robert Southey, and Richard Watson, and Isaac Taylor's *Wesley and Methodism*. [From orig. art. in *J. s. Univ. Cyc.* by PROF. T. O. SUMNER, D. D., LL.D.]

**Wesley** (SAMUEL, SR.), son of John, and father of the founder of Methodism, b. at Winterborn-Whitchurch, Dorset, 1662. At 15 he went to an acad. in London, and was thence transferred to the Stepney acad. At the end of about 2 yrs. that acad. was broken up in consequence of the persecution of the magistrates, and W. was sent to the famous acad. of Charles Morton, Newington Green. He renounced nonconformity and entered as a *servitor* and *pauper scholar* in Exeter Coll., Ox., in 1683. He took his degree of B. A. June 19, 1688, and was ordained deacon at Bromley. He was first appointed to a curacy. At the end of 1 yr. he was appointed chaplain on board a man-of-war. He held this office 1 yr., during which he began his *Life of Christ*. He then held for 2 yrs. a curacy in Lond. In 1691 he was appointed to the parish of S. Ormsby in Lincolnshire. Having dedicated his *Life of Christ* to Queen Mary, she presented him with the living of Epworth in Lincolnshire, of which he was rector 39 yrs., and where he d. Apr. 22, 1735.

**Wesley** (SAMUEL, JR.), A. M., eldest son of the Rev. Samuel Wesley and brother of John and Charles Wesley, b. in Lond. Feb. 10, 1690. In 1704 he was sent to Westminster School, where he was admitted king's scholar in 1707. In 1711 he was elected to Christ Ch., Ox. After taking his A. M. degree he went to officiate as usher in his old school at Westminster, and soon entered into holy orders. In 1732 he became head-master of Blundell's free gram. school at Tiverton, where he remained till his death, Nov. 6, 1739.

**Wesley** (SUSANNAH), wife of Rev. Samuel Wesley, Sr., was the youngest daughter of the famous ejected nonconformist divine, Dr. Annisley, b. Jan. 20, 1669. Before she was 13 she conformed to the Ch. of Eng., and in 1689 became the wife of Samuel Wesley, to whom she bore 19 children. After her husband's death and a short sojourn with her daughter Emilia, she resided with her son John in Lond., and was his judicious adviser in carrying on his great work. She was the true matriarch of Methodism, and encouraged her son to employ lay-preachers. D. July 23, 1742.

**Wesleyan Female College**, located at Macon, Ga., was founded in 1836, and it is believed, was the first female coll. in the world that was chartered with full powers to confer upon females the usual degrees conferred by other colls. upon males. It is well endowed, and has been in a prosperous condition for over 40 yrs., under the control of the M. E. Ch. S.

**Wesleyan Methodists.** See METHODISM.

**Wesleyans, Primitive.** See METHODISM.

**Wesleyan University**, located at Middletown, Conn., is the oldest of the colls. under the control of the M. E. Ch. About the close of the first quarter of the present century the leading minds of that Ch. became convinced of the need of some inst. of collegiate rank in N. Eng. or N. Y. which should be under the auspices of their own denomination. Accordingly, in the spring of 1829 a joint committee appointed by the N. Y. and N. Eng. conferences issued proposals inviting the several towns within a specified region to compete for the location of the proposed coll. by the offer of subscriptions. In response to these proposals, 2 large stone buildings in the city of Middletown, erected 5 yrs. before for the Amer. Literary, Scientific, and Military Acad., but recently vacated by the removal of that inst. to Norwich, Vt., were now offered to this committee as a gift, on the condition that an endowment fund of \$40,000 should be raised for the new coll. This offer, accompanied by a subscription of \$18,000 from the citizens of Middletown, was at once accepted; the remainder of the \$40,000 was soon raised, and the coll. organized and chartered under the name of the Wesleyan Univ. Its first class grad. in 1833. In



1872 the doors of the coll. were opened to ladies. Within the last decade the material interests of the coll. have greatly advanced. Three elegant buildings have been erected—a library, the gift of Isaac Rich, Esq.; the memorial chapel, which commemorates the 18 alumni and students who fell in the late war; and the Orange Judd hall of natural science, the gift of the gentleman whose name it bears. The total value of the buildings and grounds of the coll. is \$400,000.

**Wesleyan University**, an inst. of learning at Delaware, O., chartered in 1843, and organized in 1844 under the auspices of the O. and North O. conferences of the M. E. Ch.; has fine grounds and above 800 varieties of trees and shrubs, the site having formerly been a noted watering-place called the Sulphur Springs; has an endowment fund of \$250,000.

**Wes'sel** (JOHANN), also called **Gansfort**, b. at Grönningen, Hol., about 1420, was ed. in the school of Zwolle, then under the leadership of the celebrated Gerhard Groot, and enjoyed the friendship of Thomas à Kempis, who was superior of the neighboring monastery of Mt. St. Agnes; went to Cologne, where he learned Gr. and Heb. and studied Plato; resided for many yrs. at Paris, where he took part with great energy in the controversy between nominalism and realism, and began to teach, having Reuchlin and Agri-cola among his pupils; visited Rome, and stayed for some time at Heidelberg, teaching philos., but turned more and more decidedly away from the whole scholastic method based on Aristotle, and began to be suspected of holding heretical views; retired finally to his native city, and d. there Oct. 4, 1489.

**West** (BENJAMIN), LL.D., b. at Rehoboth, Mass., in Mar. 1730, pursued mathematical and scientific studies; pub. an almanac 1769-93; furnished the Royal Society with his observations on the transit of Venus 1769; taught math. in the Epis. sem. at Phila. 1784-86; was prof. in Brown Univ. 1786-99, and P. M. at Providence 1812-13. D. Aug. 13, 1813.

**West** (BENJAMIN), R. A., b. at Springfield, Pa., Oct. 10, 1738, studied painting at Phila. 1757; settled at London 1763; soon acquired a high reputation by his portraits; enjoyed the friendship of Reynolds and of many distinguished men, and the patronage of the nobility and of George III.; was elected to the Royal Acad. 1768; was its pres. 1792-1802, and again from 1803 until his death; produced above 400 pictures. His best-known pictures were *The Battle of La Hogue*, *The Death of Wolfe*, *Christ Healing the Sick*, and *Death on the Pale Horse*. D. Mar. 11, 1820.

**West** (J. RODMAN), b. at New Orleans Sept. 19, 1822, studied at the Univ. of Pa.; capt. of volunteers in the Mex. war; emigrated to Cal. in 1849, where engaged in commercial pursuits until the outbreak of c. war; as lieut.-col. of the 1st Cal. Volunteers he served in N. M. and the S. W. Returning to New Orleans soon after the close of the war, he served as chief deputy U. S. marshal, auditor of customs, and auditor of improvements. In 1871 he was chosen U. S. Senator from La.

**West** (NATHANIEL), D. D., b. in Ire. in 1794, studied theol. in Scot. under Dr. Chalmers; came to the U. S. 1834; was pastor of chs. at Meadville, Pittsburg, and Phila., and chaplain of the Satterlee U. S. General Hospital at W. Phila. from 1862 until his death, Sept. 2, 1864. Author of *A Complete Analysis of the Holy Bible*, etc.

**West** (STEPHEN), D. D., b. at Tolland, Conn., Nov. 13, 1735, grad. at Yale 1755; studied theol.; became chaplain of Housick Fort 1757; succeeded Jonathan Edwards as missionary to the Stockbridge Indians 1758; was pastor of the Congl. ch. at Stockbridge 1759-1818, having resigned the charge of the Indian mission 1770, at which date he adopted the Hopkinsian theological opinions, having been an Arminian. Author of *An Essay on Moral Agency*, *Remarks on Edwards's Enquiry on Freedom of the Will*, *The Duty and Obligation of Chrs. to Marry only in the Lord*, etc. D. May 15, 1819.

**West Bay City**, on R. R. and Saginaw Bay, Bay co., Mich., incorporated in 1877. Pop. 1890, 6397; 1894, 9492.

**Westborough**, on R. R., Worcester co., Mass., 32 m. W. of Boston, has boot, shoe and straw goods manufactures. Pop. tp. 1870, 3601; 1880, 5214.

**Westchester**, on R. R., Westchester co., N. Y. Pop. tp. 1870, 6015; 1880, 6789.

**West Chester**, R. R. junc., cap. of Chester co., Pa. Pop. 1870, 5690; 1880, 7046.

**Westcott** (BROOKE FOSS), D. D., b. near Birmingham, Eng., in Jan. 1825, was successively scholar and fellow of Trinity Coll., Cambridge, where he grad. 1848; took orders in the Ch. of Eng. 1851; was assistant master at Harrow School 1852-69; became preacher to the Univ. of Cambridge 1859; examining chaplain to the bp. of Peterborough 1868; canon of Peterborough cathedral 1869, regius professor of divinity at Cambridge 1870, and honorary chaplain to the Queen 1875. Wrote *The Bible in the Ch.*, a *Popular Account of the Collection and Reception of the Holy Scriptures in the Chr. Chs.*, and *A General View of the Hist. of the Eng. Bible*. Prof. W. was one of the N. T. revision committee.

**Westcott** (THOMPSON), b. at Phila. June 5, 1820, studied law; was admitted to the Phila. bar 1841; has been since its commencement in 1848 ed. of the Phila. *Sunday Dispatch*; conducted the Phila. *Inquirer* 1863-75, and was a contributing ed. of the Phila. *Commercial List* 1863-70. Wrote *A Life of John Fitch, Inventor of the Steamboat*; *The Tax-Payer's Guide*, *Names of Persons who took the Oath of Allegiance to the State of Pa. 1777-89*, with a *Hist. of the Test Laws of Pa.*, and a *Hist. of Phila.*

**Westerville**, Washington co., R. I., on R. R. and Pawcatuck River, 5 m. from L. I. Sound and 44 m. from Providence, has a public library and large manufactures of woollen, cotton, etc. The v. lies on both sides of the river, in R. I. and Conn. Pop. tp. 1870, 4709; 1880, 6104.

**Western College** was founded in 1856, and is under the control of the Ch. of the United Brethren in Christ. It is located at Western, Linn co., Ia., 8 m. S. of Cedar Rapids.

It is supported by 5 annual conferences, and is the educational centre of the United Brethren Ch. in the N. W.

**Western Empire, The**. When Theodosius the Great d. (in 395) the Rom. empire was divided, according to his will, into the E. or Byzantine empire, consisting of Gr., Macedonia, Moesia, Thrace, Asia Minor, Pontus, Syria, and Egypt, with Constantinople for its cap.; and the W. empire, consisting of It., Afr., Sp., Gaul, Pannonia, Dalmatia, and Illyricum, with Rome for its cap.

**Westerville**, Franklin co., O., on R. R. and Alum Creek, 12 m. N. of Columbus, is the location of Otterbein Univ. Pop. 1870, 741; 1880, 1148.

**Westfield**, R. R. centre, Hampden co., Mass., 9 m. W. of Springfield, contains a public library and State normal school. The manufacture of whips, cigars, etc. is extensively carried on. Pop. tp. 1870, 6519; 1880, 7587.

**Westfield**, on R. R., Union Co., N. J. In 1871 part was annexed to Cranford, and in 1878 part to Fanwood. Pop. tp. 1870, 2753; 1880, 2216.

**Westfield**, city, Chautauqua co., N. Y., on R. R., 59 m. W. of Buffalo, has an acad. Pop. 1870, 3000; 1880, 1924.

**West Gardner**, Mass. See APPENDIX.

**West Grove**, on R. R., Chester co., Pa. Pop. 1880, 269.

**West Indies**, in d'ez, the common name of that archipelago which extends from the S. extremity of the peninsula of Fla. to the N. coast of Venezuela.

**West Lebanon**, N. H. See APPENDIX.

**West Liberty**, city, R. R. junc., Muscatine co., Ia., is a centre for fine cattle in the W. Pop. 1880, 1141.

**West Liberty**, on R. R., Logan co., O. Pop. 1870, 741; 1880, 715.

**Westmacott** (Sir RICHARD), R. A., b. in Lond., Eng., in 1775, son of a sculptor of some eminence, from whom he learned the rudiments of his art; studied under Canova at Rome 1793-97; obtained the first premium from the Acad. of Florence 1794; made himself familiar with the best remains of anc. art in It.; became an associate of the Royal Acad. 1805, and an academician 1816; became prof. of sculpture at the Royal Acad. 1827, and was knighted 1837. Among his most noted statues are those of Addison, Pitt, Fox, Erskine, Nelson, etc. Another admired work is an alto-relievo, *The Dream of Horace*. D. Sept. 1, 1856.

**Westmacott** (RICHARD), R. A., F. R. S., son of Sir Richard, b. in Lond., Eng., in 1799, studied sculpture under his father; was in It. 1820-26; was in general an imitator of his father's style, but with a preference for mythological and religious compositions; was elected associate 1838, and academician 1849, and succeeded his father as prof. of sculpture 1857. Among his best ideal works are *Venus and Adonis*, *The Cymbal-Player*, *A Girl and Fawn*, the bas-reliefs *The Blue Bell*, *Go and Sin no More*, *The Angel Watching*, etc. D. Apr. 19, 1872.

**Westminster**, city, cap. of Carroll co., Md., on R. R., 28 m. N. W. of Baltimore, contains the W. Md. Coll. and several private acads. Pop. 1870, 2310; 1880, 2507.

**Westminster** (HUGH LUFUS GROSVENOR), K. G., FIRST DUKE and THIRD MARQUIS OF EARL GROSVENOR and BARON BELGRAVE, b. in Lond., Eng., Oct. 13, 1825, was M. P. for Chester 1847-69; succeeded to the marquise on death of his father, Oct. 31, 1869, and was created a duke 1874. He is reputed the wealthiest nobleman in Europe.

**Westminster** (RICHARD GROSVENOR), SECOND MARQUIS OF, b. in Eng. in 1795, sat in Parl. for the co. of Chester as a Whig 1818-35; succeeded to the peerage on the death of his father, Richard, the first marquis (1767-1845); was lord steward of the queen's household under the Russell ministry 1850-52, a member of the privy council, and possessed of real estate, mostly in Lond. and Westminster, valued at £21,000,000. D. Oct. 31, 1869.

**Westminster Abbey**, dedicated to St. Peter, may be regarded pre-eminently as the national ch. of Eng.

(1) Its arch. runs back to an anc. period. The first ch. here of which, architecturally considered, we possess any accurate knowledge, was that built by Edward the Confessor, and consecrated Dec. 28, Holy Innocents' day, 1065. It was in the Norman style, cruciform in shape, and exceeding in magnificence any sacred building at that time in Eng. Henry III. rebuilt the greater part of the abbey ch. in the style denominated Early English; and it is his work we yet see in the transepts and the choir. When he erected the new choir and transepts, he transferred the high altar to the place it now occupies, and reared behind a lofty shrine, to which he removed the body of Edward the Confessor. That shrine, somewhat mutilated, still remains. The Norman nave was not removed until the middle of the 14th century, when the present nave and aisles were commenced in a style corresponding with the arch. of Henry III.'s abbey. The W. front and its grand window, as well as the completion of the nave and aisles, belong to the latter part of the 15th century. Henry VII. built the chapel which now bears his name, a charming specimen of the florid arch. of the period—i. e. Late Perpendicular—with richly moulded windows and elaborately groined and fretted roof. The extreme length of the whole is 511 ft., and the width across the transepts 238. The height of the roof is 102 ft. There were cloisters to the Norman abbey, but those which now afford such a pleasant shade on a hot summer's day were built in the 13th and 14th centuries. The chapter-house is an architectural gem, lately restored after long neglect. The exquisitely carved screen at the back of the altar was erected recently.

(2) W. is the place where the sovereigns of Eng. have been crowned ever since the Conquest. The coronation-stone brought from Scot. by Edward I. may still be seen under the coronation-chair used by Richard II. The funerals of the kings and queens have also taken place in the minster. The remains of Oliver Cromwell were for a time deposited in a vault under Henry VII.'s chapel. In the chapter-house the Commons met when that body became an assembly distinct from the Lords. The hist. of the abbey is interwoven



with that of the Eng. Ref. The abbey fell at the time of the dissolution of the monasteries, and the abbot was succeeded by a dean. In Queen Mary's time the abbey was restored, but after Elizabeth's accession the present institution of dean and chapter was established. Convocations were transferred to W. in the time of Henry VIII. That which acknowledged the royal supremacy was held here. In the time of Elizabeth the bps. met in Henry VII.'s chapel. In Charles I.'s reign both houses were gathered together under its beautiful roof to hear a speech from Abp. Laud. In the Jerusalem chamber we find the bps. debating the final alterations made in the Book of Common Prayer in 1662; and afterward some of the most exciting scenes connected with the hist. of Convocation in the reigns of William III. and Anne occurred in the chamber itself, or in that part of the abbey where the lower house had been convened.

(3) The tombs and monuments in the abbey are exceedingly numerous. Sovereigns and members of royal families have graves and tombs in the chapels of Edward the Confessor and Henry VII. Edward himself slumbers under the shrine which bears his name. On the N. side Henry III. sleeps, and next him Edward I. On the S. side lie Edward III. and Richard II., and to the E. Henry V. In the midst of Henry VII.'s chapel the founder and his wife repose side by side; at the W. end is the sepulchre of Edward VI. In the N. aisle are Queen Elizabeth and her sister Mary; in the opposite aisle is Mary Queen of Scots. Close to the tomb of Henry VII. we meet with the grave of King James; Charles II. is buried at the E. end of the N. aisle. His grave is unmarked; so is that of William III. Queen Anne was laid next her sister Mary in the S. aisle. George II. was the last of the kings interred in the abbey. The interment was in Henry's chapel. The N. transept is distinguished as the resting-place of eminent statesmen—Pitt, Fox, Wilberforce, Canning, Peel, Palmerston. The S. transept is marked by the world-known "Poets' Corner." Here lie Chaucer, Spenser, Beaumont, Ben Johnson, Cowley, Dryden, Addison; also hard by are monuments to Shakespeare, Milton, Isaac Watts, Goldsmith, and Johnson. Numbers of gens., admirals, courtiers, divines, men of letters, and other distinguished personages are covered by the marble pavement. Two slabs on the central floor of the nave, lately inserted, mark the last home of George Stephenson and David Livingstone. [From orig. art. in *J.'s Univ. Cyc.*, by JOHN STOUTON, D.D., LL.D.]

**Westminster Assembly.** This Assembly has exercised a lasting influence on the development of Amer. as well of Brit. Presbyterianism, and its symbolical books are still regarded with veneration by almost all Eng.-speaking Presb. chs. throughout the world. It was summoned by ordinance of the 2 houses of the Eng. Parl. The Assembly, as originally constituted by the ordinance, consisted of 121 divines and of 30 lay assessors, of whom 10 were peers and 20 commoners. The purposes for which the Assembly was convoked were to vindicate the doctrine of the Ch. of Eng. from all calumnies and false aspersions, and to recommend further reformation of her discipline, liturgy, and govt. But when the Parl. acceded to the Solemn League and Covenant and urged the Scotch to send deputies to the Assembly, its objects were extended; and to promote the covenanted uniformity it was empowered to prepare a new confession of faith and catechism, as well as directories for public worship and ch. govt. which might be adopted by the chs. of the 3 kingdoms.

It was on Saturday, July 1, 1643, that the divines met in Westminster Abbey; the Assembly was constituted in the chapel of Henry VII., in which, only 3 yrs. before, Laud's unfortunate convocation had been held. On the names being read over, it was found that "threescore and nine" had obeyed the summons of the Parl. The most of the divines came not in canonicals, "but in black coat or cloak and bands, in imitation of the foreign Prots." The meetings continued to be held in the chapel of Henry VII. till after the arrival of the Scot. coms., and were chiefly occupied with the revision of the first 15 of the Eng. Articles. Soon after, the Covenant was subscribed by the Assembly and the House of Commons, and the last remaining royalist was expelled for opposing it, and for revealing the proceedings to Usher, then in the king's quarters at Ox. The Assembly was now authorized by the houses to treat of the questions of ch. govt. and worship; and about the same time it removed from Henry VII.'s chapel to the Jerusalem chamber, which since that time has generally been the meeting-place of the Upper House of Convocation.

The debates on the subject of ch. govt. were keen and protracted, and unexpected obstacles arose which for a time retarded a settlement. Several learned divines who were cordially on the side of the Parl. were inclined toward what they termed primitive episcopacy, under which the presbyters and their pres. governed the chs. in common. The Scotch coms. and their more thorough-going associates, the Puritans of the school of Cartwright, had for the sake of union occasionally to forego the claim of a *jus divinum* for the details of their polity. The Independents, though fewer than either of the other parties, proved more unyielding, and in the end resolved rather to seek for toleration outside the national Ch. than for comprehension within it if it were not to be constituted more in accordance with their system than the majority of the Assembly were willing to allow. It was therefore agreed to lay aside the discussion of these topics for a time, and proceed to take up subjects on which there was likely to be greater harmony.

The subjects on which least disagreement was expected were those relating to the form of public worship and the statement of doctrines. Early in 1644 the Assembly remitted each of these to a small committee to prepare materials for the decision of them, and to bring these first before the large committees, and then before the Assembly. In this way the *Directory for Public Worship* was prepared in 1644, considerable progress was made with a practical

*Directory for Ch. Govt.* in 1644-45, though the printing of it was delayed till 1647, and in 1645-46 the *Confession of Faith* was elaborated, and finally put into the shape in which it is still printed in Scot. In the 2 following yrs. the Assembly elaborated the *Catechisms*, and prepared the Script. proofs for them as well as for the *Confession of Faith*. It spent part of the time also in attempting to complete its answers to the famous Erastian *Queries* of the House of Commons, and gave its sanction to certain papers in answer to the Independents, formally drawn up by its grand committee. These last appeared ultimately in the vol. entitled *The Grand Debate concerning Presbytery and Independency*. The former were never completed and pub., but it is said that the substance of them is given in the preface to the *Jus Regiminis Ecclesiasticum Divinum*, prepared by the Lond. ministers. After 1648 the Assembly occupied itself almost exclusively with the examination of those appointed to ecclesiastical charges or desiring license as expectants or probationers, and it was only occasionally that the full quorum of 40 could be brought together. The 1163d session was held Feb. 22, 1648-49. The subsequent sessions are not numbered, but the last of which an entry is made in the minutes took place on Mar. 25, 1652. The Assembly was not formally dissolved, but, as Fuller says, "It dwindled by degrees," and "vanished with the Parliament" which gave it birth. (See *Minutes of the Sessions of the Westminster Assembly of Divines*, edited by Alex. F. Mitchell and John Struthers.) [From orig. art. in *J.'s Univ. Cyc.*, by PROF. ALEX. F. MITCHELL, D. D.]

**Westminster Confession of Faith and Catechisms.** See WESTMINSTER STANDARDS.

**Westminster Hall** was originally built by William Rufus, but a new one arose in the reign of Richard II., when the old walls were raised higher, the windows enlarged, and a stately porch and noble roof of timber constructed. Parls. were held in anc. times within this vast apartment. The hall has been carefully restored and skillfully adapted as an immense vestibule to the Houses of Parl., which can be approached by spacious flights of steps at the S. end. It has been the scene of many stirring events. Here Sir William Wallace of Scot., Sir Thomas More, and the Protector Somerset were tried and condemned. King Charles I. here appeared before the High Court of Justice. Here the 7 bps. just before the Revolution were acquitted, Dr. Sacheverell and the rebel lords of '45 were convicted, and Warren Hastings passed through that ordeal which has been rendered so famous by the eloquence of Burke and Sheridan. Here Oliver Cromwell was inaugurated as Lord Protector of Eng. Nor can some now living forget how in their youth, at the coronation of George IV., W. H. witnessed a coronation banquet, and at the same time the challenge of the king's champion on horseback in complete armor. W. H. was long the centre of the Eng. law courts; abutting on it were the court of chancery, the court of king's or queen's bench, the court of common pleas, and the court of exchequer. Originally they were held within the hall, in parts partitioned off for the purpose. These law courts were constructed outside, with entrances into them leading out of the hall.

**Westminster Palace**, a name originating with the anc. royal residence close to Westminster Abbey, and still applied to the group of buildings used for the meetings of Parl. and other state purposes.

(1) A palace was built on what had been called Thorney Isle by Edward the Confessor. Documentary evidence is preserved of the progress of domestic architectural works during the reigns of Henry II., Richard I., John, Henry III., Edward I., Edward II., Edward III., and Henry VI. The palace was partly burned in the yr. 1293, and was also damaged by insurgents in 1369. Henry VIII. erected a new palace at York Place and St. James, in the neighborhood, but at some distance from the old buildings occupied by his predecessors. Whitehall was the name given to the new palatial abode, and the former one, deserted by the royal family and household, came to be employed for public business. The Houses of Lords and Commons assembled within the old walls. In 1834 a terrible fire destroyed the whole pile. In 1840 the first stone of the new houses was laid.

(2) The new palace of W. occupies the site of the old one. It has 4 fronts. The E. or river front, which is the prin., presents a façade of 900 ft., divided into compartments, panelled with tracery and decorated with statuary and coats-of-arms. The other fronts are in the same style, and exhibit the same profusion of ornament. Three prin. towers crown the outspread edifice—the Royal Victoria tower, the central tower, and the clock tower. The first is 340, the second 300, and the third 320 ft. in height. The present chambers occupied by the 2 houses are richly decorated, and all the appurtenances are of a harmonious description. The royal entrance, the royal gallery, the central hall, the passages, and the libraries are all on a scale of the greatest magnificence, and wherever it is appropriate the walls are adorned with statues and frescoes.

**Westminster School**, as it now exists, was founded by Queen Elizabeth in 1560. The establishment is called St. Peter's Coll., consisting of the dean of Westminster, 12 prebendaries, 12 almsmen, and 40 scholars, with a master and usher. But to the 40 royal scholars many more have since been added, and the masters have multiplied on a corresponding scale. The boys on the foundation, however, used to be separated from the rest by a bar or curtain. The school-room was a dormitory of the abbey, and the coll. hall was the abbot's refectory, built by Abbot Littleton under Edward III. The dormitory was built by the earl of Burlington in 1732. According to an old custom, the boys at Christmas still perform one of Terence's plays, with a prologue and epilogue written for the occasion and suited to the times.

**Westminster Standards.** Under this title are sometimes comprehended all ch. books drawn up by the Westminster Assembly, at others only those relating to doctrine.



(1) *Confession of Faith*.—A committee was appointed by the Assembly "to prepare matter for a joint confession of faith" as early as Aug. 20, 1644. But the digesting of the matter into a formal "draught" was, on May 12, 1645, intrusted to a small committee. On July 7, 1645, Dr. Temple "made report of that part of the Confession of Faith touching the Scriptures," and it was read and debated. The following day Messrs. Reynolds, Herle, and Newcome were appointed a committee to "take care of the wording of the Confession," as its articles should be voted in the several sessions. On July 16 report was made from the committee of the heads of the Confession, and these were distributed among the 3 large committees of the Assembly, to be by them elaborated and prepared for more formal discussion. All were repeatedly read and debated, paragraph by paragraph, and sometimes word by word, in the Assembly. On Sept. 25, 1646, the first 19 chapters, and on Dec. 4 of that yr. the whole Confession, were finally passed, and then presented to the Houses of Lords and Commons. In 1647 the Confession was approved by the Ch. of Scot. in the form in which it had passed the Assembly, and it was subsequently ratified by the Scot. Parl. In 1648, under the title of "Articles of Christian Religion," it was passed by the Eng. Parl.

*Sources and Character of the Confession*.—It has been maintained that the Assembly's Confession was derived mainly from foreign sources. But there is conclusive evidence that in its general plan, and in the tenor and very words of its more important articles, it was derived not from foreign but from native sources. It may confidently be traced up to those confessedly Calvinistic or Augustinian Articles which are supposed to have been prepared by Usher, and in 1615 were adopted by the convocation of the Irish Ch. The Confession, under the title of *The Humble Advice of the Assembly of Divines now by authority of Parl. sitting at Westminster concerning a Confession of Faith*, etc., was printed at Lond. in Dec. 1646, without proofs, and in May 1647 with proofs, for the use of the Houses of Parl. and the Assembly.

(2) *Catechisms*.—On Jan. 14, 1646-47, "upon a motion made by Mr. Vines, it was ordered, That the committee for the Catechism do prepare a draught of two catechisms, one more large, and another more brief, in which they are to have an eye to the Confession of Faith and to the matter of the Catechism already begun." The Larger Catechism was first proceeded with. This appears distinctly from the minutes of the Assembly, though the opposite view is still sometimes maintained. It may be admitted that the Shorter one at times embodies more of the materials of the original Catechism, and seems to be less directly drawn from the Confession of Faith, but it was not cast into its present shape till after the Larger one was completed.

(3) *Directory of Public Worship*.—This occupied the attention of the Assembly during the greater part of 1644, and received the sanction of the Eng. houses of Parl. on Jan. 3, 1644-45, though one or two alterations were made in Mar. following to meet the views of the Scotch. It was approved by the Scotch General Assembly and Parl. in Feb. 1645, with one reservation. The first Eng. ed. bears the date of 1644, but was really pub. in what, according to our reckoning, would be Mar. 1645. The first Scotch ed. bears the date of 1645. From the preface, as well as from the testimony of those engaged in framing it, we may clearly infer that the Directory was not intended to form a new liturgy. The meaning of its framers only was that there might be "a consent of all the chs. in those things that contain the substance of the service and worship of God."

(4) *Church Government and Discipline*.—Two treatises on these subjects proceeded from the W. A. The former was entitled by its framers *Propositions concerning Ch. Govt.*, but it is now generally known as the *Form of Ch. Govt.*, and under this title it is still printed, along with Scotch eds. of the Confession of Faith. The greater part of it had been drawn up before Feb. 1645. To a large extent it was adopted by the Eng. Parl. in 1648 in their "Ordinance as to the Form of Ch. Govt." It was printed in Scot. in 1647, and reprinted, along with Henderson's *Form and Order of the Govt. of the Ch. of Scot.*, in 1690, and use was made of it in drawing up the *Form of Process* in the Ch. of Scot. in 1707. [From *orig. art. in J.'s Univ. Cyc.*, by PROF. ALEX. F. MITCHELL, D. D.]

**Westmoreland** (JOHN FANE), D. C. L., ELEVENTH EARL OF, and BARON BURGHESS, b. in Eng. Feb. 3, 1784, entered the army 1803; participated in the passage of the Dardanelles by Admiral Duckworth 1806, and in the storming of Rosetta, Egypt, 1807; joined the army in the Peninsula 1808; was at the battles of Vimeira and Talavera; served as aide-de-camp to Wellington and as military com. to the head-quarters of the allies Sept. 1813; took part in the invasion of Fr. 1814; was minister at Florence Aug. 1814; served in the campaign against Naples 1815; became privy councillor 1822, minister at Berlin 1841, and at Vienna 1851; was raised to the full rank of gen. 1854, and was special plenipotentiary at the Cong. of Vienna for the consideration of the "Eastern question," 1855. D. Oct. 16, 1859.

**Westmoreland** (RALPH NEVILLE), FIRST EARL OF, b. in Eng. about the middle of the 14th century, was an able military commander and a shrewd politician, displaying great dexterity in maintaining himself in power in a time of frequent revolutions; promoted the downfall of the duke of Gloucester, and was created earl by Richard II. 1397; joined Henry of Lancaster (Henry IV.) July 1399, and was by him made earl-marshal of Eng. and gov. of Tower of Lond.; captor of Mowbray, earl of Nottingham, and Scrope, abb. of York, May 1405. D. Oct. 21, 1425.

**West New Brighton**, Richmond co., N. Y., on the S. side of Kill Van Kull, opposite Bergen Point, N. J., contains extensive dyeing works. Pop. 1880, 2276.

**West Newton**, on R. R., Middlesex co., Mass., is a part of the city of Newton.

**West Newton**, Pa. See APPENDIX.

**Weston**, W. Va. See APPENDIX.

**Weston** (HENRY GRIGGS), D. D., b. in Lynn, Mass., Sept.

11, 1820, grad. at Brown Univ. in 1840, and at Newton Theological Sem. in 1843; was ordained to the ministry in the Bap. denomination in 1844, and was pastor of the Bap. ch. in Peoria, Ill., 1844-50; pastor of the Oliver st. Bap. ch., New York, 1850-62, of Madison Avenue ch. 1862-68, when he was elected pres. of Crozer Theological Sem., near Phila., which position he still holds. He was an ed. of religious newspapers and of the *Bap. Review* for several yrs.; has pub. monograph commentaries on some of the Gospels and other parts of the Scripts., and has revised the Revised N. T., putting changes adopted by the Amer. revisers in the text for Amer. Bap. Publication Society.

**Weston** (STEPHEN), b. at Exeter, Eng. in 1747, ed. at Eton and at Exeter Coll., Ox., of which he became a fellow; took orders in the Ch. of Eng., and held the livings of Mamhead (1777-90) and Little Hempston, Devonshire (1786-90), after which he devoted himself to travels on the Continent and to lit., being noted as a classical and Oriental scholar. He pub. *Specimen of a Chl. Dict.*, etc. D. Jan. 8, 1830.

**West Plains**, Mo. See APPENDIX.

**West Point**, city, on R. R. and Chattahoochee River, Troup co., Ga. Pop. 1870, 1405; 1880, 1713.

**West Point**, cap. of Clay co., Miss., on R. R., has 2 colls. Prin. business outside of v., cotton-growing. Pop. 1880, 1786.

**West Point**, on R. R., cap. of Cuming co., Neb. Pop. 530.

**West Point**, a military post and the seat of the U. S. Military Acad., is on the W. bank of the Hudson River, between the towns of Highlands and Cornwall, Orange co., N. Y., 52 m. from New York and 94 m. from Albany.

The U. S. Military Acad. was founded by act of Mar. 16, 1802, constituting the corps of engineers of the army a military acad., with 50 students or cadets, who were to receive instruction under the senior engineer officer as supt. Later acts established professorships of math., engineering, philos., etc., and made the acad. a military body, subject to the rules and articles of war. In 1815 a permanent supt. was appointed, and a yr. later an annual board of visitors was provided for, to be of war. In 1843 the present system of the appointment of cadets was instituted, which assigns 1 cadet to each Congressional dist. and Terr. in the Union, to be named by the rep. in Cong. for the time being, and 10 appointments at large, specially conferred by the Pres. of the U. S. The number of students is thus limited to 312. A large proportion of those appointed fail to pass the examination, and many others to complete the course, the proportion being stated at fully 1/4 hitherto. The course of instruction requires 4 yrs., and is largely mathematical and professional. The discipline is very strict, even more so than in the army, and the enforcement of penalties for offences is inflexible rather than severe. Appointees to the Military Acad. must be between 17 and 22 yrs. of age, at least 5 ft. in height and free from infirmity, and able to pass a careful examination in various branches of knowledge. Each cadet admitted must bind himself to serve the U. S. 8 yrs. from the time of admission to the Acad. The pay of cadets, formerly \$50 per month and rations, was fixed at \$540 per year, with no allowance for rations by the act of 1876. The Acad. is situated on a level plateau 160 ft. above the river, flanked on the W. by rocky heights, of which that on which stand the ruins of Ft. Putnam is the nearest and most prominent. On the S. the heights approach the river, leaving only room for a road southward, leading to the village of Highland Falls and to Fts. Montgomery and Clinton. The prin. buildings of the Acad. are at the S. end of the plateau; the quarters of the officers and profs. are on the W. side and along the roads leading southward and westward. On the same side of the river, 1 1/2 m. S. of the Point, is the village of Highland Falls, and 4 1/2 m. farther S., on Popolopen's Creek, are the ruins of Fts. Montgomery and Clinton; 6 m. still farther S. is the memorable Stony Point. E. of W. P., on the opposite bank, is a high, narrow, nearly level plain, from which there is a gradual rise to the hills beyond. Near the S. end of this plain, about 2 m. below the Point, still stands the Robinson House, Arnold's head-quarters. Just beyond is Sugar-loaf Hill, and farther S., projecting into the river, Anthony's Nose; 1 m. S. of the Nose was Ft. Independence. Verplanck's Point is nearly opposite Stony Point, with which it is connected by King's Ferry.

The govt. tract of land at W. P. contains about 2100 acres, most of which was purchased in 1790 from the son of one of the original patentees; the rest was purchased in 1824. Jurisdiction was ceded by N. Y. to the U. S. over a part of the tract in 1826, and over the remainder in 1875.

In the war of the Revolution, to obtain control of the navigation of the Hudson, which gave very important communication from New York to Canada and W. N. Y., and thereby separate the E. part of N. Y. and all N. Eng. from the rest of the colonies, was a favorite project of the Brit. [From *orig. art. in J.'s Univ. Cyc.*, by PROF. G. L. ANDREWS.]

**Westport**, Conn. See APPENDIX.

**West Randolph**, on R. R., Orange co., Vt., 25 m. S. of Montpelier, has acad. and normal school. Pop. 1880, 1069.

**West Troy**, Albany co., N. Y., on R. R. and Hudson River, opposite Troy, with which it is connected by an iron bridge and 2 steam-ferris, 6 m. N. of Albany. It is at one of the entrances of the Erie and Champlain canals into the Hudson, at the head of navigation, and connected by river and canals with Lakes Erie, Ontario, and Champlain. It is wholly built on the bottom-lands of the Hudson, extending on back nearly 1 m. from the river to a slight elevation, which are situated some of the most beautiful residences in the town. Its prin. business is in lumber. Its citizens are also extensively engaged in various manufactures. The Watervliet U. S. arsenal and grounds are situated here. Pop. 1870, 10,693; 1880, 8820.

**West Union**, city, on R. R., cap. of Fayette co., Iowa. Pop. 1870, 1489; 1880, 1551.

**Westville**, Conn. See APPENDIX.



**West Virginia**, one of the central States of the American Union, set off from Va. in 1863, lies between 77° 40' and 82° 35' W. lon., and 37° 6' and 40° 40' N. lat. It is bounded on the N. W. by O., on the N., N. E., and E. N. E. by Pa. and Md., on the E. S. E., and S. by Va., and on the S. W. by Va. and Ky. Its area is 24,780 square miles or 15,859,200 acres.

**Topography.**—The counties which are situated on the Potomac River form a part of the Shenandoah Valley or Valley of Va., somewhat elevated, but very fertile. W. of these, Hampshire, Morgan, Mineral, Grant, Hardy, and Pendleton cos. form portions of the "Appalachian Country." They consist of high mt. ridges, with narrow but fertile valleys between, sloping to the N. E., and belonging strictly to the Potomac River system. W. of these lies what the W. V. geologists call "the Mountain Region," forming the W. ridges of the Appalachian chain, the mts. lying in nearly parallel folds, capped originally with a hard sandstone, but having softer and more easily eroded rocks beneath. From the W. border of this Mountain Region stretches to the O. a much wider tract, called by the geologists "the Hilly Region," though some of its summits are higher than many in the Mountain Region. In this region the streams flow from E. to W., and carry their waters directly to the O. There are no considerable lakes in W. V.

**Mineralogy.**—The Appalachian coal-field covers 16,000 sq. m. in the State. The river-bottoms are generally diluvial or alluvial, but high up the steep cliffs and cañons which line their banks the coal in bands of from 8 to 16 ft. in thickness crops out. This Appalachian coal-field forms an immense basin, of which W. V. comprises more than half the breadth. In this basin (and within the limits of W. V.) are found every one of the coal deposits except anthracite lying between the conglomerate which underlies the lower coal-measures, and the Permian rocks which cap the upper coal-measures. Among these are every quality of cannel, splint, coking, block, and bituminous coals yet discovered, and all of them in thick and easily worked veins. Throughout this whole region iron ores, red and brown hematite, black manganese carbonates, black band, red and brown oxides, protocarbonate or Olyphant blue lump, and other ores abound in veins easily worked. Salt also, a usual deposit in the coal-measures, is found here in springs of great strength and purity of brine. Petroleum, both the light and heavy oils, is largely produced in the State. Common tufa, hydraulic, and building limestones of great beauty, and other building-stones, especially the Mahoning sandstone, a beautiful gray and fine sand or free stone, fire-clay, potter's clay, glass-sand, ochre, barytes, black oxide of manganese, saltpetre, are found abundantly, and zinc, copper, and lead in moderate but not profitable working quantities. The mineral springs of W. V. comprise sulphur waters of differing composition, chalybeates simple and compound, acidulous or carbonated, saline and aluminated chalybeates. Several of them are thermal waters, the highest having a temperature of about 107° F.

**Soil, Vegetation, and Botany.**—The soils of the State may be classed as *clay soils*, not very productive, found in limited areas in the E. and S. portions of the State; *sandy soils*, not productive, and occurring mainly in the N. E. mt.-cos.; *loams*, very productive and often enriched by the disintegration of the shales or limestones which crop out from the surface; *calcareous soils*, excellent soils, found on the mt.-slopes and in some of the higher valleys; *stream and upland alluviums*, possess wonderful fertility and yield immense crops or the most gigantic trees. The prin. forest trees are the white, black or water, blue, green, and mt.-ash; the aspen, beech, water-beech, black and red birch, fetid and sweet buckeye; cedar, wild-cherry, chestnut, Ky. coffee tree, cottonwood, cucumber tree, dogwood, negundo or box elder, red or slippery, white, and witch elm; black and S. balsam, fir, and the hemlock spruce; the black or sour gum and the sweet gum or liquid-amber; 3 species of hickory; the white, red, and bitter nut; the holly, hackberry, and ironwood or hop-hornbeam; the red, green, white, and honey locust; the linden; the sugar, silver, and red maple; red mulberry; 12 species of oak, 3 of pine; the poplar or tulip tree; the red-bud, the sassafras, sourwood, and sycamore; black walnut and butternut; the mt. and smooth alder; crab-apple, chinquapin, elder, persimmon, magnolia, haw, mt.-laurel, rhododendron, shadbush, spice-wood, all species of sumach, and the bush or shrub willows and osiers. W. V. has about 9,000,000 acres of forest.

**Zoology.**—The wild animals include the panther, wild-cat, lynx, wolf, black bear, raccoon, opossum, ground-hog, etc.; the elk, deer, rabbit, and hare; squirrels of several species, and the smaller rodents; the beaver, mink, and muskrat, weasel, skunk, etc.; and among game-birds the wild turkey, 2 or 3 species of grouse, snipe, woodcock, etc.

**Climate.**—The mean annual temperature is 52.46°. The

warm season is long, but the heat is not intense. Average annual rainfall—Lewisburg (lat. 37° 50', lon. 80° 27', elevation about 2234 ft.), 35.75 inches; Kanawha Salines (lat. 38° 16', lon. 81° 33', elevation about 570 ft.), 55.84 inches.

**Agricultural Productions.**—The prin. crops are Indian corn, wheat, and oats. The census of 1880 returned 14,090,609 bushels of corn, 4,001,711 bushels of wheat, 1,908,505 bushels of oats, 285,298 bushels of buckwheat, 113,181 bushels of rye, and 9740 of barley. The yield of tobacco was 2,296,146 lbs., raised on 4071 acres, and val-

ued at \$710,374. The wool clip of 1880 was 2,681,444 lbs.

**Farm Animals.**—By census of 1880, 126,143 horses, 6226 mules and asses, 458,444 cattle, 674,769 sheep, and 510,613 swine.

**Manufactures.**—The census of 1880 showed 2375 manufacturing establishments, with \$13,883,300 capital, employing 14,311 hands; wages, \$4,313,963; aggregate products, \$22,887,126. The iron and steel industry is the prin. its total product in 1880 being \$6,054,032. The salt manufacture is an important industry, employing 11 establishments and \$1,909,500 capital, and producing about 3,000,000 bushels of salt. Coal mined in 1881, 1,500,000 tons, all bituminous.

**Railroads.**—There were in operation, Jan. 1, 1882, 712 m. of R. R. in W. V., costing \$12,563,945, with net earnings of \$143,524, paying in interest on bonds, etc., \$216,050. Two of these are great trunk lines, the Baltimore and O. having, with its branches, 342 m. in W. V., and the Chesapeake and O. 214 m.

**Finances.**—The assessed value of property for taxation, 1881, was—real estate, \$105,448,502; personal, \$37,429,131. Rate of State tax, 1882, 30 cents on \$100, producing about \$6,000,000. There is no State debt, the State const. prohibiting it. The aggregate of co. and municipal debts in 1880 was \$1,513,424. Total raised by taxation, State and local, in 1880, \$2,056,979.

**Population.**—In 1860, 376,688; 1870, 442,014; 1880, 618,457 (white 592,537, colored 25,920, including 5 Chl., 29 Indians).

**Principal Cities and Towns, Pop. 1880.**—Wheeling, 30,737; Parkersburg, 6582; Martinsburg, 6335; Charleston (cap.), 4192; Huntington, 3174; Grafton, 3030; Clarksburg, 2307.

COUNTIES.	*Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
Barbour.....	4-E	10,312	11,870	Philippi.....	dist. 2,009
Berkeley.....	3-G	14,900	17,380	Martinsburg.....	6,335
Boone.....	5-C	4,553	5,824	Madison.....	.....
Braxton.....	4-D	6,480	9,757	Braxton C. H.....	273
Brooke.....	2-D	5,484	6,012	Wellsville.....	1,515
Cabell.....	5-B	6,439	13,744	Barbourville.....	261
Calhoun.....	4-D	2,938	6,072	Grantsville.....	112
Clay.....	5-C	2,196	3,460	Clay C. H.....	.....
Doddridge.....	3-D	7,076	10,552	West Union.....	356
Fayette.....	6-C	6,547	11,360	Fayetteville.....	286
Glinner.....	4-D	4,338	7,108	Glenville.....	236
Grant.....	4-F	4,467	5,542	Petersburg.....	968
Greenbrier.....	5-D	11,417	15,060	Lewisburg.....	985
Hampshire.....	3-F	7,543	10,386	Romney.....	311
Hancock.....	1-D	4,363	4,882	Fairview.....	558
Hardy.....	4-F	5,518	6,794	Moorefield.....	584
Harrison.....	3-D	16,714	20,181	Clarksburg.....	2,307
Jackson.....	4-C	10,300	16,312	Jackson C. H.....	425
Jefferson.....	3-G	12,219	15,005	Charlestown.....	2,016
Kanawha.....	5-C	22,349	32,466	Charleston.....	4,129
Lewis.....	4-D	10,175	12,269	Weston.....	1,516
Lincoln.....	5-B	5,053	8,739	Hamlin.....	.....
Logan.....	6-B	5,124	7,329	Logan C. H.....	dist. 1,769
Marion.....	3-E	12,107	17,198	Fairmont.....	900
Marshall.....	3-D	14,941	18,267	Moundsville.....	1,774
Mason.....	4-B	15,978	22,292	Point Pleasant.....	1,038
McDowell.....	6-C	1,952	3,074	Peerysville.....	.....
Mercer.....	6-D	7,064	7,467	Princeton.....	.....
Mineral.....	3-F	6,332	8,630	Keyser.....	1,693
Monongalia.....	3-D	15,547	14,985	Morgantown.....	745
Monroe.....	6-D	11,124	11,501	Union.....	372
Morgan.....	3-G	4,315	5,777	Berkeley Springs.....	534
Nicholas.....	5-D	4,488	7,223	Nicholas C. H.....	165
Ohio.....	2-D	28,831	37,457	Wheeling.....	20,737
Pendleton.....	6-E	8,455	9,022	Franklin.....	83
Pleasants.....	3-C	5,012	6,236	Saint Marys.....	350
Pocahontas.....	5-E	4,069	5,591	Huntersville.....	dist. 975
Preston.....	3-E	14,555	19,091	Kingwood.....	365
Putnam.....	4-C	7,794	11,372	Winfield.....	305
Raleigh.....	3-E	6,613	7,267	Raleigh C. H.....	144
Randolph.....	4-E	8,583	9,102	Beverly.....	235
Ritchie.....	4-C	9,055	18,474	Ritchie C. H.....	221
Roane.....	4-C	7,232	12,134	Spencer.....	296
Summers.....	6-D	.....	9,033	Hinton.....	879
Taylor.....	3-E	9,647	11,455	Grafton.....	1,150
Tucker.....	4-E	1,307	2,151	Saint George.....	290
Tyler.....	3-D	7,832	11,073	Middlebourne.....	241
Upshur.....	4-E	8,023	10,249	Buckhannon.....	761
Wayne.....	5-B	7,852	14,739	Wayne C. H.....	292
Webster.....	5-D	1,730	3,207	Webster C. H.....	120
Wetzel.....	4-D	8,595	16,598	New Martinsville.....	173
Wirt.....	4-C	4,304	7,104	Elizabeth.....	395
Wood.....	3-C	19,000	25,006	Parkersburg.....	6,532
Wyoming.....	6-C	3,171	4,322	Oceana.....	107
Total.....		442,014	618,457		

\* Reference for location of counties. See map of West Virginia in article VIRGINIA.



**Commerce.**—The shipping of W. V. in 1882 comprised 144 steam vessels, of 17,330 tons. The local commerce by river and R. R. is very large; no statistics exist of its amount.

**Banks, Etc.**—There were, in 1882, 17 national banks, with \$1,736,000 capital, \$1,387,310 circulation; U. S. bonds to deposits. There were also 16 State banks and trust cos., with \$1,158,983 capital and \$3,313,510 deposits, and 3 private bankers, with \$992,892 deposits. There were 3 insurance cos. in 1881. Losses by fire paid same yr., \$230,900.

**Education, Etc.**—The number of children of school age (6-21 yrs.) in 1880 was 310,113, of whom 143,796 were enrolled in public schools, with average daily attendance of 92,132. Total expenditure for public schools, 1880, \$720,967, of which \$527,099 was for the salaries of 4156 teachers. Number of school-houses, 3654. In 1882 W. V. had 95 newspapers, 4 of them daily.

**Churches.**—The M. E. leads, with 430 chs., 157 ministers, and 36,163 members; the Baps. have 350 chs., 205 ministers, and 25,000 members; United Brethren, 108 chs. and 8000 members; about 20 other denominations have from 2 to 100 chs. each.

**History.**—W. V. formed the W. and N. W. portion of the commonwealth of Va. until the latter seceded from the Union in 1861. In June 1861 delegates assembled from Wheeling from 89 of the W. cos. to protest against the secession ordinance and to form a provisional govt. Another convention met in Aug. 1861 and ordered an election in Oct. of that yr. to decide upon the question of organizing a new State embracing these 89 cos. Their vote was substantially unanimous, and a const. was prepared and ratified by the people in May 1862. W. V. came into the Union June 20, 1863. The energies of the State immediately manifested themselves. The young State sent 26,540 men to the Union armies. In Jan. 1869 the cos. of Jefferson and Berkeley, lying on the Potomac, were added to the State, which had previously consisted of 50 cos.

#### Governors.

Arthur J. Boreman..... 1863-69 Jacob B. Jackson..... 1881-85  
William E. Stevenson..... 1869-71 E. Willis Wilson..... 1885-89  
John J. Jacob..... 1871-77  
Henry M. Mathews..... 1877-81

REVISED BY A. R. SPOFFORD.

**West Winsted**, on R. R., Litchfield co., Conn., included in Winsted, of which the pop. in 1880 was 1805.

**Wetmore** (PROSPER MONTGOMERY), b. at Stratford, Conn., Feb. 14, 1798, removed in childhood to New York; became a merchant; pub. a vol. of poems 1830; was chosen a regent of the Univ. of New York 1833; was a member of the legislature and chairman of the committee on coils and acads. 1834-35; was pres. and a prominent supporter of the Amer. Art Union, a member of the New York Chamber of Commerce, a director of the inst. for the deaf and dumb, an active member of the New York Historical Society, and many yrs. paymaster-gen. of the State militia. In 1847 he pub. *Observations on the Origin and Conduct of the War with Mex.* D. Mar. 16, 1876.

**Wette**, de (WILHELM M. LEBERCHT). See DE WETTE.

**Wet'er**, the second largest lake of Swe., is 80 m. long, 13 m. broad, and covers an area of 850 sq. m. It is 275 ft. above the sea, and sends its surplus water to the Baltic through the Motala.

**Weyler's Cave**, a stalactitic cavern in the N. E. part of Augusta co., Va., in a low spur of the Blue Ridge Mts., contains several beautiful apartments.

**Whale**, hval [A.-S. *hwæl*], a name given to large Cetaceans, representing several different families, and even different sub-orders. The only character shared in common by them, independent of those characteristic of the order, is the large size.

**Whalebone Whales**, whales distinguished by the possession of whalebone. This substance is appecular epidermal development arising from each side of the median line of the roof of the mouth, and may be looked upon as modified hair. Teeth are existent in a rudimentary condition in the fetus, but are not functionally developed, and are absorbed and disappear before birth. In external appearance the animals are pisciform, and are distinguished from the toothed whales chiefly in that the head is more depressed above toward the margin of the jaw, the eyes situated nearly above the angle of the mouth, and the lower jaw and throat more bag-like. The forms thus combined exhibit 2 primary modifications of structure: (1) The typical W. W. (Balænidæ). (2) The finback, humpback, and scrogg whales (Balænopteriðæ).

To the family Balænidæ belongs the bowhead or Greenland whale, and several distantly related species inhabiting warmer and Antarctic waters. The bowhead is the most valuable of all the whales in a commercial point of view, and is the species especially hunted by the whalers fitted out for the Arctic seas. It is the stoutest of known species; its head forms about  $\frac{1}{4}$  of the animal's entire length. Individuals occasionally reach a length of 60 or 70 ft., although not often found much exceeding 50. In proportion to its size, it is the richest in oil-giving characters; individuals have been known to yield nearly 300 barrels. Its whalebone, which is of a black color, and developed in strips gradually attenuated toward the end, is also the most esteemed of any, and 3500 lbs. or more have been obtained from a single individual. It is a timid animal. The species is now sought for chiefly in Bering Sea and in the Arctic Ocean N. of it.

**Whale Fishery**, an old and, at one time, a flourishing industry. The increasing scarcity of the animal, however, and the extensive use of gas and mineral oils, have now made it less remunerative, and caused it to be abandoned by nations which formerly pursued it as one of the prin. branches of their trade; the U. S. is the only nation which still carries it on with vigor. As early as the 13th century there existed a W. F. in the Biscayan Sea, and in the 13th

and 14th centuries it became of considerable importance; but it was a smaller species of whale which was caught here, and in the 15th and 16th centuries this animal became extinct or left the grounds, and the industry died out. By the Dutch explorations of the N. seas in the latter part of the 16th century extensive whaling-grounds were discovered near Spitzbergen. Soon, however, the whales were driven off, and betook themselves to the coasts of Greenland. The Eng. never developed this trade to any high degree of prosperity, and they are now abandoning it. The first fishery was prosecuted by boats from the shore. In the first part of the 18th century, however, the whales had been driven off, and vessels were now fitted out for their pursuit from Nantucket, Cape Cod, Martha's Vineyard, New Bedford, etc.

**Whale-Louse**, a popular name for the sessile-eyed crustaceans of the genus *Cymon*, parasitic organisms which infest the whales, the mackerels, etc. They have the abdomen very small, and the head fused with the thorax.

**Whale Oil** [Ger. *Walbfischthran*], the liquid portion of the fat of the common whale, differing from that obtained from the *Physeter macrocephalus* (sperm oil) in possessing a darker color and more disagreeable odor. W. O. can be deodorized by agitation with chloride of lime.

**Wharton** (CHARLES HENRY), D. D., b. in St. Mary's co., Md., June 5, 1748, ed. at the Jesuit colls. at St. Omer and Bruges; became a tutor at Liege; was ordained priest 1772; officiated several yrs. as chaplain at Worcester, Eng.; returned to Md. 1783; professed himself a Prot., and printed a *Letter to the R. Caths. of the City of Worcester*; was pastor of Epis. chs. at Newcastle and Wilmington, Del., and rector of St. Mary's at Burlington, N. J., from 1798 until his death, July 22, 1838. Wrote *An Inquiry into the Proofs of the Divinity of Jesus Christ*, *A Concise View of the Prin. Points of Controversy between the Prot. and Rom. Chs.*, etc.

**Wharton** (FRANCIS), D. D., LL.D., son of Thomas L. b. at Phila. in 1820, grad. at Yale 1839; practised law many yrs. in Phila.; was prof. of logic and rhetoric in Kenyon Coll., O., 1856-63; was ordained in the P. E. Ch. as rector of St. Paul's, Brookline, Mass., 1863, and became prof. in the Cambridge (Epis.) Divinity School 1866. Wrote *A Treatise on the Criminal Law of the U. S.*, *State Trials of the U. S. during the Administrations of Washington and Adams*, *Precedents of Indictments and Pleas*, etc.

**Wharton** (HENRY), b. at Worstead, Norfolk, Eng., Nov. 9, 1604, grad. as senior wrangler at Caius Coll., Cambridge, 1634; was a favorite pupil of Newton; took orders in the Ch. of Eng. 1637; became chaplain to Abp. Sancroft Sept. 1688; was assistant to Dr. William Cave in the preparation of his *Scriptorum Ecclesiasticorum Historia Literaria*; was patronized by Abp. Tenison, who made him vicar of Minster Thane and rector of Chatham 1689. Wrote *A Treatise of the Celibacy of the Clergy*, *Anglia Sacra*, etc., and *A Defense of Pluralities*, etc. D. Mar. 5, 1695.

**Wharton** (PHILIP), DUKE OF Wharton, son of Thomas, the first marquis, b. in Dec. 1698, studied under a strict Calvinistic tutor at Geneva 1716, but ran away to Avignon, where he recognized the Pretender and received the title of duke of Northumberland; took a seat in the Irish House of Peers 1716; was made duke of Wharton in the Eng. peerage Jan. 28, 1718; entered the Brit. House of Lords 1720; distinguished himself against the ministry; soon impoverished himself by his extravagance; edited a paper, *The True Briton*, 1724; went to Vienna, and thence to Madrid, 1730; took service under the Pretender; was attainted of treason in England, and his property confiscated. D. May 31, 1731.

**Wharton** (THOMAS), D. C. L., MARQUIS OF Wharton, b. in Eng. about 1640, eldest son of Philip, fourth Baron Wharton; entered Parl. soon after the Restoration; took a prominent part in the opposition to Charles II.; was sent to the Tower for joining in the complaint against the long prorogation of Parl. Feb. 17, 1677; was one of the first to join the prince of Orange 1688; was appointed comptroller of the royal household and privy councillor Feb. 1699; was made chief-justice in eyre 1697; was com. to negotiate the union with Scot.; was lord lieut. of Ire. 1708-10, and had Addison for his sec., and became privy seal on the accession of George I., Sept. 1714, and marquis of Wharton and Malmesbury Feb. 15, 1715. D. Apr. 12, 1715.

**Wharton** (THOMAS, JR.), b. in Phila. in 1735, became a merchant; was pres. of Pa. 1777-78. D. May 33, 1778.

**White'ly** (RICHARD), D. D., b. in Lond., Eng., Feb. 1, 1787, grad. at Oriel Coll., Ox., 1808; became a fellow there 1811; took orders in the Ch. of Eng.; was intimately associated at Oriel with Keble, Arnold, Pusey, John Henry Newman, and others destined to become innovators in Brit. theol.; was noted for his wit, his freedom of thought and action, and fondness for debate; was Bampton lecturer 1822; rector of Halesworth, Sussex, 1822-25; prin. of St. Alban's Hall, Ox., 1825-30; prof. of political economy in the Univ. of Ox. 1830-31, and was appointed by Earl Grey abp. of Dublin 1831, in which capacity he was charged with the difficult task of carrying out, in the details of social, political, and religious life, the principles embodied in the recent R. Cath. Relief act. Among his numerous works are *Historic Doubts relative to Napoleon Bonaparte*, *View of the Script. Revelations concerning a Future State*, *Introductory Lessons on Chr. Evidences*, etc. D. Oct. 8, 1863.

**Wheat** [A.-S. *hwæte*], the most valuable and, next to maize, the most productive of all the cereal grasses, belongs to the genus *Triticum*, and is distinguished by a spike with many-flowered spikelets seated on opposite sides of a hollow and jointed stem, which rises zigzag and forms notches at each joint; by awned or awnless paleas; and by grains with a longitudinal furrow on one side, turgid on the other, and hairy at the top. It is not known in a wild state, but most botanists are inclined to believe that it had its home in the central parts of Asia. It was very early cultivated, and has formed the prin. breadstuff of all the civil-



ized nations since long before the historical era. The Bible and the Egyptian and the Chl. records testify to the antiquity of its cultivation. In proportionate altitude it may be cultivated very near the equator. The lowest mean temperature in which it will ripen is 57.2°.

**Wheat'ear**, or **Fallowchat**, the *Stavicola ananthe*, a European bird of the family Turdidae, allied to the chat, ranges from Afr. in winter to the N. of Europe in summer, is 6½ inches in length, generally colored ash-brown and buff, marked with white and black, and is easily trapped as a delicacy for the table. It feeds on worms and insects, and the male sings well in confinement.

**Wheat'land** (HENRY), M. D., b. at Salem, Mass., Jan. 11, 1812, grad. at Harvard 1832; studied med., but never practised; was an original member of the Amer. Association for the Advancement of Science; one of the founders of the Essex Nat. Hist. Society and of the Essex Inst.; is pres. of the latter body, v.-p. of the Peabody Acad. of Science, and director of the Salem Public Library, which has owed much of its prosperity to him.

**Wheat-Moths**. There are several lepidopterous insects which devour grain in the bin. Of these the best known is *Tinea granella*, an insect closely allied to the ordinary clothes-moth. Its larva devours the flour out of kernels of wheat, and covers the shells with its thick web. Thorough cleanliness, whitewashing, and the use of coal oil tend to prevent its ravages, and the grain should be frequently shovelled over.

**Wheat'on**, on R. R., cap. of Dupage co., Ill., 25 m. from Chicago, contains Wheaton Coll. Prin. business, farming and dairying. Pop. 1870, 998; 1880, 1160.

**Wheaton** (HENRY), LL.D., b. at Providence, R. I., Nov. 27, 1785, grad. at R. I. Coll. (now Brown University) 1802; studied law; was admitted to the bar 1805; spent 18 months at the law school at Poitiers, Fr., 1805-06; studied some months at Lond. 1807; practised law at Providence 1807-12; settled in New York in 1812; edited the *National Advocate*, the organ of the administration party 1812-15; became division judge-advocate of the army Oct. 26, 1814; was justice of the marine court of the city of New York May 1815-July 1819; reporter of the supreme court of the U. S. 1816-27; delegate to the convention for forming a new const. for N. Y. 1821; member of the N. Y. assembly 1823; was associated with Benj. F. Butler and John Duer in a commission for revising the statute law of N. Y. 1825; was U. S. *chargé d'affaires* to Den. 1825-37; was appointed minister resident at the court of Prus. 1835; was soon promoted to minister plenipotentiary 1837, filling that post until 1846; was chosen a corresponding member of the Fr. Inst. 1843, and a foreign member of the Royal Acad. of Science at Berlin 1846; signed an important treaty with Ger. (1844), which was rejected by the U. S. Senate for political reasons, but has served as the basis of later treaties, and was requested to resign in 1846 by Pres. Polk; on his return to the U. S. 1847, was chosen lecturer on international law at Harvard Univ. Author of *Reports of Cases Argued and Adjudged in the Supreme Court of the U. S. 1816-27*, *A Hist. of the Northmen, or Danes and Normans, from the Earliest Times to the Conquest of Eng. by William of Normandy*, *A Hist. of the Law of Nations in Europe and Amer. from the Earliest Times to the Treaty of Wash. D. Mar. 11, 1848*.

**Wheaton** (NATHANIEL SHELDON), D. D., b. at Washington, Conn., Aug. 20, 1792, grad. at Yale 1814; took orders in the P. E. Ch.; was rector of Christ ch., Hartford, 1818-31, pres. of Trinity Coll. 1831-37, and rector of Christ ch., New Orleans, 1837-44; visited Europe 1823-24 and 1844. He was one of the chief founders of Trinity Coll. D. Mar. 18, 1862.

**Wheaton College**, in Wheaton, Ill., 25 m. W. of Chicago, was founded in 1850 by the Ill. annual conference of the Wesleyan Meths. The coll. is in possession of a commodious and beautiful stone edifice, and of property to the value of \$100,000 above its liabilities. All the benefits of the regular coll. course are extended to both sexes.

**Wheat'stone** (Sir CHARLES), F. R. S., LL.D., b. at Gloucester, Eng., in 1802, was in early life a manufacturer of musical instruments; was led by his profession to investigate the laws of sound and their application to music; began in June 1836, with Mr. William Fothergill Cooke, a series of successful experiments in electro-magnetism, with a view to the transmission of intelligence over copper wires; took out, along with Cooke, in May 1837, a patent for a magnetic telegraph, which was not, however, practically operated until after that of Morse; invented also an electro-magnetic alarm and various instruments for registering thermometrical and barometrical indications and transit observations in astron. He was author of papers on *The Physiology of Vision*, *The Binocular Microscope*, *Fessil's Gyroscope*, etc. D. Oct. 19, 1875.

**Whe'don** (DANIEL DENISON), D. D., LL.D., b. at Onondaga, N. Y., Mar. 20, 1808, grad. at Hamilton Coll. 1823; studied law; was prof. of anc. langs. at Wesleyan Univ., Middletown, Conn., 1822-43; became a preacher of the M. E. Ch. 1836; was prof. of rhetoric, logic, and hist. at the Univ. of Mich. 1845-53, and became in 1856 ed. of the *Meth. Quarterly Review* and general ed. of the publications of the Meth. Book Concern, New York. Author of *Public Addresses, Colloquial and Popular*, *A Commentary on Matthew and Mark*, *The Freedom of the Will as a Basis of Human Responsibility*, etc.

**Wheel**, an instrument of torture and death, was used in Ger. before 1400, and was employed in Prus. as late as 1841. The prisoner was bound upon a large wheel, with his arms and legs extended, and each limb was fractured as the wheel revolved by the blows of an iron rod, both above and below the knees and elbows.

**Wheel-and-Axle**, one of the so called mechanical powers, is an application of the principle of the lever. There are 2 cylinders with a common axis, with differing radii—the smaller being termed the *axle*, the larger the *wheel*. Suppose a cord is wound around the wheel in one direction,

and another cord around the axle in the contrary direction. The condition of equilibrium of weights attached to these cords is that the product of each of the weights into their respective radii should be equal.

**Wheel-Animalcule**. See ROTIFERA.

**Wheeler** (FRANCIS B.), S. T. D. See APPENDIX.

**Wheeler** (JOHN), D. D., b. at Grafton, Vt., Mar. 11, 1798, settled at Orford, N. H., in 1804; grad. at Dartmouth Coll. 1816, at Andover Sem. 1819; was pastor of a ch. at Windsor, Vt., 1821-33; pres. of Univ. of Vt. 1833-48. D. Apr. 16, 1862.

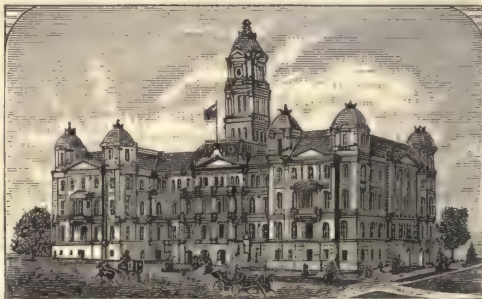
**Wheeler** (JOHN H.), b. at Murfreesboro', N. C., in 1806, grad. at Columbian Coll., Wash., 1826; became a lawyer, member of the N. C. Assembly, and a prominent Dem. politician; was appointed by Pres. Jackson supt. of the U. S. mint at Charlotte 1826; was treas. of N. C. 1842-44; minister resident of the U. S. in Nicaragua 1854-57, where he hastened to recognize the presidency of William Walker; was in 1859-61 employed in the statistical dept. of the ministry of the interior at Wash.; took part in the rebellion, and has since been a resident of that city, engaged in condensing and collating the debates of Cong., and also employed in statistical labors. Author of *Historical Sketches of N. C.* and *A Legislative Manual for N. C.*

**Wheeler** (RAYALL T.), b. in N. H. in 1810, was ed. at Kenyon Coll., O.; taught school and an acad.; studied law in Ky., and grad. B. L. in the Cin. Law School Mar. 27, 1837; went to Ark., and there practised his profession; in 1839 removed to Tex.; became judge in 1845, and rose to the supreme bench. D. Nov. 8, 1864.

**Wheeler** (WILLIAM A.), LL.D., b. June 90, 1819, in Malone, Franklin co., N. Y., entered the Univ. of Vt.; commenced the study of law with Col. Asa Hascall; was made district attorney for Franklin co., and was its supt. of schools. In 1850 and 1851 Mr. W. represented that co. in the N. Y. house of assembly; was a member of the senate of N. Y. in 1858 and 1859, and pres. *pro tem* of that body. He was a member and the pres. of the N. Y. constitutional convention in 1867-68; was elected a Rep. in Cong. to the 37th, 41st, 42d, 43d, and 44th Congs., and in June 1876 was unanimously nominated for the Vice-Presidency of the U. S. by the Rep. national convention at Cin. He was one of the organizers of the bank of Malone, and held the position of cashier and chief managing director. He was trustee of the N. N. Y. Railway Co. In the political complications which arose in La. during the session of the 49d Cong., Mr. W. was conspicuous, he having been chairman of the special committee of the House of Reps. that visited La., and finally adjusted the difficulties existing there on the basis of what is known as "the Wheeler Compromise." Elected V.-P. of U. S. Mar. 2, 1877.

**Wheeler's Eb'enus**, a W. I. leguminous tree, whose dark-green, heavy, handsome wood is much used by joiners under the incorrect name of W. I. ebony.

**Wheel'ing**, city, port of entry, and important R. R. centre, cap. of Ohio co., West Va., on both sides of Wheeling Creek, on the E. bank of Ohio River, 92 m. below Pittsburgh, Pa. The city is principally a manufacturing place, the surrounding country containing enormous deposits of



City Hall and Court-house (Wheeling, West Va.).

bituminous coal; has iron manufactures, etc. Among its public buildings the prin. are the custom-house, the new court-house, and the theatre. W. was settled in 1774, incorporated in 1806; became cap. of W. Va. in 1863, and again 1875 to May, 1885. Pop. 1870, 19,280; 1880, 30,757.

**Wheel'lock** (ELEAZAR), D. D., b. at Windham, Conn., Apr. 22, 1711, grad. at Yale 1733; was ordained pastor of the Second Congl. ch. at Lebanon, Conn., Mar. 1735, remaining there 35 yrs.; established a school 1754; had as a pupil an Indian boy, Samson Ocom, whose proficiency led to the establishment of Moor's Indian Charity School, which grew into Dartmouth Coll., for which he obtained a large tract of land in N. H., and removed thither as first pres. of the coll. Aug. 1770. Wrote *Narratives of the Indian Charity School*. D. Apr. 24, 1779.

**Wheel'lock** (JOHN), D. D., LL.D., son of Dr. Eleazar, b. at Lebanon, Conn., Jan. 28, 1754, entered Yale 1767; went to Hanover, N. H., with his father 1770, and grad. with the first class at Dartmouth Coll. 1771; was tutor there 1772-74; represented Hanover in the legislature 1775; served as major and lieutenant-col. in the army of the Revolution, and was a member of Gen. Gates's staff; was chosen successor to his father as pres. of Dartmouth Coll. 1779, though only 25 yrs. of age; visited Eng. to raise funds 1783; was partially successful, but lost the money and papers by shipwreck off Cape Cod; was removed from office 1815 in consequence of an ecclesiastical controversy, but restored 1817. Wrote *Sketches of Dartmouth Coll.* D. Apr. 4, 1817.

**Wheel'wright** (JOHN), b. in Lincolnshire, Eng., in 1594, grad. at Cambridge as a classmate of Oliver Cromwell 1614; took orders in the Ch. of Eng.; was vicar of Bilbly, near



Alford, 1623-31; was silenced for nonconformity by Abp. Laud; came to Mass. 1636; was chosen pastor of a ch. at Braintree; was a brother-in-law of the celebrated Anne Hutchinson, whose religious opinions he defended; was banished from Mass. 1638; removed with his partisans to N. H.; founded Exeter on the Squamscott, organizing a ch. there, and that terr. being subsequently claimed by Mass., located with a part of his ch. at Wells, Me., 1643; was allowed to return to Mass. 1646; resided at Hampton 1646-54; was in Eng. 1657-60, and was settled in 1662 as pastor at Salisbury, N. H., where he d. Nov. 15, 1679. He pub. *Mercurius Americanus, or Observations on a Paper entitled of the Rise, Reign, and Ruin of the Familists, Libertines, etc. in New Eng., and a Vindication*.

**Whe'lan** (RICHARD VINCENT), D. D., b. at Baltimore Jan. 29, 1809, ed. at Mt. St. Mary's Coll., Emmitsburg, Md.; grad. in theol. and philos. at the sem. of St. Sulpice, Paris, 1831; was ordained to the priesthood at Versailles the same yr.; was prof. at St. Mary's College 1832-35; performed mission-work at Harper's Ferry, Martinsburg, and other towns of Va. and Md. 1835-40; was consecrated bp. of Richmond Mar. 1850; bp. of Wheeling on the division of the diocese in 1851; was a member of the Vatican Council of 1869-70, and opposed the dogma of infallibility, but gave in his adhesion after its promulgation. D. July 7, 1874.

**Whelk** [A.-S. *hwylca*], a name popularly applied in a vague manner to species of gasteropod mollusks belonging principally to the families Buccinidae and Muricidae. The species of the 2 families agree in having shells whose body-whorls are inflated, while the aperture is notched and more or less produced forward. The animals have elongated filiform tentacles; the eyes placed outside the tentacles.

**Whew'ell** (WILLIAM), D. D., F. R. S., b. in Lancaster, Eng., May 24, 1794, grad. at Trinity Coll., Cambridge, 1816; became a fellow there; took orders in the Ch. of Eng.; was for many years a highly successful tutor; was prof. of mineralogy 1828-32, of moral theology or casuistry 1838-55; was master of Trinity Coll. from 1841, and vice-chancellor of Cambridge Univ. from 1855 to his death, at Cambridge Mar. 5, 1866. He long enjoyed the reputation of possessing more universal information than any other man in Eng. Author of several text-books on math., mechs., and dynamics, *A Hist. of the Inductive Sciences from the Earliest to the Present Time*, *The Philos. of the Inductive Sciences, Lectures on the Hist. of Moral Philos.* in Eng., etc.

**Whey** [A.-S. *hwæg*; Dutch, *wel* or *hui*; Ger. *Molken*], the serum of milk, obtained when the casein of milk is coagulated by means of rennet or acids, as in the manufacture of cheese. It forms a clear, straw-colored liquid, and contains the water and sugar (lactose) of the milk.

**Whic'cote** (BENJAMIN), D. D., b. in Shropshire, Eng., Mar. 11, 1610, grad. at Emanuel Coll., Cambridge, 1629; became a fellow there 1633; became distinguished as a tutor; took orders in the Ch. of Eng. 1636; was appointed Sunday lecturer at Trinity ch. and preacher to the univ.; became incumbent of N. Cadbury, Somersetshire, 1643, provost of King's Coll. 1644, and rector of Milton, Cambridgeshire, 1649; favored the Puritans during the great rebellion and protectorate; was deprived of his provostship at the Restoration 1661, but obtained the living of St. Anne's, Blackfriars, 1662, and the vicarage of St. Lawrence, Jewry, 1668. He was regarded as "one of the heads, if not the chief founder, of the latitudinarian school of Eng. divines." D. May 1683.

**Whif, Sail-Fluke, Marysole, or Carter** (*Lepidorhombus megastoma*), a fish of the flatfish family, related to the turbot of the N. European coasts. The body is rather elongated; the scales are small and pectinated; the lateral line describes a semicircular curve above the pectoral; the eyes are on the left side, and close together; the teeth in a band on the jaws, and present also on the vomer, but not on the palatines; the dorsal commences on the snout in advance of the eyes; the ventrals have a long base, but are free from the anal. The species does not seem to be a very abundant fish anywhere.

**Whig** [a contraction of *Whiggamore*, a local expression which in S. W. Scot. denoted a drover] was first introduced into public use in 1648, when a party of Covenanters from that part of the country attacked Edinburgh. From that time all who opposed the court were called *Whiggs*. During the Revolution the Amer. patriots called themselves Whigs, and later (1832-54) there existed a Whig party in Amer. politics. (See PARTIES, POLITICAL, OF THE U. S.)

**Whim'brel** [from *whimper*], a species of the genus *Numenius* (*N. phaeopus*), related to the common curlew (*N. aquata*), but considerably smaller, and hence also called half-curlew and jack-curlew in Eng. It is found not only in Europe, but also, in the winter season of the N. hemisphere, in Afr. and Asia.

**Whin.** See DYERS' BROOM.

**Whin'chat, or Furzechat**, the *Saxicola* (or *Pratincola*) *rubetra*, a little European bird of the family Turdidae. It considerably resembles the stonechat, but is smaller, and is also considerably less than the wheatear. Like the latter, it is highly prized for the table, and is trapped in great numbers in the autumn, when fat. It is an excellent song-bird in confinement.

**Whipple** (AMIEL W.), b. at Greenwich, Mass., 1817, grad. at the U. S. Military Academy July 1841; served in the survey of various rivers and harbors until 1844; as assistant astron. of the commission to determine the N. E. boundary between the U. S. and the Brit. provs. 1844-49; and in the same capacity on the Mex. boundary survey 1849-53; took charge of the party authorized to make the surveys necessary to ascertain a R. R. route from the Miss. to the Pacific Ocean; 1856-61 employed in the improvement of the St. Clair Flats and St. Mary's River, Mich., performing during the same period the duties of light-house engineer; served on the staff of Gen. McDowell; appointed brig.-gen. of volunteers, and commanded a brigade in the defenses of Wash.;

led the 3d corps, Army of the Potomac, at Fredericksburg and at Chancellorsville. On the second day of the latter battle he was fatally wounded. D. May 7, 1863.

**Whipple** (EDWIN PERCY), b. at Gloucester, Mass., Mar. 8, 1819, ed. in the public schools of Salem; was for some time a clerk in a bank at Salem; entered a Boston banking-house 1837; became its chief clerk; was supt. of the reading-room of the Merchants' Exchange from its foundation until 1860, since which time he has devoted himself exclusively to lit., enjoying considerable reputation as a critic. Author of *Essays and Reviews, Character and Characteristic Men, The Lit. of the Age of Elizabeth*, etc.

**Whipple** (HENRY BENJAMIN), D. D., b. at Adams, Jefferson co., N. Y., Feb. 15, 1822, was bred a merchant and took an active part in politics; in 1847 became a candidate for holy orders; was ordained deacon Aug. 17, 1849, in Trinity ch., Geneva, N. Y.; took charge of Zion ch., Rome, N. Y., Dec. 1, 1849; was ordained priest July 16, 1850, in Sackett's Harbor; became rector of the ch. of the Holy Communion, Chicago, Easter, 1857; was chosen bp. of Minn. June 30, 1859; was consecrated in St. James's ch., Richmond, Va., Oct. 13, 1859. In 1860 Bp. W., with Revs. I. L. Breck, S. W. Mauncey, and E. S. Peake, organized the Ep. Seabury mission, out of which has grown the cathedral of Our Merciful Saviour, the Seabury Divinity School, Shattuck School, and St. Mary's Hall.

**Whipple** (WILLIAM), b. at Kittery, Me., Jan. 14, 1730, was in early life a sea-capt. in the W. I. trade; subsequently a merchant at Portsmouth, N. H., where he acquired a considerable fortune; was a member of the provincial cong. 1773, of the Continental Cong. 1776; signed the Dec. of Ind.; was brig.-gen. of N. H. troops at Saratoga 1777; co-operated with Sullivan at the siege of Newport 1778; was again M. C. 1778-79; was financial receiver of N. H. 1782-84, and judge of the superior court from 1782 to his death, Nov. 28, 1785.

**Whip-poor-will**, the common designation in the U. S. of species of birds of the genus *Antrostomus* of the family Caprimulgidae. These are characterized by the bill being very small; the nostrils shortly tubular; the gape furnished with long, stiff, and sometimes pectinated bristles, which project beyond the end of the bill; the wings broad, rounded, and with the first quill shorter than the third; the tail broad and rounded; and the tarsi moderate and partly feathered above. The chief distinctive characters, in contrast with the night-hawks, are found in the bristled gape and the form of the tail, and in this respect, as well as others, the species agree with those of the genus *Caprimulgus*, or the typical goatsuckers of the Old World, to which they are, indeed, very closely related.

**Whirlwind**, the general term applied to such storms as are specifically known as hurricanes, cyclones, typhoons, etc., and whose miniatures are found in the tornado and waterspout. In these storms the air over a large region of the earth is in a state of rotation about a central space within which comparative calm exists. (See STORMS.)

**Whis'key, or Whisky** [Gaelic and Irish, *uisge, "water,"* whence *uisge-beatha*, commonly written *usquebaugh*, "water of life"], the spirituous liquor obtained by distilling fermented infusions of barley, rye, wheat, corn, oats, etc. According to some authorities, the art of distillation was first introduced in Eng. in the reign of Henry II., but it is more probable that it was known and practised in Ire. previous to this date, having been acquired by the Inhabs. of that country from India. Directions for preparing *usquebaugh* or *aqua vitæ* are contained in the *Red Book of Ousey*, compiled about 500 yrs. since, at which time it was chiefly used as a med., being considered a panacea for all diseases. The term "whiskey" appears to have been first confined to the liquor obtained in the Highlands of Scot. from barley, its general application being of a more recent date. Spirits that contain over 60 per cent. of alcohol are termed "high-wines" or common spirits; those containing 90 per cent. of alcohol are known as "cologne spirits," the name whiskey being usually given to the product of a former distillation containing about 50 per cent. of alcohol. In G. Brit. the largest amount of W. is made in Scot. and Ire.; in this country the prin. supply comes from Ill., O., Ind., Ky. (termed Bourbon W., from Bourbon co., Ky.), Pa. (Monongahela co.), Mo., and Cal.; large quantities of W. are also made in Canada, near Toronto. The grains used vary greatly in composition. In Scot. and Ire. malted barley is extensively employed, but a mixture of malted barley with raw grains (rye, oats, etc.) is also very largely used. In the preparation of Bourbon W. a mixture of 50 to 60 per cent. of Indian corn with 40 to 50 per cent. of small grain (containing about 10 per cent. malt, the balance being rye) is taken; for Monongahela W. only rye is used, it being mixed with 10 per cent. of malt; while in Canada a mixture of rye, wheat, or corn with 5 per cent. of malted barley is chiefly employed. The quantity of alcohol afforded by the different grains is influenced by the proportion of starch, including the small amount of sugar, they contain; 2 lbs. of starch will give a quart of spirit containing 30 per cent. of alcohol, or 100 lbs. of starch will give 35 lbs. of alcohol, equal to 4.375 imperial gals.

**Whist'ler** (GEORGE WASHINGTON), b. at Ft. Wayne, Ind., May 19, 1840, grad. at W. Pt. 1819; served on the S. bound; army commission 1822-28 as a member of the engineer corps; was constructing engineer of Baltimore and O. and Susquehanna and Western R. R.s., and became in 1843 chief engineer of St. Petersburg and Moscow R. R. R.s.; employed in the construction of dockyards and in the improvement of Rus. rivers and harbors. D. Apr. 7, 1849.—His son, GEORGE WILLIAM, b. at New London, Conn., in 1822, under his father became C. E. 1840; was connected with R. R.s. in the U. S.; in supt. of the Erie and New York and New Haven R. R.s.; in 1856 went to Rus., and completed the R. R. of which his father had been engineer. D. Dec. 24, 1869.

**Whit'aker** (DANIEL K.), LL.D., b. at Sharon, Mass., Apr.



13, 1801, ed. at Harvard Univ., and grad. in the class of 1820; studied law, and moved to S. C., where he was received as a partner in the profession by ex-Gov. John Lyde Wilson of that State; became the founder and ed. of several periodicals, among which was the *S. Literary Journal*, *Whitaker's Magazine*, both monthlies, and the *S. Quarterly Review*, commenced in 1841, which maintained a high position until the c. war. In 1866 he moved to New Orleans, where he became ed. of the *New Orleans Monthly Review*.

**Whitaker** (MRS. MARY SCRIMGEOUR), b. in Beaufort dist., S. C., Feb. 22, 1830, wife of Dr. Daniel K. Whitaker. At an early age she was sent to Edinburgh, where she completed her education; in 1850 a vol. of her poems was pub.; in 1867 *Albert Hastings*, a novel of great merit, made its appearance, and beside these 2 works she has contributed largely to periodical lit.

**Whitaker** (REV. NATHANIEL), D. D., LL. D., b. on L. I., N. Y., Feb. 22, 1732, grad. at Princeton Coll.; entered the ministry, and took charge of a ch. at Norwich, Conn., where he remained until 1766, when he was deputed by the Scotch Society for the Advancement of Learning (of which there was a branch in Conn.) to visit Scot., Eng., and Wales for the purpose of obtaining donations for the establishment of an inst. of learning in Amer. for the education and christianization of the N. Amer. Indians. He carried with him Rev. SAMSON OCCOM (which see), an educated Indian of the Mohegan tribe. The General Assembly of the Ch. of Scot. received the visitors with open arms. In Eng. the mission also met with favor. With an endowment so obtained, Dartmouth Coll. at Hanover, N. H., was founded, and was originally organized for the education of the Indian tribes of N. Amer. On his return home from Europe, Dr. W. was called to the charge of the Presb. ch. at Salem, Mass. He zealously supported the cause of the colonies in their struggle for independence in 1776. D. in 1794.

**Whitaker** (OZI WILLIAM), D. D., b. May 10, 1830, at New Salem, Mass., grad. from Middlebury Coll. in 1856, and from the General Theological Sem. of the P. E. Ch. in 1863; ordained deacon in Boston in July, and priest in Aug. of the same yr.; rector of St. John's ch., Gold Hill, Nev., 1863-65; rector of St. Paul's, Englewood, N. J., 1865-67; rector of St. Paul's, Virginia City, Nev., 1867; elected missionary bp. of Nev. and Ari. in 1868, consecrated Oct. 1869.

**Whitaker** (WILLIAM), D. D., b. at Holme, Lancashire, Eng., in 1548, ed. at St. Paul's School, under his uncle, Dean Alexander Nowell; grad. at Trinity Coll., Cambridge, where he became a fellow; was appointed regius prof. of divinity at Cambridge 1579, chancellor of St. Paul's 1580, and master of St. John's Coll., Cambridge, 1580; was an able Calvinistic writer, and considered the most learned Eng. champion of Protestantism of his time. D. Dec. 4, 1595.

**Whitcomb** (JAMES), b. at Stockbridge, Vt., Dec. 1, 1791, grad. at Transylvania Univ., Ky.; studied law; began practice at Bloomington, Ind., 1824; became prosecuting atty. for the dist. 1829; was a Dem. State senator 1830-35; became com. of the general land-office 1836; resumed the practice of law at Terre Haute 1841; was gov. of Ind. 1843-48; became U. S. Senator 1849, and was v.-p. of the Amer. Bible Society. D. Oct. 4, 1882.

**White** (ALBERT S.), b. at Blooming Grove, N. Y., Oct. 24, 1809, grad. at Union Coll. 1822; was admitted to the bar at Newburg 1825; removed to Ind. 1829; was several yrs. clerk of the Ind. house of reps.; M. C. 1837-39, U. S. Senator 1839-45; was a leading promoter of the Wabash and Erie Canal; became pres. of the Wabash and Indianapolis, and Lake Erie, Wabash and Indianapolis R. R. cos.; was again M. C. 1861-63; became com. of claims against the Sioux Indians 1863, and was appointed dist. judge of Ind. Jan. 1864. D. Sept. 4, 1864.

**White** (ALEXANDER), b. at Franklin, Tenn., Oct. 16, 1816, studied at Jackson Coll. and at the Univ. of Tenn. at Nashville; studied law; was admitted to the bar 1838; practised at Talladega; elected to Cong. for the term 1851-53, on the Union platform, after an exciting contest in a dist. overwhelmingly Democratic; settled at Selma 1856; supported Bell and Everett in 1860, and earnestly opposed secession, but acted with his State during c. war; was a leading member of Ala. State convention of 1865 and of 1866; sat in general assembly of 1872; was again M. C. 1879-75, and U. S. associate justice for Ut. 1875.

**White** (ANDREW DICKSON), LL. D., b. at Homer, N. Y., Nov. 7, 1832, grad. at Yale 1853; was prof. of hist. and Eng. lit. at the Univ. of Mich. 1857-62; was State senator 1863-68; introduced the bills which codified the school laws, created the new system of normal schools, and incorporated Cornell Univ.; was chosen first pres. of that inst. 1866; has been a liberal contributor to the funds for the foundation of the univ., in which, beside the presidency, he fills the chair of modern hist.; was one of the coms. sent to Santo Domingo to study the question of annexation 1871. Author of *Lectures on Medieval and Modern Hist.* Was U. S. minister at Berlin 1879-81.

**White** (CHARLES ABIATHAR). See APPENDIX.

**White** (DANIEL APPLETON), LL. D., b. at Lawrence (then a part of Methuen), Mass., June 7, 1776, grad. at Harvard 1797; was teacher of the Medford grammar school 1797-99, Lat. tutor in Harvard 1799-1803; studied law; was admitted to the bar 1804; began practice at Newburyport; sat in the Mass. legislature 1810-15; was elected to Cong., but declined the office 1814; became judge of probate for Essex co. 1815; settled at Salem 1817, and was for many yrs. a leading member of the Essex Inst. and of the Mass. Historical Society. Wrote *N. Eng. Congregationalism, its Origin and Purity*, etc. D. Mar. 30, 1861.

**White** (EZRA). See APPENDIX.

**White** (FORTUNE C.), b. at Whitestown, Oneida co., N. Y., in 1787, received a classical education; was admitted to the bar at an early age; was capt., and afterward an aide-de-camp to the gen.-in-chief 1812-14; was many yrs. a leading lawyer of Central N. Y.; was chief judge of com-

mon pleas and quarter sessions for Oneida co. 1837-43, and was for more than 40 yrs. a brig.-gen. of State militia. D. Aug. 27, 1866.

**White** (HENRY KIRKE), b. at Nottingham, Eng., Mar. 21, 1785, began to write verses for magazines in his fifteenth year; wrote *Clifton Grove*, a *Sketch in Verse*, with other *Poems*; obtained a sizarship at St. John's Coll., Cambridge, 1804; was for 2 yrs. at the head of his class, and became a tutor in math. Southey pub. his *Remains*, etc., with an *Account of his Life*, which obtained for him a permanent place in Eng. lit. D. Oct. 19, 1806.

**White** (HUGH LAWSON), b. in Ireddell co., N. C., Oct. 30, 1773, studied at Phila. 1794-96; read law at Lancaster, Pa.; began practice at Nashville 1796; was judge of the State supreme court 1801-07 and 1809-15; became U. S. dist. atty. 1807, State senator 1809 and 1817, pres. of the State Bank of Tenn. 1815, and com. of Sp. claims 1820; was U. S. Senator 1825-35 and 1836-39; pres. *pro tem.* of that body 1832, and resigned his seat in the Senate 1839. D. Apr. 4, 1840.

**White** (JOHN), b. in Ky. in 1805, was M. C. 1835-45, speaker of the 27th Cong. (1841-43), and subsequently judge of the U. S. dist. court. D. Sept. 22, 1845.

**White** (JOHN WILLIAMS). See APPENDIX.

**White** (PEREGRINE), celebrated as the first child of Eng. parentage born in N. Eng., was the son of William White and his wife Susanna, passengers in the Mayflower, and was b. on that vessel in the harbor of Cape Cod about Nov. 20, 1620; became a citizen of Marshfield; was "vigorous and of a comely aspect;" filled various civil and military offices, and reached a good old age, dying July 22, 1704.

**White** (PLINY HOLTON), b. at Springfield, Vt., Oct. 6, 1822, was admitted to the bar of Windham co., Vt., in 1843, and practised law for a number of yrs.; was ed. of the *Brattleboro' Eagle* 1851-52, and of the *Express* at Amherst, Mass., 1857-58; was ordained minister at Coventry, Vt., Feb. 1859; sat in the Vt. legislature 1862-63; was chaplain of the senate 1864-66, and for several yrs. pres. of the Vt. Historical Society. Wrote *History of Coventry*. D. Apr. 24, 1869.

**White** (RICHARD GRANT), b. in New York May 22, 1822, grad. at the Univ. of New York 1839; studied med. and law; was admitted to the bar 1845; was associate ed. of the *New York Courier and Enquirer* 1851-58, and for 1 yr., 1860-61, of the *World*; was the writer of the "Yankee Letters" in the *London Spectator* 1863-67, and for many yrs. was chief clerk of the U. S. revenue marine bureau in the dist. of New York. Author of *Shakespeare's Scholar*, *The Authorship of the Three Parts of Henry VI.*, *National Hymns*, a *Lyrical and National Study for the Times*, *The New Gospel of Peace*, etc. Published in 1884 *Riverside Shakespeare*, with biography, introductions, and notes. D. Apr. 8, 1885.

**White** (WILLIAM), D. D., b. in Phila. Apr. 4, 1748, grad. at Phila. Coll. 1765; studied theol. in Eng.; took orders in the Ch. of Eng. 1770; became rector of Christ ch. and St. Peter's ch., Phila.; was chaplain to Cong. when in session at York, Pa., 1777; presided at the first Episc. convention held in Amer., Sept. and Oct. 1785; wrote the const. of the Ch. then adopted; was chosen bp. of the diocese of Pa. 1786; was consecrated at Lambeth Palace by the abp. of Canterbury Feb. 4, 1787; was pres. of the first Bible Society established in the U. S., and of several charitable insts., and with Bp. Seabury of Conn. revised the *Book of Common Prayer* for the use of the Amer. Episc. Ch. D. July 17, 1836.

**White Ants**. See TERMITES.

**White bait**, a name given in Eng. to small fishes which are now known to be merely the young of the common herring (*Clupea harengus*). The name "whitebait" is limited to fishes under 6 inches in length, and whose sides are almost uniformly white. Such fishes begin to make their appearance in the river Thames in Eng. about the end of Mar. or early in Apr., and during the summer months are caught in immense quantities.

**White Bear**. See BEAR and URSIDÆ.

**White Copper**, an alloy; also called **Packfong**. See NICKEL and PACKFONG.

**Whitefield**, whit'feld (GEORGE), b. in the Bull Inn at Gloucester, Eng., Dec. 16, 1714, in St. Mary's gram. school acquired the rudiments of learning; entered Ox. Univ. in his 18th yr. as a Pembroke servitor. Having become intimate with the Ox. Meths., as certain pious students were called, and having undergone a great moral change, he resolved to devote himself to the ministry of the gospel heart and soul. In the choir of Gloucester cathedral he was ordained on Sunday June 20, 1736. He went to Lond., at first to read prayers in the Tower chapel, but having begun to preach at Bishopsgate ch., his fame soon spread over the city, and shortly he was engaged 4 times on a single Sunday in addressing audiences of enormous magnitude. Having addressed multitudes in other parts of his native county, he spent some weeks in Bristol. Sailed for Ga., and in Savannah he expounded at 5 in the morning, at 10 read prayers and preached, at 3 held another service, and at 7 in the evening expounded the catechism. Returning to Eng., the ship was turned into a ch. He preached in Bristol, and in Kingswood he addressed the colliers. Then he visited Wales with Howel Harris, and beginning at Cardiff, proceeded from town to town, laboring in every place with all his accustomed ardor.

At length a dispute arose between W. and Wesley. The tide for a time turned against the former. On a common near Baintree he preached to 10,000. Then he went to Scot., but the chs. would not hold the congregations. He continued preaching, always twice, often thrice, and once 7 times, a day. We find him in Gloucestershire, and again in Wales, and once more in Lond. He returned to Scot., caused a wonderful revival at Cambuslang, and then reappeared in Lond., having traversed the country, preaching where he went. In 1744 he sailed to Amer. for the third time. After untiring labors he recrossed the Atlantic, and was sent for by the countess of Huntingdon to preach in her drawing-room to the nobility, among whom were Chesterfield and



Bolingbroke. Scot. was revisited; so was the W. of Eng. Immense consternation was caused in Lond. by the shock of an earthquake in Mar. 1750: people thought the world was coming to an end. Thousands on thousands assembled in Hyde Park and stayed there till midnight. W. went to them, and told them God's true prophecy of the world's end. Afterward he visited Ire. and Scot., and then a fourth time crossed the ocean. We find him in Eng. again before the year's end, and, after preaching there, hasting once more to the other side of the Tweed. The Tabernacle and Tottenham Court chapels were built in 1753 and 1756, and there he gathered crowded congregations. Again and again he repeated his visits to Scot. He went to Amer. a fifth, a sixth, and a seventh time. He preached every day at Boston from the 17th to the 20th of Sept. 1770; then travelled to Newburyport, preaching at Exeter, N. H., Sept. 29, on the way. D. Sept. 30, 1770. [From orig. art. in *J's Univ. Cyc.*, by Rev. JOHN STOUTON, D. D., LL.D.]

**Whitefish**, a name given to fishes of the family Salmonidae and genus *Coregonus*. These have the form essentially similar to that of the salmon and trout, although less graceful, and with a stouter tail; the scales are also larger, but are of moderate size; the mouth has a narrow cleft, and the upper jaw projects more or less beyond it, or is truncated; the teeth are wanting or very minute; W. are generally distributed in the colder waters of N. hemisphere.

**White Gunpowder**, a compound of chlorate of potash 3 parts, ferrocyanide of potassium 1 part, and white sugar 1 part, each pulverized and carefully mixed. It explodes from percussion, friction, the touch of a minute quantity of sulphuric acid or of a red-hot iron.

**White Hall**, R. R. centre, Greene co., Ill. Pop. tp. 1870, 1600; 1880, 4145.

**Whitehall**, Muskegon co., Mich., on R. R. and on the E. shore of White Lake, 5 m. from Lake Mich. The v. was incorporated in 1867. Pop. 1870, 842; 1880, 1724.

**Whitehall**, R. R. centre, Washington co., N. Y., at the head of Champlain Canal, and at the S. end of Lake Champlain. The v. owes its prosperity to the transportation by lake and canal, boat-building, and lumber trade. Pop. 1870, 4322; 1880, 4270.

**Whitehaven**, Pa. See APPENDIX.

**Whitehouse** (HENRY JOHN), D. D., D. C. L., b. in New York in Aug. 1803, grad. at Columbia Coll. 1821, and at the (Epis.) General Theological Sem., New York, 1824; took orders 1824; was rector of St. Luke's ch., Rochester, 1829-44, and of St. Thomas's, New York, 1844-51; consecrated assistant bp. of Ill. Nov. 30, 1851; succeeded to that see on the death of Bp. Chase 1862, and preached the sermon before the Pan-Anglican Council, Lond., 1867. D. Aug. 10, 1874.

**White Lead**, the basic carbonate of lead, largely used in the composition of white oil paint, and to some extent in the manufacture of cements. It is made by precipitation, for which carbonic acid is employed to decompose a soluble salt, or by exposing plates of cast lead to the joint action of vapor of acetic acid, air, and carbonic acid.

**White Locke** (BULSTRODE), b. in Lond., Eng., Aug. 2, 1605, ed. at Merchant Taylors' School and at St. John's Coll., Ox.; studied law at the Middle Temple; was employed in a subordinate legal capacity at the impeachment of the duke of Buckingham 1626; was elected to the Long Parl. 1640; was chairman of the committee for conducting the impeachment of the earl of Strafford 1640-41; was a Parliamentary com. to treat with Charles I. at Ox. 1641-42; was deputy lieutenant of Buckinghamshire and Oxfordshire; aided Hampden in dispersing the coms. of array at Watlington, and took part in the defence of Brentford 1642; was a member of the Westminster Assembly of divines 1643; became gov. of Windsor 1644; was a com. of admiralty 1645; was a member of the commission sent to Uxbridge to negotiate a treaty of peace 1645; was one of the coms. of the great seal 1649, but refused to take part in the trial of the king, which he disapproved; was appointed ambassador to negotiate a treaty with Queen Christina of Swe. Sept. 1653; was created by her a knight of the order of Amaranth; became a com. of the treas. 1655, speaker of the House of Commons 1656, and one of Cromwell's lords Dec. 1657; was com. of the great seal to Richard Cromwell, whom he assisted in dethroning; pres. of the council of state during the interregnum, and retired at the Restoration to his estate at Chilton Park, Wiltshire, where he d. Jan. 28, 1678.

**White Mountains**, a group of peaks in the cos. of Coos, Carroll, and Grafton, N. H., usually regarded as a part of the Appalachian system. The W. portion of the group is known as the Franconia Mts. The W. M. proper culminate in Mt. Washington, the highest peak in the U. S. east of the Miss. River, excepting Mitchell's High Dome in N. C. Its height is 6288 ft. Of the Franconia group, the only one exceeding 5000 ft. is Mt. La Fayette, 5290 ft. high. The area of the whole is more than 800 sq. m.

**White Pigcon**, R. R. June., St. Joseph co., Mich. Pop. 1870, 922; 1880, 1021.

**White Plains**, on R. R., cap. of Westchester co., N. Y., 25 m. N. E. of New York, was the scene of one of the battles of the Amer. Revolution, in which the Brit. under Gen. Howe drove the Amer. from Chatterton Hill. W. of Bronx River, with a loss to the latter of 180 killed, wounded, and prisoners, Oct. 28, 1776. Pop. tp. 1870, 2630; 1880, 4094, including 2381 in v.

**White River** rises by several heads in the Ozark Hills of Washington and Madison cos., Ark., takes a circuit of 100 m. in Mo., returns to Ark., and after a course of some 900 m. reaches the Miss. River at a point 15 m. above the mouth of the Ark., into which a part of its waters are discharged. It is navigable by large steamboats to Batesville, Ark., 380 m.

**White River**, in Ind., rises by 2 forks. The E. or Driftwood fork (called also Blue River), flowing from Henry co., is 250 m. long, and is navigated to Rockford. The W. fork, the longer arm, rises in Randolph co., and crosses the

State. It is 300 m. long, and is navigable at high water 130 m. to Martinsville. The main stream is 50 m. long, and flows into the Wabash opposite Mt. Carmel, Ill.

**White River Junction**, R. R. June., at confluence of White and Conn. Rivers, Windsor co., Vt. Pop. 1880, 763.

**White Sea**, a large inlet of the Arctic Ocean, penetrates into European Rus. for a distance of 380 m., with a breadth of from 80 to 150 m. It is frozen from Oct. to May, and abounds in herring and codfish.

**White Sulphur Springs**, Greenbrier co., W. Va., on R. R. and Howard's Creek, 227 m. W. of Richmond, is a celebrated summer resort on account of a mineral spring, the waters having been employed medicinally since 1778. The place is conveniently located for access to the Red, Salt, and Blue Sulphur Springs, distant from 20 to 40 m.

**White Swelling**, the popular name for a chronic inflammation of the joints (for which see SCROFULA).

**White-throat**, the *Sylvia undata*, or *Curruca cinerea*, a very abundant European warbler whose song is rather sweet and very energetic. It is a favorite cage-bird, 5½ inches in length, colored reddish and whitish-brown, with a throat of pure white. There are several other warblers called white-throat in Eng.

**White wash**, a preparation of slaked lime, thinned to a milky consistence, and used for whitening walls. Skimmed milk, glue, zinc-sulphate, tallow, and various pigments are sometimes added.

**White water**, Walworth co., Wis., on R. R. and White-water River, 51 m. S. W. of Milwaukee, contains State normal school. Prin. business, wheat and stock raising. Pop. tp. 1870, 4295; 1880, 4519, including 3617 in v.

**White Whale**, the popular Eng. designation for the Delphinidae of the genus *Delphinapterus*, which is itself the type of a peculiar sub-family, represented by itself and the quite dissimilar genus *Monodon*. The type is common to all the N. seas, and on the E. coast of N. Amer. extends southward at least as far as the Gulf of St. Lawrence. The form is essentially similar to that of the common porpoise, but the head is rounded forward and the cervical region has somewhat of a contraction; the teeth in the adult are generally about 22 in the upper and 8 in the lower jaw; no dorsal fin is developed, and hence the name *Delphinapterus*—i. e. "porpoise without a fin;" the color is a spotless white, and to this peculiarity the popular name alludes.

**White wood**, a name given in the U. S. to the wood of the tulip tree. The bark of *Canella alba* is called whitewood bark. Other W. are *Pittosporum bicolor*, of Australia, etc., *Grodaphne leucogylon*, *Lagunaria Pattersoni*, *Tecoma leucogylon*, and many other trees, mostly tropical.

**Whitfield** (HENRY), b. in Eng. in 1597, son of an eminent lawyer, received a univ. education, and studied law at one of the Inns of court; took orders in the Ch. of Eng.; minister of Ockley, Surrey, where he sheltered a number of Puritan ministers during the persecution by Abp. Laud, from which he ultimately suffered himself, in consequence of his refusal to read in ch. the *Book of Sports*; came to New Haven 1637; was one of the founders of Guilford, Conn. (1639); was one of the chief founders of New Haven colony; returned to Eng. 1650, and became minister at Winchester, where he d. 1658. Wrote, *The Light Appearing more and more towards the Perfect Day*, or *A Farther Discovery of the Present State of the Indians in New Eng.*, etc.

**Whitfield** (ROBERT PARR). See APPENDIX.

**Whitgift** (JOHN), D. D., b. at Great Grimsby, Lincolnshire, Eng., about 1530, ed. at Queen's Coll. and at Pembroke Hall, Cambridge; favored the Ref. unobtrusively; took orders in the Ch. of Eng.; became chaplain to Cox, bp. of Ely, and rector of Feversham, Cambridgeshire, 1560; was appointed Lady Margaret prof. of divinity 1563, regius prof. of divinity, master of Pembroke Hall and of Trinity Coll., of divinity, master of Cambridge 1568, vice-chancellor of Cambridge 1570, dean of Lincoln 1571, prebendary of Lincoln 1572, bp. of Worcester and v.-p. of the Marches of Wales 1577; succeeded Edmund Grindall as abp. of Canterbury 1583; showed himself intolerant both of Roman Catholicism and of Puritanism, insisting on new articles of subscription suspending the clergy who refused them, and managing the Star-Chamber prosecutions with great rigor; obtained a decree against liberty of printing June 1585; became privy councillor 1586; founded a magnificent hospital and gram. school at Croydon 1595, and took part in the conferences at Hampton Court Jan. 1604. D. Feb. 29, 1604.

**Whit'ing**, or **Prepared Chalk**, chalk freed from impurities by elutriation, or pulverization and suspension of the finer and purer particles in water, from which they separate on standing; used as a water-color pigment and for coating paper, also as a polishing-powder for soft metals, like silver and brass.

**Whiting**, a European fish of the family Gadidae and genus *Merlangus*, related to the true codfishes. As in them, the body is moderately elongated and covered with small scales; the head conical; the mouth deeply cleft; the upper jaw longest; the teeth in bands in the upper and lower jaw and on the vomer, but absent on the palatines; the dorsals 3 and the anals 2; it differs from the true codfishes especially in that its barbel is developed at the chin; the color above is very dark and almost black, and below grayish; a black spot is developed in the axil of the pectoral fin. The species is esteemed for the excellence of its flesh.

**Whitinsville** (Whitin's station), on R. R., Worcester co., Mass. Pop. 1880, 2340.

**Whit'low**, better known as **Fel'on**, a painful inflammation of the fingers and toes, more often affecting the joint of the fingers. The felon may arise from a local bruise; more often it is the result of disturbed and deteriorated states of the blood. It involves the periosteum, or fibrous sheath of the bone, hence the bone, so deprived of its sheath and nutritive vessels, is liable to die, dead bone being a frequent sequel of felon. When detected early, a



felon may sometimes be dissipated by an ice-pack or by a small blister; more often it will progress. Early and efficient incision of the point of induration may avert further suffering and prevent the formation of much pus.

**Whitman** (EZEKIEL), b. at E. Bridgewater, Mass., Mar. 9, 1776, grad. at Brown Univ. 1795; settled in Me. as a lawyer 1799, residing at Portland from 1807; was M. C. 1809-11, 1817-21, and 1821-23, of the executive council 1815-16, and of constitutional convention 1819; chief-justice of common pleas 1822-41, and of superior court 1841-48. D. Aug. 1, 1866.

**Whitman** (WALT), b. at W. Hills, L. I., N. Y., May 31, 1819, ed. in the public schools of Brooklyn and New York; learned the printing and subsequently the carpenter's trade; taught school; made extended pedestrian tours through the U. S. and Canada 1847-48; edited for brief periods newspapers at New Orleans and at Huntington, L. I.; was a volunteer nurse in the hospitals at Wash. and in Va. 1862-65; held clerkships in the govt. offices at Wash. most of the time from 1865 to 1874. Wrote *Leaves of Grass*, *Drum-Taps*, and *Two Rivulets*.

**Whitmore** (WILLIAM HENRY), b. at Dorchester, Mass., Sept. 6, 1836, ed. in the Boston public schools; was associated with Mr. John Ward Dean in founding the *Historical Magazine*; has been ed. of the *New Eng. Genealogical Register* and of the *Heraldic Journal*, a contributor to several magazines, chiefly on genealogical and historical subjects, and is a prominent officer of the N. Eng. Historico-Genealogical Society. Author of *A Register of Families settled at the Town of Medford, Mass.*; *A Brief Genealogy of the Descendants of William Hutchinson and Thomas Oliver*; *The Amer. Genealogist*, being a Catalogue of Family Histories and Publications containing Genealogical Information issued in the U. S., arranged chronologically, etc.

**Whitney** (ASA), b. about 1797, became a merchant in New York, and was the first person who suggested a R. R. to the Pacific. Wrote *A Project for a R. R. to the Pacific* and *A Plan for a Direct Communication between the Great Centres of the Populations of Europe and Asia*. D. Aug. 1872.

**Whitney** (ELI), b. in Westborough, Mass., Dec. 8, 1765, grad. at Yale 1792; went to Ga.; studied law; devised a machine for cleaning seed-cotton, the COTTON-GIN (which see); suffered much from violence and fraud, the idea of his invention having been stolen by others, but formed a partnership and commenced the manufacture of the machines near the town of Washington, Ga., in 1795; turned his attention to the manufacture of firearms, entering into a contract with the U. S. govt. 1798, and reaped a fortune from his various improvements in their manufacture, which became the origin of the flourishing village of Whitneyville, Conn. D. Jan. 8, 1825.

**Whitney** (JAMES AMAZIAH), LL.D., b. June 30, 1839, at Rochester, N. Y., received a common-school education; devoted himself without assistance to the study of chemistry, mechanics, and engineering; acquired by practice the trades of pattern and model maker, machinist, and draughtsman; in 1865 came to New York and entered the office of a firm of patent solicitors as a writer of specifications; in 1868 became ed. of the *American Artisan*, a weekly technical journal; in the same yr. took a leading part in organizing the New York Society of Practical Engineering, and was elected its pres.; in 1869 became prominent in the New York Farmers' Club, and was elected prof. of agricultural chem. of the Amer. Inst.; in 1872 established himself as a solicitor of U. S. and foreign patents, and in 1876 was admitted to practice as atty. and counsellor at law in the circuit courts of the U. S. He is the author of numerous essays on the law of patents, etc., on agricultural chem., applied mechs., and engineering.

**Whitney** (JOSIAH DWIGHT), brother of Prof. Wm. D., LL.D., b. at Northampton, Mass., Nov. 23, 1819, grad. at Yale 1839; was for many years employed on State and national geological surveys, including O., the Lake Superior region, Miss., and Cal., where he has been for many yrs. State geologist; has been since 1865 Sturges-Hooper prof. of geol. in Harvard Univ., and is a prominent member of Amer. Association and of National Acad. of Science. Wrote *The Metallic Wealth of the U. S.*, *The Geological Survey of Cal.*, etc.

**Whitney** (WILLIAM C.). See APPENDIX.

**Whitney** (WILLIAM DWIGHT), LL.D., b. at Northampton, Mass., Feb. 9, 1827, grad. at Williams Coll. 1845; several yrs. clerk in a bank; 1849-50 studied Sanskrit at New Haven; 1850-53 studied in Ger. at Berlin and Tübingen; planned an edition of the *Atharva-Veda*, and copied and collated all the MSS. then in Europe, visiting Paris, Ox., and Lond. on the way home for that purpose in the summer of 1853. A vol. of the text appeared in 1856-57. He became a member of the Amer. Oriental Society in 1849, librarian from 1855-73, corresponding sec. since 1857. The *Taittiriya-Pratishikha* received the Bopp prize from the Berlin Acad. as the most important Sans. publication of the 3 yrs. then ending. Prof. W. at this time was engaged in other discussions of Asiatic astron., relating especially to the "lunar zodiac," or division of the ecliptic into 27 or 28 lunar stations. He was made prof. of Sans. in Yale Coll. in 1854, and of comparative philology in 1870; was first pres. of the Amer. Philological Association; delivered in 1864 a series of lectures on the study of langs. at the Smithsonian Inst., Wash.; repeated, in extended form, the same at Lowell Inst., Boston. A vol. on the *Life and Growth of Lang.* in "International Scientific Series" was issued in 1875. Mr. W. has made numerous contributions to journals and reviews, mostly in Amer., also in Eng. and Ger. From these, 2 vols. of *Oriental and Linguistic Studies* were collected and pub. He contributed aid to the eds. of the great Sans. lexicon of St. Petersburg. In addition to these literary labors, Prof. W. has been now for many yrs. an instructor in modern langs. in Yale Coll., and pub. a *Compendious Ger. Grammar* and a *Reader*. His latest work is *Life and Growth of Lang.*

**Whitsunday, or Whitsuntide**. See PENTECOST.

**Whittemore** (THOMAS), D. D., b. at Boston Jan. 1, 1800,

studied theology; preached to Univt. chs. in Milford 1821, and Cambridgeport 1822-31; settled at Cambridge; was joint ed. of *Univt. Magazine*, sole ed. and proprietor for nearly 30 yrs. from 1828 of its successor, *The Trumpet*; sat repeatedly in the Mass. legislature. Wrote *The Modern Hist. of Universalism*, *Notes and Illustrations of the Parables of the N. T.*, *Songs of Zion*, etc. D. Mar. 21, 1861.

**Whittier** (JOHN GREENLEAF), b. at Haverhill, Mass., Dec. 17, 1807, of Quaker parentage; received a common-school education; spent his boyhood on a farm, learning also the trade of a shoemaker; began when 18 to write verses for the *Haverhill Gazette*; spent 2 yrs. thereafter at the Haverhill Acad.; became in 1829 ed. of the *Amer. Manufacturer*, a newspaper at Boston; in 1830 ed. of the *N. Eng. Weekly Review*; returned to Haverhill 1831, and engaged in farming for several yrs.; edited, however, the *Gazette* 1832 and 1836; was a member of the legislature 1835-36; became sec. of the Amer. Anti-Slavery Society at Phila. 1836; edited the *Pa. Freeman* 1838-39, his office being sacked and burned by a mob; settled at Amesbury, Mass., 1840; became corresponding ed. of the *National Era*, an anti-slavery paper pub. at Wash., D. C.; contributed to its columns many of his anti-slavery and other favorite lyrics, and has lived in literary retirement of Quaker simplicity for many yrs., publishing frequent vols. of poetry, which have procured him a prominent place among American authors and the love and admiration of his countrymen. His prose writings are *Legends of N. Eng.*, *Justice and Expediency, or Slavery considered with a View to its Abolition*, etc.

**Whittingham** (WILLIAM), b. at Chester, Eng., in 1524, ed. at Brasenose Coll., Ox.; subsequently studied divinity at Orleans, Fr., where he married a sister of John Calvin; settled at Geneva, where he was ordained pastor of the ch. of Eng. exiles (1556) as the successor of John Knox in the ministry, and took part, with others, in the translation of the Bible called by his name. He also made metrical translations of the Ten Commandments and some of the Psalms. In 1563 became dean of Durham, Eng., where he d. in 1589. His widow and children emigrated to N. Eng.

**Whittingham** (WILLIAM ROLLINSON), D. D., LL.D., D. C. L., b. in New York Dec. 2, 1805, became a student at the General Theological Sem.; was grad. a yr. in advance of the canonical age for ordination. When made deacon by Bp. Hobart, he was sent as a missionary to Orange, N. J., and the adjoining villages, and within the yr. was advanced to the priesthood. In 1835 he was nominated to the professorship of ecclesiastical hist. in the General Theological Sem.; in 1840 chosen bp. of Md.; from his access the diocese rapidly advanced in all that belongs to Ch. improvement. By the request of the House of Bps. and as their representative, he attended the Bonn conference of the Old Catholics in Sept. 1872. While yet a student he, jointly with Dr. Turner, translated and prepared for the press Jahn's *Introduction*, and he edited various Church works, but he gave to the world but little of his own. D. Oct. 17, 1879.

**Whittington** (SIR RICHARD), b. at Pauntley, Gloucestershire, Eng., about 1350, was obliged to seek his living, and, according to a well-known legend, walked to Lond.; was apprenticed there to a merchant; became a wealthy merchant; was lord mayor of Lond. 1397, 1406, and 1419; carried on the business of a mercer; made loans to Henry IV. and Henry V.; bought on the Continent the wedding trousseaux for the princesses Blanche and Philippa, of which the invoices are still in existence, and d. in 1423. He left his large estate to public or charitable objects, among which were the rebuilding of Newgate prison, the founding of a coll. and of the libraries at Guildhall and of the Grey Friars, the repair of St. Bartholomew's Hospital, etc. He shared with Richard Harnden the expense of rebuilding the nave of Westminster Abbey, and during his magistracy ordered the compilation of a sort of directory of the city of Lond., containing curious and valuable accounts of its mediæval customs and privileges.

**Whittlesey** (ELISHA), b. at Washington, Conn., Oct. 19, 1783, received an academical education; studied law; settled in the W. Reserve of O. 1806; served in the war of 1812-15 as aide-de-camp to Gen. Wadsworth; was for 16 years prosecuting atty. of his dist.; sat in the O. legislature 1820-21; was M. C. 1822-39; was one of the founders of the Whig party; was appointed by Pres. Harrison auditor for the P. O. dept., and by Pres. Taylor first comptroller of the treasury—a post which he held until 1857, and again under Pres. Lincoln from 1861 until his death, Jan. 7, 1863.

**Whittlesey** (FREDERICK), b. at Washington, Conn., June 12, 1799, grad. at Yale 1818; studied law; was admitted to the bar at Utica, N. Y., 1821; settled at Rochester 1822; conducted an Anti-Masonic political newspaper in the campaign of 1828; was M. C. 1831-35; vice-chancellor of 8th judicial dist. 1839-47, judge of supreme court of N. Y. 1847-48, and prof. of law in Geneva Coll. 1850-51. D. Sept. 19, 1851.

**Whitworth** (SIR JOSEPH), BART., F. R. S., b. at Stockport, Eng., in 1803, was trained to mechanical and manufacturing pursuits at Manchester, where he established an important manufacturing business; invented some improvements in planing-machines and other tools, and began in 1854 the manufacture of the breech-loading rifles, cannons, and other firearms by which his name is widely known. He founded in 1868 the "Whitworth scholarships" in mechanical science, 30 in number, of the annual value of £100; was made a baronet Oct. 1869, and has written several treatises on mechanics.

**Whitworth Guns**. See ARTILLERY.

**Whooping Cough**, a disease generally occurring but once in the life of an individual, and usually during infancy or childhood, is characterized by paroxysms of convulsive coughing, followed by a long ringing inspiration, whence the name. The simple disease is rarely if ever fatal, but when complicated with pulmonary or cerebral disease it is extremely dangerous. W. C. demands care in diet, warm clothing, avoidance of exposure to cold and damp, sustain-



ing remedies when the strength flags, and the use of antispasmodic and sedative remedies to allay the paroxysms of coughing. Chloral and bromides are efficient. Quinine in small doses may be given throughout the attack.

**Whortleberry, Hurtleberry, or Huckleberry**, a well-known Amer. edible berry, being the fruit of the genera *Gaylussacia* and *Vaccinium*, constituting a sub-order of the Ericaceae, or heath family.

**Whydah-Bird**. See WIDOW-BIRD.

**Whyte** (WILLIAM PINCKNEY), b. in Baltimore, Md., in 1824, received a classical education; became a merchant; studied law at Cambridge, Mass.; was admitted to the bar at Baltimore 1846; was elected to the Md. house of deputies 1847, and State comptroller 1853; was appointed U. S. Senator for an unexpired term 1868, and has twice been elected to the same post.

**Wichita**, city and R. R. junc., cap. of Sedgwick co., Kan. Pop. tp. 1870, 689; 1880, 935, and 4911 in city.

**Wichita Falls**, Tex. See APPENDIX.

**Wickersham** (JAMES PYLE, LL.D.), b. in Chester co., Pa., in 1825, ed. at Unionville Acad.; taught school several yrs.; became prin. of an acad. at Marietta, O., 1846, and of the Pa. State Normal School at Millersville 1855-66, and in the latter yr. became State supt. of public schools.

**Wickliffe** (CHARLES A.), b. at Bardstown, Ky., June 8, 1788, ed. at the Bardstown gram. school; was admitted to the bar 1811; became a prominent lawyer; was aide to Gen. Caldwell at the battle of the Thames, Oct. 5, 1813; was a member of the legislature 1812-23, M. C. 1823-33, speaker of the legislature 1834; was elected lieut.-gov. 1836; became acting gov. 1839; was P. M.-gen. 1841-45; was sent on a secret mission to Tex. 1845; was a member of the State constitutional convention 1849, of the Peace Cong. of Feb. 1861, of the U. S. Cong. 1861-63, and delegate to the Chicago convention of 1864. D. Oct. 31, 1869.

**Wickliffe** (JOHN). See WYCLIFFE.

**Wicopy**, the popular name of *Dirca palustris*, a shrub of the mezereum family or Thymelaeaceae, found in the E. forests of the U. S. from Me. to Fla. The name is of Algonkin Indian origin, and the plant is better known under the names of "leatherwood" and "moosewood," being remarkable for the toughness of its bark, which is employed for thongs, and also for baskets.

**Widgeon**, widgeon [Fr. *gingeon*], the vernacular Eng. name for the ducks of the genus *Marca*. These are characterized by the bill being shorter than the head, rather high, with its sides parallel nearly to its end, the end somewhat obtusely pointed; the tail is pointed, and less than half the length of the wings. Four species are known, 2 of which are inhab. of the N. hemisphere, and 2 of the S.

**Widow-Bird** [a corruption of *wildah* or *whydah-bird*, the latter name having reference to its habitat in Whydah, on the W. coast of Afr.], a name given to species of *Vidua* and related genera. The species have the bill conic, but with the culmen more or less arched; the wings are moderate; the tail is variable, but in the male some of the coverts and tail-feathers are usually greatly developed; the tarsi are slender, shorter than the middle toe, and covered in front with large plates; the toes are rather slender, and the hind one especially so, being as long as the inner; the claws are all long and moderately curved, and the hindermost developed. The species are peculiar to Afr.

**Wieland**, weel'and (CHRISTOPH MARTIN), b. at Oberholzheim, Württemberg, Sept. 5, 1733, studied law, modern lang., and belles-lettres at Tübingen. Before he had finished his law-studies he went to Switz., where he resided from 1752 to 1760, partly in Zurich, in the house of Bodmer, as his guest and literary assistant; partly in Berne, as a private tutor. From 1760 to 1769 he lived at Biberach, a free imperial city not far from his birthplace, where he held an office in the civil service. In this period he produced *Don Sylvio de Rosalva*, *Königliche Erzählungen*, *Agathon*, the didactic poem *Musarion*, and a prose translation of Shakspere in 8 vols. (1762-66), which was the first introduction of the Eng. poet to the Ger. public. In 1767 he received a chair of philos. in Erfurt, and held it to 1772, in which yr. he pub., among other things, *Combatus* and *Der neue Amadis*. In 1772 he was called to Weimar as tutor to the young duke, and he remained there till his death, Jan. 30, 1813. With Goethe, Schiller, and Herder he lived very intimately and very friendly, though his enormous literary activity sometimes occasioned collisions. He edited *Deutscher Mercur* (1773-95), *Attisches Museum* (1796-1804), and *Neues Attisches Museum* (1805-09); translated and annotated the epistles and satires of Horace, all the works of Lucian, and Cicero's letters; wrote *Oberon*, a romantic epic; *Neuen Göttergespräche* and *Geheime Geschichte des Philosophen Peregrinus Proteus*, imitations after Lucian; *Geschichte der Abderiten*, and *Arctidipp und einige seiner Zeitgenossen*.

**Wieliczka**, we-litch'ka, town of Aus., in Galicia, contains the largest and richest salt-mines in the world. They extend under the town—9500 ft. in one direction, 3600 ft. in another, and 1780 ft. in depth; have been worked since 1238, employ about 1500 men, and yield annually 55,000 tons of salt. Pop. 5973.

**Wiertz**, weerts (ANTOINE JOSEPH), b. at Dinant, Belg., Feb. 22, 1806, in humble circumstances, was admitted as a pupil in the art school of Antwerp in 1820; won the great prize in 1834; studied for some yrs. in Rome and settled after his return at Brussels. The first period of his artistic career (1834-48) is characterized by colossal representations of mythological or biblical subjects. He offered his *Patroclus* as a prize to him who could show thoroughly the mischievous influence of journalism on art; forged his name on a picture by Rubens, sent it to the committee of the Paris Exhibition, and made the unfortunate judges the laughing-stock of Europe when they rejected it. In 1847 the Belg. govt. built him a large studio after his own designs, and between 1848 and 1853 he succeeded in perfecting the discovery of a new method of painting, which he called *peinture*

*mate*, and which combines the qualities of fresco and oil painting. In the later period of his life (1853-65) his polemical temper developed into an exquisite humor, and his pictures became less pretentious in size and richer both in conception and execution: *The Last Cannon*, *A Second after Death*, *Napoleon in Hell*, *Precipitate Inhumanity*, *Visions of a Head cut off*, etc. He bequeathed all his pictures to the state, and they are now exhibited in the so-called Wiertz Museum, his former studio. He also wrote *Éloge de Rubens* and *L'École Humaine de Peinture*. D. June 18, 1865.

**Wigfall** (LEWIS T.), b. in S. C. about 1834, settled in Tex. as a lawyer; represented that State in the U. S. Senate from 1859 until its secession in 1861, when he was expelled for disloyalty, and became a brig.-gen. of the Confed. army. D. Feb. 21, 1874.

**Wiglesworth** (MICHAEL), b. in Eng. Oct. 18, 1631, was brought to New Haven, Conn., and thence to Charlestown, Mass., by his father 1638; grad. at Harvard 1651; became tutor and fellow there; studied divinity; was ordained minister of the ch. at Malden 1656; had some skill as a phys. Wrote *The Day of Doom*, or *A Poetical Description of the Great and Last Judgment*, with a short Discourse about Eternity. He left in MS. a poem entitled *God's Controversy with N. Eng.*, printed in the *Proceedings* of the Mass. Historical Society 1871. D. June 10, 1715.

**Wight, Isle of**, an island in the English Channel, belonging to the co. of Hampshire, Eng., from which it is separated by the famous *roadstead* of Spithead, comprises an area of 136 sq. m., with 55,182 inhabs. It is traversed from E. to W. by a range of chalk downs rising between 600 and 700 ft. The soil is very fertile, and the climate remarkably mild and equable. Wheat, vegetables, and fruits are extensively cultivated, and a fine breed of sheep is reared on the downs. Cap. Newport.

**Wightman** (WILLIAM MAY), D. D., LL.D., b. in Charleston, S. C., Jan. 8, 1808; in 1827 grad. at Charleston Coll., and in 1828 joined the S. C. conference of the M. E. Ch.; he filled important appointments in the pastoral work till 1834, when he was made agent for Randolph-Macon Coll. in Va., in which capacity he served for 3 yrs., when he took the chair of Eng. lit. in that inst.; in 1839 became presiding elder of the Cokesbury dist., S. C., conference; and at the Gen. Conference of 1840, of which he was a member, he was made ed. of the *S. Chr. Advocate*, pub. in Charleston; was a member of the Gen. Conference of 1844, which took measures for the division of the Ch., and of the Louisville convention of 1845, which organized the M. E. Ch. S., and of the General Conferences of 1846, 1850, 1854, 1858 (1862 not held), and 1866. In 1854 he became pres. of Wofford Coll., Spartanburg, S. C., where he remained till he was made chancellor of the Southern Univ., Greensboro', Ala., 1859, when he also joined the Ala. conference; wrote *Life of Bp. Copers*. He was elected bp. at the General Conference of 1866. Resided in Charleston, S. C. D. Feb. 15, 1882.

**Wilber**, on R. R., cap. of Saline co., Neb. Pop. 1880, 710.

**Wilberforce** (SAMUEL), D. D., son of William, b. at Clapham, Eng., Sept. 7, 1805, grad. with honors at Oriel Coll., Ox., 1826; took orders in the Ch. of Eng.; became curate of Chickendon, Oxfordshire, 1828, rector of Brixton (Brightstone), Isle of Wight, 1830, select preacher before the Univ. of Ox. 1837 and again 1845, rector of Alverstoke, Hampshire, archdeacon of Surrey and chaplain to Prince Albert 1839, canon of Winchester cathedral 1840, sub-almoner to the queen 1844, dean of Westminster 1845, bp. of Ox. and *ex-officio* chancellor of the order of the Garter Nov. 1845, lord high almoner to the queen Nov. 1847, and bp. of Winchester Oct. 1869. He was a leader of the High-Ch. party, but an opponent of ritualism. Wrote *Note-Book of a Country Clergyman*, *Eucharistica*, *Sermons preached before the Univ. of Ox.*, etc. D. July 19, 1873.

**Wilberforce** (WILLIAM), b. at Hull, Eng., Aug. 24, 1759. When not much more than 7 yrs. old he was sent to the gram.-school of Hull, then under the charge of Joseph and Isaac Milner. In Oct. 1776 he entered St. John's Coll., Cambridge. At Cambridge he formed an acquaintance with William Pitt, which afterward ripened into intimacy. Having determined to enter public life, he offered himself for Hull (in 1780), and after a sharp contest was elected to Parl. at a personal expense of between £2000 and £3000. In 1784 he was elected to represent the great co. of York, a success which seemed to open before him the most gratifying prospects. The yrs. 1785-86 witnessed the whole course of his future life. The result of this was that he began in 1785 a series of efforts for the reformation of manners, and especially for abolishing the Afr. slave-trade. The latter subject was brought into Parl. and after overcoming many obstacles he opened the debate against the traffic on May 12, 1789. In this philanthropic effort he was supported by Burke, Pitt, and Fox. Although defeated, he renewed the effort whenever there seemed a chance of success, and finally, in 1807, after a struggle of nearly 20 yrs., had the joy of seeing the bill passed by both houses. It received the royal assent on Mar. 25, and became the law of the land. In 1797 Mr. W. pub. his book entitled *A Practical View of the Prevailing Religious System of Professed Chrs. in the Higher and Middle Classes, contrasted with Real Christianity*. In 1825 he retired from Parl. after a continuous service of nearly 46 yrs. After leaving Parl. he retired almost altogether from public life. Three days before his death he had the intense pleasure of its learning that the House of Commons had passed to its second reading the bill for the abolition of slavery. Held in great honor during all his later yrs., he d. July 29, 1833.

**Wilbrord**, or **Willibrod** (SAINT), called "the apostle of the Frisians," b. in the Sax. kingdom of Northumbria about 657, embraced the monastic profession while very young; spent 12 yrs. in Ire.; was ordained a priest about 680; went to Friesland in 690 or 691; was well received by Pepin the Big, the Frankman ruler of Friesland; made a visit to Rome 692; obtained ecclesiastical authority from



Pope Sergius, and during a second visit (695) was ordained bp. of the Frisians under the name of CLEMENS; is claimed as the founder of the see of Utrecht, where he built the ch. of St. Saviour, and spent his last yrs. at a monastery he had established (698) at Echtemach, where he d. in 738.

**Wilbur** (HERVEY), D. D. b. at Wendell, Mass., in 1787, was minister of his native place 1817-23, and subsequently presided over several female sems. Pub. a *Reference Bible*, *A Lexicon of Useful Knowledge*, etc. D. 1832.

**Wilbur** (HERVEY BACKUS), M. D., son of Hervey, b. at Wendell, Mass., Aug. 18, 1820, grad. at Amherst Coll. 1838; studied med., which he practised at Lowell and at Barre, Mass.; received several idiot pupils into his house at Barre July 1848; prevailed upon the legislature of N. Y. to establish in 1851 an experimental school at Albany, which under his care was so successful as to be fully organized in 1854 as State asylum for idiots at Syracuse. D. May 1, 1883.

**Wilbur** (JOHN), b. at Hopkinton, R. I., in 1774, became a minister of the Society of Friends; was accused in 1838 by several members of R. I. yearly meeting of circulating in his conversation and writings opinions and statements derogatory to the character of the celebrated Joseph John Gurney, then (1837-40) visiting the U. S.; was sustained by a large majority in his own monthly meeting, but that body having been dissolved and its members added to the Greenwich meeting, he was formally disowned by the latter body Jan. 1843. His supporters were, however, sufficiently numerous to form an independent yearly meeting, the members of which were known as "Wilburites." D. 1856.

**Wild-Cat.** See CAT.

**Wild Cherry** (*Cerasus serotina*, De Cand.). The W. C. is a very common tree throughout America, growing in all parts of the U. S. In the W. States it may attain a height of from 80 to 100 ft., but in the Atlantic States it is usually much smaller. The fruit is small, about the size of a large pea, and when ripe is of a shining blackish-purple color. The wood of the W. C. is much prized by cabinetmakers for its fine grain, handsome tint, and susceptibility to high polish. The inner bark, taken from all parts of the tree, furnishes the drug known as "wild cherry." W. C. bark is in pieces of various sizes, without epidermis, and of a light cinnamon color. It has the odor of peach-leaves and an agreeable aromatic taste, with a flavor of bitter almonds. The important ingredients of the bark are tannin and the peculiar principles *amygdaline* and *emulsine*, which by mutual reaction in the presence of water develop a volatile oil containing a small percentage of hydrocyanic acid.

**Wilde** (OSCAR), b. in Dublin, Ire., 1856, son of Sir William Wilde, oculist; ed. at Portora Royal School, Enniskillen, and at Ox., where he grad. and gained the Newdegate prize for Eng. verse. Studying under Ruskin, he joined the Eng. aesthetes, and was satirized in *Punch*. He claims to be doing for the costume of men what the pre-Raphaelites have done for painting, and Eastlake and others for house decoration. Lectured in the U. S. in 1882, and has written a volume of poems.—His mother, LADY WILDE, wrote poems under the pseudonym of "Speranza."

**Wilde** (RICHARD HENRY), b. in Dublin, Ire., Sept. 24, 1789. His parents migrated to the U. S., and settled in Baltimore while he was an infant. His father soon died, and when he was 13 his mother moved to Augusta, Ga., where they obtained a living by merchandising in a small way. Under many difficulties he studied law; was admitted to the bar; became atty.-gen. of the State; in 1815 was elected to Cong. On retiring from Cong. in 1835 he spent several yrs. in literary pursuits. Several productions of great merit came from his pen. Those which will live longest, perhaps, are, first, his famous lyric entitled "My life is like a summer rose," and the second his *Life of Tasso*. In 1843 he moved to New Orleans, when he renewed the practice of law with unusual success, and was elected prof. of constitutional law in the Univ. of La. D. Sept. 10, 1847.

**Wilde** (SAMUEL SUMNER), LL.D., b. at Taunton, Mass., Feb. 5, 1771, grad. at Dartmouth Coll. 1789; was admitted to the bar 1792; practised successively at Waldoborough, Warren, and Hallowell, Me.; was a member of the legislature and of the executive council; was a delegate to the Hartford Convention 1814, and judge of the Mass. supreme court 1815-50; removed to Newburyport, Mass., 1830, and to Boston 1831; sat in the Mass. constitutional convention 1820; was a member of the Amer. Acad. of Arts and Sciences. D. June 22, 1855.

**Wildebeest.** See Gnu.

**Wilder** (ALEXANDER), M. D., b. at Verona, Oneida co., N. Y., May 13, 1823, is self-educated; was for some yrs. a teacher; edited the *Syracuse Star* 1852, and the *Journal* 1853; was employed in the State dept. of public instruction 1854-55; became ed. of the *N. Y. Teacher* 1855, and of the *Coll. Review* 1856; was a staff contributor to the *Anglo-American*, the *New Ch. Repository*, the *New York Evening Post* 1858-71; also to the *Med. Review* and the *Med. Eclectic*; practised in New York as an eclectic phys.; became pres. of the Eclectic Med. Society of New York 1869-70, sec. of the National Eclectic Med. Association, and in 1867 pres. of the Eclectic Med. Coll. of the City of New York and lecturer on physiology and physiological med. Wrote *The Secret of Immortality Revealed*, treatises on *The Eclectics of Alexandria*, *The Intermarriage of Kindred*, etc.

**Wilder** (MARSHALL PINCKNEY), b. at Rindge, N. H., Sept. 22, 1798, ed. at common schools and at the Ipswich Acad.; worked on his father's farm; afterward engaged in commercial pursuits, and in 1825 established himself as a merchant at Boston; was prominent in the organization of the State Agricultural Coll.; was pres. of the Mass. Horticultural Society 1840-48, of the Amer. Pomological Society from 1848, of the U. S. Agricultural Society 1852-58, and of the N. Eng. Historico-Genaealogical Society from 1869; has sat in both houses of the legislature and in the executive council, and was pres. of the senate 1850.

**Wilderness, Battles of the**, fought between the U. S. and Confed. States armies. The general character of the section of the country in which this battle was fought is that of a wilderness, by which name it is locally known. During the winter of 1863-64 the U. S. forces, under command of Gen. Meade, were encamped along the line of the Orange and Alexandria R. R., extending from Bull Run to the Rapidan. The opposing army, under Gen. Lee, occupied a strong line, partly intrenched, on the S. bank of the Rapidan, extending from Mine Run westward to Orange C.-H. and Gordonsville, covering Richmond, and threatening Wash. In Mar. 1864 Gen. Grant took up his headquarters with Gen. Meade's army. Gen. Meade broke camp at midnight May 3-4, and commenced moving toward the Rapidan. Before sunset Meade's army was established with but slight opposition in the Wilderness. Gen. Grant, at 6 p. m. on the 4th, ordered an advance toward Lee next morning. On the morning of May 5 the 5th corps and the advance of Lee's army met, a fierce encounter between some 25,000 men opening this bloody campaign. The evening of May 5 found both armies face to face. At dawn of day on May 6 the battle was renewed along all the opposing lines, and continued until dark. On the morning of May 7 both armies were behind intrenched lines, each too much exhausted to renew the fight. Gen. Grant then determined to move to his left, thus securing a short base of operations by way of Fredericksburg and the Potomac River, and threatening Lee's communications with Richmond. This was begun after dark on the 7th. Gen. Lee, however, anticipated this, and having a shorter road, his main force reached there first, and the battles of Spottsylvania followed.

**SPOTTSVYLVANIA, BATTLES OF**, May 8-21.—The advance cav. of the Union army occupied this place early in the morning of May 8, but were compelled to withdraw before their enemy's advancing inf. The 5th corps forced the enemy back until it found itself confronting the corps of Longstreet, and severe fighting followed. During the day the 6th corps joined the 5th, and a combined attack was made by them at dark, but without result. The other corps of both armies continued to arrive and take up positions, attended with constant fighting and severe loss of life. The 9th, 10th, and 11th of May were passed in movements and bloody conflicts, without being decisive. Early on the morning of the 12th a general assault was made by Gen. Grant upon Lee's position, but no decisive result was obtained. The 13th to the 18th were spent in demonstrations, conflicts, and reorganization while awaiting reinforcements. Unable to force the position at Spottsylvania, Gen. Grant issued orders for a movement toward N. Anna River, around the right of Gen. Lee. The latter delayed this movement until the 21st. Lee established his forces on the S. bank of the N. Anna, where the battles were again renewed.

**NORTH ANNA, BATTLES OF**.—The 5th corps reached the N. Anna on the afternoon of the 23d, closely followed by the 6th corps, the 2d and 9th coming up about the same time. Gen. Warren effected a crossing the same afternoon without much opposition. Soon after getting into position he was violently attacked, but repulsed the enemy with great loss. Hancock on the left effected a crossing after some fighting. On the 24th the 6th corps crossed, taking position on Warren's right. The attempt of Burnside, on the centre, was repulsed. Finding the enemy's position on the N. Anna stronger than either of his previous ones, Gen. Grant withdrew on the night of the 26th to the N. bank, and moved to turn the enemy's position by his right. The battle of COLD HARBOR (which see) was the next serious engagement between the two armies.

**Wildsey** (THOMAS), b. in Eng. Jan. 15, 1783, came to the U. S. 1817; settled at Baltimore as a coach-spring maker, and there instituted in 1819 the first lodge of Odd Fellows in Amer. He was grand sire of that order from 1825 to 1833. D. at Baltimore Oct. 19, 1861.

**Wild-Goose.** See CANADA GOOSE.

**Wild Service.** See SORE TREE.

**Wiley** (CALVIN HENDERSON), b. in Guilford co., N. C., Feb. 3, 1819, studied at Caldwell Inst., Greensboro', grad. at the Univ. of N. C. 1840; studied law, and was admitted to the bar 1841; was a member of the N. C. legislature 1850 and 1852; became Stat. supt. of common schools Dec. 1852; was licensed to preach by the Orange presbytery 1856, and regularly ordained to the ministry 1866; contributed to *Sartain's* and other magazines; founded and edited the *Southern Weekly Post* at Raleigh; was ed. and proprietor of the *Oxford Mercury*; was instrumental in founding a State educational association, and one of the eds. of its journal; procured during the c. war the establishment at Greensboro' N. C., of a publishing-house to supply the State with text-books, and was prominent in organizing at Columbia, S. C., the Educational Association of C. S. A. Wrote *Life in the South*, a *Companion to Uncle Tom's Cabin*, etc.

**Wiley** (ISAAC WILLIAM), D. D., b. in Pa. Mar. 29, 1825, grad. in med.; afterward studied theol., and joined the Phila. M. E. conference in 1849; the next yr. he was sent as missionary to China, where he continued 4 yrs. Became prin. of the Pennington Sem. in N. J. In 1864 he was appointed ed. of the *Ladies' Repository*; in 1872 was elected bp. Wrote *Fallen Heroes in Foo-Chow*.

**Wilfrid, or Wilfred** (SAINT), b. in the Sax. kingdom of Bernicia (Northumberland) about 634, of a noble family; studied at Lindisfarne Abbey, where he became a monk; built a monastery at Ripon 663; was commissioned by King Alclred to regulate the usages of the Northumbrian Ch. upon the time of celebrating Easter, on which subject a famous council was held at Whitby (664) in the royal presence; was appointed by the king bp. of York, but was opposed by Ceadda (St. Chad), who had taken possession of the see in his absence; retired to his monastery for 3 yrs.; was put in possession of the bishopric 669; ejected by King Egfrid, who divided the diocese into 3 bishoprics. D. Apr. 24, 709.

**Wilhelm** (KARL), b. at Smalcald, Prus. prov. of Hesse,



was for many yrs. a teacher of music in Crefeld. In 1854 composed the music to *Die Wacht am Rhein*. D. Aug. 26, 1873.

**Wilhelmshaven.** See JADE.

**Wilhelmshöhe.** See CASSEL.

**Wilkes (CHARLES)**, b. in New York in 1801, entered the naval service of the U. S. as midpn. Jan. 1, 1818; became lieut. 1836, commander 1843, capt. 1855, com. 1862. He conducted the U. S. expedition (1838-42) to explore the Southern and Pacific oceans. In 1861 he was ordered to the W. I. in command of the frigate *San Jacinto* to search for the Confed. cruiser *Sumter*. Learning that the Confed. coms. Slidell and Mason were on their way to Europe in the Brit. mail-steamer *Trent*, he intercepted that vessel and took from her those men, whom he conveyed to Boston. In 1862 he was placed in command of the Potomac flotilla to co-operate with the Army of the Potomac, but on the withdrawal of that army from the Va. peninsula was ordered to command the flying squadron organized for the purpose of breaking up the blockade-running between the S. States and the W. I. Many captures were made. In July 1866 he was promoted rear-admiral, and was shortly after retired. Wrote *W. Amer., including Cal. and Or., The Theory of the Wind*, with maps and charts, etc. D. Feb. 8, 1877.

**Wilkes (JOHN)**, b. at Clerkenwell, Lond., Eng., Oct. 17, 1727, ed. at Hertford and Aylesbury schools and at the Univ. of Leyden; settled in Buckinghamshire; became col. of the militia and high sheriff of that co.; was elected to Parl. from Aylesbury 1757; commenced in June 1762 the publication of a weekly paper, *The N. Briton*; printed in his No. 45 a violent attack upon the king; was committed to the Tower Apr. 30, but was soon released by order of Chief Justice Pratt of the common pleas, who decided that general warrants were "unconstitutional, illegal, and also absolutely void." The House of Commons, however, declared No. 45 of the *N. Briton* to be a "seditious libel," caused it to be burned by the hangman Nov. 1763, and passed a special law for the prosecution of its author. W. meanwhile won a suit against the under-sec. of state for seizure of his papers, but was expelled from the House of Commons Jan. 10, 1764; was prosecuted on the charge of republishing No. 45, and also for printing and publishing an obscene poem called *An Essay on Woman*, and was found guilty of both charges by the court of king's bench Feb. 21, 1764; was chosen to Parl. for the co. of Middlesex (including the city of Lond.); surrendered himself to the court of king's bench; was rearrested, rescued by the mob, but went voluntarily into confinement; was the occasion of a riot in St. George's Fields May 10, 1768; was expelled from the House of Commons for the new offence of libelling Lord Weymouth, but was returned without opposition at the new election. Though declared by Parl. incapable of a seat, he was 3 times chosen by his constituency, until, on the ground of illegality of votes cast for him, an opponent who had received but few votes was declared elected. These events caused great commotion in Eng. In Apr. 1770 he was set at liberty, was chosen alderman of Lond., and took his seat in Parl., where a vain attempt was made to force him to appear at the bar in the capacity of alderman. He was elected sheriff of Lond. 1771, lord mayor 1774, in which yr. he was re-elected to Parl.; had the resolutions of the House on the elections expunged May 1782, and was chamberlain of Lond. from 1779 to his death, Dec. 27, 1797.

**Wilkes-barre**, city and important R. R. centre, cap. of Luzerne co., Pa., in the beautiful valley of Wyoming, on the E. bank of the N. branch of Susquehanna River. The tp. was surveyed under a Conn. claim in 1770, and named after John Wilkes and Col. Isaac Barré for their efforts as members of the Brit. Parl. in the cause of liberty. The town in 1772 contained 4 white women; incorporated a borough under Pa. in 1806; is the centre of Wyoming coal-field. Incorporated by act of assembly as a city May 4, 1871. N. Branch Canal affords water-communication S. Pop. 1870, 10,174; 1880, 23,339.

**Wilkie (Sir DAVID)**, b. at Culter, Fifeshire, Scot., Nov. 18, 1755, studied painting in the Trustees' Acad., Edinburgh, and at the Royal Acad., Lond., where in 1806 he exhibited his celebrated *Village Politicians*, quickly followed by *The Blind Fiddler*, *The Card-Players*, etc.; was chosen an academician 1811; produced during 12 yrs. many notable pictures, including a group of Sir Walter Scott and his family, the *Chelsea Pensioners reading the Gazette of the Battle of Waterloo*; was made painter in ordinary to George IV. Jan. 1830; was knighted by William IV. 1836; made portraits of those sovereigns and of Queen Victoria; executed a fine painting of the *First Council of Great Britain*. D. June 1, 1841.

**Wilkie (WILLIAM)**, D. D., b. at Dalmeny, W. Lothian, Scot., Oct. 5, 1721, ed. at the Univ. of Edinburgh; became a successful farmer; was ordained minister of the Scot. Kirk at Ratho 1753, and became prof. of nat. philos. in the Univ. of St. Andrew's 1759. Wrote *The Epigeniad, a Poem in Nine Books*, and a vol. of *Fables*. D. Oct. 10, 1772.

**Wilkins (Sir CHARLES)**, D. C. L., F. R. S., b. at Frome, Somersetshire, Eng., in 1749, went to Bengal in the civil service 1770; resided in India 16 yrs., during which time he acquired a knowledge not only of Bengali, Ar. and Per., but also of Sans., which lang. he was the first to make known to European scholars; founded, in conjunction with Sir William Jones, the Literary Society of Calcutta, which subsequently became the Royal Asiatic Society of Calcutta; pub. a translation from the Sans. of *The Bhagvat Geta*, or *Dialogues of Kreshtna and Arjoon*; returned to Eng. 1785, but continued his Oriental studies; became librarian of the E. I. Co. 1801, and visitor of the co.'s colls. at Haileybury and Addiscombe; was made a knight of the Guelphic order 1823. He pub. translations of the *Hitopadesa*, *The Story of Dooshwanta and Sakountala*, and was author of a *Gram. of the Sanskrit Lang.*, etc. D. May 13, 1836.

**Wilkins (JOHN)**, D. D., b. in 1614 at Fawsley, Northamptonshire, Eng., ed. at New Inn and Magdalen halls, Ox., graduating at the latter about 1632; took orders in the Ch.

of Eng. 1635; was a zealous adherent of Parl. during the great rebellion, and took the Solemn League and Covenant; was chiefly instrumental in forming at Lond. in 1645 the club of scientists which became the nucleus of the Royal Society; became warden of Wadham Coll. Apr. 13, 1648; was appointed master of Trinity Coll., Cambridge, 1659; was ejected at the Restoration 1660; became prebendary of York 1660; made rector of St. Lawrence, Jewry, Lond., 1663; became preacher to Gray's Inn; was one of the charter members and councillors of the Royal Society 1663, and became bp. of Chester 1668. He was the inventor of the perambulator or measuring-wheel. Wrote *Discovery of a New World; Mercury, or the Secret and Swift Messenger, showing how a Man may with Privacy and Speed communicate his Thoughts to a Friend at any Distance; An Essay towards a Real Character and a Philosophical Lang., with an Alphabetical Dict.*, etc. D. Nov. 19, 1672.

**Wilkins (WILLIAM)**, R. A., F. S. A., b. at Norwich, Eng., Aug. 31, 1778, grad. at Calus and Gonville Coll., Cambridge, 1800; became a fellow there 1805; devoted himself to the study of classic architecture; became arch. to the E. I. Co. and prof. of architecture at the Royal Acad. 1837. He designed the Lond. Univ. 1827, the National Gallery, Lond., 1832-38, Corpus Christi and Downing colls., Cambridge, etc.; contributed to the *Archæologia*; translated *The Civil Architecture of Vitruvius*. Among his works were *The Antiquities of Magna Græcia; Atheniensiæ, or Remarks on the Topography and Buildings of Athens*, etc. D. Aug. 31, 1859.

**Wilkins (WILLIAM)**, b. in E. Pa. in 1779, received a good education; became in 1810 pres. of the Pittsburg Manufacturing Co., subsequently transformed into the Bank of Pittsburg; was elected in 1819 to the legislature, where he became noted for knowledge of business details and for skill in debate; was U. S. Senator 1831-34, minister to Russia 1834-36; M. C. 1843-44, sec. of war 1844-45; was co-founder of the W. Pa. Hospital 1847, and judge of the U. S. dist. court for W. Pa. D. June 23, 1865.

**Wilkinson (JAMES)**, b. in Md. in 1757, studied med. in Phila.; after the death of Bunker Hill repaired to Cambridge; appointed a capt. in Reed's N. H. regiment, serving as such until July 1776, and lieutenant-col. Jan. 12, 1777; bearer of despatches to Gen. Washington from Gen. Gates Dec. 1776, he participated in the battles of Trenton and Princeton. Upon Gates's accession to command of the N. army, W. was made his adjutant-gen. May 1777, and upon the surrender of Burgoyne he conveyed the official despatches to Cong. Brevetted brig.-gen. in Nov. he was in Jan. 1778 appointed sec. of the board of war; resigned his secretaryship, and in July 1779 was appointed clothier-gen. of the army. Settled in Ky. after the peace, and engaged in mercantile affairs. Appointed lieutenant-col. 2d Inf. Nov. 1791, and conducted an expedition against the Wabash Indians 1791-92; commanded right wing of Wayne's army at Maumee Rapids, and in Dec. 1796 became gen.-in-chief of the army, serving on the W. frontier; one of the coms. to receive La. from the Fr. in 1803, he was gov. of that Terr. 1805-06; ordered to command on the Miss. Dec. 1808, he was recalled to Wash. in 1810, and tried by court-martial in 1811 on charges of corruptly receiving money from Sp. The court acquitted him with credit. In 1813 he was appointed maj.-gen., and transferred to the N. frontier. Owing to the failure of Hampton to co-operate with him, his plans for the occupation of Canada totally failed. He was superseded in command, and a court of inquiry ordered in 1815, which acquitted him of all blame. D. Dec. 28, 1825.

**Wilkinson (JEMIMA)**, b. at Cumberland, R. I., about 1753, ed. as a Quaker; recovered from a severe fever, attended by an apparent suspension of life, 1773, after which she asserted that she had been raised from the dead to instruct mankind; made a few proselytes, with whom she resided in the present town of Torrey, Yates co., N. Y., where a v. named Jerusalem was built, and settled there until her death, July 1, 1819, when the sect was broken up.

**Wilkinson (Sir JOHN GARDNER)**, D. C. L., F. R. S., b. at Haxendale, Westmoreland, Eng., Oct. 5, 1797, ed. at Harrow School and at Exeter Coll., Ox.; resided 12 yrs. in Egypt, engaged in a careful study of the anc. hist., geog., ethnography, and architectural remains of that country, making by his publications important additions to the existing knowledge, for which he was knighted 1839; presented his collections of Egyptian, Gr., and other antiquities to Harrow School for the purpose of forming a museum, to which he added in 1874 his collection of coins and medals. Wrote *Materia Hieroglyphica, The Topography of Thebes and General View of Egypt, The Manners and Customs of the Anc. Egyptians*, etc. D. Oct. 23, 1875.

**Wilks (MARK)**, b. in Eng. about 1765, was appointed a cadet in the E. I. service 1782; rose to the rank of lieutenant. 1808, and brevet col. 1814; was political resident at Mysore 1803-08; was gov. of St. Helena 1812-16, embracing the first yr. of Nap.'s captivity in that island, and was placed on the retired list 1818. Wrote *A Report on the Interior Administration of the Govt. of Mysore and Historical Sketches of the S. of India in an Attempt to Trace the Hist. of Mysore*, etc. D. Sept. 19, 1831.

**Will** is one of the 3 forms under which the human mind becomes conscious of itself, thought and feeling being the 2 others. From its lowest phase, as an entirely unconscious correlation between action and reaction, to its highest phase as the pursuit of an aim exclusively for its moral worth, and as the pursuit of its relations to the natural individual, the will runs through a great number of stages, appearing first as instinct, impulse, appetite, passion, etc., before it submits to the government of the moral ideas, and thereby enters into the sphere of freedom; and its definition varies according to the stages in which it is considered.

**Willamette River**, a branch of the Columbia, rises in the Cascade Mts. in Or., and flows first N. W. and then N. through a beautiful region, extremely fertile and now



well settled. It is navigable for ships to Portland, 15 m. Twenty-five m. from its mouth are the Willamette Falls, 40 feet high, at Oregon City.

**Willard** (CHARLES WESLEY), b. at Lyndon, Vt., June 18, 1827, grad. at Dartmouth 1851; was admitted to the bar at Montpelier 1853; was elected sec. of state 1855; was chosen State senator 1860; became ed. of the *Green Mountain Freeman* 1861, and was M. C. 1869-73, serving on the committee of foreign affairs and as chairman of that on Revolutionary pensions.

**Willard** (EMMA C. Hart), b. in Worthington parish, Berlin, Conn., Feb. 23, 1787, ed. at the v. acad.; became a dist. school-teacher at 16; taught a select school the following yr.; was at different times preceptress in acads. at Berlin, Westfield, Mass., and Middlebury, Vt.; married Dr. John Willard at Middlebury, Vt., Aug. 1809; opened at that place a boarding-school for girls 1814; wrote *A Plan for improving Female Education*, which was submitted in MS. to Gov. De Witt Clinton of N. Y.; opened a school under his patronage at Waterford, N. Y., 1819; removed the school to Troy May 1821; lost her husband 1825; wrote several school hist. and other educational books; superintended the sem. with great success until 1838; pub. *Journal and Letters from Fr. and G. Brit.*, devoting the profits (about \$1100) to the assistance of a school for women in Athens, Gr., which owed its origin to her; settled at Hartford, Conn., 1838; directed her energies for several yrs. to the revision of her numerous school-books and to public labors in the cause of higher education. D. Apr. 15, 1870.

**Willard** (FRANCES E.), b. near Rochester, N. Y., Sept. 28, 1839, grad. at the N. W. Female Coll. 1858; was a successful teacher in several W. towns; became directress of the Genesee Wesleyan Sem. at Lima, N. Y., 1867, and was chosen (Feb. 14, 1871) pres. of the Evanston Coll. for ladies, established in connection with the N. W. Univ. In 1869-71 she travelled in Europe, Egypt, and Pal., and on her return delivered lectures at Chicago.

**Willard** (GEORGE), b. at Bolton, Vt., Mar. 20, 1824, received a liberal education; removed to Mich. in early manhood; was 2 yrs. prof. in Kalamazoo Coll.; member of the board of education 1857-63; became regent of the univ. 1863; was a member of the State constitutional convention; a delegate to the national Rep. convention of 1872; was for several yrs. ed. and proprietor of the *Battle Creek Journal* and M. C. 1873-77.

**Willard** (JOHN), b. in New York in 1792, became a prominent Dem. lawyer; in 1836 judge and vice-chancellor of the 4th circuit court of N. Y.; was a justice of the supreme court of N. Y. 1847-55; was elected to the State senate by a unanimous vote 1861; served on the judiciary committee and prepared the act of 1862 restoring the death penalty. Wrote *A Treatise on Equity Jurisprudence, A Treatise on the Law of Executors, Administrators, and Guardians, and A Treatise on the Law of Real Estate, and the Mode of Alienation thereof*. D. Sept. 1, 1862.

**Willard** (JOHN DWIGHT), LL.D., b. at Lancaster, Mass., Nov. 4, 1799, grad. at Dartmouth Coll. 1819; was admitted to the N. Y. bar about 1823; began practice at Troy, N. Y., 1826; was for some yrs. ed. of the *Troy Sentinel*; member of the State senate and judge of the circuit court of N. Y. He left \$10,000 to Dartmouth Coll. D. Oct. 16, 1864.

**Willard** (JOSEPH), D. D., LL.D., b. at Biddeford, Me., Dec. 28, 1738, grad. at Harvard 1765; was tutor there 1766-72; became colleague pastor of the Congl. ch. at Beverly, Mass., Nov. 25, 1772, and was pres. of Harvard Coll. from Dec. 19, 1781, until his death, Sept. 25, 1804.

**Willard** (SAMUEL), D. D., nephew of Pres. Joseph, b. at Petersham, Mass., Apr. 19, 1776, grad. at Harvard 1803; was tutor in Bowdoin Coll. 1804-05, and pastor of the Congl. ch. at Deerfield, Mass., from Sept. 3, 1807, to Sept. 1829. Author of *The Deerfield Collection of Sacred Music, Original Hymns, An Index to the Bible*, etc. D. Oct. 8, 1859.

**Willard** (SIMON), b. in Kent, Eng., in Apr. 1605, came to Mass. in 1634; was one of the chief founders of Concord; afterward lived in Lancaster, Groton, and Salem; held various civil offices; was major of militia during King Philip's war; became a magistrate, and d. Apr. 24, 1676.

**Willard** (SIMON), b. at Roxbury, Mass., Jan. 9, 1795, grad. at the U. S. Military Acad. Mar. 2, 1815. After an unsuccessful business career of 7 yrs. he entered his father's clock-making establishment, but at the end of 2 yrs. apprenticed himself to learn the watchmaking and chronometer business. He soon became expert, and in 1828 returned to Boston, where he embarked in business for himself; attained a very distinguished reputation in his profession. At the outset of his later venture in Boston he constructed an astronomical clock that was for 40 yrs. the standard of time for that section. D. Aug. 24, 1874.

**Willehad, or Wilhead** (SAINT), b. in Northumbria, Eng., early in the 8th century, went as a missionary to the pagans of Friesland shortly after the martyrdom of (Saint) Boniface; was supported by Pope Adrian I. and by Charlemagne; became bp. of "Wigmodia" (afterward Bremen) 787; built there a noble cathedral, and had great success in the conversion of both Frieslanders and Saxons. D. in 789.

**Willemite, or Wilhelmite** [named after Wilhelm I., king of the Netherlands; also called *troostite* (the N. J. ore)], a native silicate of zinc; rhombohedral in crystallization; generally yellowish, greenish, or salmon-colored; generally opaque, but sometimes translucent, or even transparent; hardness somewhat below feldspar. W., which in European localities is not common, occurs at some Amer. localities in N. J.—about Franklin and Stirling—almost in rock-masses, constituting a very valuable and important zinc ore.

**Willitt, or Stone Curlew**, the *Symphemia semipalmata*, a bird of the snipe family, found in N. and S. Amer. It is a fine game-bird, and its eggs and flesh are prized as food. It is named from its note, "pitt-will-willet."

**Willitt** (MARINUS), b. at Jamaica, L. I., July 31, 1740, was a lieut. in Delancey's regiment during the Fr. war, and

was distinguished at the unsuccessful assault upon Ft. Ticonderoga; served in Col. Bradstreet's expedition against Ft. Frontenac; was a capt. under Montgomery in the Canada campaign of 1775-76; became lieut.-col. of the 3d N. Y. regt. 1776; defended Ft. Stanwix against the regulars, Tories, and Indians commanded by St. Leger Aug. 1777; made a successful sally as a diversion in favor of Gen. Herkimer; held the fort until its relief by Arnold; joined the army in N. J. June 1778; was present at Monmouth; accompanied Sullivan in his campaign against the Six Nations; was sheriff of N. Y. 1784-92, and mayor of New York 1807. D. Aug. 22, 1830.

**Will'ey** (HENRY), b. in Genesee, N. Y., July 19, 1824, ed. at the acad. in that town and at the Bridgewater (Mass.) Normal School; was for several yrs. a teacher, and in 1856 became ed. of the *Daily Evening Standard* of New Bedford, Mass. As a botanist has occupied himself especially with N. Amer. lichens, and has pub. the following: *List of N. Amer. Lichens, Statistics and Distribution of N. Amer. Lichens, Amer. Lichenography*, etc.

**William**, wil'iam, the name of 3 kings of the Netherlands, descending from Count Johann of Dillenburg, a brother of William the Silent of Orange-Nassau. WILLIAM I. (1815-40), b. at the Hague Aug. 24, 1772, the eldest son of William V., prince of Orange-Nassau and stadtholder of the Dutch republic. By the Cong. of Vienna the kingdom of the Netherlands, consisting of Hol. and Belg., was formed, and on Mar. 16, 1815, William I. was proclaimed king at the Hague. In compensation for his hereditary possessions, which were given partly to Prus., partly to Nassau, he received the grand duchy of Luxembourg. The combination of Hol. and Belg. proved a blunder. By the revolution of 1830 Belg. seceded. William I. would not submit to this decision, but continued his protest up to 1839 in a very expensive manner. This and other circumstances spoiled his relation to his Dutch subjects, and on Oct. 7, 1840, he found it advisable to abdicate in favor of his son. He went to Berlin with an almost fabulous fortune, and d. there Dec. 12, 1843.—WILLIAM II. (1840-49), b. at the Hague Dec. 6, 1792, the eldest son of William I., restored order to the finances, which had fallen into utter confusion during the reign of his father, but showed himself very unwilling to enter on any political reforms. Nevertheless, when, in 1848, the fermentation became dangerous in the country, he consented to a thorough reorganization of the govt., but d. before the new const. could be established, Mar. 17, 1849.—WILLIAM III., b. at the Hague Feb. 19, 1817, the eldest son of William II., succeeded to the throne Mar. 17, 1849. When the Ger. union was dissolved in 1866, he succeeded in separating Limburg and Luxembourg from all connection with Ger., and annexed the former completely to the Netherlands. Luxembourg was declared neutral under the sovereignty of the house of Orange-Nassau by the treaty of May 11, 1867.

**William**, the name of 4 kings of Eng. (1) WILLIAM I., THE CONQUEROR, king of Eng. (1066-87), b. at Falaise, Normandy, in 1027, the bastard son of Robert the Devil, duke of Normandy, by the beautiful Arietta, a tanner's daughter of Falaise, succeeded to the ducal throne of Normandy on the death of his father in 1035, and married, in 1053, Mathilde, a daughter of Count Baldwin V. of Flanders. As the Eng. king, Edward the Confessor, had no children, W. laid claims to the succession, his grandmother, Emma, being a sister to Edward. But Harold was elected king by the A.-S. nobles, and W. gathered an immense armament and landed at Hastings Sept. 29. Here, Oct. 14, the battle was fought between him and Harold; the A.-S. were completely routed, Harold fell, and Dec. 25, W. was crowned king of Eng. at Westminster. The whole country between the Tees and the Humber was laid waste, and every Sax. was expelled from his position in the administration, the courts, and the Ch., and supplanted by a Norman. The estates of the fallen or banished Sax. nobles were partitioned out to the Norman lords, and a network of military stations was spread over the whole country. In 1068 the curfew-bell was introduced, at the sound of which every light and fire in the country should be extinguished, and between 1080 and 1086 a survey was taken of the Conquest and the division of the spoil—the so called Domesday Book. D. Sept. 9, 1087.—(2) WILLIAM II., RUFUS ("the red-haired"), king of Eng. (1087-1100), b. in Normandy in 1056, the second son of William the Conqueror, succeeded to the throne of Eng. on the death of his father, while his elder brother, Robert, took possession of Normandy. He carried on a long series of wars with his brother, with Scot., etc., and came finally into possession of Normandy when, in 1096, Robert sold the country to him for £10,000. He made a similar bargain in 1100 with the count of Poitiers; but before he could take possession of this new dominion he was shot Aug. 2, 1100.—(3) WILLIAM III., king of G. Brit. and Ire. (1689-1702) and stadtholder of the Netherlands (1672-1702), a son of William II., prince of Orange and stadtholder of the Netherlands, and Mary, the eldest daughter of Charles I., king of Eng. b. at the Hague Nov. 4, 1650. In 1672 W. was made stadtholder and commander-in-chief, and by his military and diplomatic talents he freed the country from its enemies. In 1677 he married his cousin Mary, eldest daughter of James, duke of York and heir-presumptive to the Eng. crown, and in the contest between the king and the people, which became almost desperate as soon as James ascended the throne, he naturally became the centre of the opposition. In 1688 he was invited by a large number of the most prominent men in Eng. to interfere, and on Nov. 5 of the same yr. he landed at Torbay with an army of 15,000 men. James fled to Fr., deserted by all, and on Feb. 13, 1689, was deposed by Parl. and W. and Mary were established on the throne. Eng. joined the great coalition against Fr. which W. had formed between Aus., Sp., and the Netherlands, and war was declared May 7, 1689. From 1691 W. himself commanded the allied army in the Netherlands, and although he was defeated at Steenkerke (Aug. 3, 1692) and at Neerwinden (July 20, 1693), he



nevertheless prevented Fr. from making any progress. At La Hogue the Fr. fleet was nearly annihilated in 1692, and by the Peace of Ryswick (1697) Eng. and the Netherlands lost nothing and Fr. was utterly exhausted. D. Mar. 8, 1702.

—(4) **WILLIAM IV.**, king of G. Brit., Ire., and Hanover (1830-37), b. in Lond. Aug. 21, 1765, the third son of George III., entered in 1790 into a connection with an actress, Dora Jordan, with whom he lived 30 yrs. and had 10 children. In 1818 he married a Ger. princess, but he was succeeded in Hanover by his brother, and in Eng. by his niece.

**William I.**, emp. of Ger., b. Mar. 22, 1797, the second son of King Frederick William III. and Queen Louise, a princess of Mecklenburg; came to the head of the govt. as regent Oct. 9, 1858, and as king Jan. 2, 1861. The reorganization of the army irritated the people. On Oct. 18, 1861, he was crowned at Königsberg, but the relation between the king and the people remained cold, and it became even difficult after the appointment of Bismarck as pres. of the cabinet. But suddenly a change took place. In the war with Den. (1864) the army proved able and effective. The king began to be popular. Still more apparent became this change in 1866, when the victories were won over Aus. and her Ger. allies. But the greatest glory was gained by the king for his crown in the war with Fr. (1870-71). The enthusiasm for him increased every day as the Ger. army under his leadership pushed farther and farther into Fr. and gained one victory after another. The Ger. princes, so long divided, finally agreed in offering the imperial crown of Ger. to King William, and he accepted it at Versailles Jan. 18, 1871. On Mar. 15, 1871, he returned to Berlin under an indescribable enthusiasm of the people. Here a new contest awaited him. The interior state of Ger., especially on the ecclesiastical field, needed a development in a liberal direction, and the policy of Bismarck soon brought about a conflict. In this conflict the emp. assumed a firm and decided position, guarding the rights of the State and the Crown against the encroachments not only of the Ch., but also of that party which was generally considered the main support of the Prus. throne.

**William of Champeaux** (GUILLIELMUS CAMPELLENSIS), b. at Champeaux, Fr., in the latter half of the 11th century, studied at Paris under Anselm of Laon; became archdeacon of Notre Dame, and taught philos. in the school of the cathedral. Among his pupils was Abelard, and one day the disciple outwitted the master in a philosophical debate. W. retired to one of the suburbs of Paris, and founded in 1113 the abbey of St. Victor, where he opened a new school and taught in opposition to Abelard, until he became bp. of Châlons-sur-Marne. D. in 1121.

**William of Malmesbury.** See MALMESBURY.

**William of Nassau.** See WILLIAM THE SILENT (p. 1491).

**William of Orange.** See WILLIAM III. of ENG.

**William of Wykeham.** See WYKEHAM, WILLIAM OF.

**William and Mary College.** This coll. is, next to Harvard, the oldest in the U. S. It was chartered by King William and Queen Mary in 1693, when the commissary of the bp. of Lond., the Rev. Dr. James Blair, sought and obtained from the sovereigns, William and Mary, a charter and a valuable endowment. This and Columbia Coll. in New York alone in the U. S. received royal charters.

**Williams** (ALPHEUS STARKER), b. at Saybrook, Conn., Sept. 30, 1810, grad. at Yale 1831; in 1836 removed to Detroit, where he began to practise law; was chosen alderman of that city in 1843, city recorder in 1844, and from 1840 to 1844 was judge of probate of Wayne co. In 1843 he became proprietor of the Detroit *Daily Advertiser*, of which he was also ed. until 1848. In the war with Mex. he served as lieutenant-col. of the 1st Mich. Volunteers, and was P. M. of Detroit 1849-53. On the outbreak of c. war he commanded a division in the Shenandoah; succeeded to the temporary command of the 12th corps in 1862, which he led at S. Mountain, at Antietam, and until Apr. 1863; in temporary command of corps at Gettysburg; transferred with his corps to Tenn. in Oct., and engaged at Lookout Mountain. In Sherman's Atlanta campaign of 1864 he commanded a division of the 20th corps. Mustered out of service in Jan. 1866, he served in Aug. of that yr. in the adjustment of the military claims of Mo.; was U. S. minister to Salvador 1866-69; M. C. 1873-79. D. Dec. 21, 1878.

**Williams** (CHARLES KILBOURNE), LL.D., son of Prof. Samuel, b. at Cambridge, Mass., Jan. 24, 1782, removed to Rutland, Vt., in childhood; grad. at Williams Coll. 1800; practised law at Rutland; was a member of the legislature, State attorney 1814-15, collector of customs for the dist. of Vt. 1825-29, judge of the supreme court 1822-24 and 1829-42, chief-justice and *ex-officio* chancellor 1842-46, pres. of the council of censors 1847, and gov. 1850-52. D. Mar. 9, 1853.

**Williams** (EDWIN), b. at Norwich, Conn., in 1797, resided many yrs. in New York, where he was a constant contributor to periodicals; was many yrs. sec. to the Amer. Inst., an active member of the Historical and Geographical societies and of the Mechanics' Inst., and was noted for the extent of his statistical researches, and was one of the eds. of the *New York Herald*. Author of the *New York Annual Register*, *New York as it is in 1833*, *et seq.*, *The Political Manual*, *The Statesman's Manual*, etc. D. Oct. 21, 1854.

**Williams** (ELEAZAR), b. at Caughnawaga, N. Y., about 1787, son of Thomas Williams, a chief of the Caughnawaga or St. Regis Indians, who was a grandson of Eunice, daughter of Rev. John Williams of Deerfield, Mass., known as "the redeemed captive." He was ed. at Longmeadow, Mass.; served in the Amer. army in the war of 1812-15, being wounded at Plattsburg; became a missionary of the P. E. Ch. among the Oneida and St. Regis Indians, and subsequently among the tribes at Green Bay, Wis. About 1842 the claim was made that he was the dauphin of Fr., son of Louis XVI. and Marie Antoinette, and a narrative of his having been rescued from prison at Paris and brought to the U. S. gradually gathered form. The story was brought before the public by Rev. J. H. Hanson in a famous article

in *Pulnam's Magazine*—*Have we a Bourbon among us?* D. Aug. 28, 1858.

**Williams** (ELISHA), b. at Hatfield, Mass., Aug. 26, 1694, grad. at Harvard 1711; became minister of Newington, Conn., 1722, and subsequently of Wethersfield; was "rector" or pres. of Yale 1736-39; resigned on account of ill-health; returned to Wethersfield; was elected to the legislature; served as judge of the superior court; was chaplain of the Conn. regiment sent against Cape Breton 1745. D. July 25, 1755.

**Williams** (EPHRAIM), b. at Newton, Mass., Feb. 24, 1715, made several voyages to Europe; served in Canada against the Fr. in 1740-45, becoming capt.; received from the Mass. legislature a grant of 200 acres in the present tps. of Adams and Williamstown, where he erected Ft. Mass., 1751, and was made commander of the whole line of frontier posts W. of the Conn. River, and on the renewal of war with the Fr. in 1755 led a regiment of Mass. troops to join Sir William Johnson in his projected invasion of Canada; made his will while on the march, leaving his property to found a free school at Williamstown (see WILLIAMS COLLEGE); fell into an ambuscade of Fr. and Indians near the head of Ft. George, N. Y., and was killed, Sept. 8, 1755.

**Williams** (GEORGE), b. in Wales in 1814, ed. at Eton, grad. at King's Coll., Cambridge, where he became a fellow 1836; took orders in the Ch. of Eng. 1837; was chaplain to Bp. Alexander at Jerusalem 1841-45; was warden of St. Columba's Coll. 1850-55, and vice-provost of King's Coll. 1854-56, where he was for some yrs. senior fellow. Wrote *The Holy City, or Historical and Topographical Notices of Jerusalem, etc.*; *An Historical and Descriptive Memoir of Jerusalem, with Plan*; *Dr. Pierotti and his Assassins, or a Defence of Jerusalem Explored*, etc. D. Jan. 28, 1878.

**Williams** (GEORGE H.), b. in Columbia co., N. Y., Mar. 23, 1823, ed. at an acad. in Onondaga co.; was admitted to the bar 1844; settled in Ia.; was elected judge of the first judicial dist. 1847; was chief-justice of Or. Terr. 1853-57; was a member of the Or. constitutional convention 1857; was a Rep. U. S. Senator 1865-71; was a member of the commission which signed the Treaty of Wash. for settling the "Alabama claims" 1871; appointed atty.-gen. in Pres. Grant's cabinet 1872; was nominated chief-justice of the U. S. supreme court 1873, but not confirmed by the Senate; resigned his seat in the cabinet May 1875.

**Williams** (ISAIAH THORNTON), b. at New Ipswich, N. H., Feb. 12, 1819, ed. mainly under private tutelage, but received the degree of A. M. from Williams Coll.; studied law at Buffalo, where he practised his profession till 1854, when he removed to the city of New York, and at once entered upon an extensive practice; engaged as counsel for the late Mr. Greeley in his most important libel suits. In 1867 he became register in bankruptcy.

**Williams** (JAMES D.), b. in Pickaway co., O., Jan. 8, 1808, settled in Knox co., Ind., in childhood; received a common-school education; became a farmer and stock-raiser; was frequently elected as a Dem. to the lower house of the legislature; was State senator 1859-67 and 1871-75; chosen M. C. 1874, serving as chairman of the committee on accounts; was a member of the State board of agriculture 17 yrs. and its pres. 4 yrs., and was chosen gov. of Ind. at the election of Oct. 1876. D. Nov. 30, 1880.

**Williams** (JESSE L.), b. in Stokes co., N. C., May 6, 1807; at 17 he accepted the position of rodman in the surveying-party for the proposed Miami and Erie Canal; was soon advanced as assistant engineer; in 1832 accepted the position of chief engineer of the contemplated Wabash and Erie Canal; in 1835 was placed in charge of other new works, and a yr. later was appointed chief engineer of the entire system of canals throughout Ind.; in 1837 the R. Rs. and turnpikes then in progress were added to his charge, and continued under his supervision as State engineer until 1841, during which time he was *ex-officio* a member of the board of internal improvement. He was chief engineer of the Ft. Wayne and Chicago R. R. 1854-56; a govt. director of the Union Pacific R. R. during its construction 1864-69; chief engineer of the Cincinnati, Richmond and Ft. Wayne R. R. 1871-72.

**Williams** (JOHN), D. D., b. at Aber-Conway, Carnarvonshire, Wales, Mar. 25, 1582, was appointed chaplain to King James I.; was made dean of Salisbury 1619, and of Westminster July 12, 1630; was successor to Bacon as lord keeper of the great seal July 10, 1621, to Oct. 25, 1626; was consecrated bp. of Lincoln Nov. 11, 1621; had a large share in the negotiation of the Sp. marriage 1623-29; used his court influence against monopolies and illegal exactions, and displayed moderation in the management of the Star-Chamber tribunal; preached the funeral sermon of James I. 1625; offended the new sovereign, by whom he was dismissed from the keepership the following yr.; supported the Petition of Right 1628; was 3 times prosecuted by Abp. Laud before the Star-Chamber on a charge of betraying the king's secrets; was condemned, after 8 yrs. legal proceedings, to imprisonment, suspension from his bishopric, and successive fines of £10,000 and £8000; was confined 4 yrs. in the Tower 1636-40, until released by the Long Parl. and restored to his diocese; caused the withdrawal of the bps. from the House of Lords on the occasion of the impeachment of Strafford; advised the king to assent to the execution of that minister; became abp. of York Dec. 4, 1641; was soon afterward sent to the Tower with 11 other bps. for protesting against the validity of acts passed during their enforced absence from the House of Lords; was released 1643; was a firm supporter of the king during the great rebellion, and fortified and held Conway Castle. D. Mar. 25, 1650.

**Williams** (JOHN), b. at Tottenham, near Lond., Eng., June 29, 1796, was sent by the Lond. Missionary Society to the S. Pacific Islands; labored several yrs. in the Society Islands with great success, acquiring the native lang.; visited the Hervey Islands, and founded a mission a Raratonga 1823; returned to Eng. 1834; superintended the publication



of the N. T. in the Haratongan lang.; returned to Polynesia 1838; renewed his explorations, and reached the New Hebrides, where he was about to plant a mission when he was killed and eaten by the cannibals of Erromanga Nov. 20, 1839. Author of *A Narrative of Missionary Enterprises in the S. Sea Islands*.

**Williams (JOHN), D. D., LL.D., b.** at Deerfield, Mass., Aug. 30, 1817, grad. at Trinity Coll. 1835; studied divinity; was ordained in P. E. Ch. 1838; was rector of St. George's, Schenectady, N. Y., 1842-48; pres. of Trinity Coll. 1848-53; became assistant bp. of Conn. 1861, and sole bp. Jan. 1865. Author of *Anc. Hymns of the Holy Ch., Thoughts on the Gospel Miracles*, and other religious works.

**Williams (JOHN MASON), LL.D., b.** at Taunton, Mass., June 1780, grad. at Brown Univ. 1801; was admitted to the bar at New Bedford 1803; was associate justice to the court of common pleas 1821-30, chief-justice of the same 1839-44, and com. of insolvency 1844-56. D. Dec. 28, 1868.

**Williams (JONATHAN), b.** at Boston, Mass., 1750, received a good education; was employed in the office of a commercial house in Boston; made frequent business voyages to the W. I. and to Eng. During Dr. Franklin's residence in Fr. as U. S. ambassador, W. was employed by him as sec., performing also during a portion of the same time the duties of U. S. commercial agent. Returning in 1785, he resided near Phila., where he was a judge of the court of common pleas. On Feb. 6, 1801, he accepted an appointment in the army as major. In Dec. he was appointed inspector of fortifications, and took command of the post of W. Pt. and the duties of instruction of the artilleryists and engineers. The act of Mar. 16, 1802, separated the 2 corps, and provided for the present Military Acad., of which the "principal engineer" should have the superintendency. Under this act W. was retained as major of engineers (Apr. 15, 1802), and at once assumed the duties of supt. at W. Pt., where he continued until June 20, 1803. Apr. 19, 1805, W. returned to the army as chief engineer, with the rank of lieutenant, resuming also the superintendency of the Military Acad.; devoted himself personally to the fortifications of New York harbor and most of the forts, which constitute its inner line of defence. Castle Williams was the first "casemated" battery erected in this country (built 1807-10). Upon the declaration of war with G. Brit. in 1812 he was at Castle Williams, and being the senior officer present claimed command of that work. The authorities of Wash., however, assigned the command to another, whereupon Col. W. resigned July 31, 1812. Returning to Phila., he was chosen to Cong. in 1814. Wrote *Elements of Fortification, Kosciuszko's Movements for Horse Artillery*, etc. D. May 30, 1815.

**Williams (LEWIS), b.** in Surry co., N. C., about 1783, grad. at the Univ. of N. C. 1808; was a member of the State legislature 1813-15, and M. C. for 29 yrs., from 1815 until his death, Feb. 23, 1842.

**Williams (MARMADUKE), b.** in Caswell co., N. C., Apr. 6, 1772, became a lawyer; was M. C. from N. C. 1803-09; settled in Madison co., Ala., 1810, and in Tuscaloosa co. 1818; was a member of the convention that framed the State const. 1819; was 11 times chosen to the legislature between 1821 and 1840; was a com. to adjust the unsettled accounts between Ala. and Miss. 1826, and judge of the co. court from 1832 till 1842. D. Oct. 29, 1850.

**Williams (REUEL), LL.D., b.** at Hallowell (now Augusta), Me., June 2, 1783, received an academic education; studied law; was admitted to the bar 1802; took a high rank in his profession; was a member of the legislature 1822-26, and again 1829-32; of the State senate 1837-28; was a Presidential elector 1836, U. S. Senator 1837-43, and a trustee of Bowdoin Coll. D. July 25, 1862.

**Williams (ROBERT), brother of Marmaduke, b.** in Caswell co., N. C., about 1765, received a good education; became a lawyer, and adjutant-gen. of N. C.; represented that State in Cong. from 1785 until 1803, when he became com. of land-titles for Miss. Terr.; was gov. of that Terr. 1805-09; settled in Tenn. some yrs. later, and d. in La.

**Williams (ROGER), b.** in Wales about 1599, was admitted to Pembroke College, Cambridge, Feb. 8, 1623; grad. there as B. A. Jan. 1627; took orders in the Ch. of Eng.; embarked for N. Eng. at Bristol Dec. 11, 1630; arrived off Nantasket, Mass., Feb. 15, 1631; was immediately chosen "teacher;" made known some "novel opinions" denying the right of magistrates to punish a breach of the Sabbath or other offences against God, coming thereby into collision with the authorities of the infant colony; went to Plymouth; labored there as assistant pastor to Rev. Ralph Smith; supported himself by manual labor, engaging also in trade in a very limited way; made a vigorous effort to acquire the Indian lang., in which he ultimately succeeded; left Plymouth with a number of adherents in 1633; proceeded to Salem, where he assisted Mr. Skelton in the care of the ch.; wrote a treatise attacking the validity of the title of the Mass. Co. to its lands, as derived from the royal patent, which he sent to Gov. Winthrop at the latter's request, and which was submitted to the examination of the gov. and assistants Jan. 6, 1634, resulting in a vote of censure; was nevertheless settled as pastor of Salem ch. on the death of Mr. Skelton, Aug. 1634; influenced Mr. Endicott, the assistant gov. at Salem, to cut out from the flag of Eng. the red cross, as being "a superstitious thing and a relique of Antichrist" (Oct. 1634); refused to take either the freeman's or the resident's oath, preaching against the latter, which was instituted Apr. 10, 1635; was cited before the general court; drew up letters of admonition to the chs. of Mass., charging all the magistrates with "heinous sin" in postponing action upon a petition of the Salem settlers for the assignment to them of lands at Marblehead, and demanding that the magistrates should be subjected to "the discipline of admonition therefor;" withdrew his communion from the chs. of Mass., and from his own ch. in consequence of its declining to follow his guidance in the matter; appeared upon summons before the general court at Newtown (Cam-

bridge), Oct. 18, 1635; was called upon to meet the charge of teaching various doctrines considered as subversive of authority; was ordered by vote of the court of the following day (Oct. 19) to depart out of the jurisdiction of Mass. within 6 weeks; was allowed by the authorities to remain at Salem until spring, on condition that he should not "go about to draw others to his opinions;" was charged with having broken this condition in Jan. 1636, when it was determined by the general court to send him to Eng.; proceeded to his friend, the Indian "king," Massasoit, at Sowams (now Warren, R. I.); purchased of the chieftain Ousamequin a tract of land on the E. shore of Seekonk River, where he commenced a clearing in Apr.; soon removed to the other side of the river, in order to be beyond the jurisdiction of Plymouth Colony; founded with a few associates the town of Providence about May 29; drew up articles of agreement signed by all the settlers at Providence to subject themselves to the will of the majority "only in civil things;" embraced the principles of the Baps.; was baptized with some 10 associates; visited Eng. in 1643; obtained a charter for his plantation; printed in Lond. *The Bloody Tenant of Persecution for Cause of Conscience discussed, in a Conference between Truth and Peace*, etc.; returned to Providence 1644; again visited Eng. to secure a confirmation of the charter 1651; remained in Lond. nearly 3 yrs.; pub. *The Bloody Tenant yet more Bloody, by Cotton's Endeavour to Wash it White in the Blood of the Lambe*, etc., *The Traveling Ministry none of Christ's, or a Discourse touching the Propagating the Gospel of Jesus Christ*, etc. Returned to Providence early in 1654; was pres. of the colony 1654-57; refused to sanction in 1672 the proposed exclusion of Quakers from R. I., and pub. *George Fox digg'd out of his Burrows, or an Offer of Disputation on Fourteen Propositions made this Last Summer 1655 unto G. Fox, then present on R. I. in N. Eng.* D. between Jan. 18 and May 10, 1683. PORTER, C. ELIAS.

**Williams (SAMUEL), LL.D., b.** at Waltham, Mass., Apr. 23, 1743, son of Rev. Warham and grandson of Rev. John of Deerfield; grad. at Harvard 1761; accompanied Prof. John Winthrop to Newfoundland to observe the transit of Venus of June 6, 1761; was ordained minister of Bradford Nov. 20, 1765; instructed several young men in theol.; was Hollis prof. of math. and natural philos. in Harvard Coll. 1780-88; surveyed the W. boundary of Mass. at the request of the colonial govt. 1786; visited Penobscot Bay with Prof. Stephen Sewall to observe the total eclipse of the sun of Oct. 20, 1786; resigned his professorship and removed to Rutland, Vt. 1788; preached there 1789-95; subsequently preached 2 yrs. at Burlington, Vt.; was for some yrs. ed. and proprietor of the *Rutland Herald*; surveyed W. boundary of Vt. 1805, and delivered a course of lectures on astron. and nat. philos. in Univ. of Vt. soon after its establishment. Wrote *The Natural and Civil Hist. of Vt.* D. Jan. 2, 1817.

**Williams (SAMUEL WELLS), LL.D., b.** at Utica, N. Y., Sept. 22, 1812, grad. at Rensselaer Polytechnic Inst. at Troy, N. Y., 1832; went to Canton, China, as printer to the Amer. mission 1833; visited Japan to return some shipwrecked sailors 1837; learned the Japanese lang., into which he translated the books of Genesis and Matthew; pub. *Easy Lessons in Chi., The Chi. Commercial Guide, and An Eng. and Chi. Vocabulary in the Court Dialect*; visited the U. S. 1845, delivering lectures on China; pub. *The Middle Kingdom, a Survey of the Geog., Govt., Education, Social Life, Arts, Religion, etc. of the Chi. Empire and its Inhabitants*; returned to China 1848; edited the *Chi. Repository* until 1851; accompanied Com. Perry as interpreter on his expedition to Japan 1853-54; was appointed sec. and interpreter of the U. S. legation in Japan, of which he had charge until the arrival of the first minister; pub. *A Tonic Dict. of the Chi. Lang. in the Canton Dialect*; aided Hon. William B. Reed in the negotiation of the Treaty of Tientsin 1858; accompanied Mr. Ward to Peking to exchange the ratifications of 1859; revisited the U. S. 1860-61; went to reside at Peking as sec. of the U. S. legation 1862, then first established in the cap. of China; completed and brought out the great work of his life, *The Syllabic Dict. of the Chi. Lang.*; returned to the U. S. in 1875, and settled at New Haven, Conn., where he was appointed lecturer on Chi. at Yale. D. Feb. 16, 1884.

**Williams (SETH), b.** at Augusta, Me., Mar. 22, 1822, grad. at W. Pt. 1842; served as lieut. of artill. and aide-de-camp to Gen. Patterson in the Mex. war; was adjutant of the Military Acad. 1850-53; was adjutant-gen. to Gen. McClellan in W. Va. and in the Army of the Potomac; became acting inspector-gen. on the staff of Gen. Grant May 10, 1864; became maj.-gen. of volunteers Aug. 1, 1864, and subsequently brigadier and major gen. U. S. A., and rendered valuable services in organization of the army. D. Mar. 23, 1866.

**Williams (THOMAS SCOTT), LL.D., b.** at Wethersfield, Conn., June 26, 1777, grad. at Yale 1794; studied law at Litchfield, Conn.; commenced practice at Mansfield; removed to Hartford 1803; became atty. of the board of managers of the school fund 1809; represented Hartford in the general assembly 7 yrs., between 1813 and 1829; was M. C. 1817-19; associate judge of the supreme court of errors 1829-34, chief-justice of the same 1834-47; mayor of Hartford 1831-35; pres. of the deaf and dumb asylum at Hartford 20 yrs.; v.-p. of the Amer. Board of Foreign Missions, and subsequently pres. of the Amer. Tract Society. He bequeathed \$28,000 to charitable insts. D. Dec. 15, 1861.

**Williams (WILLIAM), son of Rev. Solomon, b.** at Lebanon, Conn., Apr. 18, 1731, grad. at Harvard 1751; served on the staff of his relative, Col. Ephraim Williams, in the expedition to Lake George 1755; became a merchant at Windham; many times elected to the provincial assembly; was a member of the Conn. committee of correspondence 1773, speaker of the house of reps. 1775, afterward a member of the council, of the committee of safety, and of the Continental Cong. 1776-77 and 1783-84; was a signer of the Dec. of Ind., and contributed by his pen and his estate to the cause of independence, lending his "last mite" to the Continental treas. in 1779. D. Aug. 2, 1811.



**Williams** (Sir WILLIAM FENWICK), b. in N. S. Dec. 4, 1800, entered the royal artil. in 1825, and in 1868 attained the rank of gen. in the Brit. army; was in June 1848 appointed Eng. com. for the settlement of the Turco-Per. boundary, and in 1854 was made Brit. com. with the Tur. army in the East. His gallant defence of Kars in 1855 won him the promotion to maj.-gen. Was M. P. for Caine 1856-59; from 1859 to 1865 was in command of the troops in Canada, and in 1870 was appointed gov. and commander-in-chief of Gibraltar. Retired 1877. D. July 27, 1883.

**Williams** (WILLIAM R.), D. D. See APPENDIX.

**Williamsburg**, cap. of James City co., Va., on an elevated plateau between James and York rivers, about equidistant from either stream. The town was first settled in 1632, and is the oldest incorporated town in the State. Prior to the Revolution it was the seat of the royal gov., and subsequently, until 1799, the cap. of the State. The E. lunatic asylum, authorized in 1769 and opened in 1773, is the oldest inst. of the kind in this country. It is also the seat of William and Mary Coll., incorporated in 1692. Pop. in 1870, 1892; 1880, 1480. The immediate vicinity of this town was the scene of the first serious engagement in the Peninsular campaign of 1862.

**Williams College** is beautifully located in Williamstown, Berkshire co., Mass. It owes its origin and name to Col. Ephraim Williams, who fell in 1755 near Lake George in the Fr. and Indian war. On his way to the field of battle, at the city of Albany, he made his will, devoting the bulk of his property to the founding of an inst. of learning, which in 1793 was chartered as W. C. Though the resources of the inst. have always been small, and its position in former yrs. isolated, yet in all the great interests of humanity, whether religious or scientific, it has always wrought in the front rank. Here originated in 1808 the whole series of Amer. missions in connection with Samuel J. Mills and his associates. Here, under Prof. Hopkins, was erected the first astronomical observatory on this continent. Here also, under Profs. Emmons and Hopkins, originated the first of those coll. scientific expeditions now so common, followed in later yrs. by others to Labrador, Greenland, Fla., S. Amer., and Central Amer. The condition of the coll. is highly prosperous; its libraries contain 30,000 vols. Its cabinet, recitation-room, appliances, and apparatus are of the best order.

**Williamson** (HUGH), M. D., LL.D., b. at W. Nottingham, Pa., Dec. 5, 1735, grad. at the Univ. of Pa. 1757; studied theol. and occasionally preached; was prof. of math. in the Univ. of Pa. 1760-63; studied med. at Edinburgh and Utrecht, where he took his degree; practised at Phila.; observed the transits of Venus and of Mercury for the Philosophical Society 1769; visited the W. I. 1773; was in Lond. 1774, and was examined before the privy council on the subject of the destruction of tea; spent 2 yrs. on the Continent 1774-76; engaged in mercantile business at Charleston, S. C. 1777; subsequently settled and practised med. at Edenton, N. C.; was a surgeon in the Continental service 1781-82; was a member of the N. C. legislature, a delegate to the Continental Cong. 1783-85 and 1787-88, and to the Federal constitutional convention 1787, and M. C. 1790-93; removed afterward to New York, and was one of the founders of the Literary and Philosophical Society in 1814. D. May 22, 1819.

**Williamson** (ISAAC DOWD), D. D., b. Apr. 4, 1807, in Pomfret, Vt. Beginning to preach as a Univ. in Oct. 1828, was pastor at Albany, N. Y., from 1830 to 1837; since then in Baltimore, New York, Phila., Mobile, Ala., Lowell, Mass., Louisville, Ky., and Cin. O. (1873). He has been a voluminous author of works upon Universalism.

**Williamson** (ISAAC H.), LL.D., b. at Elizabethtown, N. J., in 1769, was admitted to the bar 1791; soon became prosecuting atty. for Morris co., and rose to the head of the N. J. bar; was chosen to the assembly 1817; was gov. and chancellor of the State 1817-29, and pres. of the State constitutional convention of 1844. D. July 10, 1844.

**Williamson** (WILLIAM DURKEE), b. at Canterbury, Conn., July 31, 1779, grad. at Brown Univ. 1804; settled as a lawyer at Bangor, Me., 1807; was atty. for Hancock co. 1808-16; State senator 1816-20; pres. of the first senate of the new State of Me. and acting gov. 1821; M. C. 1821-23, and judge of probate 1824-40. Wrote *A Hist. of the State of Me.* D. May 27, 1846.

**WilliamSPORT**, city and R. R. centre, cap. of Lycoming co., Pa., on the left (N.) bank of the W. branch of Susquehanna River, 202 m. N. W. of Phila., on Pa. Canal. Selected as co.-seat in 1795, when the co. was organized, and chartered as a city in 1861; contains Dickinson Sem. It derives its prosperity and importance from its lumber manufacture. The Susquehanna boom, costing upward of \$1,000,000, is here located, catching all logs cut from the vast forests of pine and hemlock on the W. Branch and its tributaries. The manufacture of pickets, lath, and shingles is very extensive. Pop. 1870, 16,090; 1880, 18,934.

**Williamstown**, on R. R., Berkshire co., Mass., 42 m. E. of Troy; the tp. contains Williams Coll. and Greylock Inst., the latter being located at S. Williamstown. Pop. tp. 1870, 3,559; 1880, 3,394.

**Williamstown**, on R. R., Ingham co., Mich., 71 m. W. of Detroit. Pop. tp. 1870, 1,237; 1880, 1,852, including 852 of the 982 in v.

**William the Silent**, b. at Dillenburg, Nassau, Apr. 16, 1533, was the eldest son of Count William of Nassau-Dillenburg and his second wife, Juliane von Stolberg, both of whom were Prots. In 1544 he inherited from his cousin, Renatus of Nassau, the principality of Orange in Provence, whence he derived the title of prince of Orange and extensive estates in the Low Countries, and he was now sent to Brussels, where he was ed. at the court of the queen-regent, Mary of Hungary, in the R. Cath. faith. When he was 15 he became a page to Charles V., and the emp. showed him a most extraordinary attention. In the beginning, Philip II. also seemed inclined to use him. He negotiated the Peace

of Cateau-Cambrésis, Apr. 3, 1559, and he was one of the 4 hostages which Sp. sent to Fr. as a guaranty for the fulfilment of the treaty. While here the Fr. king, Henry II., one day told him that there existed a secret treaty between him and Philip II. for the purpose of exterminating by fire and sword all Prots. within their dominions. Soon after this conversation he rose in opposition to Philip II. As gov. of Hol. and Zealand he refused in 1564 to allow the establishment of the Sp. Inquisition in these provs. When Philip II. decided to send the duke of Alva as gov.-gen. to the Netherlands with a large Sp. army, W. resigned all his offices and retired with his family to Ger. He raised an army by his own funds, and invaded the country in 1569, but was soon compelled by lack of money to disband his army. In 1572 he made a new attempt, and with greater effect. In 1570 he had issued letters of marque to privateers, and these *Gueux of the Sea* inflicted great damages on Sp. commerce. On the approach of W. with a new army, the prov. of Hol. rose in open rebellion, and its states chose W. stadtholder in July 1572. Gelders, Overysel, Zealand, and Utrecht immediately joined. It soon became apparent that the provs. under Sp. rule were impoverished and fallen to ruin, while the provs. under W.'s administration prospered and gathered wealth. By degrees, the hatred to the Spaniards became universal also throughout the 8. provs., even among the R. Caths., and in Oct. 1576 W. brought about the so called "Pacification of Ghent," by which all the provs. united for the purpose of driving the foreign soldiers out of the country and establishing religious toleration. The 8. provs., however, soon separated from the league, and returned under the rule of Alexander Farnese. Meanwhile, on Jan. 23, 1579, the "Union of Utrecht" was signed, by which Philip II. was formally deposed, and it was agreed to confer the sovereignty on some other prince, who might be able to vindicate himself against the Spaniards. On Mar. 15, 1580, Philip II. put a price of 25,000 crowns on W.'s head, and after several attempts which failed, one Balthazar Gerard finally succeeded in shooting him, at Delft, July 10, 1584. He left 12 children, of whom the 2 sons, Maurice and Frederick Henry, became celebrated. CLEMENS PETERSEN.

**Willibrod**, See WILBRORD (SAINT).

**Williamville**, R. R. centre, Windham co., Conn., about 30 m. E. of Hartford. The prin. industries of the place are the manufacture of silk, cotton thread, print cloths, cotton warps, and machinery. The factories of the W. Linen Co., whose thread has a world-wide reputation, are located here. Pop. 1880, 6608.

**Willington** (THOMAS), b. at Phila. Dec. 19, 1731, studied law at the Temple, Lond.; became the head of the mercantile house of Willing & Morris at Phila.; was also mayor of Phila., judge of the supreme court, and rep. in the general assembly; was chairman of one of the earliest popular meetings in behalf of resistance to G. Brit., June 1774; pres. of the provincial cong. of Pa.; delegate to the Continental Cong. 1775-76; pres. of the first chartered bank in Amer., and of the first Bank of the U. S. D. Jan. 19, 1821.

**Willits** (NATHANIEL), b. at Boston June 6, 1780, his father and grandfather being printers; established at Portland, Me., the *E. Argus* 1803, and at Boston in 1816 the *Boston Recorder*, the first religious newspaper in Amer., and founded in 1827 the *Youth's Companion*, the first Amer. juvenile paper. D. May 26, 1870.

**Willits** (NATHANIEL PARKER), son of Nathaniel, b. at Portland, Me., Jan. 30, 1807, studied at the Boston Lat. School and at Phillips Acad., Andover; grad. at Yale 1827; gained while an undergraduate a prize of \$50, offered by the *Album* for the best poem, and wrote for his father's paper, the *Boston Recorder*, some religious poems which were much admired; edited for Mr. Goodrich ("Peter Parley") 2 annuals, *The Legendary and The Token*; founded and conducted *The Amer. Monthly Magazine*, until it was merged in the *New York Mirror* (1833-42), of which he became associate ed. with George P. Morris, and with whom he conducted 2 daily papers, *The New Mirror* and *The Evening Mirror*, and a new weekly paper, the *Home Journal*, upon which he continued to be occupied until his death, Jan. 21, 1867. Among his numerous works were *Inkings of Adventure*, *Loiterings of Travel*, *Letters from under a Bridge*, etc.

**Willis** (RICHARD STORRS), son of Nathaniel, b. at Boston Feb. 10, 1819, grad. at Yale Coll. 1841; contributed to various periodicals; edited the *New York Musical World* and *Once a Week*, and is author of *Ch. Chorals and Choir Studies*, *Our Ch. Music*, etc.

**Willis** (ROBERT), F. R. S., b. in Lond., Eng., in 1800, grad. at Calus Coll., Cambridge, 1826; was early distinguished for his attainments in several depts. of natural science, and especially for his acoustical researches upon the mechanism of the larynx; invented the lyphone, the odontograph, and a tabulo-scriptive engine to facilitate the graphical representation of the results of the application of analysis to physics; became widely known as the most profound architectural historian of Eng.; was, on the foundation of the Lond. School of Mines, appointed lecturer on applied mechanics, and was Jacksonian prof. of natural and experimental philos. at Cambridge from 1837 until his death, Feb. 28, 1875. Wrote *Remarks on the Arch. of the Middle Ages, especially of It.*; *Principles of Mechanism for Students*, *Architectural Hist. of Canterbury Cathedral*, etc.

**Willis** (THOMAS), M. D., F. R. S., b. at Great Bedwin, Wiltshire, Eng., Jan. 27, 1621, grad. at Christ Ch., Ox., 1639, and in med. 1642; served in the royalist ranks during the great rebellion; practised his profession at Ox.; became Sedgilean prof. of natural philos. in the univ. at the Restoration; afterward settled in Lond.; was one of the founders of the Royal Society; became phys. to Charles II. 1666, and was considered for many yrs. the most famous phys. of his time. Wrote *Cerebri Anatome, cum acceffit Aneurysm Specimenscriptio et Usus*; *Pathologia Cerebri et Nervosae Generis Specimina*, and *De Anima Brutorum*. D. Nov. 11, 1675.

**Willis** (WILLIAM), b. at Haverhill, Mass., Aug. 31, 1794,



grad. at Harvard 1813; studied law, and was admitted to the bar in Boston 1817; removed to Portland in 1819, and for 20 yrs. was the law-partner of William P. Fessenden; was chosen to the State senate in 1855, and mayor of Portland 1857; was for many yrs. pres. of Me. Historical Society and v.-p. of N. Eng. Genealogical Society; was the author of a *Hist. of Portland*, etc. D. Feb. 17, 1870.

**Williston** (SAMUEL), b. at Easthampton, Mass., June 17, 1795, gained a large fortune by the manufacture of buttons; established at Easthampton in 1840 the Williston Sem., to which at different times he gave \$250,000; endowed professorships in Amherst Coll. by gifts of \$125,000, 1858-59; gave liberally to the Mt. Holyoke Female Sem. His entire gifts and bequests amounted to above \$1,500,000. D. July 1874.

**Willmar**, on R. R., cap. of Kandiyohi co., Minn. Pop. 1880, 1002.

**Willmore** (JAMES TIBBITS), b. at Handsworth, Staffordshire, Eng., Sept. 15, 1800, became one of the most eminent of the landscape engravers who distinguished themselves by their beautiful reproductions of the masterpieces of Turner, and was chosen an associate of the Royal Acad. 1843. Among his prints of Turner are *Mercury and Argus*, *The Fighting Temeraire*, and *Anc. It.* D. Mar. 12, 1863.

**Willoughby**, O. See APPENDIX.

**Willoughby**, will'-o-be (Sir HUGH), supposed to have been b. at Risby, Derbyshire, Eng., about 1500, was chosen commander of an expedition fitted out by the Merchants Adventurers at the instance of Sebastian Cabot, and received from Edward VI. a "license to discover strange countries;" fitted out 3 vessels, one of them under the command of Richard Chancellor; sailed from Deptford May 10, 1553; proceeded to the Arctic regions by the coasts of Nor. By a journal, supposed to be his, which was recovered from the Rus, it appeared that his company was living in Jan. 1554, but when his vessel, the *Bona Speranza*, was discovered in the spring of 1554, all the inmates were dead. Richard Chancellor discovered the port of Archangel, and thus gave rise to direct commerce with Rus.

**Willoughby Lake**, v. on the lake of the same name in the town of Westmore, Orleans co., Vt. The lake is some 7 m. long, and is very deep. On either side is a high peak. Willoughby Mountain.

**Willow**, Cal. See APPENDIX.

**Willow** [A.-S. *willig*], the trees and shrubs of the *Salix*, of which there are over 160 well-recognized species, beside innumerable varieties. Many of the long-leaved shrubby sorts are used in basket-making (see OSMER), and the larger kinds, short-leaved, and called *salix*, are in Europe raised in coppes for hoop-poles; for charcoal, to be used in gunpowder-making; for fence-poles, which when peeled and dried are very durable; for vine-props, hoe-handles, and the like. W.-wood is also used for steamboat paddles and surgeons' splints. It is light, tough, and stands exposure in water very well. Salicine, an active principle from W.-bark, is very useful in med. The *S. babylonica*, or weeping W., has long been an emblem of grief. The U. S. have about 60 W., and Europe nearly as many more.

**Willow Grouse**, or **Ptarmigan**, tar'-me-gan, a name of the *Lagopus albus*, a species found in the N. regions of the Old and New Worlds.

**Willis** (DAVID), D. D., b. in S. C. in 1825, grad. at the State coll. in Columbia in 1847, and at the theological sem. at the same place in 1850; in 1851 was called to the pastorate of a ch. in Laurens dist.; in 1860 to the Presb. ch. in Macon, Ga.; in 1870 elected pres. of Oglethorpe Univ. at Atlanta, Ga.; in 1875 became pastor of a Presb. ch. in Wash.

**Will's Point**, Tex. See APPENDIX.

**Will'sington**, city and important R. R. centre, cap. of New Castle co., Del., on Del. River, and at junction of its affluent, Brandywine and Christiana creeks, 28 m. S. W. of Phila. and 70 m. N. E. of Baltimore, has communication by steamers with Phila. and New York. Brandywine Creek has within a distance of 4 m. a fall of 120 ft., furnishing immense water-power, which is largely utilized for manufacturing purposes. The principal manufactures are machine-work, morocco and other leather, foundry-work and ear-wheels, carriages and wagons, iron ship-building, paper, powder and chemicals, flour and meal, and cotton goods. Pop. 1870, 30,841; 1880, 42,478.

**Wilmington**, city, on R. R., Will co., Ill. Pop. 1870, 1828; 1880, 1872.

**Wilmington**, city and important R. R. centre, cap. of New Hanover co., N. C., the prin. seaport and largest city in the State, on the E. bank of Cape Fear River, 30 m. from the ocean. Lines of steamers ply to Baltimore, Phila., and New York, and there is an extensive commerce by sailing vessels with all parts of the world. The prin. exports of the place consist of naval stores, lumber, shingles, and cotton. This has long been a leading naval-store market of the world. Pop. 1870, 13,446; 1880, 17,350.

**Wilmington**, on R. R., cap. of Clinton co., O., 55 m. N. E. of Cin. Pop. 1870, 2023; 1880, 2745.

**Will'mot** (DAVID), b. at Bethany, Pa., Jan. 20, 1814, ed. at the acads. of Bethany, and of Aurora (Cayuga co.), N. Y.; studied law, was admitted to the bar, and commenced practice at Wilkesbarre, Pa., 1834; soon removed to Towanda; sat in Cong. as a Dem. 1845-51, and moved on Aug. 8, 1846, an amendment to a bill appropriating \$2,000,000 for the purchase of Mex. terr., which became celebrated under the name "the Willmot proviso." "That, as an express and fundamental condition to the acquisition of any territory from the republic of Mexico by the U. S., . . . neither slavery nor involuntary servitude shall ever exist in any part of the said territory." This proviso was adopted by the House, but rejected by the Senate, and became the starting-point for the "Free-Soil" movement of 1848. Mr. W. was pres. judge of the 13th dist. of Pa. 1853-61, a delegate to the Rep. national conventions of 1856 and 1860, U. S. Senator to fill a vacancy 1861-63, and was appointed a judge of the U. S. court of claims 1863. D. Mar. 16, 1868.

**Willmot Proviso**. See WILMOT (DAVID).

**Wilna**. See VILNA.

**Wilson**, on R. R., cap. of Wilson co., N. C., contains 2 colls. An extensive business in cotton is carried on. Pop. 1870, 1036; 1880, 1475.

**Wilson** (ALEXANDER), b. at Paisley, Scot., July 6, 1766, was trained as a weaver; engaged in peddling; pub. a vol. of poems in 1790, and was sentenced in 1793 for a lampoon, after which event he emigrated, and landed at New Castle, Del., July 14, 1794. He worked for some time as a weaver, and then as a peddler; taught school in various places, and was afterward employed in Phila. as ed. of the Amer. edition of Rees's *Cyclopaedia*. During his wanderings as a peddler he always took a great interest in observing the life of birds. He determined to make a collection of Amer. birds, and wrote an Amer. ornithology. He learned drawing, coloring, and etching, and began to make excursions for his special purpose—the first in 1804 to the wilderness of W. N. Y., which he described in a poem, *The Foresters*, pub. in the *Port Folio*. In 1808 the first vol. of his *Ornithology* appeared; the second in 1810; at his death, Aug. 23, 1813, 7 vols. had been pub.; the 8th and 9th were edited after his death by George Ord, and a continuation of his work was given by Charles Lucien Bonaparte.

**Wilson** (ALLEN B.), b. in Central N. Y. in 1827, learned the trade of a cabinet-maker. In 1849, at Pittsfield, Mass., he built a shuttle sewing-machine. This was the first machine by which an endless seam could be sewed capable of being turned on any curve or at any angle at pleasure of the operator while the seam was being formed. In 1850 he invented the rotary hook and stationary bobbin of the "Wheeler and Wilson" sewing-machine.

**Wilson** (BIRD), D. D., LL.D., son of James (1742-98), b. at Carlisle, Pa., in 1777, grad. at Phila. Coll. 1792; studied law; became pres. judge of the court of common pleas for the 7th circuit 1802; took orders in the P. E. Ch. 1819; was rector of St. John's ch., Norristown, Pa., 1819-21; professor of systematic divinity in the General Theological (Epis.) Sem., New York, 1821-50, and emeritus prof. from 1850 until his death, Apr. 14, 1859.

**Wilson** (DANIEL), LL.D., b. at Edinburgh in 1816, ed. at the Univ. of Edinburgh; became prof. of hist. and Eng. lit. in Univ. of Toronto, Canada, 1853; was pres. of the Canadian Inst. 1859-60, and edited for several yrs. the *Canadian Journal*. Wrote *The Archaeology and Pre-historic Annals of Scot.*, *Pre-historic Man*, *Researches into the Origin of Civilization in the Old and the New World*, etc.

**Wilson** (ERASMUS), F. R. S., b. in Eng. in 1809, studied med.; became lecturer on anatomy and physiology at the Middlesex Hospital Med. School, consulting surgeon to St. John's Hospital, Lond., a fellow by election of the Royal Coll. of Surgeons 1843, and a member of its council 1870; gave special attention to diseases of the skin, in which branch he is the leading Eng. authority; founded in 1869 in the Coll. of Surgeons a museum and a professorship of dermatology, and was chosen the first occupant of that chair. Wrote *The Anatomist's Vade-Mecum, a System of Human Anat., Diseases of the Skin; Ringworm, its Causes, Pathology, and Treatment*, etc. D. Aug. 9, 1884.

**Wilson** (GEORGE), M. D., b. at Edinburgh, Scot., ed. at the Edinburgh High School; grad. at Edinburgh as surgeon 1837, and as phys. 1839, but devoted himself entirely to chem., in which branch he became lecturer in the extra-academical school of Edinburgh 1840, and in the School of Arts and Veterinary Coll. 1845; was a member of the Maga Club and pres. of the Physical Society, and was director of the Scot. Industrial Museum and regius prof. of technology in the Univ. of Edinburgh from 1865 until his death. He made valuable experimental discoveries. Author of *Electricity and the Electric Telegraph*, *The Chem. of the Stars*, *The Progress of the Telegraph*, etc. D. Nov. 22, 1859.

**Wilson** (HENRY), LL.D., b. at Farmington, N. H., Feb. 16, 1812. At 10 he was bound an apprentice to a neighboring farmer until 21. In 1836 he visited Wash., where his first sight of slavery produced an impression so profound on his mind that he made a solemn resolve to devote his life to the cause of emancipation. In 1840 he was elected a member of the lower branch of the State legislature; in 1844 and 1845 he was a member of the State senate; in 1848 was a member of the national convention of the Whig party. In 1850 he was again elected to the State senate, and was made pres. of that body. In 1855 he was chosen U. S. Senator. When his colleague, Charles Sumner, was stricken down at his desk in the Senate chamber by blows from a bludgeon in the hands of a rep. of S. C., he denounced the outrage in terms of fitting indignation, although threatened himself with personal violence. Challenged to mortal combat, he pronounced the duel a survival of barbarous ages, but declared that he was ready to defend himself whenever and wherever assailed. During the war of the rebellion, following the election of Pres. Lincoln, he manifested some of the highest qualities of statesmanship. His name is associated with nearly all the important legislation of the period. In 1872 he was elected V.-P. of the U. S. In the "snatched leisure" of the last yrs. of his life he prepared his great literary work, *The Rise and Fall of the Slave Power*. D. Nov. 22, 1875. [From orig. art. in *J.'s Univ. Cyc.*, by JOHN G. WHITTIER.]

**Wilson** (HENRY BRISTOW), b. in Lond., Eng., in 1803, grad. with high classical honors at St. John's Coll., Ox., 1825; took orders in the Ch. of Eng.; was one of the 4 resident tutors at Ox. who in 1841 issued a joint protest and remonstrance to the ed. of *Tracts for the Times* on account of their Romanizing interpretation of the XXXIX Articles; was successively a select preacher, public examiner, prof. of A.-S., and Bampton lecturer (1850) at Ox.; became vicar of Great Stoughton, Huntingdonshire, 1851, and was one of the 7 clergymen of the Ch. of Eng. who in 1860 pub. the vol. of *Essays and Reviews*, to which he contributed an essay on *The National Ch.*; was tried for heresy before the court of arches, and sentenced to a yr.'s suspension from his benefice



1862, but obtained a reversal on appeal to the privy council; wrote *The Communion of Saints, an Attempt to Illustrate the True Principles of Chr. Union*, etc.

**Wilson** (HORACE HAYMAN), F. R. S. b. in Lond., Eng., in 1786, went to India in 1808 as assistant surgeon in the Bengal service of the E. I. Co.; obtained an appointment in the Calcutta mint as assistant to Dr. Leyden, the celebrated Orientalist; applied himself with great diligence to the study of Sans. lit.; was appointed sec. of the Asiatic Society of Bengal on the death of Dr. William Hunter 1811; became sec. to the public instruction committee at Calcutta, and director of studies of the Hindoo coll. at Benares 1819; returned to Eng. in 1832 to occupy the Boden professorship of Sans. at Ox. Univ.; was appointed librarian at the E. I. House on the death of Sir Charles Wilkins 1836, and retained both offices until his death. In 1832 he became a director of the E. I. Co. Among his numerous works were a *Sans. and Eng. Dict.*, a *Sans. Gram.*, a *Hist. of Brit. India from 1805 to 1835*, and many translations in verse or prose of classical works from the Sans. D. May 8, 1860.

**Wilson** (JAMES), LL.D., b. near St. Andrew's, Scot., in 1742, ed. at the univ. of Glasgow, St. Andrew's, and Edinburgh; emigrated to Pa. 1766; studied law; was admitted to the bar 1768; practised at Reading, Carlisle, and Annapolis, Md.; was a member of the Pa. provincial convention 1774, and of the Continental Cong. 1775-77, and again 1782-83 and 1785-87; signed the Dec. of Ind.; settled at Phila. 1778; was advocate-gen. of Fr. in the U. S. 1779-83; was a member of the committee which drafted the Federal const. 1787, of the Pa. convention which ratified it, and of the convention which amended the State const. of Pa. in 1790; was appointed in Sept. 1789 one of the first judges of the U. S. supreme court, and became in 1790 the first prof. of law in the Coll. of Phila. D. Aug. 28, 1798.

**Wilson** (JAMES), b. at Hawick, Roxburghshire, Scot., June 3, 1805; founded at Lond. in 1843 the *Economist* newspaper; was elected to Parl. 1847, 1852, and 1857; was sec. to the board of control 1848-53, financial sec. to the treas. 1853-56; became v.-p. of the board of trade 1859, but in the same yr. accepted the position of financial member of the council of India. Author of *The Influence of the Corn Laws*; *The Fluctuations of Currency*; *Capital, Currency, and Banking*, etc. D. Aug. 11, 1860.

**Wilson** (JAMES F.), b. at Newark, O., Oct. 19, 1838, studied law; settled in Iowa 1853; was elected to the convention for revising the State const. 1856; sat in both houses of the legislature; was pres. of the senate 1861; was M. C. 1861-69, serving as chairman of the judiciary committee and as one of the managers of the impeachment of Pres. Johnson, and in 1869 was appointed a com. for the Pacific R. R. Elected U. S. Senator for Ia. Jan. 18, 1882.

**Wilson** (JAMES HARRISON), b. in Ill. about 1838, grad. at W. Pt. 1860; served in the Port Royal expedition and at the capture of Ft. Pulaski, Ga., for which he was brevetted major Apr. 11, 1863; became staff lieut.-col. of volunteers Nov. 8, 1862; was assistant engineer and inspector-gen. of the Army of the Tenn. in the campaign against Vicksburg; was made brig.-gen. of volunteers Oct. 31; brevetted lieut.-col. U. S. A. Nov. 24, 1863, for gallantry at Chattanooga; commanded the 3d cav. division of the Army of the Potomac May to Aug. 1864; was brevetted col. May 5 for the battle of the Wilderness; took part in the ensuing battles of that campaign, and in the Shenandoah Valley Aug. and Sept. 1864; took part in Gen. Thomas's campaign in Tenn., being distinguished at the battles of Franklin and Nashville, and in a cav. raid into Ala. and Ga., Mar. and Apr. 1865; was brevetted brigadier and major-gen. U. S. A. Mar. 13, 1865, for the battle of Nashville and the capture of Selma, Ala., respectively; took Montgomery, Columbus, and Macon; was made maj.-gen. of volunteers Apr. 20; captured Jefferson Davis May 10, 1865; became lieut.-col. of 35th Inf. July 28, 1866; resigned Dec. 31, 1870, and engaged in R. R. enterprises in the W. States.

**Wilson** (JOHN), b. at Windsor, Eng., in 1588, ed. at Eton School (1599-1603); entered King's Coll., Cambridge, 1602; grad. about 1606; studied law 8 yrs. at one of the Inns of court; took orders in the Ch. of Eng.; became conspicuous for his Puritanical leanings; was chaplain to distinguished families; preached successively at Mortlake, Henley, Buntingford, Stoke, Clare, and Andish; was for some yrs. minister of Sudbury, Essex; took part in the project of the colonization of Mass.; embarked at the Isle of Wight Apr. 8, 1630; landed at Salem June 12; removed soon afterward to Charlestown, where he preached under a tree, and instituted (July 30) what was afterward the first ch. of Boston; was ordained "teacher" of that ch. Aug. 27 by imposition of hands of the members thereof; took the freeman's oath July 3; was ordained "pastor" of the ch. Nov. 22, 1632; took a prominent part in the Antinomian controversy as the chief ally of Gov. Winthrop against the party headed by Wheelwright and Mrs. Hutchinson; was chaplain to the Mass. forces sent to Conn. against the Pequods 1636, for which service he afterward received a grant of 1000 acres of land in the present town of Quincy; accompanied the "apostle" John Eliot on his visit to the Indian settlements, and labored for their interests; was noted for benevolence, hospitality, and readiness in improvising verses, being esteemed by Mather "the greatest anagrammatist since the days of Adam." He pub. in Eng. a theological treatise, *Some Helps to Faith*; a poem, *Famous Deliverances of the Eng. Nation*, and a tract, *The Day Breaking, if not the Sun Rising, of the Gospel with the Indians in N. Eng.* D. Aug. 7, 1667.

**Wilson** (JOHN), more generally known by his pseudonym CHRISTOPHER NORTH, b. at Paisley, Scot., May 19, 1785, was ed. at the univ. of Glasgow and Ox. Pub. in 1812 the poem *The Isle of Palms*. In 1815 he removed to Edinburgh, and was admitted to the bar; pub. in 1816 the dramatic poem, *The City of the Plague*; became one of the chief contributors to *Blackwood's Magazine*, founded in 1817, and was appointed prof. of morals in 1820 at the Univ. of Edinburgh,

in preference to Sir William Hamilton. In 1822 he pub. *Lights and Shadows of Scottish Life*; in 1823, *The Trials of Margaret Lindsay*; in 1824, *The Forerunners*; but his most popular productions were his contributions to *Blackwood's Magazine* under the pseudonym of "Christopher North": *Noctes Ambrosianae*, *Dies Boreales*, or *Christopher under Canons*, etc. In 1851 he resigned his chair at the univ. D. Apr. 3, 1854.

**Wilson** (PETER), LL.D., b. at Banff, in the N. of Scot., Nov. 23, 1746; studied in the Univ. of Aberdeen; removed to New York in 1763; called to be prin. of Hackensack Acad.; from 1777 to 1788 served in the N. J. legislature; in the latter yr. was appointed to revise and compile the laws of his adopted State; in 1789 was elected prof. of the Gr. and Lat. langs. in Columbia Coll., New York; resigned in 1792, and became prin. of Erasmus Hall, Flatbush, L. I.; was recalled in 1797 to Columbia Coll. as prof. of Gr. and Lat. and of Gr. and Rom. antiquities, which office he retained till 1820. Pub. treatises on *Lat. Prosody*, *Gr. Prosody*, an edition of Sallust, Longinus, the Gr. Testament, and a revision of Adam's *Rom. Antiquities*. D. Aug. 1, 1825.

**Wilson** (Sir ROBERT THOMAS), son of Benjamin, b. in Bloomsbury, Lond., Eng., in 1777, ed. at Westminster and Winchester schools; took part as a volunteer in the campaign in Flanders 1798-94; was on the staff in Ire. during the rebellion of 1798; served in Hol. 1799, and in Egypt under Abercromby 1800; accompanied Sir D. Baird to Brazil and the Cape of Good Hope 1805; went with Lord Hutchinson on a secret mission to the allied armies on the Rusa frontier 1806-07; served in Port. and Sp. 1808-10; was Brit. military correspondent at the Rusa head-quarters during the campaign in Ger. and Fr. 1812-14; aided in effecting the escape of Count Lavalette at Paris Jan. 1815; incurred the displeasure of the prince-regent by espousing the cause of Queen Caroline; was in consequence dismissed from the army 1821, but was indemnified by a public subscription, and a few yrs. later was restored to his rank; sat in Parl. as a Liberal 1818-31; attained the full rank of gen. 1841, and was gov. of Gibraltar 1842-49. Wrote *A Hist. of the Brit. Expedition to Egypt*, *A Sketch of the Campaigns in Poland in 1806-07*, *A Sketch of the Military and Political Power of Rus.*, etc. D. May 9, 1849.

**Wilson** (Sir THOMAS), LL.D., b. at Stroby, Lincolnshire, Eng., about 1524, son of Thomas Wilson; ed. at Eton; was sent on an Eton scholarship to King's Coll., Cambridge, where he grad. 1546; took orders in the Ch. of Eng.; became tutor to Henry and Charles Brandon, sons of the duke of Suffolk by Mary, the ex-queen of Fr.; both of whom, however, soon d.; pub. *The Rule of Reason, containing the Arte of Logique set forth in English*, and *The Arte of Rhetorike for the Use of all Suche as are Studious of Eloquence, sette forth in English*, said to be the first critical treatises on logic and rhetoric in Eng., and incidentally to give the author a title to rank as the founder of Eng. philology; withdrew to the Continent on the accession of Mary 1553; took the degree of LL.D. at the Univ. of Ferrara; was imprisoned by the Inquisition at Rome on charges said to have been based on his published works; was put to the torture; obtained his liberty at the death of Pope Paul IV. 1558, when the populace broke open the prison of the Inquisition; returned to Eng. soon after the accession of Elizabeth, to whom he became private sec. 1558; was made master of requests and master of St. Katherine's Hospital near the Tower; went as ambassador to the Netherlands 1576; succeeded Sir Thomas Smith as sec. of state and colleague of Sir Francis Walsingham 1577, and became dean of Durham 1579. D. June 16, 1581.

**Wilson** (THOMAS), D. D., LL.D., b. at Burton, Cheshire, Eng., in 1663, ed. at Trinity Coll., Dublin; took orders in the Ch. of Eng.; became curate of Winwick, Lancashire, 1686, domestic chaplain to the earl of Derby 1692; travelled with that nobleman's son, Lord Strange, on the Continent 1694-97, and was bp. of Sodor and Man 57 yrs., from Jan. 16, 1698, until his death. He was "held in the most exalted reputation for apostolic piety and unquenchable zeal in good works," and is even yet prominent in the writings of Matthew Arnold, Ruskin, and their followers as an exemplar of their doctrine of "sweetness and light." Author of *The Principles and Duties of Christianity, Short and Plain Instructions for the Better Understanding of the Lord's Supper, Sacra Privata*, etc. D. Mar. 7, 1755.

**Wilson** (WILLIAM DEXTER), D. D., LL.D., L. H. D., b. in Stoddard, N. H., Feb. 28, 1816, entered the theological dept. of Harvard Univ., in 1842 was ordained to the ministry of the P. E. Ch., and soon after pub. *The Const. of the Chr. Ch.*; in 1847 ed. *Bp. Mant On the Rubrics*, and in 1848 pub. a *Hist. of the Ref. in Eng.*; in 1848-49 wrote a series of articles entitled *The Ch. Identified*; in 1849 received the degree of D. D. from Geneva Coll., and in 1850 became prof. of hist. and moral and intellectual philos. in that inst.; in 1868 received the degree of LL.D., and at the opening of the Cornell Univ. became prof. of intellectual and moral philos. in that inst.; in 1872 received the degree of L. H. D. from the regents of the Univ. of the State of New York, and soon after pub. an *Introduction to the Study of Metaphysics and Intellectual Philos.* and a work on *Political Economy*; has also written many important monographs on mathematical and metaphysical subjects.

**Wilton** (JOSEPH), R. A., b. in Lond., Eng., in 1722, studied sculpture at Brabant, at Paris, and at Rome; spent 8 yrs. in It., chiefly occupied in copying anc. statues; became director of the duke of Richmond's art-gallery in Spring Gardens and the most popular sculptor in Eng.; was one of the founders of the Royal Acad. D. 1803.

**Wilton Junction**, city, on R. R., Muscatine co., Ia. Pop. 1870, 1317; 1880, 1431.

**Wimpffen**, de (EMANUEL FELIX), b. at Laon, dept. of Aisne, Fr., Sept. 13, 1811, began his military career in Algeria; was made a brig.-gen. in the imperial guard in 1855; distinguished himself both in the Crimean and in the It. wars; was made a gen. of division in 1859; commanded at



Lyons, and was subsequently made gov. first of the prov. of Algeria, then of that of Oran. In the Franco-Ger. war he received the command, first of the 12th, then of the 5th army corps, and during battle of Sedan, after MacMahon had been wounded, he assumed command of the whole army, and signed the capitulation of Sedan.

**Winamac, Ind.** See APPENDIX.

**Winans** (JAMES J.), b. at Maysville, Ky., June 7, 1818, removed in infancy to Xenia, O.; was clerk of the court of common pleas in Greene co. 1845-51; was elected to the State senate 1857, and to the assembly 1863; chosen judge of common pleas 1864; re-elected for 5 yrs. 1866, and was a Rep. M. C. 1869-71. D. Apr. 28, 1879.

**Winchell** (ALEXANDER), LL.D., b. at North East, Dutchess co., N. Y., Dec. 31, 1824, grad. at the Wesleyan Univ., Middletown, Conn., 1847; was teacher of natural sciences at Amenia Sem., N. Y., 1848-51; and at Mesopotamia Female Sem., Ala., 1851-53; was pres. of the Masonic Female Univ. at Selma, Ala., 1853; became prof. of physics and civil engineering at the Univ. of Mich. 1853, and of geol., zoology, and bot. 1885; pres. of Mich. Teachers' Association 1869; State geologist of Mich. 1869-62; prof. of geol. in Ky. Univ. 1866-69; director of the geological survey of Mich. 1869; vice-pres. of American Association for Advancement of Science. 1871; chancellor of Syracuse Univ. 1872-74; lecturer in Vanderbilt Univ., Nashville, Tenn., 1876-78; became prof. of geology and palaeontology in Univ. of Mich. 1879. Author of *The First Biennial Report of the Geological Survey of Mich., Geological Chart, World Life, or Comparative Geology*, etc. Revised *Johnson's Natural History*, 1885.

**Winchendon, R. R. June.** Worcester co., Mass., on Miller's River, contains a library and the N. Eng. Home for orphan and destitute children; has extensive manufactures of wooden-ware. Pop. tp. 1870, 3398; 1880, 3722.

**Winchester, town of Eng.** cap. of Hampshire, on the Itchen, is the *Caer-Gwent* of the Britons and the *Venta Belgarum* of the Romans. After being taken in 495 by the Sax., it received its present name, and was for several centuries the cap. of Eng. and the residence of its kings. Pop. 17,469.

**Winchester, cap. of Scott co., Ill.** 84 m. N. of St. Louis. Pop. tp. 1870, 1661; 1881, 2602, including 1826 in v.

**Winchester, R. R. June.** cap. of Randolph co., Ind. Pop. 1870, 1456; 1880, 1958.

**Winchester, on R. R.** cap. of Clark co., Ky. Pop. 1870, 1616; 1880, 2277.

**Winchester, R. R. June.** Middlesex co., Mass. Pop. tp. 1870, 2645; 1880, 2802.

**Winchester, Tenn.** See APPENDIX.

**Winchester, city, on R. R.** cap. of Frederick co., Va., has 4 female sems. The place is the key to the valley of the Shenandoah, and during the c. war it was repeatedly occupied by the forces on either side, and in its vicinity were fought several battles. Pop. 1870, 4477; 1880, 4938.

**Winchester (ELIHANAN), b.** at Brookline, Mass., Sept. 30, 1751, began preaching to a Bap. ch. at Newton 1769; was pastor of a ch. at Rehoboth 1771, but excommunicated in consequence of his views on close communion; went to S. C. 1774; preached to the negroes on the plantations on the Pedee River; became pastor of the first Bap. ch. at Phila. 1780, and, having adopted the doctrine of universal salvation, founded there a Univ. ch. 1781, after which he traversed several States to propagate his new doctrines, and preached in Eng. 1787-94. He was one of the precursors of the modern system of Universalism. D. Apr. 18, 1797.

**Winchester (WILLIAM PAULET or POULET), K. G.,** MARQUIS OF, b. in Hampshire, Eng., about 1475; dissipated large estates in youth; entered the personal service of Henry VII.; became comptroller and afterward (1536) treas. of household to Henry VIII.; was made Baron St. John Nov. 1537; received from Henry VIII. order of the Garter; was appointed treas. to Edward VI. 1549; made earl 1550 and marquis of Winchester Oct. 1551; presided at trial of Somerset Dec. 1551, in capacity of lord high treas., which post he retained under Mary and Elizabeth; built a magnificent mansion in Hampshire called Basing House, afterward celebrated for its siege by Cromwell. D. Mar. 10, 1572.

**Winckelmann (JOHANN JOACHIM), b.** at Stendal, Prus. prov. of Brandenburg, Dec. 9, 1717, in humble circumstances; studied theol. at Halle, med. at Jena; lived for several yrs. as tutor in a private family, and from 1743 to 1748 as co-rector at the school of Seehausen in Brandenburg, and came finally in 1748 to Dresden as librarian and sec. to Count Heinrich von Bülow. Here he also pub. his first work, *Gedanken über die Nachahmung der griechischen Werke in Malerei und Bildhauerkunst* (1755). In this latter yr. he went to Rome, having joined the R. Cath. Ch., and received a pension of \$300. In 1764 appeared his prin. work, *Geschichte der Kunst des Alterthums*, and in 1767 his *Monumenti antichæ inedita*. In 1768 he started on a visit to his native country, but was murdered at Trieste, June 8, 1768.

**Wind.** See WINDS, by PROF. A. GUYOT, LL.D.

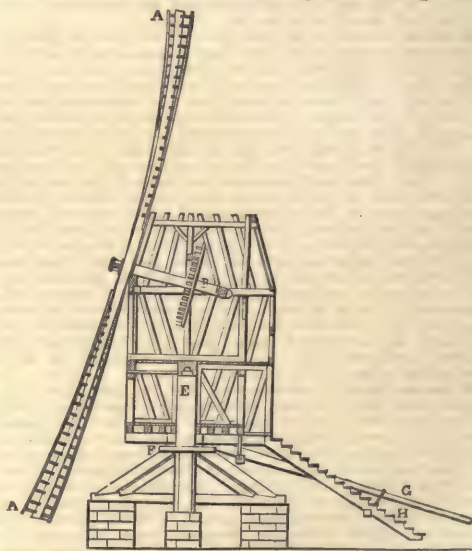
**Win'dermere, or Winandermere,** the largest lake of Eng., 14 m. long and 1 m. broad, lies in Lancashire, and is celebrated for the great beauty of its shores.

**Win'deshelm, in Hol.** between Deventer and Zwolle, the seat of a monastery founded in 1386 by Florentius Radevini, a disciple of Gerard Groot, for Brethren of the Common Lot. It was their most famous monastery, and the seat of the general chapter of the order, which played an important part in preparing the way for the Prot. Ref.

**Wind'ham (WILLIAM), D. C. L.** b. in Lond., Eng., May 3, 1750, ed. at Eton, at Glasgow Univ., and at Univ. Coll. Ox.; travelled on the Continent; became a member of Dr. Johnson's Literary Club and a friend of Burke and Fox, with whom he co-operated in denouncing the Amer. war; entered Parl. for Norwich 1781; distinguished himself as an orator; was prin. sec. to Lord Northampton, lord leut. of Ire. 1783; was one of the managers of the impeachment of Warren Hastings 1787; was a strenuous opponent of the Fr. revolution and advocate of war with Fr.; was sec. at

war in Pitt's cabinet 1794-1801; bitterly opposed the Peace of Amiens 1802; was again sec. at war, and also for the colonies, in the Grenville administration 1806-07; after which, declining a peerage, he remained in opposition and denounced the Copenhagen and Walcheren expeditions. D. June 3, 1810.

**Wind'mill,** a mechanical prime-mover, in which the motive-power is derived from the currents of the atmosphere. In its ordinary form the W. presents the appearance of a turret with a conical or hemispherical dome, from which projects a nearly horizontal shaft, carrying at its extremity 4 or more radiating arms at right angles to it, which support sails designed to receive the force of the wind. The W. was probably the earliest form of mechanism used by man for making a force of nature subservient to the uses of industry. The original type was very simple in construction; and, though modern ingenuity has devised a variety of more efficient forms, this type, substantially unaltered, continues still to be most frequently met with in countries where this motor is in general use. The radiating arms of this early type of W. are 4 in number, and the sails are formed of canvas. The canvas is stretched and supported by a kind of lattice-work constructed as follows: The arms, called the whips, which are 90 or 40 ft. long and 8 or 10 inches in diameter, are perforated through their axes at intervals of about 15 inches throughout their length, beginning at about 6 ft. from the centre of motion, the perforations being at right angles to the axes, but inclined to the plane of rotation, the inclination being from 18° to 30° nearest the centre, and diminishing down to between 6° and 12°, or less, at the outer extremities. Through these perforations are passed stiff rods, which extend some 3 ft. on each side the whip, but which are often made of gradually increasing lengths from the centre outward. The ends of these rods on each side are connected and secured by longitudinal pieces, which make of the whole a sort of frame or lattice on which the canvas of the sail is to be extended. The sail is therefore not plane, but is what is called in math. a warped surface. If, as is usually the case, the mill is to be used for grinding or for driving any rotatory machinery, a face-gear or bevel-gear wheel upon the shaft connects with a pinion on a vertical spindle, to which it thus transmits the motion; but if it is to be employed for pumping, an eccentric or crank takes the place of the geared wheel; and in this case it is preferable that the shaft be truly horizontal. As the direction of the wind is variable, and as the efficiency of the machine depends on the presentation of the plane of rotation of the sails at right angles to it, the dome or the entire turret must be capable of being turned



about a central pivot. The cut shows one of the forms not infrequent in Fr., in which the whole structure is pivoted on a stout mast, or upright, about which it is turned by means of the lever G. The lever G affords a partial support to the flight of steps H, which must not touch the ground, as it revolves with the mill. With heavy constructions of this kind it is necessary to employ a portable windlass or capstan to turn the mill. To assist in the operation, a set of posts are fixed in the ground in a circle around the mill, to which the windlass may be attached, while a rope extended from it is fastened to the lever G. It is more usual, however, to make only the dome rotatory; and then this may be turned by means similar to those employed in giving rotation to the domes of astronomical observatories. The W. here described is that which is most largely in use on the Continent of Europe, but it is beginning to be superseded by greatly improved forms, of some of which descriptions will be found in the article by F. A. P. BARNARD, under this title, in *J.'s Univ. Cyc.* There are some Amer. W. which combine in a high degree power, lightness, and elegance of construction. F. A. P. BARNARD.

**Win'dom (WILLIAM), b.** in Belmont co., O., May 10, 1827, studied law, and entered upon the practice of his profession in O.; removed to Minn. in 1855; M. C. 1858-68; appointed U. S. Senator July 1870, to fill a vacancy, and elected Senator for the full term 1871-77; re-elected in 1876; sec. of



the treas. Mar. 5, 1881, to Oct. 27, 1881; re-elected U. S. Senator Oct. 26, 1881, for term ending 1883.

**Win'dow Pane**, a name given on certain parts of the N. Amer. coast to the *Lophopsetta maculata*, most nearly related, among Amer. fishes, to the turbot of Europe. This is so called on account of its thin, transparent body.

**Winds, or Vinds.** See SLOVENTZLI.

**Winds.** Wind is air in motion. The word is usually applied to currents of air more or less horizontal, though vertical or slanting currents of air, whether ascending or descending, equally deserve the name. Winds are named from the quarter of the horizon from which they come. Thus, a wind blowing from E. to W. is an E. wind; one moving from N. to S. is a N. wind. The direction of the surface-winds can easily be taken from a wind-vane so located as to be free from all surrounding obstacles. For the direction of the winds in the upper part of the atmosphere, we must look to the course of the clouds. The winds from the 4 cardinal points and those from 4 intermediate directions are the 8 prin. winds usually noted in meteorological journals, and are indicated simply by their initials. Further intermediate directions give 8 more winds. For the use of mariners the divisions are carried to 32 winds.

The velocity and force of winds vary from an almost inappreciable breath of air to the furious hurricane which sweeps everything before it. It is measured by means of the anemometer ("wind-measure"), an instrument of which various kinds have been invented. That of Robinson, composed of 4 hemispherical cups revolving around a perpendicular axis, with a self-recording apparatus, has been adopted by the Smithsonian Inst. and U. S. Signal Service. In all these instruments the velocity has to be computed by formulas based on previous experiments. It is on such trials that the various scales proposed to express the force and velocity of winds are founded. The scale adopted by the Smithsonian Inst., which is almost identical with that used by the U. S. Signal Service, distinguishes 10 grades, the names of which, with the corresponding pressures and velocities, are as follows:

Grade.	Velocity in Eng. m. per hour.	Pressure in lbs. avoidsdups on each sq. foot.	Name.
0	0	0.00	Calm.
1	2	0.02	Very light breeze.
2	4	0.08	Gentle breeze.
3	12	0.75	Fresh wind.
4	25	3.00	Strong wind.
5	35	6	High wind.
6	45	10	Gale.
7	60	18	Strong gale.
8	75	....	Violent gale.
9	90	....	Hurricane.
10	100	....	Most violent hurricane.

Winds may be grouped in 3 classes—namely, *constant, periodical, and variable*; the first 2 are mainly tropical, the other characterizes the temperate and cold lats.

Winds are the consequence of a disturbance of equilibrium in the layers of the atmosphere, and the tendency of their motion is to restore the equilibrium which has been destroyed; as soon as that is accomplished the movement ceases and everything settles into a calm. One of the chief conditions of this equilibrium of the atmosphere is, that any level layer should have the same density at all points; otherwise the denser portions flow under the less dense, while the lighter rise to the top. Now this occurs when the different parts of the layer are unequally heated. At the point of greater warmth the air expands, becomes lighter; then, pressed by the neighboring layers, which have remained colder and heavier, it rises into the higher layers, until it reaches a stratum of equal density with itself. The result of this process is an ascending current and lateral currents rushing from all sides toward the spot where the temperature is higher. Differences in the moisture of the air will have a similar effect, for moist air is lighter than dry air of the same temperature, and will cause an ascending current, or increase the ascending power of one already in progress. Moreover, when the moisture is condensed into rain, its latent heat, becoming free, adds to the buoyancy of the air.

**Land and Sea Breezes.**—As an example from nature, let us see what takes place on an island alone in the midst of the ocean. In proportion as the sun rises above the horizon, the island becomes warmer than the neighboring sea. Their respective atmospheres participate in these unequal temperatures; the fresh air of the sea rushes from all directions in the form of a *sea breeze*, which makes itself felt along the whole coast, and the warmer and lighter air of the island will ascend into the atmosphere. During the night it is the reverse. The island loses heat by radiation, and cools quicker than the sea. Its atmosphere, having become heavier, flows into that of the sea in the form of a *land breeze*; and this interchange lasts until the temperature, and consequently the density, of the 2 atmospheres have again become the same. The same again occurs on a great scale between an entire continent and the ocean, between the tropical regions and the temperate and polar regions. To each difference of temperature, unequal in duration and amount, particular atmospheric currents, which are their consequence, correspond—to the difference of temperature between day and night, the diurnal breezes, whether along the coasts or in the interior of the continent at the foot of the mts.; to the difference of temperature between the extreme seasons, the monsoons; to the difference of temperature between the tropics and the poles, the trade-winds.

**General Circulation of the Winds.**—The regions near the equator having a higher temperature, and the heat gradually diminishing as we advance toward the poles, the atmosphere of the tropical zone is more dilated and constantly lighter than that of the temperate and polar regions. As a consequence, the denser air of the colder regions presses

that of the hot on two sides, the N. and the S.; the warmer portion of the tropical atmosphere, the equatorial, rises, and 2 lower currents are established from the poles to the equator, and 2 upper currents, which carry back the air from the equator toward the poles, to commence again the same rotation. The rotation of the earth from W. to E., however, causes these currents to deviate from their original direction. The speed of rotation, which is almost nothing in the neighborhood of the poles, gradually increases, with every parallel, to the equator, where it is over 1000 m. an hour. The masses of air which rush toward the equator have an acquired speed of rotation less than that of the regions toward which they go. At each step they are forced to assume a greater velocity; but in virtue of the law of inertia they find themselves a little behindhand, that is, a little farther to the W. These successive retardations accumulating, gradually deflect the polar currents toward the W., changing them into a N. E. wind in the N. hemisphere, and a S. E. wind in the S. hemisphere. These 2 polar currents, entering the tropical zone, become those permanent winds blowing nearly from the E. which are called *trade-winds*. Approaching the equatorial zone, these masses of air, strongly heated by the rays of a vertical sun, ascend, forming there a broad *zone of calms*, and return, as upper currents, toward the poles to supply the constant outflow from the polar regions. The same cause makes the upper currents, which set from the equator toward the poles, sweep, but in the opposite way. They arrive successively in the higher lats., with a velocity of rotation greater than that of the parallel which they enter, and are always a little in advance of the earth's motion in each place—that is, always more and more to the E. Thus, the returning equatorial currents, when descending to the surface of the earth, become the S. W. winds, so prevailing in N. hemisphere, and the N. W. winds in S. hemisphere.

This circulation, arising from constant differences of density and pressure in different parts of the atmosphere, has its counterpart in permanent differences in the average height of the barometer at the level of the sea in various latitudes. In the equatorial regions the overflowing of the air from the ascending current toward the poles causes a diminution of its mass, and consequently a low barometer; while its descent about lat. 30° and the encounter of the extra-tropical air produce in that latitude an accumulation and a belt of high barometer. The constant flow of the cold air from the polar regions is manifested by a greater barometric depression within the Arctic circle.

**Winds of the Tropical Regions.**—The all-prevailing currents of air between the tropics are the trade-winds, which blow the whole yr. round in the same direction, and occupy the greater part of the zone. Wherever they blow the sky is cloudless and serene, the temperature even and moderate, and the atmosphere without tempests. The trade-winds occupy from 20 to 25 degrees of lat. on each side of the equator, forming 2 belts—the N. E. and the S. E. trade-wind. They blow with entire regularity only on the open sea, their course and character elsewhere being modified by continental relief and other local influences.

**Zone of Equatorial Calms.**—The width of this zone of calms, which separates the 2 great bodies of the N. E. and S. E. trade-winds, is not uniform, but varies on an average from 4° to 6° in lat. It is wider in the E. part of the 2 oceans, probably because the force of the trade-winds is broken by the neighboring continents. It is wider again during the N. summer, especially in the Atlantic, owing to the higher temperature of the extensive continental surfaces, which draws the polar limit of the trades up to the 30th parallel. To this predominance of land over water in the N. hemisphere the fact has to be referred that in the Atlantic, more than in the Pacific, this central zone is not on the equator, but somewhat N. of it, so that a ship sailing in the N. hemisphere encounters the S. E. trade before crossing the equator. The mean position of this zone is, in the Atlantic, between 3° and 9° N. lat.; in the Pacific, between 3° S. and 4° N. lat. It would be an error to suppose that the air in the region of calms is without motion; the horizontal trade-wind is only changed into an upward current, which appears, at the surface, like a calm. The mixture of this warm current with the colder air of the upper atmosphere causes frequent descending variable winds, and often sudden squalls, and those tremendous tornadoes which are the terror of the navigator. The zone of calms, unlike the serene region of the trade-winds, has an almost daily accumulation of clouds, which soon after mid-day burst in torrents of rain, accompanied by terrific thunder and lightning.

The calms of the tropics of Cancer and Capricorn are probably caused by a portion of the upper returning current descending to the surface and re-entering the general trade-winds, while the other portion continues its way toward the temperate lats. Light but variable winds and absence of rain characterize these regions.

**Monsoons.**—The influence of the lands is already marked in the Pacific and Atlantic by the broader extent of the trade-wind zone in their neighborhood, but it is still more perceptible in the Indian Ocean. Here the regular trade-wind ceptible only exists in the S. half. In the N. half it is completely broken and changed into season winds called *monsoons*, which blow alternately 6 months from the N. E. and 6 months from the S. W. The region of calms is mostly S. of the equator, and quite undefined, if found at all. The disturbing effect of the land-masses is evident. During the N. summer the great continent of Asia is overheated, while the S. part of Afr. has winter. The colder air, therefore, rushes toward the continent of Asia, making the S. W. monsoon, which blows from Apr. to Oct. The cold winter air of Asia flowing into the warm summer air of Afr. causes a N. E. monsoon, blowing from Oct. to Apr. The time of the change from one monsoon to the other is marked by high winds and great tempests. Similar monsoons play between



the continents of Asia and Australia, also all along the E. coast of Asia, along the coast of Brazil and the W. coast of S. Amer., of Mex., and Central Amer.

**Winds of the Temperate Regions.**—If the tropical zone is that of constant and periodical winds, the temperate regions are those of *variable* winds, for all the year round they blow alternately, without apparent rule, from every quarter of the horizon. Two winds, however, in our hemisphere—the N. E. and S. W.—are more steady, and so prevailing that they may be called the normal winds of the middle lats. The N. E. in Europe, or the N. W. in E. N. Amer., cold and dry, is the polar wind deflected by the earth's rotation; the S. W., warm and moist, is the returning upper equatorial current, which gradually descends and reaches the surface about the 30th degree of lat., blowing from the S. W. The polar or equatorial winds, flowing side by side, or one above the other, but in contrary directions, encounter each other, each constantly struggling for the mastery. Their fierce battles are our never-ceasing storms; our lats. their battlefield. They control the weather. The S. W. equatorial brings us heat, cloudiness, and rain; the polar winds, clear sky, dry, cold, bracing air, and sunshine. The science of the winds is the science of the weather.

**Influence of Winds and Marine Currents on Isothermal Lines.**—The circulation of the winds just explained, together with that of the great marine currents, warm and cold, equatorial and polar, which follow the same general course, and add their influence, enable us fully to understand the remarkable deviations of the isothermal lines from the parallels (see description of them under CLIMATE), and the great difference in the temperature of places situated in similar lats.

In the N. hemisphere all heating influences, winds and waters coming from the equatorial regions, take their course toward the N. E., and benefit the W. coasts of Europe and Amer., which are the warm coasts. All cooling influences, winds and waters from the polar regions, are directed to the S. W., and cool the E. coasts of Asia and N. Amer., which are the cold coasts. In the Atlantic the S. W. equatorial winds and the Gulf Stream travel together toward the N. E., and along their path the isothermals are pushed far to the N. Moving on the warm surface of the Gulf Stream, the winds take up a part of its heat and spread it, with their own, over W. Europe. They add thus, from this double source, a large share to the temperature due to its lat., and make Europe the warmest continent of the temperate lats. In the Pacific Ocean, the warm Asiatic Gulf Stream or Japanese Current is so far removed that it has lost its heat when its waters, after a long circuit, return from the N. and glide along the coasts of N. Amer. As the equatorial winds alone have an influence, the increase of temperature is only  $\frac{1}{2}$  of what it is in Europe. In the interior of the continents, removed from these warming influences, the isothermal lines bend again toward the equator.

In the S. hemisphere, the domain of the waters, the marine currents have the greatest sway. In the Atlantic, the S. branch of the Equatorial Current, running along the coast of Brazil, carries a tropical temperature far beyond the tropics, while the cold Antarctic current reduces the heat of the Peruvian coast down to that of the temperate lats. The same phenomenon is repeated in S. Afr. The warm equatorial current of Mozambique gives to the coast of Natal a tropical temperature, while the Antarctic waters in their northward course cool the W. coast of the Cape Land. (For storms, etc., see STORMS, HURRICANES, AND CYCLONES.)

A. GUYOT.

**Windsor**, town of Eng., in Berkshire, on the right bank of the Thames, is an anc. borough, but has undergone much alteration of late yrs., owing to the improvement of the castle. High st. is the best part of the town, in which are situated the parish ch., a modern structure of late much improved, and the town-hall, covering a railed-in space used as a corn-market, and consisting of a quaint chamber of the time of Queen Anne, and other apartments for municipal purposes. Pop. 12,273. (See WINDSOR CASTLE.)

**Windsor, Mo.** See APPENDIX.

**Windsor**, Windsor co., Vt., on R. R. and Conn. River, contains a library and the State prison. Pop. pt. 1870, 1699; 1880, 2175, including 1696 in v.

**Windsor Castle** is built upon a chalk hill near the river Thames, about 22 m. from London. William the Conqueror built a Norman edifice on the spot, but no part of the existing castle can be identified as coeval with his time. The most anc. portions are the Garter and Caesar towers. These towers were erected in the reigns of Henry I., II., and III. To the same period belong the S. ambulatory of the Dean's Cloister, a door behind the altar in St. George's chapel, and the remains of Domus Regis in the N. of the chapel. The Norman gateway near the keep, the groining of the Devil's Tower and King John's Tower, and the Dean's Cloister pertain to the time of Edward III. St. George's chapel was built by Edward IV., the choir roof by Henry VII., the outer gateway of the lower ward by Henry VIII., and the buildings from the Norman gate to the state apartments, including the library, were raised by Queen Elizabeth. Thus, some materials are here afforded for illustrating the history of castellated arch. in Eng. from the 13th to the 16th century. But the castle, as it now appears, is almost entirely the creation of George IV.'s reign. The arch., Sir Jeffrey Wyattville, preserving somewhat the character of an anc. fortress, transformed it into a royal residence replete with all the accessories of modern luxury and splendor. Its hist. is, to a large extent, that of the successive kings, royal families, and courts of England.

**Windsor Locks**, on R. R. and Conn. River, Hartford co., Conn. Pop. pt. 1870, 2154; 1880, 2332.

**Windward Islands.** See ANTILLES.

**Wine and Wine-Making.** By *wine* is usually understood the fermented juice of the grape, although the name is occasionally applied also to fermented beverages derived

from other fruits. Its preparation dates from the most anc. times. Grapes to be used in wine-making should be fully ripe; when this is not the case, the juice is deficient in quantity as well as quality, and especially poor in sugar. When the weather permits, the grapes are often allowed to become over-ripe to such extent as to make them appear to be wilted; they then yield less, but sweeter wine (*Ausbruch-wein*, Ger.). Finally, in S. countries (Sp., It., Gr.) wine is frequently made from grapes fully dried, or raisins, the requisite water being added in crushing and pressing.

**Stemming and Crushing.**—In the making of white wines, the berries are mostly either picked off by hand or separated by means of an implement resembling a coarse comb. The berries are then crushed by passing them between ribbed rollers, set so as to avoid crushing any kernels. In the manufacture of red or tinted wines the bunches themselves are fed on the crushing-mill, or are crushed by treading with clogs or sandals or pounding with wooden pestles.

**Pressing.**—This is effected by means of presses of every variety of pattern, from the primitive lever and wedge press to the hydraulic; and even the centrifugal process has been successfully used. When the "first run" has been separately received, the pressed juice constitutes the "second run," while the pressed residue is the "pomace," which is thereafter utilized for the production of inferior wine, vinegar, or brandy.

**Composition of Grapes and Must.**—The grape-berries contain from 12.6 to 22.9 per cent. of soluble matters, 2.5 to 7.0 of insoluble matters, and from 70.0 to 85.0 of water. The mineral (ash) ingredients range between 0.4 and 0.5 per cent., of which  $\frac{3}{4}$  or more are soluble, and therefore pass into the must. The ash of must varies from 0.25 to 0.4 per cent. of its weight; from 80 to 85 per cent. of this ash consists of alkali (chiefly potash). Kernels contain as much as 20 per cent. of ash, chiefly earthy phosphates and carbonates. The *proximate ingredients* of must may be briefly stated as follows: *sugar*, in the form of grape-sugar or glucose; *gum and dextrine*; *vegetable acids*—tartaric (sometimes racemic), malic, citric; *albuminoids*; *tannin*; *coloring-matter*; *volatile aroma*, pre-existing chiefly in the husks of some kind of grapes, distinct from the wine flavor and "bouquet"; *ash ingredients*—potash, soda, lime, magnesia, alumina, iron, phosphoric and sulphuric acids, chlorine, silica.

**Grape-sugar** may be considered the most important ingredient of must, its amount, together with that of the vegetable acids, being usually the index to the commercial value of the product. Of all known fruit-juices, grape-must contains the largest amount of sugar. In fermentation the sugar is partially or wholly transformed into about half its weight of alcohol, the rest being given off in the shape of carbonic dioxide (carbonic acid). Beside common alcohol, there are formed succinic acid, glycerine, and a number of aromatic ethereal compounds, whose presence and quantity materially influence the quality of the wine. The *acids* of must rank next in importance to sugar. Their amount varies from 0.5 to 1.02 per cent. Of the special nature of the *albuminoids* of must we know but little. Their amount varies from 0.24 to 0.93 per cent., and their presence exerts a most important influence upon the fermentation and keeping qualities of wine. *Tannin* is not present in the pure juice, but occurs largely in the husks of some kinds of grapes, as well as in the stems and kernels. Hence, close crushing and pressing, and still more the presence of the whole pomace during fermentation, cause the wine to be rich in tannin.

**Fermentation and Ripening of Wine.**—The process of fermentation naturally subdivides into 2 periods—(1) That of violent fermentation, during which the temperature rises considerably, a lively evolution of gas takes place, and most of the sugar is converted into alcohol. Its duration is from 24 hours to as many days—usually 10 to 14. (2) The after-fermentation of the cleared liquid, without perceptible elevation of temperature, and without a very definite limit, lasting through 3 or 4 months, during which the action is completed, and a further deposition of lees takes place.

**Sparkling Wines.**—Ordinary "still" wines retain only so much of the gas generated in fermentation as to impart to them a refreshing quality, which soon vanishes on exposure to the air; the wine becomes "flat." Sparkling wines, of which champagne is the type, effervesce on account of an excess of carbonic acid gas contained in them under pressure. This gas is generated in a second fermentation produced in the young wine, subsequent to after-fermentation, by the addition of sugar and (when necessary) yeast-forming matter (gelatine). This is effected in strong bottles tightly corked, and when the fermentation is completed the sediment of yeast is ejected from the mouth of the inverted bottle by dexterous manipulation.

**"Doctoring" of Wines.**—Few wines reach the consumer as they result from the processes above detailed. It is the general practice to adapt the various kinds and qualities of wines to the taste of the consumers by the intermixture of such as will improve each other. To this practice no reasonable objection can be made, since from beginning to end intelligent management influences the nature of wine nearly as much as its origin, and it would be difficult to define just what should be understood by "natural wine."

**Classification of Wines.**—The wines of commerce may in a general way be divided into—(1) *dry* wines, not obviously sweet, but possessing a more or less distinctive and high flavor—"bouquet"; (2) *liqueur* or sweet wines, permanently and decidedly sweet, and rich in alcohol, with but little aroma, mostly from S. climates.

**Wines of France.**—Fr. produces an especial abundance and variety of red wines (clarets), of which those most highly esteemed are grown in the Bordelais and in Burgundy, as well as in Dauphiné. The Bordeaux wines have a full, agreeable bouquet, a good deal of body, are spirited yet not heady, with a pleasant astringency. The Burgundy wines are rather heavy, oily, less astringent, with a fine peculiar



aroma. *Petite vins*, or *vin ordinaire*, is produced in all but 8 out of 86 depts. The white wines of Fr. are more fiery and have more body than the Rhenish wines. Superior dry wines are also produced in the S. of Fr.; the prin. are the *liqueur* wines of Perpignan, Languedoc (Frontignan, Lunel), Roussillon, and the "straw wines" of Dauphiné and N. Fr.

Foremost among the wines of Germany are the high-flavored, dry Rhenish wines, grown from Alsace down to Coblenz, in the valley of the Rhine and its tributaries. The Moselle wines resemble those of the Rhine in flavor, but are light and acid. The same, to a less degree, is true of the wines of Franconia. The wines of N. Ger. are very acid.

*Austria* is second to Fr. in the amount of wine produced, but only the wines of Hungary and some of the *liqueur* wines of the Adriatic provs. are somewhat widely known in commerce, and the aggregate export is quite small. The sweet, fiery, and aromatic wine of Tokay in Hungary is by some esteemed even above that of Johannisberg on the Rhine. Many other excellent wines are in high local repute.

*Italy* produces abundance of wine, largely of the *liqueur* class; of these, the wines of Asti, Monte Pulciano, and Fiascone, and the *Lachrymæ Christi*, are best known.

The wine-production of the *Sp. Peninsula* is very extensive and of considerable commercial importance. Among the wines exported, the best known are those of Jerez ("sherry"), Malaga, and Oporto ("port"). The latter is essentially a dry wine, mixed to suit the Eng. market.

Few of the wines of Greece enjoy a general reputation at present, although the wines of Cyprus and Chios are still praised. They suffer for want of care in preparation.

Of American wines, those of Cal. approach most nearly those of the Mediterranean countries, being, thus far, mostly fiery, sweet, and heady, but somewhat deficient in flavor. To a certain degree these defects can, and doubtless will, be remedied by judicious selection of grape varieties and appropriate treatment. The wines of the States E. of the Rocky Mts., made from Amer. grapes, bid fair to rival those of Fr. and Ger., from which they differ in possessing more or less of the "foxy" flavor of the berries, to which the European palate has not yet become accustomed. [From orig. art. in *J.'s Univ. Cyc.*, by PROF. E. W. HILGARD.]

**Winebrenner** (JOHN), b. in Frederick co., Md., Mar. 25, 1797, became a minister of the Ger. Reformed Ch. at Harrisburg, Pa., but in consequence of a difference of views in regard to revivals seceded from that Ch. in Oct. 1830, and established a new denomination under the title of "The Church of God," now more generally known as "Winebrennerians," their distinctive ordinances being baptism by immersion, the washing of feet, and the Lord's Supper. W. edited the *Ch. Advocate* of his sect. D. Sept. 12, 1860.

**Winebrennerians.** See CHURCH OF GOD.

**Wines** (ENOCH CORB), D. D., LL.D., b. at Hanover, N. J., Feb. 17, 1806, grad. at Middlebury Coll. 1827; took charge of the Edge Hill School, Princeton, N. J., 1833; became prof. of langs. in the Central High School at Phila. 1838; was pastor of chs. at Cornwall, Vt., and Easthampton, L. I.; became prof. of anc. langs. in Washington Coll., Pa., 1853; became pres. of the City Univ. of St. Louis, Mo., 1859; founded the National Prison Association 1870, of which he became sec.; went to Europe as a rep. of the U. S. govt. 1871; succeeded in convening reps. of 26 govts. at the first International Penitentiary Congress at Lond., July 4, 1872, when he was appointed chairman of a commission which met at Brussels 1874, at Bruchsal 1875, and at Stockholm 1877. Author of *Commentaries on the Laws of the Anc. Hebs.*, etc. D. Dec. 10, 1879.

**Winfield**, city and R. R. junc., cap. of Cowley co., Kan., on Walnut River. Pop. 1880, 2844.

**Win'gate** (PAINE), b. at Amesbury, Mass., May 14, 1739, grad. at Harvard 1759; was ordained Congl. minister at Hampton Falls, N. H., Dec. 14, 1763; removed to Stratham, and became a farmer 1771; was M. C. under the Confederation 1787, U. S. Senator 1789-93; M. C. 1793-95, and judge of the superior court of N. H. 1798-1809. D. Mar. 7, 1838.

**Win'gfield** (EDWIN MARIA), b. in Eng. about 1570, took part in the enterprise of colonizing Va. under the patent of Apr. 10, 1606; sailed with the first company of emigrants Dec. 19, 1606; was named pres. of the colony by the sealed instructions opened on shipboard; was deposed and replaced by Ratcliff, and returned to Eng. in 1608, after which no further details of his life are known.

**Winkelried**, wink'-el-reet, von (ARNOLD STRUTH), decided by his patriotic self-sacrifice the battle of Sempach, July 9, 1386, in which a small Swiss force was engaged with a large Aus. army. By gathering the lances of Aus. halberdiers into his body and bearing them down to the ground, he effected breach in the Aus. line, through which the Swiss made the attack.

**Win'lock** (JOSEPH), LL.D., b. at Shelbyville, Ky., Feb. 6, 1836, grad. at Shelby Coll. 1845; was employed at the observatory at Cambridge, Mass., as one of the computers of the *Nautical Almanac* 1852; became prof. of math. in the U. S. N. 1857; was employed at the Naval Observatory at Wash., D. C., and at the Naval Acad. at Annapolis, Md.; became director of the observatory at Cambridge, Mass., and Phillips prof. of astron. in Harvard 1865; conducted expeditions to Ky. to observe the solar eclipse of Aug. 1869, and to Sp. to observe that of Dec. 1870, and made several improvements in the equipment of the observatory. D. June 11, 1875.

**Winneba'go Lake**, the largest lake entirely within the limits of Wis., is traversed by the navigable Fox River. It is 26 m. long, and has a maximum breadth of 10 m. Area, 212 sq. m. It is navigated by steamboats.

**Winnemue'ca**, on R. R., cap. of Humboldt co., Nev. Pop. 1880, 763.

**Win'nipeg**, cap. of Manitoba, Canada; also known as Ft. Garry. (See WINNIPEG in APPENDIX.)

**Winnipeg Lake**, of Brit. N. Amer., between lat. 50° and 54° N. and lon. 96° and 99° W., the great reservoir of the Saskatchewan, is 280 m. long, varying in width from 60 m.

in the N. part to 3 m. at the narrows toward its S. end. It receives at its S. end Red River, upward of 750 m. long by its very tortuous course. Toward its S. end the river Winnipeg enters, coming from the E. S. E. Lake W. is about 9000 sq. m. in area, and is 710 ft. above the sea.

**Winnipeg River** has its source in the outlets of Lake Sal and Lake of the Woods, and flows circuitously in a N. W. direction, entering Lake Winnipeg toward its S. E. extremity. It is 520 m. long, and delivers about as much water into Lake Winnipeg as the Saskatchewan, though not draining half the area, having about 3 times the vol. of the Red River. Lac des Milles Lacs and other lakes, upper waters of the W. R., offer a line of navigation of great capacity as an outlet of the Saskatchewan Valley. On its lower course the W. receives English River, about 310 m. long. On the W. side of the middle of Lake Winnipeg it receives, through Little Saskatchewan River, the waters of Lake Manitoba, 135 m. long, and Lake Winnipegosis, 118 m., forming with Red Deer River, which enters the upper part of the latter, a tributary 514 m. long, presenting an interior extent of navigation of considerable value.

**Winnipiseogee** (win-e-pe-saw'ke) Lake lies between Carroll and Belknap cos., N. H. It is of irregular outline, and has an extreme length of 25 m. and a breadth varying from 1 to 10 m. It is studded with picturesque islands. Area, 175 sq. m.; elevation, 472 ft.

**Winniborough**, S. C. See APPENDIX.

**Wino'na**, city and R. R. centre, cap. of Winona co., Minn., on the W. bank of Miss. River. The first white settlement made in this place was in 1851; in 1857 a city govt. was organized. Since that period the growth of the place has been steady and permanent. It is the seat of the soldiers' orphans' home, a State Inst., and also of the first State normal school of Minn., and has a public library. Lumber and grain are among the leading staples of trade. Pop. 1870, 7192; 1880, 10,208.

**Winooski**, Vt. See APPENDIX.

**Wins'low** (EDWARD), b. at Droitwich, Worcestershire, Eng., Oct. 19, 1595, became imbued with the doctrines of Puritanism, and having made the acquaintance of Rev. John Robinson, pastor of the "Pilgrim" ch. at Leyden, joined his congregation 1617; embarked in the Mayflower 1620; was one of the party which explored the coasts of Cape Cod and discovered the port of Plymouth; married Mrs. Susannah White, being the first marriage in N. Eng.; offered himself as a hostage to Massasoit, curing him of a severe illness, thereby assuring his friendship; wrote a narrative of his visit to the Indians; made a voyage to Eng. as agent of the colony 1623, returning with a supply of necessaries and the first cattle; was chosen gov. 1633, again 1636, and a third time 1644; went to Eng. for the last time 1649, when he was influential in the formation of the "Society for Propagating the Gospel among the Indians of N. Eng.," remained in Eng. during the Protectorate, and in 1655 was one of 3 coms. sent by Cromwell to direct an expedition against the Sp. settlements in the W. I. D. May 8, 1655.

**Winslow** (FORBES BENIGNUS), M. D., D. C. L., b. in Lond., Eng., in Aug. 1810, a descendant of the Mass. Winslows; came to the U. S. in early life; commenced the study of med. at New York; grad. at the Coll. of Surgeons, Lond., 1835; took his degree of M. D. at Aberdeen; commenced practice in Lond.; gave special attention to insanity; was Lettsomian lecturer to the Med. Society of Lond. 1837; opened a private asylum at Sussex House, Hammersmith, and subsequently another in Lond.; founded in 1848 the *Quarterly Journal of Psychological Med. and Mental Pathology*; became in 1857 pres. of the association of med. officers of hospitals and asylums for the insane, and in 1859 a com. of lunacy; founded *The Med. Critic* 1861; was chosen pres. of the Med. Society of Lond. 1863. Wrote *The Application of the Principles of Phrenology to the Elucidation and Cure of Insanity*, *The Anatomy of Suicide*, *The Plea of Insanity in Criminal Cases*, etc. D. Mar. 3, 1874.

**Winslow** (HUBBARD), D. D., brother of Dr. Myron, b. at Williston, Vt., Oct. 30, 1799, studied at Phillips Acad., Andover, Mass.; grad. with honors at Yale 1825; studied theol. at New Haven; preached at Litchfield, Conn., 1827-28; was pastor of the First ch. at Dover, N. H., 1828-31, and of the Bowdoin st. ch., Boston, Mass., 1832-44; was prin. of Mt. Vernon (Boston) inst. for young ladies 1844-53; took an active part in the discussion of educational questions; edited the *Religious Magazine* and wrote for numerous periodicals; gained great repute as a polemical, educational, literary, and lectures on scientific, religious, the duties of citizens; preached to the First Presb. ch. at Geneva, N. Y., 1857-59, and became pastor of the Fifth st. Presb. ch., New York, 1861. Wrote *Controversial Theol.*, *The Doctrine of the Trinity*, *Elements of Intellectual Philos.*, etc. D. Aug. 13, 1864.

**Winslow** (JOHN), grandson of Gov. Josiah, b. at Marshfield, Mass., May 27, 1702, was prominent in the Kennebec and Acadia expeditions, being the prin. actor in the expulsion of the Acadians from their homes in 1755; commander at Ft. William Henry 1758; took part as maj.-gen. in the expedition against Canada 1758-59; became Judge of common pleas for Plymouth co. 1762; was the founder of the town of Winslow in the dist. of Me. 1766, and was a member of the Mass. legislature and of the provincial council during Stamp-Act difficulties. D. Apr. 17, 1774.

**Winslow** (JOHN A.), U. S. N., b. Nov. 9, 1811, in N. C., entered the navy as a midpn. Feb. 1, 1827; became lieut. in 1830, commander in 1855, capt. in 1862, com. in 1864, rear-admiral in 1866. Served on the E. coast of Mex. during our war with that country, and participated in the capture of an Tuspan; on June 19, 1864, he sent to the bottom, after an hour's action, the Confed. steamer Alabama, which had made such havoc among Amer. merchantmen. The fight was about as fair a one as has ever been fought at sea. D. Sept. 29, 1873.

**Winslow** (JOSEPH), son of Gov. Edward, b. at Marsh-



field, Mass., in 1629, became commander of the Marshfield military company 1652; captured Alexander, the son of Massasoit, 1656; became major and commander-in-chief of the colonial forces 1658; was chosen deputy 1657, and one of the coms. of the united colonies 1688, to which post he was annually re-elected until 1670; served several yrs. as assistant gov., and was gov. from 1673 until his death, including the period of King Philip's war. D. Dec. 18, 1680.

**Winstow** (MYRON), D. D., LL.D., brother of Dr. Hubbard, b. at Williston, Vt., Dec. 11, 1789, grad. as valedictorian at Middlebury Coll. 1815, and at Andover Theological sem. 1818; sailed for Ceylon as a missionary of the A. B. C. F. M. June 1819; labored there 17 yrs.; founded the Madras mission 1837; was pres. of the important native coll. established at that city in 1840; translated the Bible into Tamil; pub. educational and religious books in that lang.; wrote largely for the *Missionary Herald* and other European and Amer. periodicals; prepared *A Comprehensive Tamil and Eng. Dict. of High and Low Tamil*, a work of a highly original character. D. Oct. 22, 1864.

**Winsted**, R. R. junce., Litchfield co., Conn., 62 m. N. of Bridgeport and 26 m. N. W. of Hartford. The borough contains the 2 v. of Winsted and W. Winsted; has fine water-power and sundry manufactures. Pop. 1880, 1895.

**Win'ston**, cap. of Forsyth co., N. C. (near Salem sta. on R. R.), 120 m. N. W. of Raleigh. An extensive traffic is carried on in fruit. Pop. 1870, 443; 1880, 2854.

**Winston** (JOHN ANTHONY), b. in Madison co., Ala., in 1812, settled in 1834 in Sumter co.; was a member of the assembly 1839-40, and again 1842, and of the senate 1843-52, being pres. of the latter body 1845-48; engaged in mercantile business at Mobile 1844; was an influential member of the Baltimore convention of 1848, where he was leader of the Ala. Democracy; gov. of Ala. 1853-56; was delegate to the Charleston convention of 1860, and was placed on the Douglas electoral ticket; went as com. to La. in 1861; raised the 8th Ala. inf. in the Confed. service; commanded it as col. at Yorktown and on the Peninsula, being distinguished at Seven Pines; was chosen to the State constitutional convention 1865, and elected in 1866 U. S. Senator, but not admitted to a seat. D. Dec. 21, 1871.

**Winston** (JOSEPH), b. in Va. in 1746, marched to the W. frontier against the Indians 1760; removed to Stokes co., N. C., 1766; took an active part in the Revolution; raised a regiment, of which he was commissioned major, 1766; marched against the Cherokee Indians, with whom he made a treaty 1777; had various actions with the Tories of N. C.; commanded the Amer. right wing at the battle of King's Mountain; was M. C. 1793-95, and again 1803-07. D. 1814.

**Win'ter**, that season of the yr. which begins with the shortest day, Dec. 21, and ends with the vernal equinox, Mar. 21. In the S. hemisphere the W. months are June, July, and Aug., and in the tropical zone the rainy season corresponds to the winter.

**Winter** (WILLIAM), b. at Gloucester, Mass., July 15, 1836, was ed. in Boston; grad. at the Harvard Law School, and admitted to the Suffolk bar; in 1856 lectured on literary subjects; pub. poems, entitled *Queen's Domain*, in 1858; went to New York in 1859, and became book reviewer on *Saturday Press*; was dramatic critic for the New York *Albion* 1861-66; for 5 yrs. managing ed. and literary and dramatic critic of the New York *Weekly Review*; in 1865 became dramatic critic of the New York *Tribune*. Wrote *Life of Edwin Booth*, 1872, and of Henry Irving, 1885.

**Win'terberry**, a name applied to several Amer. shrubs, forming a sub-genus of the *Ilex* or holly, and more particularly designating the black alder (*Ilex verticillata*), which ranges from 5 to 12 ft. high, grows on edges of swamps, and bears an abundance of brilliant crimson berries.

**Wintergreen**. See GAULTHERIA.

**Wintergreen**, Oil of, of *Oil of Gaultheria*, an aromatic liquid contained in the leaves of *Gaultheria procumbens* (partridge-berry, wintergreen, deer-berry, tea-berry, mountain tea), also in *Betula lenta* (sweet birch), and probably in the roots of *Polygala paucifolia*, *Spiraea ulmaria*, *Spiraea lobata*, and *Gaultheria hispida*. It is colorless when freshly prepared, but gradually acquires a yellowish or reddish hue; possesses a peculiar sweetish taste and a characteristic and very agreeable odor; has a greater density than any other of the essential oils (1.173), and boils at 412° F.

**Winter's Bark** [named from Capt. John Winter, who first brought it from the Straits of Magellan in 1579], the bark of *Drayna Winteri*, a magnoliaceous evergreen shrub which grows from Cape Horn northward through the Andes. It is pleasantly aromatic, and was once considerably employed in med. as a stimulant tonic.

**Winterset**, on R. R., cap. of Madison co., Ia., 42 m. from Des Moines, was incorporated in 1857. Pop. 1870, 1485; 1880, 2583.

**Winthrop**, Me. See APPENDIX.

**Winthrop** (FITZ-JOHN), F. R. S., eldest son of Gov. John of Conn., b. at Ipswich, Mass., Mar. 14, 1638, was ed. in Eng.; held a commission under the Protector Richard Cromwell 1638; returned to Conn. about 1670; was elected to the assembly 1671; served as major in King Philip's war; was one of the council of Gov. Andros 1686; became a magistrate in Conn. 1689; maj.-gen. of expedition against Que. 1690; highly efficient agent of Conn. in Lond. 1693-98; gov. of Conn. from 1698 until his death, Nov. 27, 1707.

**Winthrop** (JAMES), LL.D., son of Prof. John, b. at Cambridge, Mass., in 1732, grad. at Harvard 1769; was librarian there 1772-87; participated in the battle of Bunker Hill, where he was wounded 1775; was for some yrs. chief-justice of the Mass. court of common pleas and register of probate. He bequeathed his valuable library to Alleghany College, Meadville, Pa. Wrote *A Systematic Arrangement of Several Scriptural Prophecies relating to Antichrist and An Attempt to Arrange, in the Order of Time, Script. Prophecies yet to be Fulfilled*. D. Sept. 26, 1821.

**Winthrop** (JOHN), b. at Groton, Suffolk, Eng., Jan. 12,

1587 (O. S.), was ed. at Trinity Coll., Cambridge, graduating about 1605; studied law; was appointed a justice of the peace at 18; was chosen gov. of the "Company of the Massachusetts Bay in N. Eng." Oct. 30, 1629; was the leader of the great emigration of the following yr., when he sailed from Yarmouth Apr. 7, 1630, in the Arbella, with some 900 colonists, in a fleet of 17 vessels; wrote on board the Arbella his treatise *A Modell of Christian Charity*; landed at Salem June 12, 1630; soon removed to Charlestown; selected the peninsula of Shawmut (now Boston) as the site of the capital town of the colony, and settled there Sept. 7, 1630; visited Plymouth, and established a good understanding with the gov. of that colony; acquired in the same yr. the island in Boston harbor known as Governor's Island; was annually re-elected gov. until 1635; gov. 1637-40 and 1641-43, deputy gov. 1644-45, and gov. from 1646 until his death, Mar. 26, 1649.

**Winthrop** (JOHN), F. R. S., son of the preceding, b. at Groton, Suffolk, Eng., Feb. 12, 1606, grad. at Trinity Coll., Dublin, 1625; studied law at the Inner Temple, London; came to Mass. 1631; was chosen a magistrate 1633, and settled at Ipswich Mar. 1633; went to Eng. the same yr.; obtained a commission under the grant to Robert Rich, earl of Warwick, by virtue of which he founded a settlement at Saybrook, at the mouth of Conn. River, Nov. 1635; built a fort there and acted as gov.; removed his family from Boston to Pequot Harbor 1645, and founded New London; was chosen a magistrate of Conn. 1651, after the union of Saybrook to that colony; was chosen gov. of Conn. 1657, and annually re-elected through life; went to Eng. 1661; obtained from Charles II. a charter uniting Conn. and New Haven in one colony, under himself as gov.; represented Conn. at Boston 1676 and the cong. of the united colonies, D. Apr. 5, 1676.

**Winthrop** (JOHN), LL.D., F. R. S., a great-grandson of Gov. John, b. at Boston Dec. 19, 1714, grad. at Harvard 1732; was Hollis prof. of math. and natural philos. in that inst. from 1738 until his death; made accurate observations of the transit of Mercury 1740, and that of Venus Jan. 6, 1761, making for the purpose on the latter occasion a voyage to St. John's, Newfoundland; was several yrs. judge of probate for Middlesex co.; was a member of the executive council 1773-74, and a firm advocate of political liberty. Wrote *A Lecture on Earthquakes*, *Two Lectures on Comets*, *Relation of a Voyage from Boston to Newfoundland for the Observation of the Transit of Venus*, etc. D. May 3, 1779.

**Winthrop** (ROBERT CHARLES), LL.D., son of Thomas Lindall, b. at Boston, Mass., May 12, 1809, grad. at Harvard 1828; studied law with Daniel Webster 1828-31; was a Whig member of the Mass. legislature 1836-40, and speaker of the House 1838-40; M. C. 1841-42 and 1843-50; was speaker of the 30th Cong. 1847-49; delivered an address before the N. Eng. Society of New York 1840, and the official oration at Wash., at the laying of the corner-stone of the Washington Monument, July 4, 1848; wrote the official oration read at its dedication, Feb. 21, 1855; was pres. of the Mass. coll. of electors 1848; U. S. Senator, by executive appointment, to fill the unexpired term of Daniel Webster 1850-51; delivered at Boston, Nov. 23, 1853, an oration on *Archimedes and Franklin*, which gave rise to the statue of Franklin in that city; was the orator on the occasion of the inauguration of that monument Sept. 17, 1856; was pres. of the Mass. Historical Society 1855-85.

**Winthrop** (THEODORE), b. at New Haven, Conn., Sept. 22, 1823, grad. with honors at Yale 1848; accompanied Lieut. Strain's expedition and made other explorations of S. and Central Amer.; studied law at St. Louis, Mo.; was admitted to the New York bar 1855; joined the famous 7th regiment of New York on its entering the national service Apr. 1861; was major in New York volunteers; became a member of the staff of Gen. B. F. Butler as his military sec., and was killed at the head of an assaulting column in the earliest formal engagement of the war, at Big Bethel, Va., June 10, 1861. Wrote *Cecil Dreeme*, etc.

**Winthrop** (THOMAS LINDALL), LL.D., b. at New London, Conn., Mar. 6, 1760, was great-grandson of Gov. John Winthrop, Jr. (1606-76); grad. at Harvard 1784; settled at Boston; became a successful merchant and a scientific agriculturist; was a member of many literary and scientific societies; pres. of the Mass. Agricultural Society, the Mass. Historical Society, and the Amer. Antiquarian Society, and was lieut.-gov. of Mass. 1826-32. D. Feb. 25, 1841.

**Winthrop** (WAITSTILL), son of Gov. John of Conn., b. at Boston, Mass., Feb. 27, 1642, became a member of Gov. Andros's council and of that of 1692; maj.-gen. of Mass. militia; judge of admiralty and chief-justice of the superior court of Mass. D. Nov. 7, 1717.

**Win'yaw Bay**, in Georgetown co., S. C., receives the waters of Waccamaw, Pedee, and Black rivers. It is 14 m. long and 2 m. in average breadth.

**Wire and Wire-Drawing**. The manufacture of wire depends upon the ductility of metals—that is to say, upon their property of being drawn out into attenuated form. This property is quite different from a capacity for working under the hammer—copper, which is third among the metals in the order of its malleability, being sixth in ductility. Gold, however, stands first in both properties, and silver stands second in both. So far as our knowledge extends, these were the first metals from which wire was made. The first wire was fabricated by beating the metal into thin sheets, then cutting these into narrow strips or filers, one or both. Such wire was woven into fabrics with an admixture of textile material—literally, the cloth of gold. The date when silver was first made into wire is uncertain, the earliest that can be fixed being the time of the later Gr. emps. It was doubtless in the middle of the 14th century that the draw-plate, with graduated holes or dies, which still remains, and probably always will remain, the chief appliance in the manufacture of wire, was first invented or



brought into use. Wire was at first manufactured with the draw-plate entirely by hand, but at an uncertain date, probably before the yr. 1400, a machine, the inventor of which is unknown, was made to operate by water-power.

Wire for industrial purposes is for the most part made of iron of the best quality. Steel, brass, and copper wire are also largely made, the methods of the manufacture being substantially the same as with iron. But the modern methods of making wire of the precious metals still form an important though inferior branch of the art. What is known in later days as gold wire has an exterior of gold and a core of silver, being made by forming a cylindric ingot of silver and coating the latter with gold. This compound ingot is gradually reduced in size by means of the draw-plate, first, through a hole slightly smaller than the original diameter of the ingot; then through another still smaller, and so on until the requisite reduced diameter is reached. The finest wire ever made is made by first covering a platinum wire with solid silver. This compound wire, platinum within and silver without, is then reduced in diameter in the same manner as the gold wire with the silver core just referred to. This compound wire may be thus brought down to a diameter of about  $\frac{1}{300}$  part of an inch. Assuming a platinum core to be  $\frac{1}{10}$  the whole diameter, this core will be attenuated to the  $\frac{1}{3000}$  part of an inch. This fine compound wire being then dipped into hot nitric acid, the silver is dissolved and the inner core of platinum remains. In the manufacture of iron wire, rods of the requisite tough quality of metal are rolled into rods at the rolling-mills; these rods are bent in coils, and these are placed in large tumbling boxes or rotating cylinders with water and gravel, in order that the abrading action exerted thereby may detach the scale from the rods. The rods are then passed through the successively diminishing holes of the draw-plate—for example, 10, 15, 30, or more times, according to the degree of attenuation required. [From orig. art. in *J.'s Univ. Cyc.*, by Prof. JAMES A. WHITNEY, LL.B.]

**Wire-Worm**, a term applied to certain myriapods and to the larvæ of various beetles, but properly restricted to the tough, light-brown, cylindrical larvæ of various species of elaters, family Elateridae. These beetles are well known to most persons under the popular names of "spring-beetles," "click-beetles," "skip-jacks," "snapping-bugs," etc.—names having reference to the peculiar power which the insects have of jumping with a clicking noise when placed on their backs upon any hard surface. These beetles are elongated in form, and have the posterior angles of the prothorax produced into an acute spine, so as to prevent all lateral movement. The back is convex and the legs short, so that without the peculiar jumping power they would be unable to recover the natural position when once laid on the back. If carefully examined beneath, an acute spine is found to proceed from the fore breast (presternum), and to be received at will into a groove in the middle breast (mesosternum). Placed on the back, the insect lowers the head till this comes in contact with the surface upon which it lies, and the spine is entirely thrown out of its groove; then by suddenly jerking the head upward the spine is thrown back into the groove with a clicking noise and sufficient violence to cause the elastic body to rebound. The family comprises a number of genera, and many species which vary much in size, though averaging about  $\frac{1}{2}$  of an inch. The prevailing color is brown, but a few are jet black and others speckled with white. The eggs from which these worms hatch are soft, pale, and broadly oval. They are generally laid loosely in the ground, and the newly hatched worm is invariably pale. The worms are from 1 to 3 yrs. attaining full growth, according to the species.

The W.-W. are about the greatest insect pests of the farmer. In this country the crops most affected are wheat and Indian corn. The remedies proposed and adopted to counteract their injuries are innumerable. As W.-W. cannot subsist on the soil, and as they mostly require about 3 yrs. to come to full growth, one of the most effectual ways to prevent their injuries is to fallow the land for 1 yr. In a small plot of ground they may be trapped by strewing on the surface sliced potatoes, turnips, lettuce, or other succulent vegetables. Being unusually fond of these, the worms eat into them, and while doing so may be collected and destroyed. Fall ploughing, by which the worms are exposed to their natural enemies, especially birds, at a time when most insect-life is sluggish, and submersion where feasible, are two of the most practicable ways of destroying them on a large scale. Rape-cake was very strongly recommended in Eng. 30 yrs. ago. The worms have a great partiality for it, and are supposed to die from eating it. While I consider that this last opinion is founded on incorrect observation, the cake may be made to kill them by being mixed with Paris green. Thus poisoned and spread in lumps over a field from which domestic animals can be excluded, it will probably prove the best of all the remedies, and act at the same time as a manure. [From orig. art. in *J.'s Univ. Cyc.*, by C. V. RILEY, M. D.]

**WIRT (WILLIAM)**, LL.D., b. at Bladensburg, Md., Nov. 8, 1772, studied law; commenced practice in Culpeper and Albemarle cos., Va., 1792; settled near Charlottesville, Va., 1795; removed to Richmond 1799; settled as a lawyer at Norfolk 1803, and pub. in the *Va. Argus* his celebrated *Letters of a British Spy*; returned to Richmond 1806; sat in the house of delegates 1807-08; was appointed U. S. atty. for the dist. of Va. 1816; was atty.-gen. of the U. S. 1817-29; delivered at Wash. a discourse commemorative of the death of Adams and Jefferson Oct. 19, 1826; settled at Baltimore 1830, and was the Anti-Masonic candidate for the Presidency 1832. His chief work was *Sketches of the Life and Character of Patrick Henry*. D. Feb. 18, 1834.

**Wiscasset**, seaport, on R. R., cap. of Lincoln co., Me., 50 m. N. E. of Portland, has a fine harbor. Prin. business, commerce, ship-building, manufacturing, and farming. Pop. tp. 1870, 1977; 1880, 1847.

**Wisconsin**, one of the N. W. States of the upper Miss.



Valley, between 42° 27' and 45° N. lat., and 89° 53' and 92° 53' W. lon. It is bounded N. by Lake Superior, N. E. by the upper peninsula of Mich., E. by Lake Mich., S. by Ill., and W. by Ia. and Minn.; greatest length from N. to S., 302 m.; greatest breadth, 258 m.; area, 56,040 sq. m. or 35,865,600 acres.

**Topography.**

—W. has no mts.: there are 2 watersheds, the highest in the N. portion of the State, known as the Iron range of hills, which divides the tributaries of the Miss. from the waters which flow into Lake Superior; the other watershed is in the S. and central portions of the State. E. of the central meridian, and divides the tributaries of the Miss. from the streams falling into Green Bay and Lake Mich. In the S. W. part of the State, in Dane and Grant cos., are elevations called "mounds," of considerable height. The affluents of the Miss. drain  $\frac{1}{4}$  of the State, and the general slope is S. W.

**Rivers, Lakes, Etc.**—The rivers which discharge their waters into Lake Superior are the Montreal, Bad River, Bois Brulé, and St. Louis. The Menomonee, Peshigo, Oconto, Penuakee, and Fox or Neenah rivers run into Green Bay. The last named is a very important stream, passing so near the Wis. River that a canal  $\frac{1}{2}$  m. long connects the 2, and navigation is possible between Green Bay and the Miss. River. The Keweenaw, Two Rivers (E. and W. Twin), Manitowoc, Sheboygan, and Milwaukee empty into Lake Mich. The Miss. forms a part of the W. boundary of the State, and receives within the State the St. Croix, Chippewa, Buffalo, Trempealeau, Black, and Wis. rivers, as well as several smaller streams. The Rock, Ill., Fox, and Des Plaines rivers, all directly or indirectly tributaries of the Miss. in Ill., drain the S. portion of the State. The Wis., St. Croix, Chippewa, and Neenah or Fox rivers are navigable for a considerable distance. The State abounds in lakes, many of them of great beauty. Aside from Lakes Superior and Mich., Lake Winnebago is the largest. Around Madison, the cap., are 4 very beautiful lakes. Green Bay, an arm of Lake Mich., extends far into the State.

**Mineralogy.**—The minerals of the State are gold, silver, and copper in a metallic state, found in small quantities; 2 or 3 ores of silver, 8 ores of copper, 9 of iron, 3 of zinc, 4 of lead, 2 of arsenic, 2 of manganese, 7 varieties of crystallized quartz, 3 of hornblende, 2 of feldspar, dolomite, and sulphates, carbonates, and phosphates of lime, fluor-spar, fluoite, potter's and porcelain clays, talc or steatite, serpentine, chlorite, garnet, epidote, tourmaline, laumontite, leonhardtite, stilbite, crysoecolia, and numerous other rare minerals of scientific importance, together with petroleum, asphaltum, peat, and valuable building-stones. Amethyst, carnelian, agate, jasper, chalcedony, garnet, and malachite are among its precious stones, and gypsum, graphite, kaolin, steatite, and asbestos among its economic minerals.

**Soil and Vegetation.**—The greater part of the soil of the State is arable, and much of it very fertile. Much of the N. portion is covered with forests which furnish many millions of feet of lumber annually. A large portion of these forests is composed of coniferous trees, and especially of the white pine, though the balsam, hemlock, spruce, and fir are also found in considerable quantities. The harr and red oak and other deciduous trees occur. The S. half of W. is partly prairie, though under cultivation it produces a fair amount of timber and fruit trees.

**Zoology.**—The elk is occasionally found, and deers, bears, beavers, the fisher, wolf, otter, wild-cat, and porcupine are not uncommon; while the rabbit, squirrel, striped gopher, mole, bat, and field- and shrew-mouse exist in great numbers. Of the Raptures, or birds of prey, the golden and bald eagles, several species of hawk, the great white owl, and the crow are best known; of game-birds, the quail, partridge, spruce, willow, prairie, and sharp-tailed grouse, woodcock, wild-geese, many species of duck and teal, and pigeons in immense numbers, as well as the pelican, loon, etc. The lakes and rivers abound with fish, especially the whitefish, lake-trout, siscowet, muscalonge, perch, pickerel, and sturgeon. The billfish and the spoonbill sturgeon are sometimes taken. The reptiles are those common to the N. W.

**Climate.**—The mean annual temperature does not vary much from 42° F., being on the S. border about 45°, and at the N. limit about 40°. Snow falls in the N. before the occurrence of heavy frosts, and continues till spring. The winters are long and cold, but nearly uniform in temperature; the springs backward; the summers short, and usually hot, often dry; the autumns generally mild and pleasant. Rainfall—in Madison (lat. 43° 43' 33", lon. 89° 21' 58", altitude 1088 ft.) 23.75 inches; Duluth, Minn. (lat. 46° 48', lon. 92° 6', altitude 642.7 ft.) 34.59 inches.

**Agricultural Productions.**—The 3 great crops are Indian corn, wheat, and oats. The census of 1880 showed 31,390,579 bushels of corn, 32,905,320 bushels of oats, 24,881,689 bushels of wheat, 5,043,118 bushels of barley, 2,298,513 bushels of rye, and 299,107 of buckwheat. The tobacco crop yielded 10,008.



423 lbs., valued at \$899.118. The wool clip of 1880 yielded 7,016,491 lbs.

**Farm Animals.**—In 1880 W. had 352,428 horses, 7136 mules and asses, 1,129,141 cattle, 1,336,807 sheep, 1,128,825 swine.

**Manufactures.**—There were, in 1880, 7674 manufacturing establishments, with \$73,821,892 capital, employing 57,109 hands; wages, \$18,814,917; total value of products, \$128,355,480. In 1881, 102,029 tons of pig iron were produced.

**Railroads.**—There were in operation in W. Jan. 1, 1882, 3442 m. of R. R., costing \$174,198,117, with \$7,783,364 net earnings, and paying \$6,450,479 interest and dividends. Several of these are important trunk lines. The Chicago, Milwaukee and St. Paul has 1096 m. in W., the Chicago and N. W., 899 m., the Milwaukee, Lake Shore and W., 276 m., and the Chicago, St. Paul and Omaha, 341 m. The Wis. Central is 928 m. long.

**Finances.**—The assessed valuation of property for taxation was, in 1881—real estate, \$351,322,946; personal, \$36,482,022; total, \$447,804,968. Rate of State tax, 5¢ on \$100, producing in 1882, \$449,281. State debt, 1882, \$2,252,057; aggregate indebtedness, State, co., and municipal, 1880, \$11,875,992. Total taxation, State and local, 1880, \$5,753,966.

**Commerce.**—The shipping of W. in 1882 embraced 261 sailing and 145 steam vessels—91,883 tons. Its lake commerce is very large, and its R. R. transportation still greater. Milwaukee is a port of entry, importing in 1881 goods valued at \$292,396, and exporting \$500,594 in products.

**Banks, Etc.**—There were, in 1882, 34 national banks, with \$3,025,000 capital, \$2,330,563 circulation, \$2,629,500 U. S. bonds to secure circulation, and \$12,827,886 aggregate deposits. There were also 29 State banks and trust cos., with \$982,117 capital and \$5,204,869 deposits, and 79 private bankers, with \$4,901,882 deposits. There were 6 local insurance cos.

**Education.**—Number of children of school age (4-20 yrs.) in 1880, 483,227, of whom 299,514 were enrolled in public schools, with average daily attendance of 185,276. Total expenditure for public schools, \$2,163,845, of which teachers' salaries required \$1,570,997. There are 8 univs. and colls., with 103 instructors and 1401 students, receiving for tuition \$62,676. The Univ. of Wis., at Madison, has a liberal endowment. There are 4 excellent normal schools.

**Churches.**—The Lutheran Ch. leads, with 458 chs., 256 ministers, and 60,000 members; the M. E. has 478 chs., 306 ministers, and 32,395 members; the R. Cath., 470 chs., 340 priests; Congl., 196 chs., 167 ministers, and 14,000 members. Twenty-five other denominations have from 2 to 120 chs. each.

**Population.**—In 1870, 1,054,670; 1880, 1,315,497 (white 1,309,618, colored 5879, including 16 Chi. and 8161 Indians).

**Principal Cities and Towns.** Pop. 1880.—Milwaukee, 115,587; Racine, 16,031; Oshkosh, 15,748; La Crosse, 14,505; Fond du Lac, 13,094; Madison (cap.), 10,324; Eau Claire, 10,119; Janesville, 9018; Appleton, 8005; Watertown, 7883; Green Bay, 7464; Sheboygan, 7314; Kenosha, 5039; Beloit, 4790; Portage, 4346; Neenah, 4202; Chippewa Falls, 3982; White-water, 3617; Beaver Dam, 3416; Berlin, 3353; Baraboo, 3266; Ripon, 3117; Wausau, 2969.

**History.**—The first white settlement in W. was made at Green Bay in 1639 by the Fr. It was under the laws of Canada; but in 1796 the U. S. annexed it for purposes of gov't. to the N. W. Terr., ceded by Va. and other States to the U. S. In 1809 it was included in the Terr. of Ill., as then formed; in 1818, when Ill. was admitted into the Union as a State, W. was annexed to Mich. Terr. The Indians became troublesome, and the Black Hawk war ensued in 1832. They removed to reservations beyond the Miss. July 3, 1836, a Territorial gov't. was organized, which at first included a part of the upper peninsula of Mich., the whole of Minn. and Ia., and that part of Dak. lying E. of the Mo. and White Earth rivers. On the admission of Mich. into the Union as a State, a part of the Lake Superior region was set off to her, and when the Terr. of Ia. was formed, it included all the region W. of the Miss. The first effort to procure the admission of W. to the Union as a State was made in 1846. A convention was held in that yr., and a const. drafted. Cong. passed an act admitting the State under this const. in 1847, but the people rejected the const. on account of some objectionable features. Another convention was called Dec. 15, 1847, which submitted a new const.; this was ratified in Mar. 1848, and the State was admitted to the Union by act of Cong. May 29, 1848.

#### Governors.

TERRITORIAL.	E. Salomon (acting).....	1862-63
Henry Dodge.....	1836-41 James T. Lewis.....	1863-66
James D. Doty.....	1841-44 Lucius Fairchild.....	1866-72
N. P. Tallmadge.....	1844-45 C. C. Washburn.....	1872-74
Henry Dodge.....	1845-48 William H. Taylor.....	1874-76
STATE.	Harrison Ludington.....	1876-78
Nelson Dewey.....	1848-51 William E. Smith.....	1878-82
Leonard J. Farwell.....	1851-53 Jeremiah M. Rusk.....	1882-87
William A. Barstow.....	1853-55	
Coles Bashford.....	1855-57	
Alex. W. Randall.....	1857-61	
Louis P. Harvey.....	1861-62	

REVISED BY A. R. SPOFFORD.

**Wisconsin River** rises in Lake Vieux Desert (which is partly in Mich. and partly in Wis.), flows in a generally S. course to Portage City, Wis., where it turns to the S. W. It reaches Miss. River 4 m. below Prairie du Chien. Breadth at its mouth, 1800 ft.; elevation, 600 ft. Its length is over 600 m. It is navigable 200 m. to Portage City, whence a short canal leads to Fox River.

**Wisconsin, University of,** at Madison, Wis., was incorporated in 1838 and organized in 1848. In 1849 a preparatory dept. was established, in 1850 the univ. was formally opened, in 1851 the first coll. classes were formed, and in 1883-84 the univ. comprised 88 instructors and 338 students. Cong. in 1838 granted 46,080 acres of land to the Terr. of Wis. for the support of a univ., and in 1854 it made another grant of 46,080 acres of land. In 1866 the univ. also received those 240,000 acres of land which Cong. had granted to the State in 1862 for the establishment of an agricultural school, and in 1867 it was reorganized in accordance with the conditions of this grant. The univ. comprises a coll. of letters, consisting of a dept. of anc. and a dept. of modern classics; a coll. of arts, consisting of a dept. of general science, agriculture, civil engineering, mining and metallurgy, mechanical engineering, and military science; a school of law, organized in 1868, of whose faculty the judges of the supreme court are members; and, finally, a sub-freshman and a post-graduate course. Tuition is free to all students from the State, and all depts. are open to women.

**Wisdom, Book of,** called by the Septuagint "Wisdom of Solomon," was considered canonical by some of the Fathers of the Ch., who believed that Solomon was its author, and by the R. Cath. Ch. Prot. generally consider it apocryphal. It is supposed to have been written in Gr. by some Alexandrian Jew, probably not far from 200 B. C.

**Wise (DANIEL), D. D.,** b. at Portsmouth, Eng., Jan. 10, 1813, came to the U. S. 1833; became a minister of the M. E. Ch.; was ed. of *The Sunday School Messenger*, *Ladies' Pearl*, *The R. I. Temperance Pledge*, and *Zion's Herald*; was corresponding sec. of the Meth. Sunday School Union and Tract Society 1856-72, and became ed. of *The Sunday School Advocate* and of all the Sunday school and tract publications of the M. E. Ch.

**Wise (HENRY ALEXANDER), b.** at Drummondtown, Accomac co., Va., Dec. 3, 1806, grad. at Washington Coll., Pa., in 1825; became a lawyer, and practised with great success; was elected to Cong. in 1833, and re-elected successively until 1843. By many he was considered one of the greatest orators of the House at that time. In 1843 Pres. Tyler nominated him as minister to Fr., but his nomination was rejected by the Senate. In 1844 he was nominated as minister to Brazil; this appointment was confirmed, and for 3 yrs. he represented his country at Rio Janeiro. In 1855 he was triumphantly elected gov. of Va. He continued in office until after the John Brown raid in 1859. Mr. W. was decidedly opposed to the policy of secession in 1860, but went with his State, and took the commission of brig.-gen. in the Confed. service, which position he held until the close of the war. D. Sept. 12, 1876.

**Wise'man (NICHOLAS PATRICK STEPHEN), D. D.,** b. at Seville, Sp., Aug. 3, 1802, of Irish parents; ed. at Waterford, at Durham Coll., and in the Eng. coll. at Rome, where he grad. 1824; was ordained to the priesthood 1825; became prof. of Oriental langs. in the Rom. univ., and vice-rector of the Eng. coll. 1827; was advanced to the rectorship 1828; returned to Eng. 1835; established with O'Connell the *Dublin*

COUNTY.	* Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
Adams.....	6-D	6,601	6,741	Friendship.....	137
Ashland.....	2-C	221	1,559	Ashland.....	tp. 193
Barron.....	3-B	538	7,024	Barron.....	981
Bayfield.....	2-C	344	564	Bayfield.....	495
Brown.....	3-F	25,198	34,078	Green Bay.....	7,484
Buffalo.....	5-B	11,123	15,529	Alton.....	1,244
Burnett.....	3-B	706	3,140	Granburg.....	101
Calumet.....	5-F	12,335	16,832	Chilton.....	1,132
Chippewa.....	3-C	8,311	15,491	Chippewa Falls.....	3,982
Clark.....	3-F	8,459	10,715	Neuville.....	1,050
Columbia.....	6-D	26,802	29,085	Portage.....	4,246
Crawford.....	7-C	13,075	15,644	Prairie du Chien.....	2,777
Dane.....	7-D	53,096	53,233	Madison.....	10,324
Dodge.....	6-E	47,005	45,931	Janeau.....	434
Dor.....	4-F	4,919	11,645	Surgeon Bay.....	1,199
Douglas.....	9-B	1-1-2	655	Superior.....	tp. 635
Dunn.....	4-B	9,482	16,817	Menomonee.....	2,589
Eau Claire.....	4-C	10,769	19,993	Eau Claire.....	2,115
†Florence.....	3-E	—	—	Florence.....	267
Fond du Lac.....	6-E	46,273	46,893	Fond du Lac.....	12,094
Grant.....	7-C	37,479	37,852	Lancaster.....	1,969
Green.....	7-D	23,611	21,729	Monroe.....	8,293
Green Lake.....	0-E	13,195	14,483	Dartford.....	241
Iowa.....	7-D	24,544	23,628	Dodgeville.....	1,547
Jackson.....	6-C	7,687	13,295	Black River Falls.....	1,427
Jefferson.....	7-E	34,040	32,154	Jefferson.....	2,115
Janeau.....	6-D	12,272	15,582	Mauston.....	1,013
Kenosha.....	7-F	13,147	13,550	Kenosha.....	5,039
Kewaunee.....	5-F	10,128	15,807	Kewaunee.....	1,050
La Crosse.....	6-B	90,287	27,073	La Crosse.....	14,505
La Fayette.....	7-C	22,659	21,273	Sterling.....	1,372
Langlade.....	3-E	—	655	Antigo.....	—
Lincoln.....	3-D	—	2,011	Merrill.....	—
Manitowoc.....	6-F	33,364	37,605	Manitowoc.....	6,367
Marathon.....	4-D	6,895	17,121	Wausau.....	4,277
Marquette.....	4-F	—	8,229	Marquette.....	2,750
Marquette.....	6-D	8,056	8,908	Mantell.....	394
Milwaukee.....	7-F	89,930	138,337	Milwaukee.....	115,587
Monroe.....	6-C	16,550	21,607	Sparta.....	2,387
Oconto.....	4-E	5,221	5,848	Oconto.....	4,171
Outagamie.....	5-E	18,430	29,716	Appleton.....	8,000
Ozaukee.....	6-F	15,564	15,461	Port Washington.....	1,386
Peplin.....	5-B	4,659	6,296	Arkansas.....	212
Pierce.....	4-A	9,958	17,744	Elsworth.....	432
Polk.....	3-A	3,422	10,018	Oscoda Mills.....	311
Portage.....	6-D	16,834	17,731	Stevens Point.....	4,441
Price.....	—	—	785	Phillips.....	170
Racine.....	7-F	26,740	30,922	Racine.....	16,031
Richland.....	7-C	15,731	18,174	Richland Centre.....	1,227
Rock.....	6-B	38,030	38,823	Janeville.....	9,018
Sauk.....	6-D	26,860	29,739	Baraboo.....	3,266
†Sawyer.....	2-C	—	—	Hayward.....	—
Shawano.....	4-E	3,166	10,371	Shawano.....	690
Sheboygan.....	6-F	31,749	34,206	Sheboygan.....	7,314
St. Croix.....	4-A	11,065	18,856	Hudson.....	2,298
Taylor.....	4-C	—	2,311	West Bend.....	504
Trempealeau.....	5-B	10,732	17,189	Whitehall.....	267
Vernon.....	6-C	18,645	23,235	Viroqua.....	762
Walworth.....	7-E	26,972	26,249	Elkhorn.....	1,122
Washington.....	6-F	23,919	—	Shick Lake.....	—
Waukesha.....	7-F	28,274	28,957	Waukesha.....	1,273
Waupaca.....	5-E	15,339	20,955	Waupaca.....	1,392
Waushara.....	6-D	11,279	12,687	Wautoma.....	295
Winnebago.....	5-E	37,279	42,740	Oshkosh.....	15,748
Wood.....	6-D	5,912	8,861	Grand Rapids.....	1,350
Total.....		1,054,670	1,315,497		

\* Reference for location of counties. See map of Wis. and Mich., in article MICHIGAN.  
† Organized since census of 1880.



**Review**, and delivered a course of lectures on R. Cath. doctrines at St. Mary's, Moorfields, during Lent, 1836; maintained a polemic on the "Real Presence" with Dr. Turton, bp. of Ely, and pub. several able works in advocacy of Rom. Catholicism; lectured at Rome during Lent, 1837, at which time he induced Pope Gregory XVI. to appoint several additional vicars apostolic in Eng.; was consecrated bp. of Melipotamos in *partibus infidelium* 1840; became in the same yr. pres. of St. Mary's Coll., Oscott; visited Rome shortly after the accession of Pius IX., 1847, and gave his influence in favor of the measure then preparing for the restoration of the R. Cath. hierarchy in Eng.; was appointed pro-vicar apostolic of the Lond. dist. 1848, and vicar apostolic on the death of Bp. Walsh 1849; was summoned to Rome Aug. 1850; aided in preparing the "apostolic letter" of Sept. 29, re-establishing the Eng. hierarchy; was nominated abp. of Westminster Sept. 30, and made cardinal Oct. 1, 1850. Wrote *Lectures on the Connection between Science and Revealed Religion, The Real Presence, Fabiola, or the Ch. of the Catacombs*, etc. D. Feb. 15, 1865.

**Wishart, (George)**, b. near beginning of 16th century, began preaching doctrines of Ref. in Scot. about 1535; had to flee to Eng. about 1538; returned 1543; began anew to preach at Montrose, Perth, Ayr, and Dundee, with such effect that in the latter town the populace destroyed the convents and chs. of the Black and Grey Friars; made a preaching tour of the W. cos.; was arrested by the earl of Bothwell at Ormiston; was tried for heresy at St. Andrew's Feb. 28, before Cardinal Beaton's ecclesiastical court, composed of several bps.; condemned to the stake, and burned at St. Andrew's Mar. 1, 1546.

**Wishart, or Wisheart (George)**, D. D., b. at Yester, E. Lothian, Scot., in 1609, ed. at the Univ. of Edinburgh; became a parish minister at N. Leith and at St. Andrew's; refused to take the covenant 1639, for which he was deprived of his living and imprisoned; made his way to Newcastle, Eng., where he preached, and was captured by the Scot. army Oct. 1644; was for some months imprisoned in the common jail at Edinburgh, suffering great hardships; succeeded in joining the celebrated royalist leader James Graham, marquis of Montrose, to whom he became chaplain; escaped to the Continent 1646; returned to Scot. in the expedition of Montrose 1650, and narrowly escaped sharing his fate; became chaplain the same yr. to Elizabeth, the ex-electress-palatine and titular queen of Bohemia; accompanied her to Eng. at the Restoration 1660; became rector of Newcastle-upon-Tyne, and was consecrated bp. of Edinburgh June 1, 1668; was averse to the intolerant policy of Charles II., and recommended leniency to the Covenanters. Wrote *Hist. of the Wars of Montrose*. D. 1671.

**Wisner (Moses)**, b. at Aurelius, N. Y., in 1818, removed to Mich. 1839; studied law; was admitted to the bar at Pontiac 1842; became prosecuting atty. for Lapeer co. 1843-44; was Rep. gov. of Mich. 1850-61; entered the army as col. of the 22d Mich. Volunteers 1862. D. Jan. 5, 1863.

**Wis'tar (Caspar)**, M. D., b. at Phila. Sept. 13, 1761, of Quaker parents, was a volunteer nurse in the hospitals after the battle of Germantown, and was thereby induced to study med.; completed his med. education at Edinburgh 1786; began practice in Phila. Jan. 1787; was prof. of chem. in Phila. Coll. and phys. to the dispensary and hospital 1789-92; adjunct prof. of anat. and surgery 1792-1808; thenceforth sole prof. of anat. and censor of the Coll. of Phys. from 1794 until his death, Jan. 22, 1818. Wrote *A System of Anatomy*.

**Wista'ria** [named in honor of Dr. Caspar Wistar], an interesting genus of climbing leguminous shrubs. *W. consequana*, a native of China, is one of our most beautiful spring flowering climbers. *W. frutescens* is a smaller ornamental species, growing wild in the W. and S. of the U. S.

**Witchcraft**. Closely connected with the speculations concerning the first origin of evil, the true constitution of free will, the absolute difference between good and bad, etc., and yet, on the other hand, singularly independent of the results of these speculations, there grew up during the Middle Ages a view according to which the world was subject not to one god, but to two—namely, God and the devil; and this view was held by every good Christian. Of course, the pious and devout man had no doubt as to which of these 2 princes was the mightiest, but as little did he doubt that it was possible for him and for any man to withdraw himself from the mercy and justice of God and sell his immortal soul to the devil. By this general view of the world the idea of witchcraft was formed as a supernatural power to inflict diseases and miseries of all kinds, acquired by a bargain with the devil. After creeping around among people for centuries as a dumb superstition, the belief in W. finally burst out, in the 15th century, into an open mania. In the bishopric of Bamberg 600 persons were burned or hanged for sorcery in the course of 4 yrs., and 900 in the bishopric of Würzburg. In Geneva 500 persons were burned in 4 months in 1516, and 1000 in the dist. of Como in 1524. In England a statute of Elizabeth (1562) made W. a capital crime. But the frenzy did not develop fully until the reign of James VI., who himself wrote a treatise on demonology, while Hopkins and his "witch-finders" scoured the country from one end to the other. During the Long Parl. 3000 persons are said to have been put to death for sorcery. The colonists of N. Eng. were also staunch enemies of witches, as shown by the dread Salem tragedy of 1691-92. The first to oppose these dreadful errors were Johann Weier, with his *De Præstigiis Demonum* (1563), and Friedrich von Spee, with his *Cautio criminalis* (1631), but it was not until after the publication of Balhasar Becker's *Bezauberte Welt* (1691), and Christian Thomasius's *Theses de Crimine Magie* (1701) that the clouds of superstition, malice, ignorance, and lies began to disappear. In Eng. the laws against W. were repealed in 1736, and the last witch was officially tried and executed in 1736 in Posen.

**Witch-Elm, Wych-Elm, or Scotch-Elm**, the *Ulmus montana*, a large fast-growing European elm, much planted for ornament and affording good timber.

**Witch-Hazel**, a N. Amer. shrub, the *Hamamelis virginica* of the order Hamamelaceæ. Its blossoms appear very late in autumn, just as the leaves are falling, and the fruit matures early in the succeeding autumn. Like the true hazel in Europe, its twigs are employed as divining-rods, whence the name. The bark is employed in med., and joins somewhat aromatic to astringent and sedative qualities.

**Wit/enagemot**, A.-S. "assembly of wise men"; the old A.-S. national council, the great court of justice and supreme legislative body of the Eng. nation before the Conquest, superior to the *scir-gemot* or county assembly, and itself the offspring of the primitive *folk-mot*, an old Germanic inst. The W. was the original germ of the Brit. Parliament.

**With'er (George)**, b. at Brentworth, Hampshire, Eng., June 11, 1588, entered Magdalen Coll., Ox., 1604; studied law at Lincoln's Inn; printed in 1613 a vol. of metrical satires on the manners of the time, entitled *Abuses Stript and Whipt*, for which he was thrown into the Marshalsea prison; pub. many political and devotional pieces in prose and verse; served as capt. of horse and quartermaster-gen. of a regiment in the expedition sent by Charles I. against the Scotch Covenanters 1639; sold his estate and raised a troop of horse for the Parl. 1642; was soon promoted to the rank of major; was made by Cromwell "maj.-gen. of all the horse and foot in the county of Surrey;" at the Restoration he was imprisoned 3 yrs. in Newgate on the charge of being the author of a "scandalous and seditious libel." D. May 2, 1667.

**With'erite**, a mineral carbonate of baryta, named after its discoverer, Withering. Crystallization right rhombic; almost as hard as fluor-spar; white, sometimes transparent; rare, so far as known, in Amer.; one locality near Lexington, Ky.; occurs so abundantly at Fallowfield, Northumberland, Eng., as to be mined largely, and sold for making plate glass and for chemical uses.

**With'ers (Jones Mitchell)**, b. in Madison co., Ala., Jan. 12, 1814, grad. at W. P. 1835; served on the staffs of Gen. B. S. Patterson and Gen. Jessup, commanding the Ala. volunteers for the threatened Creek war of 1836; studied law at Tuscaloosa; acted as private sec. to Gov. C. C. Clay; was admitted to the bar 1838; settled at Mobile as lawyer and commission merchant 1841; was elected to the legislature 1855; was mayor of Mobile 1856-61; entered the Confed. service; became brig.-gen. July 1861; took command of the defenses of Mobile; was appointed maj.-gen. early in 1862; had command of a division at Shiloh Apr. 6, and in the W. army organized at Tupelo June 1862; took part in the memorable Ky. campaign; was distinguished at the battle of Stone River Dec. 31, 1862, and afterward commanded a dept. with head-quarters at Montgomery. After the war he became editor of the *Mobile Tribune*.

**With'ers (Robert E.)**, M. D., b. in Campbell co., Va., Sept. 18, 1821, ed. at the Univ. of Va., where he grad. in med. 1841; began practice at Danville, Va.; entered the Confed. military service in 1861 as major; was speedily commissioned col. of the 18th Va. regiment; was severely wounded in one of the battles near Richmond 1862; subsequently commanded the military post at Danville; removed to Lynchburg 1866; edited the *News* until 1868; was chosen Presidential elector at large 1872, Lieut.-gov. 1873, and soon afterward U. S. Senator for the term 1875-81.

**With'erspoon (John)**, D. D., LL.D., b. at Yester, Haddingtonshire (E. Lothian), Scot., Feb. 5, 1722, was ed. at the W. Univ. of Edinburgh; was parish minister of Beith in the W. of Scot. 1745-57; joined the Pretender with a corps of militia at Glasgow; was taken prisoner at the battle of Falkirk; in but released after 2 weeks' confinement in Dune Castle; in 1768 accepted the presidency of the Coll. of N. J. at Princeton, becoming also prof. of divinity there and pastor of the ch.; was in 1776 chosen a member of the constitutional convention of N. J., and also of the Continental Cong.; was one of the signers of the Dec. of Ind. and of the Articles of Confederation; was a member of the board of war, and visited the camps to inquire into and ameliorate the condition of the troops; sent his only son to war, in which he became a major and was killed at the battle of Germantown; opposed in Cong. the repeated issues of paper currency, and showed great sagacity in anticipating political contingencies; gave lectures on moral philos. and rhetoric at the coll., of which he greatly raised the reputation and improved the financial condition. Wrote *Considerations on the Nature and Extent of the Legislative Authority of the Brit. Parl.*, etc. D. Nov. 15, 1794.

**Wit'ness** [A.-S. *witnæss*], in law, is a person who testifies in a judicial proceeding as to the existence of facts material to the issue which is to be decided. The common law absolutely prohibited certain classes of persons from being witnesses, of which the following were the most important: (1) The parties in all civil actions and the accused in all criminal prosecutions. (2) Persons pecuniarily interested in the event of the action if the interest was in favor of the party by whom they were called. (3) Husband and wife were not allowed to be witnesses for or against each other in civil suits, nor in criminal trials unless the prosecution was an offence committed by one against the other. (4) Persons who denied the existence of God or of a future state. (5) Persons who had been convicted of a felony or other infamous crime. (6) Idiots, lunatics, and persons of other infamous crime. (7) Children so young as not to understand the nature of an oath. By modern legislation, parties in civil suits are allowed to be witnesses for themselves or for their adversaries, and husbands and wives to testify for and against each other. There are also certain facts from which parties are prohibited from testifying. (1) No one which parties are prohibited from testifying. (2) No one which parties are prohibited from testifying. (3) No one which parties are prohibited from testifying. (4) No one which parties are prohibited from testifying. (5) No one which parties are prohibited from testifying. (6) No one which parties are prohibited from testifying. (7) No one which parties are prohibited from testifying. (8) No one which parties are prohibited from testifying. (9) No one which parties are prohibited from testifying. (10) No one which parties are prohibited from testifying. (11) No one which parties are prohibited from testifying. (12) No one which parties are prohibited from testifying. 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**Wit'ekind, or Widukind**, in the wars between the Sax. and Charlemagne, the leader of the Westphalian Sax., as Albion was of the Eastphalians. When most of the Sax. chiefs submitted to Charlemagne at the Diet of Paderborn (777), W. fled to Gotfred, king of Jutland, and with aid from him he returned in 778 and renewed the war in the Rhine countries. But W. was once more compelled to flee to Jutland. In 782 he again returned, and annihilated a Frankish army at Stüntelberg on the Weser. Charlemagne took a cruel revenge by massacring 4500 Sax. at Verdun on the Aller, but this cruelty occasioned a general rising of the Sax. under W. and Albion. They were defeated, at Detmold and on the Hase, and the 2 chiefs fled to Holstein. Nevertheless, the next yr. a reconciliation took place between the emp. and his 2 great antagonists; they repaired to his camp at Attigny in Champagne, and were baptized.

**Wittenberg.** See APPENDIX.  
**Wood**, wôd [Lat. *Isatis tinctoria*; A.-S. *weald*; Fr. *guède* or *poêle*; Ger. *Weide*], a biennial herbaceous plant, indigenous in Europe, which has been employed from the times of the Romans for dyeing blue. It is cultivated in Fr. and Ger. The leaves possess a pungent odor and an acrid taste. These are either simply dried and sent to market, or are made into a paste by grinding, which is then prepared into balls, allowed to undergo fermentation, and dried.

**Woburn**, on R. R., Middlesex co., Mass., 10 m. from Boston, was founded in 1640. Prin. industry, manufacture of leather, a tannery having been established here as early as 1673. Has an acad. Pop. tp. 1870, 8560; 1880, 10,931.

**Wod'row** (ROBERT), b. at Glasgow, Scot., in 1679, ed. at Glasgow Univ., where he became librarian, and became in 1703 minister of Eastwood, Perthshire. Wrote a *Hist. of the sufferings of the Ch. of Scot. from the Restoration to the Revolution*, *Lives of the Reformers and most Eminent Ministers of the Ch. of Scot.*, etc. D. Mar. 21, 1734.

**Wofford College**, named for Rev. Benjamin Wofford, who gave \$100,000 "for the purpose of establishing and endowing a coll. for literary, classical, and scientific education, to be located in his native dist., Spartanburg, and to be under the control and management of the conference of the M. E. Ch. of his native State, South Carolina." The coll. was chartered by the legislature of S. C. Dec. 16, 1851, and the board of trustees held their first meeting to organize under it at Newbury C.-H. Nov. 24, 1853, when they elected a pres. and 4 profs., who opened the inst. for regular scholastic exercises Aug. 1, 1854.

**Wolcot, or Wolcott** (JOHN), M. D., better known as PETER PINDAR, b. at Doddbrooke, Devonshire, Eng., in 1738; took orders in the Ch. of Eng., and obtained a curacy in Jamaica 1768, but soon returned to Eng. on the death of his patron; spent 12 yrs. at Truro, Helston, and other towns in Cornwall as a phys.; discovered the merits of the obscure painter Ople, with whom he went to Lond. 1780; made himself conspicuous by his poetical productions, mostly satirical, which involved him in many quarrels. His attacks upon the king were so effective that at one time the ministry purchased his silence by the payment of £900 per annum. D. Jan. 13, 1819.

**Wolcott**, on R. R., Wayne co., N. Y. Pop. tp. 1870, 3223; 1880, 3731.

**Wolcott** (OLIVER), LL.D., son of Gov. Roger, b. at Windsor, Conn., Nov. 26, 1726, grad. at Yale 1747; served as a capt. of N. Y. volunteers on the Canada frontier 1748; was elected sheriff of Litchfield co. 1751; became a judge of common pleas and of probate; was a member of the executive council 1774-86; com. of Indian affairs for the N. Y. dept. 1775; was elected to the Continental Cong. Jan. 1776; signed the Dec. of Ind.; commanded as maj.-gen. the 14 Conn. regiments raised for the protection of N. Y.; joined Gen. Gates with several hundred volunteers, and was present at the battle of Saratoga; was lieut.-gov. of Conn. 1786-96, and gov. 1796-97. D. Dec. 1, 1797.

**Wolcott** (OLIVER), LL.D., son of the preceding, b. at Litchfield, Conn., Jan. 11, 1760, grad. at Yale 1778; served as volunteer to repel the Brit. attack on Danbury 1777, as volunteer aide to his father 1779, and as an officer in the commissary dept. 1780-81; was employed in the financial affairs of the State govt.; was a member of the society of "Hartford wits"; was comptroller of public accounts of the U. S. 1788-89, auditor of U. S. treas. 1789-91, comptroller 1791-95, sec. of the treas. 1795-1800, and judge of U. S. circuit court 1801-02; removed to New York 1802; was a merchant there until 1812; took part with his brother Frederick in founding extensive manufacturing establishments at Wolcottville, near Litchfield; was pres. of the State constitutional convention 1817, and gov. 1817-27. D. June 1, 1833.

**Wolcott** (ROGER), b. at Windsor, Conn., Jan. 4, 1679, was commissary in the expedition of 1711 against Canada; served as an officer in subsequent wars with Fr., and was maj.-gen. and second in command at the capture of Louisbourg 1745; was successively a member of the assembly and of the executive council, judge of the co. court, deputy gov., chief judge of the superior court, and was gov. of the colony 1751-54. Wrote a *Brief Account of the Agency of the Honorable John Winthrop, Esq., in the Court of King Charles the Second, Anno Dom. 1662, when he obtained a Charter for the Colony of Conn.* D. May 17, 1767.

**Wolei, or Olei**, is the *papyrus* of India. It is the palm-leaf, the anc. paper of Hindoos. It is written on with a sharp iron style. After the writing, lampblack or any other dark pigment is rubbed into the leaves, which seem to defy the ravages of time. The leaves are cut in long narrow slips. Yellow at first, by age they become brown. Holes are bored in them, and the leaf-books are attached and bound together by strings passing through these holes.

**Wolf** (Ger. *Wolf*), the common name for those wild species of the family Canidae and genus *Canis* that most resemble the dog, and which agree with the ordinary types of that animal in the possession of circular pupils to the eyes and a moderate bushy tail. The species are somewhat

numerous, and the typical representatives are chiefly found in the N. hemisphere and southward to India; but allied species, which are properly called wolves, although more generally designated as wild-dogs or foxes, are also found in Afr., S. Amer., and Australia. They agree essentially in their habits with the dogs, and hunt their prey either by surprising or running it down. At some seasons of the yr. they live, to some degree, in solitude, although they often associate in packs; and especially is this the case in winter, when they combine in the pursuit of game and other objects of prey. In Amer. there are 2 well-marked species: (1) the large common W. (*Canis lupus*), identical with the W. of Europe and N. Asia, and (2) the small prairie W. (*Canis latrans*), occurring on the plains of W. States and Terrs.

**Wolf** (F. A.). See APPENDIX.  
**Wolf** (GEORGE), b. in Allen tp., Northampton co., Pa., Aug. 12, 1777, of Ger. stock; became a lawyer, and was P. M. of Easton, Pa.; M. C. 1824-29; gov. of Pa. 1829-35, and the proposer of the Pa. public-school system; first comptroller of the U. S. treasury 1836-38, and then became collector of the port of Phila. D. Mar. 11, 1840.

**Wolf-Dog**, a large variety of the domestic dog, allied to the shepherd's dog, now found almost exclusively in Sp., though formerly common in Ire. and Scandinavia.

**Wolfe** (JAMES), b. at Westerham, Kent, Eng., Jan. 15, 1726, was present at the battles of Dettingen, Fontenoy, Falkirk, and Culloden; distinguished himself at Lafeld 1747, and at the siege of Maastricht 1748; commanded a regiment in the highlands of Scot. 1749-54; was quartermaster-gen. in the expedition against Rochefort 1757, and brig.-gen. in that against Louisbourg, Cape Breton, 1758; was appointed by Pitt maj.-gen. and placed in command of an expedition for the conquest of Canada 1759; arrived with 8000 men in the St. Lawrence in June; was repulsed by Montcalm in a first attack, July 31, and fell in the moment of victory in the battle on the Plains of Abraham, Sept. 13, 1759.

**Wollenbüttel Fragments** is the name of a delictic attack on Christianity, which Lessing published 1774-78, pretending to have found the manuscript in the library of Wollenbüttel, but which in reality was written by Reimarus, rector of the gymnasia in Hamburg. D. in 1768.

**Wolff** (JOSEPH), D. D., LL.D., b. at Wellersbach, near Bamberg, Ger., in 1795, son of a Jewish rabbi; was baptized into the R. Cath. Ch. at Prague 1812; devoted himself to Oriental langs.; went to Rome in 1816; admitted as a student into the Rom. Coll., and afterward into the Coll. of the Propaganda, from which, however, he was expelled in 1818 for heretical opinions; went to Lond. 1819; united with the Ch. of Eng.; was ordained as a missionary to the Jews Apr. 1821; made an extensive tour through the East, visiting Gibraltar, Malta, Egypt, Pal., Per., Circassia, the Crimea, and Turkey; returned to Eng. 1826; penetrated through Per. to Bokhara, and thence to Afghanistan, Cashmere, and the Punjab, reaching Calcutta Mar. 1835; visited S. India; sailed from Bombay to Ar.; spent some time in Abyssinia, where he learned the Amharic lang.; returned to Eng. 1834; pub. accounts of his labors; revisited Abyssinia, Ar., and India 1836; proceeded thence to the U. S., reaching New York in Aug. 1837; was ordained deacon in the P. E. Ch.; lectured in the prin. cities and preached before Cong.; reached Eng. Jan. 1848; was ordained priest at Dublin; obtained the curacy, first of Louthwaite and afterward of High Hoyalnd, Yorkshire; made a second journey to Bokhara in 1843; was imprisoned and condemned to death, but saved by the interposition of the Per. ambassador; returned to Eng. 1845, and spent the remainder of his life as parish priest at Isle Brewers, Somersetshire. Wrote *Researches and Missionary Labors among Jews and Mohammedans, A Narrative of a Mission to Bokhara*, etc. D. May 2, 1862.

**Wolf-Fish**, a name given to the fishes of the family Anarrhichidae and genus *Anarrhichas* on account of their fierce aspect and large canine teeth. They are elongated, but stout fishes, closely related to the blennies. The scales are rudimentary; the head has a steep profile; the mouth is widely cleft; the jaws armed with strong, conical teeth in and toward the front, and with molars in 2 rows on the palate and sides of the lower jaw; the dorsal fin is long and sustained by flexible spines; the ventrals absent. The species are peculiar to the N. seas.

**Wolfram**, called **Wolframite** by Dana, mineral tungstate of iron, ferrous tungstate. It is right rhombic; dark brown or black; hardness between apatite and feldspar; lustre metalloidal; streak also nearly black, sometimes slightly magnetic; exceedingly heavy; density from 6.67 to 7.535. It is abundant with the Cornish tin ores and in many European localities; in Amer. at Monroe, Conn.; with native bismuth; Trumbull, Conn., with massive topaz; in Mecklenburg co., N. C., and a number of other localities. Its lesser hardness, dark opaque streak, and frequently greater density will distinguish it from tinstone or cassiterite, with which it so often occurs.

**Wolfsbane**. See MONKSHOOD.  
**Wolf, von** (CHRISTIAN), BARON, b. at Breslau, Silesia, Jan. 24, 1679, studied first theol., then math. and philos. at Jena and Leipzig, and began to lecture in the latter city; received an appointment as prof. of math. and nat. hist. at the Univ. of Halle. Here his lectures attracted much attention, and his writings gained for him a great reputation all over Ger., but being opposed to the pietistical tendency which at that period characterized the Univ. of Halle, he was formally accused of heresy by his theological colleagues, and by a cabinet order of Nov. 15, 1723, was ordered to leave Halle within 24 hours and the Prus. states within 2 days. He found refuge in Hesse-Cassel, and lectured for several yrs. with great success at Marburg, but on the accession of Frederick II. he was recalled to Halle in 1740, made chancellor of the univ. in 1743, and a baron in 1745. He was an immensely prolific writer. He wrote on math., law, and all the various disciplines of philos. He was a pupil of Leib-



nitz, and his philos. is simply a modification and popularization of the ideas of his master; but to the development and representation of these ideas he applied the strict mathematical method. D. Apr. 9, 1754.

**Wollaston** (WILLIAM HYDE), M. D., F. R. S., b. in Lond., Eng., Aug. 6, 1766, ed. at Caius Coll., Cambridge, where he grad. in medicine 1793; devoted himself to experiments in chem., mineralogy, and physics; became sec. of the Royal Society 1806; discovered the metals palladium and rhodium (1803), and a method of making platinum malleable, for which he was awarded the medal of the Royal Society Nov. 30, 1828, and by which he gained £30,000; was the first to detect the dark or Fraunhofer lines in the solar spectrum (1825), and to demonstrate the identity of galvanism and frictional electricity; made a galvanic battery so small as to be contained within a thimble; constructed a sliding scale of chemical equivalents; invented the reflecting goniometer, the camera lucida, and the cryophorus for freezing water by means of its own evaporation; improved the construction of the microscope by means of the "Wollaston doublet" or compound lens; was the first to describe cystic oxide and 3 new species of urinary calculi; rendered many other services to science, and was chosen pres. of the Royal Society 1820. D. Dec. 22, 1828. He may be considered the founder of modern Brit. chemistry.

**Wolle**, wol'leh (PETER), b. in the island of St. John, W. I., Jan. 5, 1792, son of a Moravian missionary, ed. at the Moravian schools and theological sem. in Pa.; became an eloquent preacher of that denomination; was made a bp. about 1830; rearranged the hymn-tunes in use by his denomination. D. Nov. 14, 1871.

**Wollstonecraft**. See GODWIN (MARY W.).

**Wolseley** (Sir GARNET JOSEPH), b. in Ire. 1833, served in the Burmese war of 1852-53; with Sir John Cheape's expedition against the robber-chief Myatsoon; engaged in the siege of Sevastopol from Dec. 1854 to the close of the war. During the Indian mutiny of 1857-59 he served under Sir James Outram at the relief of Lucknow, the defence of the Alumbagh, and the siege and capture of Lucknow. In the war with China (1860) he served throughout that campaign upon the staff of the quartermaster-gen. In 1870, in command of the expedition from Canada to the Red River terr., he suppressed the insurrectionary govt. established by Riel and others at Ft. Garry. In 1873 was appointed gov. of the Gold Coast settlements, the inhabs. of which had become involved in a war with the Ashantees, and as commander-in-chief of the Brit. forces defeated the enemy's army, occupied and destroyed Coomassie, his cap., and the king's palace, and brought the war to a speedy and successful end; inspector-gen. of auxiliary forces 1874-76, gov. of Cyprus in 1878, and of S. Afr. in 1879. Appointed commander-in-chief of the Brit. forces in Egypt, 1882; arrived at Alexandria Aug. 15; won the battle of Tel-el-Kebir Sept. 13, which practically closed the war. He received a peerage, and was made gen. 1882. In 1884 again took command of English forces in Egypt.

**Wolsey** (THOMAS), b. at Ipswich, Suffolk, Eng., in 1471, ed. in Magdalen Coll., Ox.; studied theol.; took holy orders, and received in 1500 the rectorship of Lymington, Somersetshire; was appointed a chaplain to Henry VII.; went to Bruges in 1508 on a special diplomatic mission to the emp. Maximilian; was rewarded on his return with the deanery of Lincoln. Henry VIII. made him abp. of York in 1514, lord chancellor of Eng. in 1515, and showed him unlimited confidence; the pope made him a cardinal in 1515 and legate in 1519. He built Hampton Court, founded Christ Ch. Coll. and 7 lectureships at Ox., and kept a household of from 500 to 800 persons. The goal of his ambition was to become pope. At last his ambition came into conflict with the king's passion. The king wished to be divorced from Catharine of Aragon, the aunt of Charles V., and W. had to carry through the necessary negotiations; but this task for him proved impossible. The negotiations seemed to be endless. The king began to distrust the cardinal. Moreover, after the divorce the king wished to marry Anne Boleyn, and to this marriage W. was opposed. Anne Boleyn demanded and obtained from the king the cardinal's dismissal in disgrace, and on Oct. 17, 1529, the great seal was taken from him and he left the court. On Nov. 4, 1530, he was arrested at Cawood on a charge of high treason. He was conducted to Lond., but on the way thither d. Nov. 29, 1530.

**Wolverhampton**, town of Eng., co. of Stafford, on the W. outskirts of the rich mining dists. of Staffordshire. Beside hardware, in which branch of manufacture W. is one of the leading centres of the world, it has extensive manufactures of tinware, articles of papier-mâché, and japanned and enamelled goods, such as kitchen utensils, etc. Has many good educational and benevolent insts. Pop. 75,738.

**Wolverene**, the name of the glutton of N. Amer.

**Women, Diseases of**. See UTERINE DISEASES.

**Wood** (ALPHONSO), b. at Chesterfield, N. H., Sept. 17, 1810, grad. at Dartmouth Coll. 1834; studied theol. 1 yr. at Andover, Mass.; taught in Kimball Union Acad., Meriden, N. H., 1834-39; was pres. of Ohio Female Coll. 1851-57; prof. in Terre Haute Female Coll. 1857-60; prin. of Clinton Female Sem., Brooklyn, N. Y., 1860-65; travelled 1865-66, and afterward resided at W. Farms, New York. Botany was his specialty, and he pub. *Class-Book of Botany, Leaves and Flowers, American Botanist and Florist*. D. Jan. 4, 1881.

**Wood** (DE VOLSON), A. M., b. at Smyrna, N. Y., June 1, 1832, grad. at the State Normal School, Albany, 1853; taught math. in that inst. 1854-55; grad. at the Rensselaer Polytechnic Inst., Troy, 1857; prof. of civil engineering in Univ. of Mich. 1857-72; since 1872 prof. of math. and mechs. in Stevens Inst. of Technology, Hoboken, N. J.; wrote *On the Resistance of Materials, On Bridges and Roofs, and On the Elements of Analytical Mechanics*.

**Wood** (FERNANDO), d. at Phila. June 14, 1812, of Quaker parentage, settled in New York in childhood; became a successful shipping-merchant; was elected to Cong. as a

Dem. 1840; mayor of New York 1856-57, and again 1861-62, and again M. C. 1863-65 and 1867-81. D. Feb. 13, 1881.—His brother BENJAMIN has also been M. C., and is ed. and proprietor of the *New York Daily News*.

**Wood** (GEORGE B.), M. D., LL.D., b. at Greenwich, N. J., Mar. 13, 1797, grad. at the Univ. of Pa. 1815, and in med. 1818; was prof. of chem. in the Phila. Coll. of Pharmacy 1822-31, and of materia medica 1831-35; prof. of the same branch in the Univ. of Pa. 1835-50, and of theory and practice of med. 1850-60; was phys. in the Pa. Hospital 1835-39; became pres. of the Amer. Philosophical Society in 1839; was long pres. of the Coll. of Phys. of Phila., and in 1863 endowed an auxiliary faculty of med. in the Univ. of Pa. Author of *A Treatise on the Practice of Med.*, etc.; with Dr. Franklin Bache he prepared *The Dispensary of the U. S.* D. Mar. 30, 1879.

**Wood** (ISAAC), M. D., b. at Clinton, Dutchess co., N. Y., Aug. 21, 1793, studied med.; was attending phys. in the New York Hospital 1814-16; one of the phys. of the New York Dispensary until 1825, and resident phys. of the Bellevue Hospital 1825-33; was in high repute as an ophthalmic surgeon; was for 25 yrs. a manager of the New York Inst. for the Blind, and was active in founding many med. and charitable insts. D. Mar. 25, 1858.

**Wood** (JAMES), b. at Winchester, Va., about 1740, was a member of the Va. convention of June 1776; was commissioned col. in the Va. service Nov. 15, 1776; became lieutenant and member of the executive council, and gov. of Va. 1796-99. D. June 16, 1813.

**Wood** (JAMES), D. D., b. at Greenfield, N. Y., in 1799, grad. at Union Coll. 1822; was pastor of a Presb. ch. at Amsterdam, N. Y., 1823-33; became prof. in a theological sem. at New Albany, Ind., 1839; was pres. of Hanover Coll., Ind., 1859-66, and pres. of Van Rensselaer Inst. at Hightstown, N. J., from 1866 until his death, Apr. 7, 1867. Author of *A Treatise on Baptism, Old and New Theol.*, etc.

**Wood** (JAMES FREDERICK), b. in Phila. Apr. 37, 1813, in 1837 went to Cin., where he became a bank-clerk, advancing to cashier; in 1837 went to Rome to study for the priesthood; in 1844 was ordained priest, and returned to Cin.; became pastor of St. Patrick's ch. in Cin.; was appointed by papal bull coadjutor-bp. of Phila.; was consecrated Apr. 26, 1857, and in Jan. 1860 succeeded to the bishopric. He was present at the Vatican Council in 1869, recording his belief in papal infallibility. On Mar. 15, 1875, the diocese of Phila. was raised to an archiepiscopal see, and Bp. W. was elevated to the position of abp. June 18, 1875. D. June 20, 1883.

**Wood** (JAMES R.), M. D., LL.D., b. in New York Sept. 14, 1816, grad. at Castleton, Vt. Med. Coll. 1846; removed to New York 1847, and became assistant resident phys. at Bellevue Hospital; commenced his surgical clinics in 1856, which were continued till his fatal sickness; was prof. of operative surgery in Bellevue Hospital Med. Coll. 1861-68. As a lecturer and clinical instructor he was highly esteemed; was member of many med. societies, etc., and was famous as a surgeon. D. May 4, 1882.

**Wood** (JOHN TURTLE), b. at Hackney, near Lond., Feb. 13, 1821, was articled to an arch., H. E. Kendall, Jr. While pursuing his studies in it, in 1849 he got involved in the political troubles of the country, and was imprisoned for a time. In 1858 he went to Asia Minor to assist in building the railway between Smyrna and Aidin (80 m.); in 1863 returned to Smyrna to begin the work of exploring the ruins of Ephesus, and continued the work of exploration until the spring of 1874. His discoveries were of the greatest interest and importance. Wrote *Ephesus*.

**Wood** (REUBEN), b. in Rutland co., Vt., in 1792, served as capt. of Vt. volunteers in the war of 1812-15; settled as a lawyer at Cleveland, O., 1817; was State senator 1825-28; pres. judge of the 3d dist. 1833-45; Dem. gov. of O. 1850-53, and U. S. consul at Valparaiso 1853-54. D. Oct. 2, 1884.

**Wood** (SILAS), b. in Suffolk co., L. I., in 1769, grad. at Princeton 1789, and was M. C. 1819-29. Wrote *Hist. of L. I.* D. Mar. 2, 1847.

**Wood** (WILLIAM MAXWELL), M. D., b. at Baltimore, Md., May 27, 1809, grad. in med. at the Univ. of Md. 1829; entered the navy as assistant surgeon; became full surgeon 1838; was fleet-surgeon of the Pacific squadron 1844-46, and of the N. Atlantic squadron during the c. war; became chief of the bureau of med. and surgery in the navy dept. 1870, surgeon-general 1871, and was retired 1872. Author of *Wandering Sketches, etc., Fankerei, or the San Jucinto in the Seas of India, China, and Japan*, etc. D. Mar. 1, 1880.

**Woodbridge** (WILLIAM), b. in Norwich, Conn., Aug. 20, 1780, received his earliest education in Conn.; studied law at Litchfield, and was admitted to the bar in O. in 1806; in 1807 was elected to the assembly; was prosecuting atty. for his co. 1808-14, during which period he was also a member of the State senate; in 1814 appointed sec. of the Terr. of Mich., and removed to Detroit; in 1819 was elected the first delegate from Mich. to Cong.; judge of the supreme court of Mich. Terr. 1823-32; in 1835 was a member of the convention called to form a State const.; in 1837 was elected to the State senate of Mich.; in 1839 was chosen gov. of the State; was U. S. Senator 1841-47. D. Oct. 20, 1861.

**Woodbridge** (WILLIAM CHANNING), b. at Medford, Mass., Dec. 18, 1794, grad. at Yale 1811; was prin. of Burlington Acad., N. J., 1812-14; became a teacher in M. Gallinger Acad., N. J., 1814-15; became a teacher in M. Gallinger's inst. for the deaf and dumb at Hartford, Conn., 1817; pub. in conjunction with Mrs. Emma Willard, *Universal Geog., Anc. and Modern*; issued also *Outlines of Universal Geog., Modern School Geog.*, etc. D. Nov. 9, 1845.

**Woodbury**, city and R. R. junct., cap. of Gloucester co., N. J., 8 m. S. of Phila. Pop. 1870, 1905; 1840, 2238.

**Woodbury** (DANIEL PHINEAS), b. at New London, N. H., in Dec. 16, 1812, grad. at U. S. Military Acad., July 1, 1836. In 1847-50 he directed the construction of Ft. Kearney, Neb., and Ft. Laramie, for the protection of the route to Or. Subsequently (1856-60) he was in charge of the important works of fortification—Fts. Jefferson (Tortugas) and Taylor (Key



West). At the outbreak of the c. war he became engaged in providing for the defence of the capital and in the engineering organization of the Army of the Potomac. In the battle of Bull Run he took a prominent part in the reconnaissances upon which the battle was based. When the Army of the Potomac took the field, W. had the control of a large part of the engineering in the siege of Yorktown and subsequent operations before Richmond. In the engineering works by which the army was able to cross the White Oak Swamp and move to the James River, he rendered conspicuous services. At the battle of Fredericksburg his personal gallantry in throwing bridges across the Rappahannock won him the brevet of brig.-gen.; was detailed for the important command at Key West Mar. 16, 1863. Wrote *Theory of Arches*, etc. D. Aug. 15, 1864.

**Woodbury** (ISAAC BEVERLY), b. at Beverly, Mass., in 1819, studied music in Europe; became an eminent composer; teacher of music in the public schools of Boston; removed in 1845 to New York, and edited the *Musical Review* (1850 seq.) and the *Musical Pioneer*. He compiled the *Anthem Dulcimer*, the *Cythara*, and the *New Lute of Zion*, etc. D. Oct. 26, 1858.

**Woodbury** (LEVI), b. at Francistown, N. H., Dec. 22, 1789, grad. at Dartmouth Coll. in 1809; entered the law school of Judges Reeves and Gould at Litchfield, Conn.; was admitted to the bar, and commenced practice of law in his native town in 1812. He was an earnest Dem., and zealously supported the war then declared against G. Brit. In 1816, at the age of 27, he was appointed a judge of the supreme court of the State; in 1819 removed to Portsmouth, N. H.; in 1823 was elected gov.; in 1825 was elected speaker of the house of reps. of the State, and to the Senate of the U. S.; in May 1831 was appointed sec. of the navy, and in 1834 sec. of the treas.; in 1845 he was appointed a justice of the supreme court of the U. S., and held that position until his death, Sept. 4, 1851.

**Woodchat**, the *Lanius rufus*, a shriek of the Old World which has a very wide geographical range. In S. Afr. it is called "magistrate bird," from its habit of impaling and hanging its victims.

**Wood, Chemistry of.** Wood is chiefly made up of cellulose, the substance of the plant-cells, with the so called "incrusting matters" of the cells, the soluble constituents of the sap, with the water of the same, and the mineral matters of the ash. Cellulose forms the great mass of dry wood, cotton, hemp, linen, and other vegetable substances. The incrusting matters are not so well known. In dried wood they must be very mixed in character, comprising of course all the substances left during the drying up of the sap, which contains saline substances, albuminoid matters, tannin substances, gummy matters, and sugar. In the making of paper from woody or other fibre, as also during the bleaching of vegetable tissues, almost or quite everything is dissolved and removed except pure cellulose and some albuminoid matter, which still gives a yellow-brown stain with nitric acid. Cotton also, when raw, contains little or none of this albuminoid, as nitric acid will show. Some woods contain also *starchy* matters, as the iodine-test will indicate. Water is one of the most practically important constituents of wood, green or fresh-cut wood being usually completely filled in every pore with it. As cellulose is a definite substance of a definite density (1.525), it is probable that the amount of water in fresh-cut woods will furnish a pretty close index to their relative degree of porosity.

**Woodchuck, Ground-Hog, or Maryland Marmot**, the *Arctomys monax*, a large rodent mammal of N. Amer., quite common in the eastern portions. It is some 18 inches long, and has a grizzled reddish-brown fur, which has a limited industrial use. It is very prolific, and digs a deep burrow.

**Woodcock**, a name applied to 2 different game-birds of the snipe family. The European W. ranges over the E. continent from Japan to the Brit. Isles, and attains a length of 14 inches, while the Amer. bird, which attains only 11 inches, is found abundantly in the N. U. S. and in Canada.

**Woodeson** (RICHARD), D. C. L., b. at Kingston-upon-Thames, Surrey, Eng., May 15, 1745, ed. at Pembroke and Magdalen colls., Ox., became Vinerian scholar 1766, and fellow of Magdalen 1771; became deputy Vinerian prof. of civil law at Ox. 1772; was full prof. 1777-93, and subsequently bencher of the Middle Temple and com. of bankrupts. Wrote *Elements of Jurisprudence* and *A Systematical View of the Laws of Eng.* D. Oct. 29, 1822.

**Wood Duck, or Summer Duck** (*Aix sponsa*), one of the most beautiful members of the family of Anatidae, and whose only congener is the still more beautiful mandarin duck (*Aix galericulata*) of China. It is about 19 or 20 inches long. The species ranges over most of N. Amer.—in the warmer regions as a permanent resident, and in the N. as a summer migrant. It chiefly builds its nest in a hollow tree, and this habit gives origin to the name "wood duck." It is generally seen in pairs, and rarely in flocks of more than 3 or 4. It feeds chiefly on acorns, the seeds of wild oats, and insects. The flesh is tolerably good food.

**Wood-Engraving.** See ENGRAVING.

**Woodford** (STEWART L.), LL.D., b. Sept. 3, 1835, in New York, grad. at Columbia Coll. 1854; appointed assistant U. S. atty. 1861; entered the U. S. volunteer army in 1862, and was in active service till he resigned in 1865, having been chief of staff in the dept. of the South, military commandant of Charleston, Savannah, etc., attaining the rank of col. and brevet brig.-gen.; elected lieut.-gov. of N. Y. in 1866; elected to Cong. 1872; also chosen Presidential elector at large and made chairman of the N. Y. electoral college in 1872; was U. S. atty. at New York 1877-83; is trustee of Cornell Univ., and author of several pamphlets on classical, financial, and legal subjects.

**Woodford** (WILLIAM), b. in Caroline co., Va., in 1735, distinguished himself in the Fr. and Indian wars; was appointed col. in the autumn of 1775; repulsed the fleet of

Lord Dunmore from Hampton Roads, sinking 5 vessels; commanded at the battle of Great Bridge on the Elizabeth River, Dec. 9, 1775, winning a signal victory; called to arms the militia of Norfolk and Princess Anne cos.; occupied Norfolk in triumph Dec. 14; was commissioned brig.-gen. early in 1777; was wounded at Brandywine; took an active part in the battles of Germantown and Monmouth; went to the relief of Charleston, S. C., with Va. and N. C. recruits, marching 500 m. in 28 days; reached that city Apr. 1780; was taken prisoner during the siege, and carried to New York, where he d. Nov. 13, 1780.

**Wood Grouse.** See CAPRECAULZIE.

**Woodhull** (NATHANIEL), b. at Mastic, Suffolk co., L. I., Dec. 30, 1722, served in the Fr. war of 1755-63; sat in the provincial legislature 1769-76; was pres. of that body 1776; took command as gen. of L. I. militia on the landing of the Brit. in Aug.; was taken prisoner a few days later by Brit. light-horse near Jamaica, when, after delivering up his sword, he was so brutally wounded that he d. Sept. 20, 1776.

**Woodland**, R. R. junc., cap. of Yolo co., Cal., 86 m. N. E. of San Francisco. Pop. 1880, 2257.

**Wood-Louse**, a popular name for various sessile-eyed, 14-footed isopod crustaceans, of the families Armadillidae and Oniscidae, and of the genera *Porcellio*, *Oniscus*, *Armadillo*, etc. They are otherwise called slaters, and the large ones are also called sow-bugs and pill-bugs. They inhabit moist places, rotten wood, cellars, etc.

**Woodman** (JOHN SMITH), b. at Durham, N. H., in 1819, studied at S. Berwick Acad., grad. at Dartmouth Coll. 1842; taught school at Charleston, S. C., 1842-46; made a tour of Europe on foot 1847-48; studied law at Dover, N. H.; practised his profession there and at Rollinsford; prof. of math. at Dartmouth 1851-56; taught also in Chandler Scientific School from its establishment in 1852; became in 1856 prof. of civil engineering, v.-p. and practical head of that inst., and retained those posts until his death, May 15, 1871.

**Wood-Oil**, a fine aromatic drying oil used in making varnish, in preventing insect ravages, in making lithographic ink, and in med. as a cure for gonorrhoea. It comes from Burmah.

**Woodpecker**, a strong and vigorous bird belonging to the family *Picidae*. These birds possess a long, sharp bill, with which they bore into the bark of trees and the decayed parts of the limbs and trunks, in search of insects, as well as carve out holes for their nests. Their toes are opposed in 2 groups, the second and third being directed forward, the first and fourth backward. They live in forests, and the structure of the feet enables them to run with great dexterity along the trunks of trees, even on surfaces inclined downward, while in climbing they are assisted by the stiff points of their tail-feathers. In ascending they continually tap the surface, to discover the hiding-place of insects and larvae, and when they find such a spot they dig into it with great energy. Their tongue is extensible, and facilitates the capture of their insect prey. The species are numerous.

**Wood, Preservation of.** See PRESERVATION OF TIMBER.

**Wood-Rat.** See RAT.

**Woodruff**, the *Asperula odorata*, a favorite herb of the European peasants, belonging to the order Rubiaceae. It has, when dry, a pleasant odor, somewhat like that of the Tonquin bean or sweet clover.

**Wood-Rush.** See LUZULA.

**Woods** (ALVA), D. D., b. at Shoreham, Vt., Aug. 13, 1794, fitted for coll. at Phillips Andover Acad.; grad. at Harvard 1817, and at Andover Sem. 1821; was prof. of math. and natural philos. in Columbian Coll., D. C., 1821-24; prof. of math. and natural philos. in Brown Univ. 1824-28; pres. of Transylvania Univ., Lexington, Ky., 1828-31, and pres. of the Univ. of the State of Ala. at Tuscaloosa 1831-37. He has founded a lectureship of elocution in Newton Theological Sem. and five scholarships in Brown Univ.

**Woods** (CHARLES R.), b. in Licking co., O., about 1831, grad. from U. S. Military Acad. July 1, 1852, when appointed brevet second lieut. of inf.; served in garrison and on frontier duty until 1861. In the attempt to relieve Fort Sumter (Apr. 1861) he commanded the troops on the steamer Star of the West; served in the W. Va. campaign, and appointed col. 76th Ohio Volunteers Oct. 23, 1861. Engaged at Ft. Donelson, Shiloh, Corinth, Chickasaw Bayou, Arkansas Post, and Vicksburg. Commissioned brig.-gen. of volunteers Aug. 1863, and engaged in the battle of Chattanooga. In Sherman's Atlanta campaign and subsequent march to Savannah and through the Carolinas to Wash. he commanded a division of the 15th corps, participating in all the actions of those campaigns, and remained in the volunteer service until Sept. 30, 1866, when he resumed his regular army duties, having been appointed lieut.-col. 33d Inf. July 28, 1866. Became col. 2d Inf. in 1874, in Dec. of which yr. he was retired from active service. For gallantry in action during the c.-war he was brevetted lieut.-col., col., brigadier and major gen. D. Feb. 25, 1885.

**Woods** (LEONARD, D. D.), b. at Princeton, Mass., June 19, 1774, grad. at Harvard 1796; studied theol.; was ordained pastor of the Congl. ch. at W. Newbury 1798; took an active part in the Unit. controversy, vindicating "orthodox Calvinism" against Drs. Ware, Buckminster, and Channing; was prominent in the organization and management of tract, education, temperance, and foreign missions societies; was prof. of theol. in Andover Sem. from its establishment in 1807 until 1846, and emeritus prof. from that time until his death, Aug. 24, 1854. Among his works were *Letters to Units.*, *Reply to Dr. Ware's Letters to Trinitarians*, *Lectures on the Inspiration of the Scripture*, etc.

**Woods** (LEONARD, JR.), D. D., LL.D., son of the preceding, b. at Newbury, Mass., Nov. 24, 1807, grad. at Union Coll. 1827, at Andover Sem. 1830, and was tutor there 1831; was ordained to the Congl. ministry 1833; translated George Christian Knapp's *Lectures on Chr. Theol.*; edited the *Literary and Theological Review* 1834-37; was prof. of sacred



lit. in Bangor Theological Sem. 1836-39, and pres. of Bowdoin Coll. 1839-66. D. Dec. 24, 1878.

**Wood-Sorrel.** See OXALIS.

**Woodstock,** city, on R. R., cap. of McHenry co., Ill., 51 m. N. of Chicago, has a sem. Prin. business, farming and dairying. Pop. 1870, 1574; 1880, 1475.

**Woodstock,** on R. R., cap. of Windsor co., Vt., has a fine park, extensive water-power, utilized by many manufactures. Pop. tp. 1870, 2910; 1880, 2815, including 1266 in v.

**Woodstock, Va.** See APPENDIX.

**Wood-Swallows, or Swift Shrikes,** a group of birds superficially resembling swallows in habits and appearance, but assigned to Ampelidæ or chattering. In E. I. and Australia they abound. They eat insects and seeds.

**Woodward** (GEORGE W.), b. at Bethany, Pa., Mar. 26, 1809, received an academic education; became a lawyer; was a member of the State constitutional convention of 1837, pres. judge of the 4th judicial dist. 1841-51, judge of the supreme court of Pa. 1852-67, and Dem. M. C. 1867-73. D. May 10, 1875.

**Woodward** (SAMUEL BAYARD), M. D., b. at Torrington, Conn., June 10, 1787, became phys. to the State prison; sat for several yrs. in the State senate; was one of the founders of the Hartford Retreat for the Insane; was supt. of the Mass. lunatic asylum at Worcester 1832-46, and was the projector of an asylum for inebriates and of the Mass. School for Idiotic Youth. In 1846 he settled at Northampton, Mass. D. Jan. 3, 1850.

**Woodwaxen, or Woodwaxen.** See DYERS' BROOD.

**Woodworth** (JOHN), b. at Schodack, N. Y., Nov. 13, 1768, grad. at Yale 1789; studied law at Albany; commenced practice at Troy 1791; settled at Albany 1800; was surrogate of Rensselaer co. 1793-1804; member of the assembly 1803, of the senate 1804-07, atty.-gen. of N. Y. 1804-08, com. to revise the laws of N. Y. 1811-13, and judge of the supreme court of N. Y. 1819-28. Wrote *Reminiscences of Troy from its Settlement to 1807*, etc. D. June 1, 1853.

**Woodworth** (SAMUEL), b. at Scituate, Mass., Jan. 13, 1785, settled in New York 1809; conducted during the war of 1812-15 a weekly paper, *The War*, and a monthly Swedenborgian magazine, *The Halcyn Luminary*, both unsuccessful; wrote a romantic hist. of the war entitled *The Champions of Freedom*; pub. a small vol. of poems 1818, and another 1826; was one of the founders of the *New York Mirror* 1823-24; edited the *Parthenon* 1827, and wrote a number of dramatic pieces. D. Dec. 9, 1842.

**Wool** (JOHN ELLIS), b. at Newburg, N. Y., Feb. 20, 1784, studied law, which he abandoned in Apr. 1812, and became capt. of the 13th Inf. At Queenstown Heights he led his company, and was severely wounded Oct. 13, 1812; major 29th Inf. Apr. 13, 1813, he again distinguished himself at Plattsburgh (Sept. 11, 1814), and was brevetted col.; was appointed (Apr. 29, 1815) inspector-gen. with rank of col., which position he retained until June 25, 1841, when appointed a brig.-gen. As inspector-gen. he made in 1832 a professional tour of Europe. In the Mex. war he organized W. volunteers, and after despatching 12,000 to the seat of war, conducted himself a force of 3,000 on the march from San Antonio to Saltillo, 900 m., where he joined the army of Gen. Taylor as second in command. After Taylor's return to the States, W. remained in command of the army of occupation until the close of the war. For his services at Buena Vista he was brevetted maj.-gen. Returning E. in July 1848, he commanded the E. military division until 1853, the dept. of the E. 1853-54, that of the Pacific 1854-57, when again in command of the E. dept. until 1860. In Aug. 1861 he commanded at Ft. Monroe, Va., and in May 1862 occupied Norfolk and Portsmouth. He was promoted to be maj.-gen. May 16, 1862; was in June placed in command of the Middle military dept., including the 8th army corps; transferred to New York Jan. 1863, he commanded the dept. of the E. until July 15, when relieved, and Aug. 1, 1863, was placed on the retired list. D. Nov. 10, 1869.

**Wool, Woolen Manufactures, and The Wool Trade.** 1. *Wool*, the fleece of the sheep and other animals of the ovine-family. W. differs from hair and most furs in possessing the felting property, due to the imbricated or corrugated character of its fibres, which enables them, under certain conditions, to interlock with each other and form a close and solid fabric. The W. of certain breeds of sheep possesses more of this property than others. W. was the earliest of all the textiles used in the manufacture of the clothing of man. From the use of the sheep-skin, with the W. outward, for the haiks or rough mantles of the primitive men, to the spinning and twisting of the same W. into threads, afterward woven by rude processes into a rough cloth, the transition was not very great; but before silk or cotton were used as textiles, woolen cloths, for clothing, for curtains, shawls, etc., of great beauty, were produced in the Oriental countries. Sheep formed a large part of the wealth of E. nations, and their fleeces frequently constituted an important item in the tribute paid by a subject monarch to his suzerain. The W. of the sheep of the Orient retained its good qualities through many ages, without any known effort for its improvement. The first experiment on record for improving the breed of sheep for W. is that mentioned by Columella, about A. D. 12, who relates that his uncle, a rich farmer in Sp., crossed some fine white Afr. rams with the brown or black but fine-wooled Tartarian ewes until he had produced a breed of fine white-wooled sheep, of the hardy constitution and heavy fleece. This breed were the ancestors of the Sp. merinoes, the parent stock of the greater part of the sheep of Europe and Amer. The pure Sp. merino ranks higher as a wool-producing than a flesh-producing sheep; but where the flesh was more of an obnoxious article than the W., and where combing W. for worsted goods, ject than the W., and where combing W. for worsted goods, carpets, etc. were wanted, a judicious crossing has produced breeds of larger size, better flesh, and combing wool, which left nothing to be desired. Still, for most purposes of woolen manufacture, except worsted goods, carpets, etc.,

the merino sheep of the best breeds, or some of the improved breeds nearest to them in quality, furnish the best W. grown. The Amer. W. are of different qualities, from their different origins. In Mex., Central Amer., and the N. states of S. Amer., the Jesuit fathers imported, very early, Sp. merinoes, but by neglect and carelessness in 3 centuries these had degenerated until they were very small, and their fleeces scanty. In Southern and Central S. Amer. a different breed of sheep was introduced very early—long-limbed, large-boned, and with a fleece which seemed more like hair than wool. In the U. S., about 1800 to 1812, and since, great efforts were made to improve the breeds of sheep, by Humphrey, Livingston, Atwood, Randall, Geddes, and others. Their efforts were directed toward the importation of Sp. merinoes and other allied breeds. In 1801 the W. clip of the United Kingdom was 94,000,000 lbs., and 8,000,000 lbs. more were imported; in 1851, 208,000,000 lbs. were produced and 83,000,000 imported; in 1875, 298,000,000 lbs. were produced and 325,000,000 imported, beside 85,000,000 lbs. of shoddy, etc. Much of the imported W. was from Australia; 100,000,000 lbs. were exported. In 1880 the production had not materially increased, amounting to about 312,000,000 lbs., but the importation was 463,508,963 lbs., and the exportation 237,408,589 lbs. In the U. S. the production had increased from very small beginnings in 1800 to 193,000,000 lbs. in 1875, and 223,183,082 lbs. in 1880, and the importation of raw W. was 55,000,000 lbs. in 1875, and 55,964,236 lbs. in 1881.

2. *Woolen Manufactures.*—For the hist. of these manufactures from the earliest times, and the process of manufacture, see *J.'s Univ. Cyc.*, vol. iv. pp. 1748, 1749. From pre-historic times to the present it has been manufactured (for many ages by the rudest hand-processes) into garments, shawls, coverings, curtains, carpets, and textile or felted goods of all kinds. Within the last hundred yrs. wonderful advances have been made in the machinery for this manufacture, and now, in G. Brit. and the U. S. alone, it furnishes employment directly to 460,000 persons, and indirectly to a million more. The goods coming under the denomination of woolen manufactures are generally classed under 6 or 8 heads, each having from 12 to 20 subdivisions: cloths and cassimeres, shawls, repellents, blankets, carpets, felt-goods, worsted goods, soft dress goods, upholstery goods, wool hats, hosiery and knit goods. There are also items of considerable amount which do not come under any of these titles. What may be the world's production in any yr. of these varied goods it would be impossible to estimate. G. Brit., Fr., and Ger. are the largest producers in Europe, and their united annual production must exceed \$1,500,000,000. In the U. S. the production has risen from \$4,413,068 in 1820 to \$267,699,504 in 1880, and the growth of these manufactures is more rapid now than at any former time. The importation of manufactured woolen goods had risen from \$7,437,737 in 1821 to \$31,156,426 in 1881. As the imports are reckoned at their foreign cost, and without the addition of the duty, their market value here would be nearly doubled, but even then it would be less than  $\frac{1}{10}$  of our own production. There has been very great and rapid improvement in the processes of manufacture, and most of the machines which have fostered this industry, and made a larger and more perfect production possible, though now used in all European countries, are of Amer. invention.

3. *The Wool Trade.*—Dealing in W. has been a recognized business for more than 4000 years. In Damascus, Tyre, Ephesus, Corinth, Thebes, and Rome the W. dealers had their marts. In the Middle Ages the dealer in W. was called a wool-stapler. From his skill in selecting and appraising the different qualities of W. At the present time the W. trade is one of the most important in civilized countries. Its weekly, monthly, and annual variations are carefully reported in all the W. markets of the world. W. are classified by their qualities, and by the countries from which they come. The report of the W. trade in the U. S. in 1880-81 specifies 6 different classes of W. in the domestic production, and 8 or 10 in foreign W.; the prices of Amer. ranged from 24 to 60 cents, according to quality, and of foreign from 16 to 33 cents. The total receipts at all the Amer. W. markets was stated as 403,681,898 lbs., and there were on hand at the closing of the yr. 51,902,970 lbs., showing the actual consumption of W. in the calendar yr. to have been 351,778,928 lbs. L. P. BROCKETT.

**Woollett** (WILLIAM), b. at Maidstone, Kent, Eng., Aug. 27, 1735, was apprenticed to an obscure engraver in Lond., but soon adopted a style of his own, uniting in a single plate the use of aquafortis, the burin, and the dry needle; gained a high reputation, especially by his landscapes. His masterpieces are 9 Eng. landscapes after Richard Wilson, *The Death of Gen. Wolfe*, and *The Battle of La Hogue* after Benjamin West. D. May 23, 1785.

**Woolman** (JOHN), b. at Northampton, Burlington co., W. Jersey, in Aug. 1720, worked on a farm until his 21st yr., when he became clerk to a shopkeeper at Mt. Holly, and began to speak in the meetings of the Society of Friends; opened a school for poor children at Mt. Holly; learned the trade of tailor, by which he supported himself during a tour with Isaac Andrews to visit the Friends in the back settlements of Va. (1746); adopted itinerancy as his regular mode of life, visiting the societies of Friends in nearly all the colonies; spoke and wrote frequently against slavery; visited the Indians on the Susquehanna 1763; subsequently went to Eng. Wrote *Considerations on Pure Wisdom and Human Policy, on Labor, on Schools, and on the Right Use of the Lord's Supper*, etc. D. Oct. 7, 1772.

**Woolner** (THOMAS), R. A., b. at Hadleigh, Suffolk, Eng., Dec. 17, 1825, ed. at Ipswich; became a distinguished sculptor; was chosen an associate of the Royal Acad. 1871, and an academician Dec. 1874. Among his prin. statues are those of Lord Bacon, and Prince Albert at Oxford, Lord Macaulay and Prof. Whewell at Cambridge, and Lord Lawrence at Calcutta.



**Woolsey** (THEODORE DWIGHT), D. D. Harvard 1847, LL. D. Wesleyan 1845, b. in New York Oct. 31, 1801, grad. at Yale 1820; studied theol. at Princeton; was a tutor in Yale 1823-25; licensed to preach in 1825, and studied the Gr. lang. in Ger. 1827-30; elected prof. of Gr. in Yale in 1831; elected pres. in 1846, resigned this office in 1871; has since resided in New Haven, giving for a time instruction in the law school, and busily occupied in researches and studies chiefly in political science; edited the *Alcibiades* of Euripides, the *Antigone* of Sophocles, the *Electra* of Sophocles, etc.; pub. an *Historical Discourse upon Yale College, An Introduction to the Study of International Law, An Essay on Divorce and Divorce Legislation*, etc. After the death of Prof. Francis Lieber, Pres. W. re-edited, with notes, his work on *Civil Liberty and Self-Government*, also his *Manual of Political Ethics*. Pres. W. was for several yrs. one of the regents of the Smithsonian Inst., and was chairman of the Amer. division of the committee for the revision of the N. T. He was one of the associate eds. of *J.'s Univ. Cyc.*

**Woolwich**, town of Eng., co. of Kent, on the S. bank of the Thames, 9 m. below Lond., has an excellent dockyard, provided with dry and wet docks, from which some of the largest ships of the Eng. navy have been launched. It is also the seat of the chief arsenal of Eng. Pop. 41,695.

**Woonsocket**, R. R. centre, Providence co., R. I., on the Blackstone River, 16 m. from Providence and 37 from Boston. It is noted chiefly for its extensive manufacturing industries, and possesses an unusual prestige by reason of the numerous manufacturing villages that cluster about it and contribute to its trade and general business. Its water-power is the finest on Blackstone River. Contains Harris Inst., with free library of about 7000 vols. Among the leading industries are woollen and cotton mills, rubber works, etc. Pop. pt. 1870, 11,527; 1880, 16,050.

**Woorari**, or **Woorara**. See CURARI.

**Wooster**, city, on R. R., cap. of Wayne co., O., 130 m. W. of Pittsburgh, is the seat of Wooster Univ. Pop. 1870, 5419; 1880, 5840.

**Wooster** (DAVID), b. at Stratford, Conn., Mar. 2, 1710, grad. at Yale 1738; commanded a sloop-of-war in the expedition against Louisburg 1745; went to Europe in charge of a cartel-ship; visited Eng.; was presented at court, and made a capt. in Pepperell's regiment; was appointed col. of the 3d Conn. regiment 1755; served as brig.-gen. in the N. campaigns of 1758-60; was one of the originators of Arnold's expedition for the capture of Ticonderoga Apr. 1775; was appointed brig.-gen. June 22, 1775; succeeded to the command in Canada on the death of Montgomery; became maj.-gen. of State militia 1776; mortally wounded in the defence of Danbury against Tryon, dying there May 2, 1777. A monument was erected by the State in 1854.

**Wooster University**, an inst. of learning at Wooster, Wayne co., O., was organized by joint action of the 4 synods of the Presb. ch. of O. in 1866, 21 acres of forest-land on a commanding elevation 1 m. N. of Wooster being donated as a site, and \$110,000 contributed by citizens of the co. with which a spacious brick building was erected and furnished for recitation-rooms, society halls, etc. A commodious chapel was also added, with rooms for library, museum, and laboratories. Endowment to the amount of \$250,000 was obtained from friends in the State, and liberal contributions were made for a valuable library, extensive museum, and apparatus for the various depts. Three courses of study were projected—classical, philosophical, and scientific—for the collegiate dept.

**Worcester**, woos'ter, city and important R. R. centre, cap. of Worcester co., Mass., near centre of State, in one of the richest and most productive agricultural and manufacturing dists. of N. Eng.

**Manufactures.**—These are various and extensive. Among the prin. are metals and metallic goods, boots and shoes, machinery and woollen goods, steel rails, etc. In 1880 W. had 536 manufactories of various kinds; capital, \$9,776,004; value of products, \$24,138,871.

**Education, Etc.**—W. has an excellent system of graded free schools, which includes a classical and Eng. high school. The R. Cath. Coll. of the Holy Cross is situated on high ground in the S. E. part of the city. The Worcester Co. Free Inst. of Industrial Science, a very important inst., established in 1893, is finely situated in the N. part. There is a State normal school in the city. Among the prin. private schools are the Highland Military Acad., the Worcester Acad., and the Worcester Co. Music School. The city has an electric fire-alarm and works for supplying the city with water. There are two parks. On one, the Old Common, stands the imposing soldiers' monument, designed and executed by Randolph Rogers, and also a monument erected to the memory of Col. Timothy Bigelow, a soldier of the Revolution. Within the city limits lies the beautiful Lake Quinsigamond, which is connected with the central portion of W. by R. R. Its banks are supplied with boat and summer houses. The Mechanic Hall is one of the finest of the kind in the country. W. has a well-endowed city hospital and a home for aged women, 2 State lunatic asylums, and a flourishing free public library, with free reading-rooms. The hall of the Amer. Antiquarian Society, with its library of about 70,000 vols., is here. Its prin. societies for mutual and general improvement are a mechanics' association, with a library, reading-room, and hall; a nat. hist. association, a very successful horticultural society, a law library association, 2 med. societies, and the Worcester Co. Musical Association, celebrated for its annual music festival.

**History.**—The settlement of W. began in Apr. 1674. King Philip's war brought hostile Indians against the settlement, which was broken up for a time. Attempts to re-establish it were harassed by Indian hostilities until 1713, when the settlement became permanent and prosperous. The first city govt. was organized in 1848. Pop. 1870, 41,105; 1880, 58,291; in 1883, about 70,000. [From orig. art. in *J.'s Univ. Cyc.*, by JOHN S. BALDWIN, ED. "WORCESTER DAILY SPX."]

**Worcester**, EARL OF. See TIPTOFT (JOHN).

**Worcester** (EDWARD SOMERSET), SECOND MARQUIS OF, b. at Raglan Castle, Eng., about 1601; received a careful education; spent some yrs. in foreign travel; married in 1628; devoted himself to mathematical and mechanical researches at Raglan Castle; entered the military service of Charles I. in 1641; was known from 1642 by the courtesy title of Lord Herbert; is alleged to have been created earl of Glamorgan by Charles I. Apr. 1, 1644; was sent to Ire. as a secret agent of the king to treat with the Irish R. Caths. 1645; was imprisoned on the discovery of his errand, and at first disowned by the king; was released, and went into voluntary exile in Fr. Mar. 1648; returned to Eng. 1652; was imprisoned in the Tower 1652-55; drew up while in the Tower a little work entitled *A Century of the Names and Scandlings of such Inventions as at present I can call to mind to have Tried and Perfected*, etc. (1663), in which he describes a steam-engine as "an admirable and most forcible way to drive up water by fire," and spent a large sum of money upon the erection of water-works at Vauxhall. D. Apr. 3, 1667. He is recognized as one of the greatest mechanical geniuses that have ever lived.

**Worcester** (JOSEPH EMERSON), LL.D., b. at Bedford, N. H., Aug. 24, 1784, grad. at Yale 1811; taught school at Salem, Mass.; studied theol. 2 yrs. at Andover Sem.; settled at Cambridge, Mass., 1819, and devoted himself thenceforth to the preparation of a series of valuable text-books and of his dict., for which purpose he visited Europe 1830-31. Among his works are *Elements of Geog., Anc. and Modern; Elements of Hist., Anc. and Modern; A Dict. of the Eng. Lang.*, etc. D. Oct. 27, 1865.

**Worcester** (NOAH), D. D., b. at Hollis, N. H., Nov. 25, 1758, received only a common-school education; served 3 yrs. as fifer and file-major in the Continental army 1775-77, being present at Bunker Hill and at Bennington; taught school at Plymouth, N. H.; settled at Thornton, where he was chosen to the legislature; turned his attention to theol.; pub. a *Letter to Rev. John Murray concerning the Origin of Evil*; was pastor of the Congl. ch. at Thornton 1787-1809, receiving a salary of \$200, and made up the deficiency by farming and shoemaking; removed to Salisbury, N. H., 1810; settled at Brighton, Mass.; edited the *Chr. Disciple* 1813-19, and a quarterly magazine, the *Friend of Peace*, 1819-29; founded the Mass. Peace Society in Jan. 1816; was its sec. until 1828; pub. *Solemn Reasons for Declining to adopt the Bap. Theory and Practice; Impartial Review of Testimonies in Favor of the Divinity of the Son of God*, etc. D. Oct. 31, 1837.

**Worcester** (SAMUEL), D. D., brother of Noah, b. at Hollis, N. H., Nov. 1, 1770, grad. at Dartmouth Coll. 1795; was pastor of the Congl. ch. at Fitchburg, Mass., 1797-1802, and thenceforth of the Tabernacle ch. at Salem; became corresponding sec. of the A. B. C. F. M. at its organization in 1810; pub. several sermons and orations, and *Three Letters to Dr. Channing on the Trinitarian controversy*, and edited *Chr. Psalmody*, etc. D. June 7, 1821.

**Worcester** (SAMUEL MELANCTHON), D. D., b. in Fitchburg, Mass., Sept. 4, 1801, grad. at Harvard 1822; studied 1 yr. at Andover; was tutor in Amherst Coll. 1823-25, and prof. of rhetoric and oratory 1825-34; was pastor of the Tabernacle ch. in Salem 1834-60, when he resigned on account of impaired health; was a member both of the Mass. senate and house of reps. Wrote *Essays on Slavery and Memorial of the Tabernacle, Salem*. D. Aug. 16, 1866.

**Worcester County Free Institute**, at Worcester, Mass., was founded by John Boynton of Templeton by a gift of \$127,000; the late Hon. Ichabod Washburn established the machine-shop, and otherwise enlarged the resources of the inst. to a total amount of \$130,000; further endowments by Hon. Stephen Salisbury of \$250,000, and the State of Mass. of \$50,000, increased the available annual income to \$25,000. The school is free to all citizens of Worcester co., and 23 students, residents of Mass. but not of the co. of Worcester, may receive free tuition. Residents of any other place may be admitted upon payment of a tuition fee of \$100 per annum. The inst. offers facilities for acquiring, theoretical and practical knowledge of mechanical engineering, civil engineering, chem., physics, modern langs., and drawing.

**Worden** (JOHN LORIMER), U. S. N., b. in New York Mar. 12, 1818, entered the navy as midpn. Jan. 10, 1834; became lieut. in 1846, commander in 1862, com. in 1868, rear-admiral in 1872; commanded the Monitor in her famous fight with the Merrimack, Mar. 9, 1862, and the Montauk in the attacks on Ft. McAllister of Jan. 27 and Feb. 1, 1863, and the first Ft. Sumter fight Apr. 7, 1863. Near the end of the engagement with the Merrimack, a shell, exploding against the pilot-house of the Monitor, broke one of the great iron logs of which it was composed, and filled his eyes with powder, so that for a long time he was blind.

**Wordsworth** (WILLIAM), b. at Cockermouth, Cumberland, Eng., Apr. 7, 1770, second son of John Wordsworth, atty.-at-law. In his 18th yr. (Oct. 1787) he entered St. John's Coll., Cambridge, at which he was grad. in Jan. 1791. After leaving the univ. he spent over a yr. in Fr., catching the spirit of the Fr. revolution, and embracing it enthusiastically. At the close of 1792 he returned to Eng., with no pecuniary means, with no plans for life, urged by his friends to take orders as a clergyman, but unable to find any inner impulse that way. In 1793 he published 2 little poems, *The Evening Walk* and *Descriptive Sketches*. In 1797 Coleridge paid him a visit, and the 2 were so charmed with each other that they soon after went to Ger. together, providing themselves with funds for the journey by publishing a thin vol. of *Lyrical Ballads*, of which Coleridge's *Ancient Mariner* was the first, and all the rest by W. Returning to Eng. in 1798, W. found his home in the beautiful Westmoreland and Cumberland Lake country, to which Coleridge and Southey also resorted, and from which he and they received the name of "Lake poets." Imbibing the spirit of the Fr. revo-



lution, enthusiastic in behalf of the rights of the people, and earnestly opposed to all social distinctions and privileges which the will of the people had not decreed, it was very easy for him to feel also that poetry should take its direction from the popular heart, and that the true poet should seek to represent exactly the sentiments which the common people feel, and in exactly the lang. which the common people employ. In a narrow circle his poems were at once welcomed with enthusiastic admiration, but with the general public they got little favor. The *Edinburgh Review* ridiculed them unmercifully, and their sale was for a long time small. But he kept on writing; and though he never possessed any sense of humor, and never could make merriment, he was recognized before he died, foremost in his generation, as the poet both of nature and of human life. He was made poet-laureate on the death of Southey in 1843, and d. Apr. 23, 1850.

J. H. SEELYE.

**Wor'man** (JAMES H.), b. at Berlin, Prussia, about 1835, ed. at the univ. of that city; came to the U. S. 1860; became prof. of modern langs. in Knox Coll., Galesburg, Ill.; has been since 1867 librarian and instructor in Drew Theological Sem., Madison, N. J., and on the death of Dr. John McClintock became assistant in the non-biblical dept. of McClintock and Strong's *Cyc. of Biblical Lit.* Author of a *Hist. of Ger. Lit.*, a *Complete Ger. Dict.*, etc.

**Worms** [A.-S. *wurm*; Lat. *vermis*], a name given to numerous invertebrates whose sole common character is the possession of an elongated flexible body. Under the term are embraced the representatives of not only different classes, but forms so diverse in morphological characters that they have been by some naturalists separated under 2 or more of the primary divisions of the animal kingdom. The organization may be of the most primitive and simple character, or it may be of the most complex nature. The development is also so extremely diverse in the different groups that no common characters can by any possibility be formulated for them in contrast with other groups of animals. Even in habitat, too, they are more than usually variable, and to such an extent, indeed, that kindred forms may vary greatly in this respect. Under these circumstances it is impossible to give any generalized characters. (1) The general idea of W., however, is best exemplified in the common earth-W. and the species related to them found in the fresh waters and in the sea (Oligochaeta). (2) Closely related to these are the W. with well-developed and numerous setiform appendages, common in almost every sea (Polychaeta). (3) Another type is manifested under the form of the familiar leech, and for it and the quite numerous species more or less resembling this animal has been established a group of variously assessed value (Discophora or Hirudinea). (4) A fourth form is exemplified in animals resembling, superficially, the *bêche-de-mer*, or holothurians, rather than the typical W. (Gephyrea). (5) A few singular swimming, finned, and comparatively short animals have been segregated under the name Chetognatha. (6) Certain W. passing through a remarkable series of metamorphoses, the first of which greatly resemble those undergone by echinoderms, have been isolated under the name Enteropneusta. (7) More or less elongated, smooth, inarticulated W. are the Turbellarians. (8) Leech-like W., generally provided with one or more suckers, and with the body flattened and inarticulated, typified by the common fluke, are called Trematodes. (9) The tape worms form another group, named Cestodea. (10) A peculiar type of parasitic W. without an intestinal canal and with an armed head is called Acanthocephala. (11) Elongated, round, inarticulated forms of simple structure are the Nematoids. (12) Certain microscopic forms are well known under the name of wheel-animals, Rotatoria, and Rotifera. These several forms have been variously combined. The entire subject-matter is still, however, in a transition stage.

See ASCARIS, TAPEWORM, VERMIFUGES.

**Worms**, town of Hesse-Darmstadt, on the Rhine, is one of the oldest cities of Ger. It was the seat of the diet before which Luther was summoned in 1521. It manufactures leather, tobacco, and soap, and in its vicinity is made the famous Rhenish wine called *Liebfraumilch*. Pop. 19,005.

**Wormseed**, the name given in this country to the fruit of *Chenopodium anthelminticum*, a wild herbaceous plant, native in the U. S., and most commonly met with in the S. States. The plant possesses a peculiar aromatic but disagreeable smell. W. is found in commerce in the form of very minute grains, which have the characteristic odor of the plant. When distilled they yield a volatile oil. In Europe the term "wormseed" is given to the small unexpanded flowers of *Artemisia wahiana*, *A. sieberi*, and *A. culta*. The first (Levant W.) is indigenous in Per. and Asia Minor; the second (Afr. or Barbary W.) is found in E. I. W. Barbary, and Ar.; the third is said to furnish the E. I. W. W. is employed in med. as a vermifuge, but lately santonine has been generally used in its place. In the U. S. the seeds and oil of *Chenopodium anthelminticum* are most generally employed as an anthelmintic remedy.

**Worm-wood** [A.-S. *wermod*; Ger. *Wermuth*; Fr. *absinthe*], the leaves and flower-tops of *Artemisia absinthium*, a perennial plant indigenous in Europe, but naturalized in the U. S. It possesses a strong, peculiar odor and a very bitter, unpleasant taste, which are imparted to its aqueous and alcoholic infusions. The bitter principle of W. is obtained by agitating the concentrated solution so obtained with the leaves with ether, evaporating the solution; or by dilute hydrochloric acid, dissolving in alcohol, precipitating by plumbic acetate, decomposing the solution; or by agitating the concentrated aqueous infusion with animal charcoal, extracting the absinthine therefrom by treatment with alcohol, and then partially purifying it as directed above, afterward by precipitation with tannic acid and crystallization from alcohol. The remaining constituents

of W. are chlorophyll, albumen, fibrine, lignine, starch, and saline matters. It is occasionally employed externally in med. as an antiseptic and discutient, and was formerly used also as a tonic. The volatile oil of W., upon which its active qualities depend, possesses narcotic properties, and in large dose produces epileptiform convulsions, and even death; when mixed with oil of anise, fennel, etc., and dissolved in alcohol, it forms the well-known *liqueur absinthie*.

**Wort** [A.-S. *wort*; Ger. *Wortch*; Fr. *moût*], the sweet infusion of malt obtained in the preparation of beer.

**Wörth**, v. of Alsace, with about 1300 inhabs., at the junction of the Sulzbach and the Sauerbach, is noted as the point where the first decisive encounter took place between the Fr. and Ger. armies, Aug. 6, 1870.

**Worth** (WILLIAM JENKINS), b. at Hudson, N. Y., Mar. 1, 1794. On the outbreak of the war with G. Brit. in 1812 he entered the army as a private soldier, but was appointed, Mar. 10, 1813, a first lieutenant of the 23d Inf. In the campaign of 1814 he was on the staff of Gen. Scott, and engaged in the battles of Chippewa and Niagara, gaining the brevet of capt. and of major. From 1820 to 1822 he was commandant of cadets and instructor of inf. tactics at W. P. t.; was director of the art. school of practice at Ft. Monroe 1829-30, and in garrison there until May 1832, having been brevetted lieutenant in 1824. Appointed col. of the 8th Inf. July 1833, he commanded the N. dept. during the insurrectionary movement on the Canada border 1838-39. In 1840 he was ordered to Fla., and in 1841 placed in command of the army there. During this and the next yr. the hostile Seminoles were subdued. For gallantry in Fla. he was brevetted brig.-gen. Mar. 1, 1842; in 1846 he was again called to the field by the outbreak of the war with Mex. The battle of Monterey was his first opportunity for distinction. He was now brevetted maj.-gen. and placed in command at Monterey, but soon after detached to support the movement under Gen. Scott by way of Vera Cruz, his brigade of regulars making the descent upon that city Mar. 9, 1847. He was one of the coms. to negotiate the terms of capitulation, and in command of the city after the surrender. In the subsequent operations during the march to Mex. he was engaged in the battle of Cerro Gordo, Apr. 17-18. Upon the resumption of active operations in Aug., W. was directed, Aug. 20, to attack San Antonio, which was soon in his possession, and returning he was engaged in carrying the works of Charabusco the same day. His command fought the battle of Molino del Rey Sept. 8, was engaged in the storming of Chapultepec, and of the San Cosme Gate, and the occupation of the City of Mexico, Sept. 13-14, 1847. In Nov. 1848 he was placed in command of the dept. of N. M. and Tex. D. May 7, 1849.

**Worthington**, R. R. June, cap. of Nobles co., Minn., 177 m. S. W. of St. Paul, has a sem. and a public library. Pop. 1880, 636.

**Wotton** (WILLIAM), D. D., b. at Wrentham, Suffolk, Eng., Aug. 13, 1666, was able at 5 to translate chapters and psalms from the Heb., Gr., and Lat. into Eng.; was admitted to Catherine Hall, Cambridge, in his 10th yr., when Dr. John Eachard, master of the coll., certified (Apr. 1, 1676) that his classical attainments were equal to those of Hammond or Grotius; grad. as A. B. at 12, at which time he was acquainted with 12 langs. and was able to repeat an entire sermon after a single hearing; became fellow of St. John's Coll., Cambridge, 1685; took orders in the Ch. of Eng., and was presented with the sinecure living of Llandrillo, Denbighshire, 1691; became chaplain to the earl of Nottingham, who gave him the rectory of Middleton Keynes, Buckinghamshire, 1693; was made prebendary of Salisbury 1705; retired to his Welsh living 1714, and was able soon afterward to preach in Welsh. Author of *Reflections upon Anc. and Modern Learning*, *A Hist. of Rome from the Death of Antoninus Pius to the Death of Severus Alexander*, *Traditions and Usages of the Scribes and Pharisees*, etc. D. Feb. 13, 1736.

**Wounds**, woundz or wovndz. W. are classified according to the nature of the injury, as (1) punctured W., made with pointed instruments; (2) incised W., produced by cutting instruments or sharp edges; (3) lacerated W., in which the borders of the W. are irregular, ragged, and torn, and the result of great force, dull instruments, or tearing; (4) poisoned W., in which either an animal venom or virus or some impure, poisonous, or irritating matter has gained entrance to the injured tissues and contaminated the blood; (5) gunshot W., which as a rule are penetrating and may be lacerated, but are peculiar from other W. owing to the character of the missile, the shock they give to the part and to the nervous system, and the grave complications to which they are liable. (6) Contusions and "contused W." are also classed with W., but the contusion is not properly a W., since there is no actual solution of continuity of the flesh, unless it be an abrasion of the skin; and a contused W. is simply a punctured, incised, or lacerated W. Punctured borders and adjacent tissue are severely contused. Punctured W. are relatively the most serious class, for they are often poisoned by the entrance, if not of venom or virus, of foreign matter, as rust, dust, splinters, clothing, etc., which cause suppuration at the bottom of the deep puncture, and lead to grave inflammation, erysipelas, and contamination of the blood by retained unhealthy pus. The punctured W. is to be well washed, cleansed of all blood-clots and dirt, and if deep or in the vicinity of dense fibrous tissue, as in the hand or foot, or near joints, must be freely cut and converted into an incised W. Incised W. heal in several ways. They heal most promptly and simply when perfectly smooth, clean cuts, free from clotted blood, and in the flesh of persons in perfect health. Thus, a clean cut, whose borders do not gape or separate, may, if instantly closed and sealed from the air by plaster or collodion, heal in a few hours, and approximately warrant the designation "immediate union." More often a day or two is required: the W., being cleansed of clots or foreign matter, is exposed for a moment to the air, and closed either by adhesive



plaster or stiches of silk or silver wire. When a W. has been lacerated, or a considerable area of tissue has been removed, the deficit has to be made up by a slower process of new tissue-growth; new cells develop, one by one, in superimposed strata, until the level of the surface is reached, when the skin begins to heal and shoot over the raw area. This is the process of "healing by granulation." In the granulation the growth of tissue may become exuberant and rise above the surrounding healing parts on the healthy, intact surface. Such excess of granulation is popularly termed "proud flesh." It must be reduced by use of astringents or compression, or destroyed by caustics, and the site stimulated to a healthier action. Poisoned W. (see VENOM). Contusions often call for stimulating lotions, as turpentine and oil, to counteract the shock of the part, and hot cloths to maintain the temperature and restore the circulation when cold. The "antiseptic method" of healing W. consists in using Lister's spray of carbolic acid or thymol at the time of the incision, or of constantly disinfecting the parts by carbolic wash or antiseptic cotton. E. D. HUDSON, JR.

**Wouvermans**, wou-ver-mahns (PHILIP), b. in Haarlem, Netherlands, 1620, became not only the most popular of Dut. landscape painters, but one of the most eminent in the world; he delighted in subjects where horses were prominent, for he rendered them with wonderful spirit and truth. He worked carefully, but rapidly. His catalogued pictures are nearly 800 in number. D. in 1668.

**Wrack** [Fr. *varec*], or **Sea-Wrack**, names applied to many sea-weeds, especially to the Fucaceae, useful as manures and as sources of iodine; also to wrack-grass, eel-grass, or grass-wrack, *Zostera marina*, a naiadaceous plant useful as manure, and extensively used for packing glass and pottery.

**Wrangel**, vrahng'gel (KARL GUSTAV), COUNT, b. Dec. 13, 1613, at Skokloster, the family estate, on Lake Mälar, near Upsala, Swe.; fought in the Thirty Years' war under Gustavus Adolphus, Bernhard of Saxe-Weimar, Bauer, and Torstenson. In 1643 he received the command of the Swe. fleet, but was defeated off the island of Femern, Oct. 13, and shut up in the Bay of Kiel. In 1646 he was made commander-in-chief of the Swe. force in Ger., and defeated the Austro-Bavarian forces repeatedly. Under Charles X. he commanded in the campaigns in Poland (1655) and in Den. (1658), and in 1674 led the army of 16,000 men which suddenly invaded the country of the elector of Brandenburg, who was a member of the coalition against Louis XIV., and stood with his whole force in the Rhine countries. But the Swedes were defeated at Rathenow and Fehrbellin, and driven out of Brandenburg. D. July 1676.

**Wrangell**, von (FERDINAND), BARON, b. in Esthonia about 1795, was ed. in the naval acad. of St. Petersburg; accompanied Capt. Golownin on his journey around the world 1817-19; commanded an expedition to the Polar Sea Nov. 2, 1820-Aug. 15, 1824; made a second voyage around the world 1825-27; was gov. of the Rus. possessions in N. Amer. 1829-34. His account of his polar expedition was pub. in Rus.—*Wrangell's Expedition to the Polar Sea in 1820-23*. The tract of land in the Arctic Ocean bearing his name was found by Capt. Berry, in 1881, to be an island. D. June 6, 1870.

**Wren**, ren, a family of passerine birds, including a number of small, lively, familiar birds, some of them living under the habitations of man, and feeding upon insects and seeds. The form is exemplified in the familiar W. The group comprises the W. of the N. hemisphere and numerous related species, the greater part of which are American. The species of the N. hemisphere are rather plain-looking but prepossessing birds. They are chiefly insectivorous.

**Wren** (Sir CHRISTOPHER), b. at E. Knoyle, Wilts, Oct. 20, 1632, entered Wadham Coll., Ox., at 14; at 21 was elected a fellow of All Souls', being already distinguished; at 25 was appointed prof. of astron. at Gresham Coll., Ox., which 3 yrs. later he resigned for the Savilian professorship. The Royal Society, established soon after the Restoration, owed to him, in considerable measure, its reputation, and even its existence; in 1663 was commissioned to report a plan for the reconstruction of St. Paul's cathedral; visited Paris in 1665. The great fire of 1666, which destroyed a large part of Lond., laid St. Paul's in ruins, and made necessary its entire rebuilding. W.'s scheme for rebuilding the waste city was rejected; his plan for the new cathedral was partially adopted. His fame rests chiefly on St. Paul's cathedral. His other obs. are less admired—St. Stephen's, Wallbrook; St. James's, Westminster; St. Clement's, Eastcheap; St. Martin's, Ludgate; Christ ch., Newgate. The W. towers of Westminster Abbey, the steeples of Bow ch. and St. Bride's, Temple Bar, and Marlborough House were his constructions. D. Feb. 25, 1723.

**Wright** (AMBROSE RANSON), b. Apr. 26, 1826, in Louisville, Jefferson co., Ga., read law when between 14 and 15; was admitted to the bar, and after coming of age opened an office in Louisville. He soon entered the political arena as a Dem. In 1854 he espoused the side of the Amer. party; in 1860 removed to Augusta, Richmond co., and espoused the cause of secession. The secession convention of Ga. appointed him a com. to Md. for the purpose of inducing that State to cast her fortune with her S. sisters. In Apr. 1861 he enlisted as a private in the Confed. Light Guards of the 3d Ga. regiment, and was elected its col. His first service was in the battle of Chicamaucocomo, off the coast of N. C., where, being chief in command, he achieved an important victory. He was subsequently promoted to the rank of brig.-gen., and then to that of maj.-gen. After the surrender of the Confed. armies he resumed the practice of his profession in Augusta; became ed. of the *Chronicle and Sentinel*, one of the leading journals in the S. States, and opposed the reconstruction measures of Cong. In 1872 he was elected a member from the 8th Congressional dist. to the 43d Cong. as a Dem., but d. (Dec. 21, 1872) before taking his seat.

**Wright** (Augustus R.), b. at Wrightsborough, Ga., June 16, 1813, entered the law school in Augusta, and was admit-

ted to the bar in 1834; first settled in Crawfordville, then moved to Cassville. In 1842 he was elevated to the circuit court bench; in 1854 he was elected to the 34th Cong., and was re-elected to the 35th; opposed secession, but yielded to the sovereign will of his State, and espoused the Confed. cause, serving as M. C. After the war he resumed his profession at Rome, Ga.

**Wright** (BENJAMIN), b. in Wethersfield, Conn., Oct. 10, 1770. With his parents in 1788 he settled at Ft. Stanwix (now Rome), N. Y.; became actively employed in laying out the purchases of the new settlers, and laid the foundation for his future success as C. E.; was engaged to make a survey of the Mohawk from Ft. Stanwix to Schenectady, and propose a plan for the improvement of that river; in 1811-12 conducted for the canal coms. a survey of the N. side of the Mohawk from Rome to Waterford, and of the country from Seneca Lake to Rome, thence the S. side of the Mohawk to Albany; was repeatedly elected to the State legislature, and during the war with G. Brit. was appointed co. judge, which office he relinquished in 1816 upon receiving the appointment of engineer of the middle section of the Erie Canal, and to him, with James Geddes, is mainly due the credit of the successful completion of the enterprise; was at different times chief engineer of the Delaware Canal, Chesapeake and O. Canal, Harlem R. R., St. Lawrence Ship-Canal; was street com. of New York 1834; conducted the survey for the route of the New York and Erie R. R. 1834-36, when he returned to Va. D. Aug. 24, 1842.

**Wright** (EDWARD), b. at Garveston, Norfolk, Eng., about 1560, was the projector of the water-supply of Lond. from the New River at Ware; sailed on a voyage to the Azores with George, earl of Cumberland, 1589, in order to study practical navigation; devised the sea-chart now in use under the name of "Mercator's projection;" pub. *Certain Errors in Navigation detected and corrected*; translated from Stevinus *The Haven-Finding Art*, etc.; was mathematical tutor to Prince Henry, son of James I., for whom he caused to be constructed in Ger. a sphere which not only showed the motions of the heavenly bodies, but sufficed to foretell eclipses for 17,100 yrs.; delivered lectures on navigation for the E. I. Co.; wrote a *Description and Use of the Sphere* and a *Short Treatise of Dialling, shewing the Making of all Sorts of Sun-dials*. D. 1615.

**Wright** (ELIZUR), b. at S. Canaan, Conn., Feb. 12, 1804, grad. at Yale 1826; taught in the Lawrence Acad. at Groton, Mass., 1827-28; was prof. of math. and natural philos. in W. Reserve Coll. 1829-33; became sec. of the Amer. Anti-Slavery Society 1833; edited the paper *Human Rights* 1834-35, and the *Quarterly Anti-Slavery Magazine* 1837-38; removed to Boston 1838; became ed. of the *Mass. Abolitionist* Apr. 1839, of the *Daily Chronotype* 1845, and of its successor, the *Boston Commonwealth*, 1850; was com. of insurance for Mass. 1858-66; translated La Fontaine's *Fables*.

**Wright** (GEORGE), b. in Vt. in 1803, grad. at W. P. 1822; served in the Fla. and Mex. wars; was breveted lieutenant-col. for gallantry at Churubusco Aug. 20, 1847; commanded the storming-party at Molino del Rey, where he was wounded Sept. 8, gaining the brevet of col.; was distinguished in campaigns against the Indians of Wash. Terr. 1856 and 1858; became brig.-gen. of volunteers Sept. 28, 1861; commanded the dept. of the Pacific Oct. 1861 to July 1864, and the dist. of Cal. 1864-65, and was drowned July 30, 1865.

**Wright** (GEORGE G.), brother of Joseph A., b. at Bloomington, Ind., Mar. 24, 1830, grad. at the Ind. State Univ. 1839; studied law; removed to Ia. 1840; served as prosecuting atty. 1847; was elected to the State senate 1849; chosen chief-justice of supreme court of the State 1854, and re-elected 1860 and 1865; elected Rep. U. S. Senator 1871.

**Wright** (HENDRICK). See APPENDIX.

**Wright** (HORATIO G.), b. at Clinton, Conn., Mar. 1830, grad. at U. S. Military Acad. 1841; was in 1846 sent to the Gulf coast, and for 10 yrs. had charge of the construction of Ft. Jefferson, and for a portion of that period superintended the construction of Ft. Taylor, Key West, being also charged with the duties of light-house engineer and the improvement of St. John's River. He was commissioned a brig.-gen. of volunteers Sept. 14, 1861, and assigned to the command of a brigade of the land-forces of the Port Royal expedition. In Feb. 1862 he set out from Port Royal with a brigade of volunteers, and by the middle of Mar. had occupied Fernandina, Jacksonville, St. Augustine, and retaken possession of Ft. Marion and Ft. Clinch; commanded a division in the assault on Secessionville, S. C., June 16; was promoted to be maj.-gen. of volunteers in July, and commanded the dept. of the O. until Mar. 1863. In July 1863 he was engaged at Gettysburg on the second and third days of the battle and subsequent pursuit of Lee's army. In the assault on Rappahannock Station (Nov. 7, 1863), he commanded the corps. After the Mine Run affair, in which he led his division, he was called to Wash. as a member of a board to devise modifications of our system of sea-coast defences. Returning to the army in the spring of 1864, he led his division in the severe fighting in the Wilderness and Spottsylvania battles. His subsequent war-record is that of the 6th corps. With the Army of the Potomac he was present at every engagement up to July 1864, when summoned from the front of Petersburg with his corps to the defence of Wash., then threatened by the Confeds. under Gen. Early. In the pursuit which followed the latter's retreat, W. overtook Early, and after a sharp skirmish defeated him at Snicker's Gap. In the ensuing campaign of the Army of the Shenandoah under Sheridan he led his corps at Opequan and Fisher's Hill, and was in command of the Army at Cedar Creek, where Early was hopelessly defeated. The 6th corps was soon after returned to the Army of the Potomac, and bore a prominent part in succeeding operations resulting in the surrender of Lee. At Petersburg it was the first to break through the enemy's lines, thus ending the siege and effecting the capture of the city, and with the cav. it fought the last battle and won the last victory of that army, at



Sailor's Creek, Apr. 6, 1865. Mustered out of volunteer service in Sept. 1866; returned to corps of engineers as lieutenant. Nov. 1865; was brevetted major-gen. Member of board of engineers for fortifications 1867-79; chief of engineers 1879-84; retired Mar. 6, 1884.

**Wright** (Sir JAMES), b. at Charleston, S. C., about 1730. became a lawyer at Charleston; was appointed chief-justice and lieutenant-gov. of S. C. May 13, 1760; became royal gov. 1764; was created a baronet Dec. 8, 1772; managed the affairs of the colony with prudence and success during a long administration, but ultimately became unpopular from his unwavering loyalty to the Crown; was imprisoned by the Revolutionary party Jan. 1776, but soon escaped to Eng.; returned with the fleet 1779, and resumed the govt., which he held until the evacuation of S. C. D. in 1786.

**Wright** (JOHN C.), b. in 1783, settled as a lawyer at Steubenville, O., about 1805; was for many yrs. a judge of the supreme court of O.; was M. C. 1823-29, and was long ed. and proprietor of the *Cin. Gazette*. D. Feb. 13, 1861.

**Wright** (JOSEPH), b. at Bordentown, N. J., in 1756, went with his family to Eng. 1773; became a successful artist; painted a portrait of the prince of Wales; pursued his studies in Paris under the care of Dr. Franklin; painted 3 portraits of Washington, by whom he was appointed first draughtsman and die-sinker in the U. S. mint, the first national coins and medals being his handiwork. D. 1793.

**Wright** (JOSEPH A.), b. in Pa. Apr. 17, 1810, settled at Bloomington, Ind., early in life; studied at the Ind. Univ.; was admitted to the bar 1839; sat in both houses of the legislature; was M. C. 1843-45, gov. of Ind. 1849-57, minister to Prus. 1857-61, U. S. Senator 1861-62, U. S. com. to the Hamburg exhibition 1863, and again minister to Prus. from 1865 until his death, at Berlin May 11, 1867.

**Wright** (ROBERT), b. in Kent co., Md., about 1765, was at one time a member of the State executive council; was U. S. Senator 1801-06, gov. of Md. 1806-09, and M. C. 1810-17, 1821-23. D. Sept. 7, 1826.

**Wright** (SILAS), b. at Amherst, Mass., May 24, 1795, grad. at Middlebury Coll. 1815; studied law; was admitted to the bar 1819; settled at Catons, St. Lawrence co., N. Y.; was appointed surrogate of that co. 1820; became a magistrate and P. M. of Canton; was elected to the State senate as a Dem. 1823; was commissioned brig.-gen. of State militia 1827; was M. C. 1827-29, comptroller of N. Y. 1829-33, and U. S. Senator 1833-44; supported Clay's Compromise bill and defended the removal of the deposits from the U. S. Bank by Pres. Jackson, 1833; opposed the recharter of the U. S. Bank, the distribution of the surplus Federal revenues among the States, and the admission of Tex.; supported the tariff of 1842; maintained, in reference to the abolition of slavery, the right of petition, the inviolability of the mails, and the sovereignty of Cong. over the Terr. 1838; was chosen gov. of N. Y. 1844. D. Aug. 27, 1847.

**Wright** (THOMAS), F. S. A., b. on the Welsh border, near Ludlow, Shropshire, Eng., Apr. 21, 1810, studied at the Ludlow gram. school; grad. at Trinity Coll., Cambridge, 1834; began while an undergraduate to write for *Fraser's* and other magazines upon the archaeological and historical subjects to which he devoted his life; was the originator in Eng. of the annual archaeological congs. (1844), and has successfully conducted the excavations upon several Rom. sites in Brit., especially those which brought to light the remarkable ruins of the Rom. Uriconium at Wroxeter, Shropshire. He has written or edited above 100 vols., nearly all connected with Brit. hist., philology, or archaeology, and was selected by the emp. Nap. III. to translate his *Hist. of Julius Caesar*. Among his original works are *A Dict. of Obsolete and Provincial English*, *A Hist. of Caricature and Grotesque in Lit.*, and *Uriconium, an Historical Account of the Anc. Rom. City*. D. Dec. 23, 1877.

**Wright** (WILLIAM), b. at Clarkstown, N. Y., in 1794, was a volunteer in the war of 1812-15 for the defence of Stonington, Conn.; was mayor of Newark, N. J., 1840-43, a Whig M. C. 1843-47, a Dem. U. S. Senator 1853-59, and again from 1863 to his death, Nov. 1, 1866.

**Wright** (WILLIAM), PH. D., LL.D., b. in Bengal, India, Jan. 17, 1830, was appointed prof. of Arabic in Univ. Coll., Lond., 1855, in Trinity Coll., Dublin, 1856, and in the Univ. of Cambridge 1870; has been employed in the MS. dept. of the Brit. Museum since 1861, and became assistant keeper 1869. He has received the honorary doctorate of laws from the 4 univs. of Cambridge, Dublin, Edinburgh, and St. Andrew's, and that of philos. from the Univ. of Leyden. He has edited in Arabic the *Travels of Ibn Jubair*, etc.; has issued *The Book of Jonah in four Semitic Versions—Chaldee, Syriac, Ethiopic, and Arabic—with Glossaries*; *Anc. Syriac Documents relative to the Earliest Establishment of Christianity in Edessa*, etc.

**Wright's Grove**, Ill. See APPENDIX.

**Wright's Cramp**. See SCRIVENER'S PALSY.

**Writing**, the art of conveying ideas by means of signs inscribed on some material, is either ideographic or phonetic. Ideographic W., again, in which the signs represent the ideas themselves, is either pictorial, representing the ideas by direct imitation of the corresponding objects in nature, or symbolical, representing the ideas by hints or associations. Phonetic W., in which the signs are conveyed, is either syllabic, each sign standing for a syllable, or alphabetic, each sign representing only a single sound.

**Writing-Machines**. This term may include all contrivances for recording, either for mechanical purposes or for preserving lang. written or spoken, as well as to aid in writing. Of the former class are all those means for permanently recording the pressure of phenomena, the investigation of the wind, meteorological phenomena, the investigations of the astronomer, etc. Examples of this class are the steam-engine indicator, the meteorograph, and the delicate recording apparatus now used in large observatories. The latter class are usually termed type-writers, the

simple elements of which are a movement to bring the type into position, an inking device, an impression movement, and means for letter and line spacing. The earliest form perhaps was invented in Eng. in 1714, and many modifications have since been patented in various countries. Attempts have been made to record the spoken word by automatic means. One of these is the machine invented by M. H. Huppinger, a Frenchman, which is about the size of the hand, and is put in connection with the vocal organs, recording their movements on a moving band of paper in dots and dashes. The person using it repeats the words of a speaker after him inaudibly, and this lip-language is afterward written out. A stenographic machine has been invented in Fr., which has a keyboard of 12 black and 12 white keys on a plane, arranged in 3 groups of 4 black and 4 white keys. The keys, operated like a piano, produce indications in ink on a roll of paper, the black keys giving long marks, and the white ones simple dots. These keys may be simultaneously struck, so that the combinations may give several letters or words for every movement of the operator's fingers. It is said that 6 months' practice will enable one to follow a speaker. Attention may here be drawn to the type-wheel used in the recording telegraph, the telephone for conveying to a distance vocal and musical sounds, and the automatic telegraph. Mention may also be made of the Edison electrical pen, which by electricity rapidly moves a needle while the pen is forming the letters on paper as in ordinary writing. The paper, having every line of the letters perforated by the needle, may be placed on carbon paper or other coloring medium, and many impressions taken on paper by simple pressure, the copy receiving the coloring-matter through the fine holes.

**Wry-neck** [named from its habit of twisting the neck in a serpentine manner], the *Funx torquilla*, a common European woodpecker of the group *Yuncinæ*, not represented in the U. S. It is easily tamed.

**Wulfstan, or Wolstan**, b. in Worcestershire, Eng., about 1007, ed. in the monastic school at Evesham, and afterward in the sem. at Peterborough; became a monk and prior of the monastery at Worcester; was appointed bp. of Worcester in 1062, on the promotion of Aldred to the archbishopric of York; offered a vigorous resistance to the efforts of that prelate and of his successor to appropriate the estates of the see of Worcester; paid successful court to William the Conqueror; had the diocese of Worcester transferred to the jurisdiction of the abb. of Canterbury; enjoyed the favor of William Rufus; defended the city of Worcester against the rebels led by Roger de Montgomery, and rebuilt Worcester cathedral. He was the last of the A.-S. prelates. D. Jan. 19, 1095.

**Wurmser, von** (DAGOBERT SIGMUND), COUNT, b. in Alsace in 1734, entered first the Fr., afterward the Aus. army; fought in the Seven Years' war and the Bavarian succession war; was made a gen. in 1787, and appointed military commander in Galicia. In the wars between Aus. and the Fr. republic he achieved some successes on the Rhine, and in 1796 he was sent to It. with a reinforcement of 15,000 men to supersede Beaulieu as commander-in-chief; was defeated by Bonaparte at Castiglione Aug. 5, and compelled to retreat into the Tyrol. At the head of a new reinforcement he advanced toward Mantua a second time, through the valley of the Brenta, but Bonaparte beat him at Rovereto Sept. 4, Bassano Sept. 8, and under the walls of Mantua Sept. 13, and shut him up in the fortress. Alvinzy, who was sent to his rescue, was defeated at Arcole Nov. 15, and Rivoli Jan. 14, 1797, and on Feb. 2 W. capitulated. He was appointed military commander of Hungary, but d. before entering his new position, Aug. 22, 1797.

**Württemberg**, a kingdom forming part of the Ger. empire, and comprising an area of 7675 sq. m., bounded N., W., and S. by Bavaria and Baden, E. by Bavaria; on its S. frontier it is separated from Switz. by Lake Constance. The larger part of it is mountainous, traversed by the Schwarzwald and the Rauhe Alp. The average elevation is 1535 ft.; the highest peak rises 7323 ft. The country is well provided with water. A minor part of it belongs to the basin of the Danube, the rest to that of the Rhine. The Danube traverses the S. part of the country for a distance of 90 m. The Neckar, which rises in the S. E. part of the country, where the Schwarzwald and the Rauhe Alp meet, flows northward to the Rhine for a distance of about 180 m. Lakes are numerous; a part of the Lake of Constance belongs to the country. The climate is moderate and healthy; the soil good and well cultivated. Agriculture is flourishing. Of cereals, spelt, oats, millet, maize, rye, and wheat are raised in abundance, together with leguminous plants and tobacco, hops, chicory, etc. The garden and fruit cultivation is famous. Also, the vine cultivation is considerable; 150,000 emers of wine are annually produced. Cattle-breeding is extensively carried on. The mining, which is chiefly in the hands of the govt., is almost exclusively engaged in the production of iron and salt. The manufacturing industry, supported by the copious water-power, is flourishing and steadily progressing. Noteworthy are the flax spinning and weaving establishments, the manufactures of iron goods and other metal ware—especially represented by the machine-factories of Stuttgart and Esslingen—the tile-works and manufactures of earthenware, glass, and chemicals, the rapidly developing cotton manufactures, the tanneries, the old, celebrated wool manufactures of paper, tobacco, wooden-ware, etc. The commerce is mostly confined to the country itself; the traffic with other countries shows a greater exportation than importation. The principal articles of export are corn, cattle, wood and wooden-ware, wool and woollens, cotton goods, salt, metal-ware, fruit, and wine; and of import, colonial ware, cotton, coal, fancy articles, etc. The navigation on the Neckar, Tauber, Danube, and the minor streams, as well as on Lake Constance, is very lively, and the country is well provided with good



roads and railways. The educational standard of the country is good. There are numerous elementary schools, and education is compulsory. The pop. belongs in the S. part to the Alemannian, in the central to the Swabian, and in the N. E. to the Frankish race. The govt. is a constitutional monarchy. The crown is hereditary also in the female line. The const. dates from Sept. 25, 1819. The representation consists of 2 chambers; the state council consists of the chiefs of the ministries and such persons as the king may call. The military force forms the 13th corps of the Ger. imperial army; it is commanded by a Prus. gen. and is under the inspection of the crown prince of the Ger. empire; the other officers are appointed by the king. For administrative purposes the country is divided into 4 circles—Neekar, Schwarzwald, Danube, and Jaxt. Pop. 1880, 1,971,118. Cap. Stuttgart.

**History.**—In olden times W. was occupied by the Sueves, a Germanic race. Afterward it came under Rom. authority, and out of the Rom. colonies grew up the cities. At the period of the great migration the Alemanni penetrated into the country. In 493 the Franks defeated the Alemanni, and about 900 the duchy of Swabia was formed. The family of the counts of W. first appears in the 11th century. The most remarkable of these counts was Eberhard VII., who was made a duke in 1495. In 1530, W. came under the dominion of Aus. In 1683 the country entered into an alliance with Swe. against Aus., and was fearfully devastated by the imperial troops. In 1796 it became implicated in a war with Fr., and was compelled to cede Mompelgard, but in 1803 Duke Frederick II. Wilhelm Carl received as a compensation the electoral dignity and extensive terrs. On Oct. 3, 1805, an alliance was concluded with Nap. I., and on Jan. 1, 1806, the elector was made a king and his country much enlarged. The kingdom became a member of the Rhenish confederacy, and on May 14, 1809, Ulm, Mergentheim, etc. were added to it, but it had to furnish an army of 18,000 men for the campaign in Rus. By the Treaty of Fulda (Nov. 2, 1813) W. broke its alliance with Fr. and joined the other Ger. princes against Nap. King William (1816-64) gave the const. of Sept. 25, 1819, but pursued a particularistic policy, though leaning toward Aus. His successor, Carl, sided with Aus. in the war of 1866, and the W. army corps was defeated (July 24) at Tauberbischofsheim. On Aug. 13 peace was concluded with Prus. W. paid 8,000,000 florins in war indemnities, and formed an offensive and defensive alliance with Prus. On Nov. 25, 1870, it joined the other Ger. states in the formation of the Ger. empire. [From orig. art. in *J. N. Cyc.*, by AUGUST NIEMANN.]

**Wurtz (HENRY)**, Ph. D., b. at Easton, Pa., June 5, 1828, grad. at Princeton 1848; studied at the Lawrence Scientific School, Cambridge, Mass., and also privately under Prof. John Torrey of New York, giving his chief attention to chem.; became in 1850 assistant in charge of the laboratory of the Yale (now Sheffield) Scientific School at New Haven; was State chemist of N. J. 1854-56, being also engaged on the geological survey of that State; was subsequently prof. of chem. in Queen's Coll., Kingston, Canada, prof. in the National Med. Coll. at Wash., D. C., 1858-59, and chemical examiner in the U. S. patent office 1858-61; edited the *Amer. Gas-Light Journal* 1871-75; has made several important discoveries in chem., among which are the use of sodium in the amalgamation of the ores of precious metals, the determination of alkalies in silicates by fusion with chloride of calcium, and, above all, the discovery of the geometrical laws of the condensation of chemical molecules, first pub. in 1876. Prof. W. has pub. more than 60 scientific papers. He is also the originator of the *dynamic theory of metamorphic heat* in geol. He was one of the assistant eds. of *J. N. Univ. Cyc.*

**Würzburg**, town of Bavaria, on the Main, which here is crossed by a splendid stone bridge of 8 arches, was formerly the cap. of the bishopric of Würzburg. The episcopal palace, built in 1720, is one of the most magnificent royal residences of Europe. The cathedral, built in the 11th century, is an elegant edifice. The univ., with which are connected a magnificent hospital and a library of 100,000 vols., enjoys a great reputation, especially for its med. dept. The city has manufactures of leather, tobacco, cloth, woolen fabrics, and surgical and mathematical instruments. The vicinity produces very fine wine. Pop. 1880, 51,014.

**Wyandotte**, city, on R. R., cap. of Wyandotte co., Kan., at the confluence of Mo. and Kan. rivers, is connected with Kansas City, Mo., by 2 free bridges; contains an acad. and parochial school under the auspices of the R. Cath. Ch., a public library, and a State asylum for the blind. Its prosperity and importance are derived from the machine-shops of Kan. Pacific R. R., the Kan. stock-yards, the Kan. rolling-mills, the immense pork and beef packing-houses, and large cooper-shops located in its outskirts. It is underlain with coal which will pay to mine. Pop. 1870, 2940; 1880, 6149.

**Wyandotte Cave**, in Jennings tp., Crawford co., Ind., 5 m. N. of Leavenworth, a town on the O. River. The cave is in the St. Louis limestone, and is the rival of the Mammoth Cave in extent and grandeur. It has been explored for 23 m. (including the side galleries), and numerous diverging branches have not yet been measured. It has a rich cave-fauna, consisting chiefly of articulate organisms. Epsom salts, nitre, and alum have been procured from the earth of this cave.

**Wyatt (Sir MATTHEW DIGBY)**, F. S. A., b. at Bowle, Wiltshire, Eng., in 1820, studied arch. at the Royal Acad.; arranged and decorated the New Adelphi Theatre 1848; was employed by the Society of Arts to report upon the Exposition of Industry at Paris 1849; was associated as sec. with those members of the Society of Arts who originated the project of the Universal Exposition held at Lond. in 1851; assisted in settling the general plan of the Crystal Palace in Hyde Park, and superintended its erection; superintended the fine arts dept. and the decorations of the Crystal Palace at Sydenham 1852-54, visiting various parts of Europe to

collect works of art; was one of the jurors of the Fr. International Exposition of 1855, for which he had selected and arranged the contributions of the E. I. Co.; became surveyor to the E. I. Co. Dec. 1855, for which he made designs for great public works in India and for several important buildings in Eng.; performed the duties of superintending the transfer to the Crown of the vast properties owned by that corporation at the date of its dissolution in 1859; has since been architect to council of India; was honorary sec. to the Royal Inst. of Brit. Archs. 1855-59; was a com. of the Society of Arts to the Italian Exposition of Industry; was prominently connected with the Brit. Universal Exposition of 1862; received her Majesty's gold medal for architectural excellence 1866; was knighted Jan. 14, 1869, and was Slade prof. of fine arts at Cambridge 1869-72. Wrote *Industrial Arts of the Nineteenth Century, Metal-Work and its Artistic Design*, etc.

**Wyatt (Sir THOMAS)**, b. at Allington Castle, Kent, in 1503, ed. both at Ox. and at Cambridge, where he grad. at St. John's Coll. 1518; became a gentleman of the king's bed-chamber; gained a high reputation at court by his poems, his skill at arms, in music, and in repartee, and his knowledge of continental langs.; officiated as "ewerer" at the coronation of Anne Boleyn July 1533; soon fell into disfavor with the king on her account; was tried for seditious lang., but acquitted and restored to favor; was knighted by the king Mar. 15, 1536; was made high sheriff of Kent early in 1537; was sent as minister to Sp. Apr. 1537, and again along with Bonner in May 1538; returned to Eng. June 1539; was accused by Bonner of treasonable correspondence with Cardinal Pole, but maintained his favor at court; was sent as ambassador to Charles V., whom he accompanied on his journey in Fr. Dec. 1539; aided Cromwell in promoting the match between the king and Anne of Cleves (1540), thereby losing the favor of Henry; was involved in the fall of Cromwell, thrown into prison, and tried on the old charges brought by Bonner, but acquitted June 1541; again recovered the royal favor; was created high steward of the king's manor of Maidstone, and received valuable grants of lands. D. Oct. 11, 1542.

**Wyatt (Sir THOMAS)**, called THE YOUNGER, only son of the above b. at Allington, Kent, about 1521, was imprisoned in the Tower Apr. 1543 for riotous conduct in the streets of Lond.; was released; raised a body of soldiers at his own expense and took part in the siege of Landrecies 1544; commanded the Eng. forces at Boulogne 1545; lived in retirement at Allington until the accession of Mary, when he was involved in a conspiracy against her in favor of Lady Jane Grey; assembled a body of Kentish men under pretext of resisting Mary's marriage with Philip II.; took Rochester Castle Jan. 16, 1554; was joined by the forces sent against him under the duke of Norfolk Jan. 29; marched upon Lond. and entered Southwark Feb. 3; retired to Kingston Feb. 6; returned to Lond. and attempted to surprise Ludgate Feb. 7; was captured, condemned to death Mar. 15, and executed on Tower Hill Apr. 11, 1554.

**Wyattville (Sir JEFFREY)**, originally WYATT, b. at Burton-upon-Trent, Eng., Aug. 3, 1766, was a nephew of James Wyatt, under whom he studied arch.; was selected by George IV. in 1824 to remodel Windsor Castle, a task which employed him the remainder of his life. His great work, *Illustrations of Windsor Castle*, was posthumously edited. D. Feb. 18, 1840.

**Wycherley (WILLIAM)**, b. at Clive, near Shrewsbury, Eng., about 1640, ed. at Angoulême, Fr.; studied at Queen's Coll., Ox.; produced with success in 1673 his play *Love in a Wood*, or *St. James's Park*; was favored by the duke of Buckingham and by the king, who afforded him employment at court; brought out 3 other plays, *The Gentleman Dancing-Master*, *The Country Wife*, and *The Plain Dealer*; having lost favor at court was several yrs. a prisoner for debt in the Fleet until after the accession of James II., by whom his debts were paid and a pension of £200 settled upon him. D. Jan. 1, 1715.

**Wyckoff, wick'off (WILLIAM H.)**, LL.D., b. in New York Sept. 10, 1807, studied 2 yrs. at Hamilton Coll.; grad. at Union Coll. 1828; was for many yrs. from 1828 prin. of the classical dept. of a collegiate school in New York, in which he became a partner; fitted for Columbia Coll. and New York Univ. a larger number of students than any other private inst.; was the founder and ed. for several yrs. of the *Bap. Advocate* (now the *Examiner*); was for many yrs. pres. of the Young Men's City Bible Society and of the Bap. Domestic Mission Society; aided in the organization of the Amer. and Foreign Bible Society 1835, and of the Amer. Bible Union 1850; was corresponding sec. of the former 1846-50, of the latter 1850-77, and was called to the ministry by the Laight St. Bap. ch. 1846. Author of *The Bible Question*, or *the Amer. Bible Society and the Baps.*; *The Bible, its Excellence*, etc. D. Nov. 2, 1877.

**Wycliffe, Wickliffe, or Wiclif, de (JOHN)**, b. at Spenwiel, in the parish of Wycliffe, near Old Richmond, Yorkshire, Eng., probably some yrs. earlier than 1324; took orders; is supposed to have pub. in 1356 his first work, *The Last Age of the Ch.*, in which he argued that the millennium was past, that the world was then under the reign of Satan and of Antichrist, and that the day of judgment was near at hand; was soon led to identify the papacy with Antichrist; about 1360 vigorously attacked the mendicant orders of preachers, who had begun to abound in Eng.; took his degree of D. D., and began to read lectures on divinity at Ox. about 1363; was appointed warden of Canterbury Hall by its founder, Abp. Islip, 1365; was soon unseated by Abp. Langham, the successor of Islip; appealed to the pope, by whom an adverse decision was rendered 7 yrs. later; was appointed chaplain to King Edward III., and wrote against the papal demand for arrears of tribute from the Eng. Crown 1365; was one of 6 coms. sent in Aug. 1374 by Edward III. to Bruges to confer with the papal delegates upon questions of ecclesiastical authority in Eng.; was dur-



ing his absence presented by the king with a prebend in the collegiate church of Westbury, Gloucestershire (Nov. 1375), and with the rectory of Lutterworth, Leicestershire (1376); began to attack the pretensions of the papacy with great vigor; was accused of heresy by Abp. Courtney, and summoned before a convocation of the clergy at St. Paul's, Lond., was attended thither (Feb. 19, 1377) by the 2 most powerful subjects of the kingdom, John of Gaunt and Henry Percy; was directly accused of heresy in 4 bulls issued by Pope Gregory VI. May 1377, by virtue of which he was cited before a clerical synod at Lambeth early in 1378; was saved from active persecution by the intervention in his behalf of the queen-mother, and especially by the breaking out in that year of the great papal schism; began about this time to send out many disciples, who under the name of "poor priests" preached his doctrines in all parts of the kingdom; prepared with the assistance of his pupils a version of the entire Bible into Eng.; lectured at Ox. against transubstantiation 1381, and was condemned by a synod of 12 doctors; was summoned before a clerical convocation at Ox. 1382, when he defended his opinions, presenting 2 confessions of faith in which they were reaffirmed, but in a conciliatory manner; was debarred by royal command from lecturing further at Ox.; retired to his living at Lutterworth, where he continued preaching and writing controversial and expository treatises until his death Dec. 31, 1384. He is called "the morning-star of the Reformation." The Council of Constance, as a preliminary to the martyrdom of John Huss and Jerome of Prague, examined and condemned 45 articles of the doctrines of W. (May 5, 1415), formally declared him a heretic, and ordered his bones to be removed from consecrated ground and cast upon a dunghill. This sentence was not executed until 18 yrs. later, when, on the demand of the antipope Clement VIII., his remains were burned and the ashes thrown into the Swift, a tributary of the Avon.

PORTER C. BLISS.

**Wycliffites.** See WYCLIFFE.

**Wydeham, or Woodville.** See RIVERS, EARL OF.

**Wykeham, wík'am, William of, b.** at Wykeham or Wiekham, Hampshire, Eng., in 1314, of poor parents, was recommended to the notice of Edward III., who received him into his service as clerk of the royal works then being carried on at Henley and at Yethamstead May 1356; became "chief keeper and surveyor of the castles of the king at Windsor, Leeds, Dover, and Hadlee" Oct. 30, 1356; was virtually the arch. of Windsor Castle; took holy orders; became rector of Pulham, Norfolk, 1357, prebendary of Lichfield 1359, of London and Southwell 1361, of Lincoln 1362, of York Mar. 1363, and archdeacon of Northampton and of Lincoln the same yr.; was appointed keeper of the privy seal 1364, sec. of state 1366, bp. of Winchester 1367; was lord chancellor 1367-71; founded St. Mary's Coll., Winchester, and New Coll., Ox., 1373; was deprived of temporalities of his see and excluded from Parl. 1376, but restored on accession of Richard II. (1379); completed his munificent foundation at Ox. 1398; again chancellor 1389-91, and rebuilt Winchester cathedral 1395-1405. D. Sept. 24, 1404.

**Wylie (ANDREW), D. D., b.** in Washington Co., Pa., Apr. 12, 1789, grad. at Jefferson Coll. 1810; was licensed as a Presb. preacher 1812; was pres. of Jefferson Coll. 1812-16, of Washington Coll. 1817-23, and of Ind. Univ. from 1823 to his death, Nov. 11, 1851.

**Wylie (SAMUEL BROWN), D. D., b.** at Moylarg, near Ballymena, Ire., May 21, 1773, grad. at the Univ. of Glasgow 1797; came to Phila. the same yr.; became tutor in the Univ. of Pa. 1798, and in 1801 pastor of the First Reformed Presb. ch. in that city, filling that post 51 yrs.; conducted a private acad. for many yrs.; was a prof. in the theological sem. of the Reformed Presb. Ch. 1809-51; prof. of anc. langs. in the Univ. of Pa. 1838-45, and vice-provost of that inst. 1838-45; was an eminent classical and Oriental scholar, and co-editor of the *Presb. Magazine* 1821-22. Wrote *The Faithful Witness for Magistracy and Ministry upon a Scriptural Basis*, etc. D. Oct. 14, 1852.

**Wyllys (GEORGE), b.** at Fenny Compton, Warwickshire, Eng., about 1590, settled at Hartford, Conn., 1638; was an assistant 1639, deputy gov. 1641, and gov. 1642. D. Mar. 9, 1645.—His son SAMUEL, b. in Eng. in 1632, grad. at Harvard 1653, was an assistant gov. 1654-84. D. May 30, 1709.

**Wyman (JEFFRIES), M. D., b.** at Chelmsford, Mass., Aug. 11, 1814, grad. at Harvard 1833, and at the Harvard Med. School 1837; became demonstrator of anat. and curator of the Lowell Inst. 1839; was prof. of anat. in the Hampden-Sidney Med. Coll. at Richmond, Va., 1843-47, and from the latter date until his death Hersey prof. of anat. in Harvard Univ. He soon began the formation of the Museum of Comparative Anat.; delivered before the Lowell Inst. in 1849 a course of *Lectures on Comparative Anat. and Physiology*; became prof. of comparative anat. in the Lawrence Scientific School at Cambridge; was successively sec. of the Boston Society of Nat. Hist., its curator in different depts., and its pres. 1856-70; was pres. of the Amer. Association for the Advancement of Science 1857; became curator of the Peabody Museum of Archaeology at Cambridge 1866; made first anatomical investigation of the gorilla, and gave it its scientific name. Wrote *The Osteology of Troglodytes gorilla*, *The Anat. of the Nervous System of Rana pipiens*, in the *Smithsonian Contributions*, etc. D. Sept. 4, 1874.

**Wyman (R. H.), U. S. N., b.** July 18, 1822, in N. H., became lieut. in 1850, commander in 1862, capt. in 1866, com. in 1872; served on W. coast of Mex. during our war with that country, and participated at battle of Port Royal, and in 1861 commanded the Pawnee at battle of Port Royal, and in 1863 was many times engaged with the batteries and sharpshooters on Potomac flotilla; was for several yrs. in while commanding Potomac flotilla; was for several yrs. in charge of the hydrographic office, Wash.; became rear-admiral Jan. 15, 1879. D. Dec. 2, 1882.

**Wymore, Neb.** See APPENDIX.

**Wyoming**, one of the Terrs. of the Rocky Mt. region, between 41° and 45° N. lat., 104° and 111° W. lon.; bounded N. by Mont., E. by Dak. and Neb., S. by Col. and Ut., W. by Ut., Id., and Mont.; length from E. to W., 355 m.; width from N. to S., 276 m.; area, 97,890 sq. m. or 62,649,600 acres.

**Topography.**—The main range of the Rocky Mts. enters W. at the N. W., extending in a S. E. direction through the Terr. into Col. The Wind River Mts. are the culminating crests of the main range of the Rocky Mts. in the N. W. part of W. The Snow Mts. lie E. of the Wind River Range, being a prolongation S. from Mont. This range has the valley of the Yellowstone on the W. and that of the Big Horn on the E. The Big Horn Mts. lie still farther E., also in the N. E. part of the Terr. The Rattlesnake Mts. are S. of the Big Horn Mts., near the geographical centre of the Terr. The Black Hills, which constitute the E. foot-hills of the Rocky Mts., occupy part of the E. section of the Terr., extending from Dak. in a S. W. direction. Medicine Bow Mts. are in the S. part of W.; the Sweetwater Range lies on the S. side of Sweetwater River; Bishop, Queen, and Horned Mts. E. of Green River, near the S. boundary of the Terr., being spurs of the Sierra Escalante in Col. The highest peak in the Terr. is Fremont's Peak in the Wind River Range. The sources of Lewis or Snake River, one of the branches of Columbia River, of the Madison and Big Horn, affluents of Mo. River, and of Green River, one of the largest tributaries of the Colorado of the West, are all about the base of this peak. The whole Terr. has an elevation of from 3000 to 8000 ft. above the sea; the Laramie Plains, an excellent grazing region of great extent, are from 5000 to 6000 ft. above the sea.

**Rivers, Lakes, Etc.**—The N. fork of the Platte, with its tributaries, and a few of the smaller affluents of the S. fork of the Platte, drain nearly  $\frac{1}{2}$  of the Terr., the central, S. E., and S. S. E. portions; Green River and its tributaries traverse the S. W. section; the affluents of Lewis or Snake River are formed in the N. W.; while the tributaries of the Yellowstone, the Big Horn, the Tongue, Powder, Little Mo., and Shyenne drain the N. and N. E. of the Terr. In the YELLOWSTONE NATIONAL PARK (which see), of which the greater part is in this Terr., there are several lakes of considerable size.

**Mineralogy.**—The coal-beds along and near Union Pacific Railway, near Evanston and at Rockspring and Carbon stations, are probably lignite, but they are equal to most of the better bituminous coals for all purposes of combustion. They contain from 50 to 54 per cent. of fixed carbon. They are extensively worked. Gold is found and mined in the Sweetwater region and in places on the slopes of Medicine Bow Mts. In the Seminoe Mts. and in the Ferris Mineral dist., as well as at Crow Creek, 90 m. W. of Cheyenne, deposits of both silver and gold have been found and worked. In other localities, especially around Laramie Peak, gold has been discovered. Iron-mines have been opened at Rawlin's Springs, and are yielding large quantities of excellent ore. Copper, lead, gypsum, and petroleum are abundant.

**Soil and Vegetation.**—About 5,000,000 acres are arable land, and not far from 35,000,000 are available for grazing. The mts. are clothed with a thick growth of pine, spruce, and hemlock trees of large size; the foot-hills have some pine, spruce, aspen, walnut, elm, ash, box elder, hackberry, and red cedar of smaller growth, while the river-bottoms are abundantly supplied with 2 species of cottonwood and thickets of willows. As a considerable portion of this Terr. is included in the Great Amer. Desert, the sage-bush (*Artemisia*) and the buffalo-grass are of course very abundant, especially on the Laramie Plains, some of which are alkaline. But these alkaline lands, when irrigated, yield most bountiful crops.

**Zoology.**—The wild animals are the grizzly bear, black bear, wolf, prairie wolf, badger, wolverene, otter, fisher, porcupine, mink, skunk, little ermine, buffalo, elk, mule or black-tailed deer, big-horn or mt. sheep, prong-horn antelope, hare or rabbit, squirrel, prairie-dog, gopher, muskrat, etc.; in all, about 30 species of mammals have been described in the Terr., and 124 species of birds, including 12 birds of prey; many game-birds, including a dozen or more of the duck and teal family; grouse, etc., and many song-birds; there are over 80 species of mollusks. Reptiles are not numerous. Many of the streams abound in mt.-trout, and other fresh-water fish are abundant.

**Climate.**—The average mean temperature of the yr. is for the whole Terr. about 44° F. In the mts. it is in some yrs. as low as 36°, while on the plains in the E. it averages 45° to 46°, and in the Green River region (S. W.) it is about 42°. The summer is for the most part cool. The cold of winter is at times intense, the winds and snow sweeping over the great plains with almost irresistible fury. The annual rainfall varies from 8 to 13 inches.

**Agricultural Productions.**—Very imperfect returns of crops are found in the census of 1880—4674 bushels of wheat, 22,512 bushels of oats, and 78 bushels of rye. The wool clip of 1880 was 601,650 lbs.

**Farm Animals.**—The census of 1880 showed 11,975 horses, 278,073 cattle, 140,225 sheep, and 567 swine.

**Manufactures and Mining.**—There were, in 1880, 57 manufacturing establishments, with \$364,673 capital, employing 391 hands; wages, \$187,738; aggregate products, \$898,491. Coal mined in 1880, 589,595 tons.

**Railroads.**—There were in operation in W., Jan. 1, 1882, 533 m. of R. R. The longest is the U. Pacific (transcontinental) m. of R. R. The Oregon Short Line has 60 m. in W. 464 m. of which is in W.

**Finances.**—The valuation of property for taxation was \$13,621,829, real and personal; rate of Territorial tax, 40 cents on \$100, producing \$37,358. Total raised by taxation, general and local, 1880, \$230,228. The Terr. has no debt. Total local debts, county and town, \$205,402 in 1880.

**Commerce.**—W. has only internal trade by R. R., being without shipping.

**Banks, Etc.**—In 1882 W. had 3 national banks, with \$235,



000 capital, \$83,350 circulation, \$856,004 aggregate deposits. There were 4 private bankers, with \$421,310 deposits.

**Education.**—The number of children of school age (7-21 yrs.) enrolled in public schools was 2907 in 1880, with average attendance of 1920; total expenditure for public schools, \$38,504. W. had 8 newspapers in 1882.

**Churches.**—The Mormon Ch. takes the lead, having 82 chs., 98 high-priests, and 3000 members. The Presb., R. Cath., Bap., and Congl. Chs. have from 1 to 4 chs. each.

**Population.**—1870, 9118; 1880, 20,789 (white 19,437, colored 1352, including 914 Chi. and 140 Indians).

**Principal Cities and Towns.** Pop. 1880.—Cheyenne City (cap.), 8456; Laramie City, 2696; Rawlins, 1451.

COUNTIES.	*Ref.	Pop. 1870.	Pop. 1880.	COUNTY TOWNS.	Pop. 1880.
Albany.....	6-F	2,021	4,628	Laramie City.....	2,696
Carbon.....	6-F	1,308	3,438	Rawlins.....	1,451
Crook.....	5-F	.....	239	.....	.....
Fremont.....	5-D	.....	.....	.....	193
Johnson.....	5-E	.....	637	Buffalo.....	.....
Laramie.....	6-G	2,857	6,409	Cheyenne City.....	3,456
Sweetwater.....	5-E	1,916	2,561	Green River City.....	327
Uintah.....	5-D	856	2,779	Evansville.....	1,277
Total.....		9,118	20,789		

\*Reference for location of counties. See map of Wyoming, etc., in article IDAHO.

† Formed since census of 1880.

**History.**—The oldest white settlement is probably that at Ft. Laramie, where a fur-trading post was established in 1834, rebuilt by the Amer. Fur Company in 1836, and sold to the U. S. in 1849, since which time it has been garrisoned. The Terr. was organized by act of Cong. approved July 25, 1868. There had been no serious fighting with the Indians until 1876, when the Sioux in the Black Hills in the extreme N. E. of the Terr. attacked Gen. Custer's command and totally destroyed it.

#### Governors.

John A. Campbell..... 1869-75 William Hale..... 1882-86  
John M. Thayer..... 1875-78  
John W. Hoyt..... 1878-82

REVISED BY A. R. SPOFFORD.

#### Wyoming, Ill. See APPENDIX.

**Wyoming Valley,** in Luzerne co., Pa., was called *Wyoming* ("great plains") by the Delaware Indians, who, with the Shawnees and the Wyomings (Iroquois), inhabited this region, in later days remarkably productive of anthracite coal of excellent quality. It is traversed by the N. branch of Susquehanna River; was settled in 1762 by people from Conn. The valley includes parts of the tps. of Pittston, Jenkins, Plains, Wilkesbarre, Hanover, Plymouth, Kingston, and Exeter, but the Conn. colony occupied a large tract in Luzerne and several other cos. July 3, 1778, a battle was fought here between about 800 settlers and a body of 400 British troops, 700 Seneca Indians, and some Tories. The settlers were utterly defeated, the Tories and Indian murdering all the prisoners.

**Wythe,** with (GEORGE), b. at Elizabeth City, Va., in 1736, ed. at William and Mary Coll.; was admitted to the bar 1757; soon became eminent as a lawyer; was chosen to the house of burgesses as the representative of William and Mary Coll. 1758; drew up in 1764 a remonstrance addressed to the Brit. Parl. against the Stamp act; was elected to the Continental Cong. Aug. 1775; signed the Dec. of Ind.; was appointed Nov. 1776 to revise the laws of Va.; was chosen speaker of the house of delegates and appointed judge of the high court of chancery 1777; became sole chancellor on the reorganization of that court 1786, filling that post 20 yrs.; was prof. of law at William and Mary Coll. 1779-89; was a member of the Va. convention which ratified the Federal const. 1788; emancipated his slaves toward the close of his life, and furnished them with the means of subsistence. D. June 8, 1806.

**Wytheville,** with/vil, on R. R., cap. of Wythe co., Va. Pop. 1870, 1671; 1880, 1885.

**Wyttenbach** (DANIEL), b. at Berne, Switz., Aug. 7, 1746, studied 1760-64 at the Univ. of Marburg; went thence in 1768 to Göttingen. In 1769 he attracted attention by his *Epistola Critica super Nonnullis locis Juliani Imperatoris ad Dav. Ruhnkenium*; obtained the chair of philos. and lit. at the coll. of the Remonstrants in Amsterdam; was appointed in 1779 prof. of philos. at the Athenaeum of Amsterdam, and in 1779 was invited to succeed Ruhnken in Leyden as prof. of Gr. lit. and library of the Univ. He prepared editions of *Plutarchi de Seris Numinibus Vindicta*, *Selecta principum Græciæ Historicorum*, *Platonis Phædon*, etc. D. Jan. 17, 1820.

## X.

**X**, a letter which represents in Eng. the sound of *ks*. X stands for the numeral 10; *x* in math. is the most frequent symbol for the unknown quantity.

**Xabaten'ses** [from the Fr. *sabot*], one of the names given to the Waldenses, from the wooden shoes they wore, which were distinguished in some way by the sign of the cross upon them.

**Xalapa.** See JALAPA.

**Xalisco.** See JALISCO.

**Xanthine**, or **Xanthic Oxide** [Gr. *ξανθός*, "yellow; "Ger. *Xanthin* or *harnige Säure*], the prin. constituent of a rare form of urinary calculi. It also occurs in human urine, in the spleen and liver, in the muscular flesh of the horse and ox, and in the variety of guano found in the island of Jarvis. It is artificially produced by the reduction of uric acid with sodium amalgam, and by treating *guanine* with nitrous acid. It can also be obtained from xanthic calculi or Jarvis guano, but it is most often prepared from the muscular organs of the horse or ox.

**Xanthippe.** See SOCRATES.

**Xanthophyl** [Gr. *ξανθός*, "yellow," and *φύλλον*, "leaf"], a modified form or product of transformation of *chlorophyll*, the green coloring-matter of leaves. Before separation from the tree, the green matter is changed into other compounds, sometimes yellow and sometimes red, this being the first stage of decay, the final product being brown.

**Xanthoproteic Acid** [Gr. *ξανθός*, "yellow," and *πρωτεϊον*, "chief rank"]. When the fingers are wetted with nitric acid, they become stained of a deep and indelible yellow, which becomes orange-red on the subsequent application of an alkali. Mülder isolated the yellow substance, to which he gave the above name. White of egg and other albuminoid matters give the same compound.

**Xanthorhamnine** [Gr. *ξανθός*, "yellow," and *rhamnus*, a plant], a yellow coloring-matter, contained in the ripe Per. or Tur. berries and in Avignon grains. It appears to be formed by the decomposition of *chrysorhamnine*, which is present in the unripe berries. Its extraction is effected by boiling the ground berries with alcohol, allowing the decoction to stand until the various impurities present settle, then allowing the X. to crystallize, and afterward purifying it by recrystallization from alcohol. It is also obtained upon boiling *chrysorhamnine* with water. It forms yellow crystals, which are easily soluble in water and in alcohol, but do not dissolve in ether.

**Xanthoxylum.** See PRICKLY ASH.

**Xanthus**, city of Lycia. See LYCIA.

**Xavier, de** (FRANCIS). See FRANCIS XAVIER (SAINT).

**Xavierian Brothers**, a R. Cath. community of instructors, founded in 1839 at Bruges by T. J. Kyken (1797-1871). They have several houses in the U. S.

**Xenia**, zee-ne-a [Gr. *ξενία*], those gifts, honors, provisions, and securities which in anc. Gr., where hospitality was a religious duty, and often formed the foundation of important political relations, the host offered the guest. The 13th book of the Epigrams of Martial, which treats of subjects relating to this social feature, is inscribed *Xenia*, and hence Goethe and Schiller took the title under which, in 1797, they pub. in *Musenalmnach* about 400 epigrams.

**Xenia**, city and R. R. centre, cap. of Greene co., O., located in the midst of a highly cultivated agricultural region, 3 m. from Little Miami River, on Shawnee Creek, 65 m. N. E. of Cin. and 52 m. S. W. of Columbus. The town was laid out in the year 1803. X. contains a female coll., theological sem., and numerous mercantile and manufacturing establishments. Pop. 1870, 6377; 1880, 7026.

**Xenocrates**, b. at Chalcedon in 396 b. c., became a pupil of Plato. He accompanied Plato to Syracuse, and went after his death, together with Aristotle, to Asia Minor. Afterward he returned to Athens, and succeeded Speusippus as chief of the Acad., which position he occupied till his death, 314 b. c.—To be distinguished from him is *XENOCRATES* the physician, a native of Aphrodisias in Cilicia, who flourished during the reign of Nero. A little essay by him, *Περὶ τῆς ἀπὸ τῶν Ἐνδύων Τροφῆς* (*De Alimento ex Aquatilibus*), is still extant.

**Xenophanes**, ze-nof-a-nēs, b. at Colophon, Ionia, about 570 b. c., went as an exile to Sic., thence to Magna Græcia, and settled at Elea, where he d. about 480 b. c. He is the founder of the Eleatic School of philos.

**Xenophon**, b. in Athens about 444 b. c., became a disciple of Socrates. In 401 b. c. he followed the younger Cyrus on his expedition against his brother, Artaxerxes Mnemon, as a sort of volunteer in the corps of 10,000 Gr. auxiliaries. After the battle of Cunaxa, X. led the Gr. troops from the Mesopotamian plains, across the mt.-ranges and plateaus of Asia Minor, to Trapezus on the S. shore of Pontus Euxinus, thence to Chrysopolis, opposite Byzantium, and finally to the camp of Thimbrion, the Lacedæmonian gen. who commanded against Tissaphernes and Pharnabazus. In 396 he stayed in the Lacedæmonian camp in Asia under Agesilaus, and all his life through, in his actions and in his writings, he showed a great partiality for Sparta. He accompanied Agesilaus to Gr., and fought on the Lacedæmonian side in the battle of Coronea, 394 b. c. He was then banished from Athens, and settled at Scillus, near Olympia in Elis; thence he was expelled in 371 b. c., after the battle of Leuctra, and took up his residence in Corinth, where he remained till his death, about 354 b. c. Of his historical writings the most remarkable is the *Anabasis*. Of his philosophical writings the most widely known is his *Apomnemoneumata* or *Memorabilia Socratis*. He also wrote *Hellenica*, a hist. of Gr. from the end of Thucydides' hist. to the battle of Mantinea; *Cyropædia*, a sort of political romance; and minor treatises on hunting, finances, etc.

**Xenotime**, a beautiful and interesting mineral, essentially phosphate of yttria, but sometimes containing zirconia, and sometimes cerium oxide. In crystallization dimetric; hardness between fluor-spar and apatite; density about 4.5. Its color varies much.

**Xerxes**, zerk-sēs, king of Per. 486-465 b. c., b. about 519, the eldest son of Darius Hystaspis and Atossa, the daughter of Cyrus; succeeded to the throne on the death of his father in preference to his 3 elder brothers, sons of Darius by his first wife, a daughter of Gobryas, and was the leader of the Per. host against Gr., though without playing any prominent part himself. He was assassinated 465 b. c.

**Ximenes de Cisneros** (FRANCISCO), b. at Torre Laguna, New Castile, Sp., in 1438 or 1437, ed. at the univs. of Alcalá de Henares and Salamanca, where he grad. in both civil and canon law 1456; became a priest; took possession in 1473 of the living of Uzeda, near his native v., against the will of the abp. of Toledo, and on declining to surrender the living was imprisoned 6 yrs. in the tower of Santorcaz; was released and given possession of his benefice 1480; exchanged it for a chaplainship near Sigüenza, where he studied Heb. and Chaldee; entered the Franciscan convent of San Juan de los Reyes in Toledo 1482; acquired a great reputation for sanctity; retired to the secluded mt.-convent of Our Lady of Castañar, where he built with his own hands



a cell in which he passed his time in prayer and meditation; was appointed confessor to Queen Isabella 1492, provincial of his order in Castile 1494, and made his visits of inspection on foot, subsisting on alms; was nominated high chancellor of Castile, abp. of Toledo, and primate of Sp. 1495; retained the austere simplicity of his former mode of life, dispensing the vast revenues of his see chiefly in charities; effected a vigorous reform among the Sp. clergy; founded the Univ. of Alcalá 1498; insisted upon the conquered Moors of Granada receiving Chr. baptism during the residence of the court at Granada 1499, thus giving rise to the rebellion in the Alpujarras 1500; commenced in 1502 the printing at his own expense, at Alcalá de Henares, of the famous Complutensian Polyglot Bible; was the director of most of the public acts of Isabella up to her death in 1504; was mediator between Ferdinand and the archduke Philip in their rival claims upon the regency of Castile; became pres. of the Castilian council of regency on the death of Philip 1506; was appointed by Pope Julius cardinal and inquisitor-gen. of Castile 1507; led an expedition against the pirates of Oran on the Barbary coast 1509; effected the proclamation of Charles V. against the rival pretensions of the partisans of the insane queen Joanna; extended the Inquisition throughout the Sp. dominions; took measures for the protection of the rights of the Amer. Indians and to check the growth of Afr. slavery; introduced reforms into the revenue system. D. Nov. 18, 1517.

**Ximenes de Quesada** (GONZALO), b. in Granada, Sp., about 1500, went to Santa Marta in a judicial capacity 1535; commanded an expedition against Chibcha Indians; penetrated with 500 men into the heart of New Granada; conquered the rich cities of Tunja and Iragua; gained great victories over the Chibchas, and accumulated vast quantities of gold; founded city of Bogota Aug. 6, 1538; went to Sp. 1539; returned with title of marshal 1551; led an expedition in search of El Dorado, and founded city of Santa Agueda 1572. D. Feb. 16, 1579.

**Xisuthrus**. See XYSUTHRUS.

**Xorullo**. See XORULLO.

**Xylene**, or **Xylol** [Gr. *ξύλον*, "wood"], one of the series of coal-tar hydrocarbons, a homologue of benzole or benzene. It is a colorless liquid of little odor, boiling at 139.8°. Longuinine gives its density, at melting ice, .877; the computed density, according to the new view of its constitution, is .8712 at -2° C.

**Xyloidine** [Gr. *ξύλον*, "wood"], an explosive substance discovered by Braconnet in 1832, prepared by dissolving starch in nitric acid; by the addition of water a white explosive compound is precipitated.

**Xylol**. See XYLENE.

**Xyris**. See YELLOW-EYED GRASS.

**Xysuthrus**, king of Babylon at the time when the Deluge occurred. The Chaldaean historian Berosus tells how in the plain of Shinar many people of various descent dwelt together without laws, after the fashion of animals; how Oannes, a monster-god with the head of a man, the body of a fish, and the legs of a woman, arose from the Per. Gulf, sat down among the men of Shinar, and taught them all the arts of civilization. Thus Babylon was built, and Alorus became the first king of the new empire. The last was X. Warned of the coming of the Flood, he built a ship and was saved from the Deluge. When the waters subsided, the ship landed on the mts. of Koordistan.

## Y.

**Y**, as an Eng. vowel, represents our *i*, and has both its sounds, as seen in *by*, *lovely*. As a consonant in Eng. it has a sound analogous to the vowel-sound of long *e* (Eng.). Its consonantal power is that of the Lat., Polish, and Ger. *J*. In pure Eng. words it was intended for the long vowel of *machine*, and was formed from *ii*, written *ij*.

**Yacht**. See APPENDIX.

**Yak**. The yak (*Poephagus grunniens*) is a bovine mammal of Thibet, widely known, chiefly because of the beauty of its tail and the extensive use to which it is everywhere put in the East. It is a large animal, as tall as a large ox, very hairy, and like a bison in appearance. However, the long sweeping tail marks it out as a distinct type. It is generally black or white, or black and white, the latter most commonly. Its hair is not coarse, though long and thick; it can be easily tamed and domesticated. Its hair protects it from the cold of the great mt.-heights which it loves to frequent. It is a most sure-footed animal, climbing over rocks with the agility of a chamois. The Thibetans frequently keep large domesticated flocks of yaks, and the milk of the female yak is much prized. It is very rich and in color yellow, and has a strong but pleasant odor. It has a small head, and horns half covered by a mass of hair, but its eyes are very large, soft, and brilliant. The legs and the neck are short. The yak has over the shoulders an immense mass of hair resembling a hump. It does not low like an ox, but has a peculiar sharp, quick, deep voice, very much similar to the grunt of a boar. The yak is sometimes hunted by large dogs. Its flesh is said to be superior to venison.

**Yale** (ELIOT), F. R. S., b. at New Haven, Conn., Apr. 5, 1648, went to Eng. with his parents when 10 yrs. of age, and never returned to Conn.; went to the E. I. 1678; was gov. of Ft. St. George, Madras, 1687-92; gained a large fortune, and was afterward in Eng. a gov. of the E. I. Co. He made various gifts in books and money to the newly established coll. at his birthplace, in consequence of which his name was in 1718 given to the collegiate building, and applied in the charter of 1745 to the whole inst. D. July 22, 1721.

**Yale College**, "the collegiate school of Connecticut," was chartered by the general assembly of the colony of Conn. in Oct. 1701. The school was formally established at Saybrook in Nov. 1701, though the classes until 1707 were taught at Killingworth (now Clinton), an adjoining town.

After long dissatisfaction and amid much opposition the school was permanently settled in New Haven in 1716, and in 1718 its name was changed to Yale College. In 1745 the present charter was granted by the general assembly, confirming the trustees in all their powers under the title of "the pres. and fellows of Y. C. in New Haven." Down to the period of the Revolution the coll. received from the colonial govt. stated or occasional grants of funds, without which it could hardly have survived. In 1792 the gov., lieutenant, and 6 senior senators of the State were made, *ex officio*, members of the corporation, the State making at the same time a grant valued at \$30,000 to the coll. funds. In 1871 the assembly, with the assent of the corporation, substituted for the 6 senators 6 graduates of the coll., who were chosen, as their successors (one vacancy occurring annually) are also chosen, by the votes of a plurality of graduates of the first degree of 5 yrs.' standing. For the first 100 yrs. instruction was chiefly given by the rector or pres., assisted by 2 or 3 tutors chosen from among the recent graduates and serving for a brief period. The instructors now number about 80, four fifths of whom are permanent officers. As at present constituted, there are 4 depts. of instruction grouped under the name of Y. C.—viz. the depts. of philos. and the arts, of theol., of law, and of med., the first of these including the academical dept., Sheffield Scientific School, the School of the Fine Arts, and the school of graduate instruction.

The course of study in the academical dept. extends through 4 yrs. The requirements for admission are mainly in Gr., Lat., and math., and the first 2 yrs. of the course are given largely to further drill in these branches; while the studies of the last 2 yrs. take a wider range, and about ¼ of the time in these 2 yrs. is given to advanced courses in subjects in which the student has already made some progress, and which he chooses from among a larger number offered to his option. The annual charge for tuition and incidental expenses is \$140. Beneficiary funds help to meet this charge for those who need such relief, to the extent of over \$15,000 yearly. About \$6000 is also disbursed yearly to graduate and undergraduate students in premiums for the encouragement of scholarship. The permanent funds of the dept. are about \$850,000.

The Sheffield Scientific School, begun in 1847 as a school of applied chem., was gradually expanded until in 1890 it received its first considerable endowment from Mr. Joseph E. Sheffield of New Haven, who has since largely added to his original gift. The school provides for advanced and special students in the mathematical, physical, and natural sciences, and also for undergraduates who wish a training leading chiefly in this direction.

The School of the Fine Arts was founded in 1864 by Mr. Augustus R. Street of New Haven, who erected a building for its use and otherwise endowed it. At present instruction is provided in drawing and painting only.

The theological dept. was founded in 1822 in connection with the Congl. denomination, and provides a 4-yr. course.

The law dept., begun as a private school soon after 1800, was not recognized as part of the coll. until 1824. It now offers a 3-yr. course for the degree of LL.B.

The med. dept. was organized in 1813, and in 1814 received a grant of \$30,000 from the State. The requirements for a degree include attendance on 3 yearly courses of lectures.

The coll. library contains upward of 110,000 vols. In the same building is a separate library of about 25,000 vols. There are also special libraries belonging to the theological, law, med., and scientific schools.

The Peabody Museum of Nat. Hist., chiefly of zoology, geol., and mineralogy, was established by a gift of \$150,000 from the late George Peabody of Lond. in 1866. [From orig. art. in *J.'s Univ. Cyc.* by PROF. FRANKLIN B. DEXTER.]

**Yam**, the tuberous root of *Dioscorea sativa*, a climbing woody vine of the order Dioscoreaceae. Many other species of yam are described, but they may be only very strongly marked varieties, since the yam-vine has a tendency to assume various forms. Yams are extensively grown in all warm countries as food. The great tubers are cooked like potatoes, and most kinds are very palatable.

**Yama**, a god of the Hindoo Pantheon. The Y. of the Vedic Hymns is quite a different being from the Y. of the *Puranas*. To the mind of the modern Hindoo, Y. is an Oriental Pluto, the judge of the dead, the luminous lord of the manes, and the monarch of hell. Y., as he appeared to the imagination of the primitive Aryans who first crossed the Indus, was simply an aerial phenomenon, a vague potency, worshipped vaguely. In the *Rig-Veda*, for instance, Y. is represented as being the son of Vivasvat and Suranyu, and the twin-brother of the lustful Yami. Yami tries to entice Y. to become her husband, but he resists resolutely. The god is represented as seated on a buffalo. He is four-armed and of austere aspect. In one hand he holds a mace, in another a noose. He guides the animal on which he is seated by the horns. His garments are of the color of fire, while the complexion of his skin is of a bluish-green. He is frequently crowned, and demons of a dwarfed size are frequently represented as worshipping him at his feet. His eyes are inflamed and bloodshot, and his teeth like a tiger's.

**Yambu**, or **Yembo**, town of Ar. in a hot and arid plain between a chain of barren and steep mts. and an inlet of the Red Sea. It is well built, has a good harbor, and is of great importance as the port of Medina and one of the prin. stations for the pilgrims who visit the holy cities of Ar. Pop. between 6000 and 7000.

**Yancey** (WILLIAM LOWMYER), b. at Ogeechee Shoals, Ga., Aug. 10, 1814, ed. at the North, and admitted to the bar in Abbeville, S. C.; moved to Ala. in 1836; served in both branches of the legislature of 1848; an ardent opponent of national Dem. convention of 1850, and a leader of the secession party of the South; advocated in 1858 the formation of committees of safety in the cotton States; succeeded from



the national Dem. convention at Charleston on the nomination of Douglas; advocated the election of Breckenridge; was reporter of ordinance of secession in Ala. convention Jan. 1861; went to Europe as a Confed. agent, and was subsequently a member of Confed. Cong. D. July 28, 1863.

**Yang-tse-Kiang** (the "son of the great water"), the prin. river of China, rises in E. Tibet from 2 streams which unite in lat. 26° 30' N., lon. 102° E.; flows with a very winding and tortuous course, first S. E., then N., and at last N. E., and enters the Yellow Sea in lat. 32° N., lon. 121° E., through a vast estuary several miles broad. Its entire length is probably more than 3000 m., and it receives from both sides numerous and powerful affluents. The largest vessels can ascend it as far as Hang-kow, 700 m. from its mouth, and it is navigable to within a few miles of its sources.

**Yankee**, *yang'ke*, a term originally employed familiarly to denote natives of the N. Eng. States, was applied during the Amer. Revolution to all the insurgents, and during the c. war was the usual designation given in the "Confederate States" to Union soldiers. In Europe, especially in Eng., it is generally synonymous with Anglo-American.

**Yankee Doodle**, a popular air, considered, especially in parts of the N. States, as one of the national airs. It is reported to have been a popular tune in Eng. during the Commonwealth, at which time its doggerel words originated, Oliver Cromwell being designated as *Yankee Doodle*. Others say that it was the tune originally set to the well-known old Eng. song "Lydia Locket lost her pocket," and that the present words were composed in 1775, by a Brit. sergeant in Boston.

**Yank'ton**, city, on R. R. and Mo. River, cap. of Yankton co., and formerly of Dak., connected by steamers with prin. ports on the Mo. It has 2 colls., and the Dak. Insane Asylum, costing \$100,000. Pop. 1870, 737; 1880, 3431.

**Yard** [*geard*, "hedge," or *gyrdun*, "to gird," Old Sax.], the statutory unit of length in Eng., declared by the act of 5 Geo. IV, 1824, to be "to the pendulum beating seconds in a vacuum at the level of the sea in the lat. of Lond. in the proportion of 36 to 39.1393." The same act declared the standard measure then in custody of the clerk of the House of Commons, bearing the engraved legend, "Standard Yard, 1760," to be the original and genuine standard. This standard was constructed by Bird by direction of a parliamentary committee appointed in 1758, and was a copy of one prepared in 1742 by the eminent horologist and mechanician George Graham, after a careful comparison of the various yards and galls of Henry VII. and Elizabeth, kept in the Exchequer. In the earlier periods of Brit. history the standards of weight and measure were very inexact. As a cloth-measure, the Y. is divided into 4 quarters = 16 nails. For other purposes it is divided into 3 feet = 36 inches, the foot being in general made practically the unit. The Y. is also the unit-base of the measures of length in the U. S. The standards authorized by Cong. to be constructed at the bureau of weights and measures in Wash., and presented to the executive authorities of the several State govts., were for many yrs. adjusted from a scale of 82 inches length divided on brass by Troughton of Lond. for Mr. Hassler, the first chief of the U. S. Coast Survey, the length being taken between the 27th and 83d divisions of the scale; but in 1856 an officially certified copy of the imperial standard Y. was obtained, and the recently constructed Amer. standards have been copies of this. F. A. P. BARNARD.

**Yarkand**, city of E. Toorkistan, in lat. 38° 30' N., lon. 77° 30' E., about 105 m. S. E. of Kashgar, on the left bank of the river Yarkand, is surrounded by an earthen wall and defended by 2 citadels. It is the centre of a very important trade. Caravans from India arrive here, carrying with them the manufactures of Manchester, and through Rus. Toorkistan lines of commerce connect it with the Caspian Sea and Moscow. Its manufactures of silks, cottons, linen, and woollens are important. The city is well built; the houses are mostly of stone; the streets are frequently intersected by canals; the bazaars, caravanserais, and mosques are numerous. Pop. 80,000.

**Yar'mouth**, town of Eng., co. of Norfolk, on a slip of land between the N. Sea and the Yare, along the bank of which runs a quay nearly 2 m. long; the harbor is accessible for vessels of 200 tons burden. It is the prin. seat of the Eng. herring fisheries. Crape and silk goods are manufactured, and a great number of coasting vessels are built here. Pop. 46,211.

**Yar'muk** [from the Talmudic *Jarmok*], a permanent river in E. Pal., which the Grs. called *Hieromax* or *Hieromax*, and which is now called *Sheriat el-Mandhur*, from a Bedouin tribe dwelling on its banks. It is considered the S. boundary of ancient Bashan. Its prin. tributaries drain the Hauran and Jolan. It traverses a limestone region overlaid here and there by basalt. At the end of its course it plunges down a wild gorge and empties into the Jordan, with a strong current 130 ft. wide, about 5 m. S. of the Sea of Galilee. It is full of fish, and lined with oleanders.

**Yarriba**, See YORUBA.

**Yarrow**, or *Milfoil* (*Achillea millefolium*), a European plant of the Compositæ family, nearly allied to camomile, wormwood, and tansy, is found as a common weed in Eng. and the U. S., produces leaves and flowers which have a bitter, astringent taste and an aromatic odor, and yields a blue volatile oil. It was once much used as a vulnerary, and in Swe. is employed by brewers as a substitute for hops.

**Yassy**, See JASSY.

**Yates** (JOSEPH C.), b. at Schenectady, N. Y., Nov. 9, 1768, became a lawyer there; was one of the founders of Union Coll.; served as mayor 1798-1808, as State senator 1806-07, as judge of the supreme court 1808-22, and gov. of N. Y. 1823-25. D. Mar. 19, 1837.

**Yates** (RICHARD), b. at Warsaw, Ky., Jan. 18, 1818, grad. at Ill. Coll., and studied law; served several terms in the Ill. legislature, and in 1850 was elected to Cong. on the Whig ticket; in 1861 was elected gov. of Ill., and took an active

part in raising troops for the Union army; U. S. Senator from Ill. 1865-71. D. Nov. 27, 1873.

**Yates** (ROBERT), b. at Schenectady, N. Y., Jan. 27, 1738, admitted to the bar 1760; settled at Albany; was a member of the committee of public safety 1775, of the provincial cong., and chairman of committee of military operations 1776, of the constitutional convention 1777; was appointed a judge of the supreme court of N. Y. the same yr.; became chief-justice 1779; was a member of the national convention which formed the Federal const. of 1787; retired from the bench 1798, and was appointed a com. to settle disputed land-titles in the "Military Tract," and to settle claims of N. Y. against Vt. D. Sept. 9, 1801.

**Yaupon**, See HOLLY.

**Yawn'ing** consists of a long, deep inspiration, during which the jaws open widely, and slowly close again, with a long, forcible expiration, often accompanied by firm closure of the lids, a slight flow of tears, a flow of saliva, and ringing in the ears, while other muscles of the body may become rigid, particularly the extensors. Y. is excited by mental fatigue or monotony, and also by witnessing the process in others. The dog as well as man possesses the habit of Y. A disordered condition consisting of a rapid succession of yawns has been termed *chama* by medical writers.

**Yazoo City**, cap. of Yazoo co., Miss., on R. R., in Yazoo Valley, one of the richest corn and cotton growing dists. of the South, 60 m. from Vicksburg. Yazoo River is navigable for over 300 m. above the city. Pop. 1880, 2542.

**Yazoo Fraud**, *The*, was the name popularly applied to the sale by Ga. in 1795 of the greater portion of her W. terr. The treaty of peace of 1783 having made the Miss. the W. boundary of the U. S., and the treaty of Beaufort of 1787, between the States of Ga. and Miss., having settled the questions of boundary between these States, the State of Ga. was possessed of a vast and valuable W. terr., including what afterward became the States of Ala. and Miss. In 1789 Ga. sold to the S. C. Yazoo Co., the Va. Yazoo Co., and the Tenn. Co. lands in this terr. estimated at 10,000,000 to 12,000,000 acres for about \$140,000. These sales seem to have been practically inoperative. But in 1795, under a reorganization of the purchasers, Ga. sold to 4 companies—the Ga. Co., the Ga.-Miss. Co., the Upper Miss. Co., and the Tenn. Co.—for \$500,000 an immense body of W. lands. This sale naturally excited the apprehension of the Federal govt., but it created an indignant excitement in Ga. It was charged, with apparent truth, that the legislation necessary for the sale had been obtained by the wholesale bribery of the members of the legislature. In 1796 all acts authorizing the sale were repealed, the purchase-money paid was ordered to be returned, and every vestige of the transaction was obliterated from the records. Having thus cancelled the legislative sale, Ga. ceded all this W. terr. to the U. S. in 1802, and the rights of the purchasers thus became a question for the Federal govt. In 1803 Mr. Madison, sec. of state, Mr. Gallatin, sec. of the treas., and Mr. Lincoln, atty.-gen., appointed by Mr. Jefferson under an act of Cong. to report on the Yazoo claims, recommended compensation in land or money. The popular feeling, however, against the transaction prevented any action by Cong. Chief-Justice Marshall in 1810 held that the original sale by Ga. must be sustained. Consequently in 1814 Cong. appropriated \$5,000,000, to be raised by the sales of the lands, to quiet and extinguish all the Yazoo claims.

**Yazoo River** (the name signifies "river of death" in the Choctaw lang., alluding to the malarial diseases which prevailed upon its shores), a navigable stream of Miss., originates in the Yazoo Pass, Coldwater River, Beaver Dam River, and other bayous and sloughs springing from the E. bank of Miss. River. These join the Tallahatchie, a navigable stream from the N. E., at Polkville, Miss., where the Yokeney also comes in from the E. The Y. proper below this point is 290 m. long, deep, serpentine, and sluggish, and navigable the yr. round. It joins the Miss. 12 m. above Vicksburg.

**Yberville**, See INVERVILLE, D'.

**Yeu'mans** (Sir JOHN), b. at Bristol, Eng., settled in S. C. 1665, at which time he was the introducer of Afr. slaves into the colony; was gov. of S. C. 1671-74; was removed from office for arbitrary conduct. D. 1675.

**Year** [A. S. *gear*; Ger. *Jahr*], the time of one complete revolution of the earth round the sun, or of the apparent revolution of the sun in the celestial sphere. This is the sidereal Y., so called because it is the interval between 2 consecutive returns of the sun to the same point among the stars; the sensible or natural Y., called in astronomy the tropical or equinoctial Y., is the period within which the cycle of the seasons is fully completed. The seasons are dependent on the progressive and periodical changes of the sun's place in declination. The declination is maximum at the tropics and zero at the equinoxes. Hence, the tropical or equinoctial Y. is the interval between 2 successive arrivals of the sun at the same tropic or at the same equinox.

The length of the tropical Y. was approximately ascertained by the anc. Egyptians by measuring, from day to day at noon, the shadow of a vertical gnomon erected for the purpose upon a horizontal plane. The shadow is necessarily minimum on the day of the summer solstice, and the interval between 2 such minima is the number of entire days in the solar Y. A calendar Y. of 365 days would, however, go backward, in reference to the natural Y., about 25 days in a century, and the fact, if not the amount, of its error would soon become perceptible. The Thebans are said to have first discovered that 6 hours must be added to the length of the calendar yr. to prevent this displacement. As, in the practical affairs of life, convenience requires that the Y. should be composed of a definite number of entire days, the fractional excess of about a quarter of a day above 365 is allowed to go on accumulating for 4 yrs., and the fourth Y. is increased by the addition of another day, making it 366. But as the fractional excess is not quite a quar-



ter of a day, falling short that amount by 11m. 18.95s.—a quantity sufficient to amount to 18 hours in a century, or 3 days in 400 Y.—allowance is made for this by omitting the intercalary day in 3 out of every 4 centennial yrs. This is the Gregorian correction.

The epoch of the reformed Julian calendar is Jan. 1, a. c. 45, as reckoned by the chronologists; or Jan. 1, a. c. 44, according to the reckoning of the astronomers. The intercalation was first applied in the Y. 42 a. c., chronological reckoning, and subsequently every third Y., instead of every fourth, as intended, until the 37th Y. of the era, which was the 9th a. c., by chronological reckoning, and was the final leap-Y. of this irregular series. Then, by order of Augustus, for the purpose of correcting the irregularity, the intercalary day was suppressed for 3 successive quadriennia; that is, in the 41st, 45th, and 49th of the era, being the 4th Y. before the birth of our Saviour, the Y. of that event, and the 4th Y. after. The birth of Jesus Christ is assumed, for chronological purposes, to have occurred on the 25th of Dec. in the 45th Y. of the Julian era; and as, by the Julian calendar, Jan. 1 was made the beginning of the Y., the first calendar Y. of the Chr. era commenced 7 days after the event from which it nominally dates, or on Jan. 1 of the 46th Julian Y. The first century of the era terminated, therefore, Dec. 31, A. D. 100, and the 18th century Dec. 31, A. D. 1800.

The Chr. era was only first used for the purposes of chronological reckoning some time in the 6th century, when it was adopted in It. on the recommendation of Dionysius Exiguus, a Lat. monk. It did not become well established in Fr. and Ger. until the time of Charlemagne (A. D. 742-814). The Y. of the Nativity was not then well known, and has never, in fact, been positively ascertained to this day. It was assumed, as above stated, for the purpose of establishing the era, that this Y. was identical with the 45th of the Julian era, and the 46th of that era was made the first of the Chr., the count applying equally to the first day and the last day of that Y. The 145th Julian Y. was, therefore, the 100th Chr. Y., and the first Chr. century ended with its hundredth Y., so named.

The Rom. Y., before the time of Julius Cæsar, began on the 1st of Mar. The civil Y. of the Jews began at the autumnal equinox, through their sacred Y. began at the vernal. The Gr. Y., before the time of Meton, began at the winter solstice; afterward at the summer solstice. The Egyptians, Pers., and other E. peoples began, like the Jews, at the autumnal equinox. The Mohammedan Y., being a lunar Y., has no determinate epoch, but continually goes backward among the seasons. The first of Sept. was the beginning of the Y. in the Eastern Empire, and the same was true in Rus. before the time of Peter the Great. In Fr., under the Merovingian kings, the Y. began Mar. 1; under the Carolingians, Mar. 25; under the Capetians, at Easter; and from 1564 onward, Jan. 1. The anc. N. nations of Europe placed the beginning of the Y. at the winter solstice. In Eng. the Y. began on the 25th of Mar. previously to the adoption of the Gregorian calendar, which took place in 1752. The same usage prevailed in the Brit. Amer. colonies from N. S. to Ga., and was abandoned at the same time.

F. A. P. BARNARD.

**Yearley** (Sir GEORGE), b. in Eng. about 1580, was gov. of Va. 1616, 1619-21, and 1625; member of the council, and promoted many important improvements in Va. D. in 1627.

**Yeast, Yeast-Plant.** See BREAD, FERMENTATION, and TORULA CEREVISIÆ.

**Yeddo of Yedo, now Tokio of Tokel.** See JAPAN. **Yell** (ARCHIBALD), b. in Ky. in 1797, settled in Ark.; was appointed judge of the Terr.; was M. C. 1837-39, and again 1845-46; was gov. of Ark. 1840-44; took part in Mex. war, and was killed at battle of Buena Vista, Feb. 23, 1847.

**Yellow Berries.** See FRENCH BERRIES. **Yellow-Bird,** the common name given in U. S. to 2 varieties of birds, the Amer. goldfinch (*Chrysomitris tristis*) and the yellow-poll warbler (*Dendroica æstiva*).

**Yellow-eyed Grass,** the common name of the Xyridaceæ, an order of endogens chiefly consisting of the *Xyris*, a genus of biennial or perennial rush-like plants with two-edged, sword-shaped leaves. More than 50 species have been described, and 15 are found in the N. U. S., chiefly in sandy swamps and pine-barrens.

**Yellow Fe-ver,** so called because of the peculiar yellow tinge of the skin characterizing it. Y. F. prevails chiefly in tropical and warm climates. When occurring in temperate or cold zones it has been imported in the course of commercial travel. It is indigenous chiefly in the W. I., upper coasts of S. Amer., the borders of the Gulf of Mexico, and the S. U. S. Rigid quarantine of all ships coming from Y. F. localities, and their fumigation before disembarking passengers and cargo, have averted the epidemics formerly so frequent. Y. F. is not now regarded, as formerly, a fever of malarial origin, allied to intermittent and remittent. Y. F. has no definite duration of its period of incubation or formation. In some cases, for 3 or 3 days or more, there will be general lassitude, loss of appetite, and sense of debility. In graver cases the attack may be precipitate and speedily fatal; reversely, there are "walking cases," in which, with jaundice and even mental disturbance, the muscular power is retained. There is usually an initial chill, some headache, and slight increase of temperature. The pulse is but little accelerated. The stomach is irritable at an early date; the mind may be mildly or actively delirious; the skin grows yellow, and vomiting occurs of a tar-like substance, known as "black vomit." This is regarded as a critical or even fatal sign. The average duration is a week. There is no specific treatment. Cold and evaporating lotions to the head may prevent brain symptoms; ice, effervescing waters or champagne in small quantity, and other vesicating waters for the stomach, are valuable. "The remedies for composing the stomach, are valuable. Spanish method"—quiet, discreet nursing, warm drinks, and blanketing, and, later, abundant nutrition—is found to be the most successful means of cure. E. D. HUDSON.

**Yellow-Hammer** [Ger. *Ammer* or *Goldammer*], the *Emberiza citrinella*, a very common and quite handsome European bunting. In G. Brit. it is looked upon with a superstitious dislike, and its nests and eggs are destroyed by the rustic. In It. it is fattened and eaten.

**Yellowlegs,** the *Totanus flavipes*, a N. Amer. snipe, found all along our Atlantic coast. It is a fine game-bird, and is esteemed by epicures.

**Yellow River.** See HOANG-HO.

**Yellow Sea** [Chi. *Whang-Hai* or *Hoang-Hai*], large inlet of the Pacific Ocean on N. E. coast of China, between China proper and the peninsula of Corea. It is rather shallow, and its depth is steadily diminished by the large amount of yellowish mud which the Hoang-Ho and Yang-tse-Kiang carry along with them, and which give it its name.

**Yellowstone Lake and River.** See YELLOWSTONE NATIONAL PARK.

**Yellowstone National Park.** Located mainly in N. W. corner of Wyo. Terr. is a tract of country more remarkable for wonderful curiosities of nature than any other region on the globe. In Feb. 1872 Cong. passed an act reserving an area of about 3575 sq. m. in the N. W. corner of Wyo. Terr., withdrawing it from settlement, occupancy, or sale under the laws of the U. S., dedicating and setting it apart as a public park or pleasuring-ground for the benefit and enjoyment of the people. It extends from lat. 44° 8' to lat. 45° 2', and from the 110th meridian to a short distance beyond the 111th. Its general elevation is high, averaging about 8000 ft., more than 1½ m. The mt.-ranges have a general elevation of from 9000 to 10,000 ft. above the sea-level. The winter extends far into the spring, and it is no unusual thing to find snow covering September's flowers. During July and Aug. the weather is delightful, the thermometer rarely if ever rising higher than 70° F. The air is so dry and invigorating that the cold is not felt as much as higher temperatures are in the moister E. climate. Near the N. E. corner of the park heads Clarke's Fork of the Yellowstone. From the S. W. Snake River, or Lewis's Fork of the Columbia, starts toward the Pacific, while on the W. side Madison and Gallatin rivers, 2 of the 3 branches that unite to form the Mo., have their origin. The largest mass of water in the park is Yellowstone Lake, which lies near the S. E. corner of the park, from the upper part of which Yellowstone River flows in a northerly direction, and after a course of 1300 m. reaches the Mo.

**The Mammoth Hot Springs.**—This group is one of the most remarkable in the limits of the park, and probably has not its equal in grandeur in the world. The steep sides of the hill are ornamented with a series of semicircular basins, with margins varying in height from a few inches to 6 or 8 ft., and so beautifully scalloped and adorned with a kind of bead-work that the beholder stands amazed at this marvel of nature's handiwork. Add to this a snow-white ground; there is every variety of shade of scarlet, green, and yellow. The pools or basins are of all sizes, from a few inches to 6 or 8 ft. in diameter, and from 2 inches to 2 ft. in depth. At the top of the hill there is a broad flat terrace covered more or less with these basins 150 to 300 yards in diameter. Here we find the largest, finest, and most active spring of the group at the present time. The largest spring is very near the outer margin of the terrace, and is 25 by 40 ft. in diameter. The sides of the basin are ornamented with coral-like forms, with a great variety of shades, from pure white to a bright cream-yellow; and the blue sky reflected in the transparent waters gives an azure tint to the whole which surpasses all art. The calcareous deposit around the rim is also most elegantly ornamented, but, like the icy covering of a pool, extends from the edge toward the centre, and this projects over the basin until it is not more than a fourth of an inch thick. These springs have one or more centres of ebullition, and in this group it is constant, seldom rising more than 2 to 4 inches above the surface. From various portions of the rim the water flows out in moderate quantities over the sides of the hill. Whenever it gathers into a channel and flows quite swiftly, basins with sides from 2 to 8 ft. high are formed, with the ornamental designs proportionately coarse; but when the water flows slowly, myriads of the little basins are formed, one below the other, with a kind of irregular system, as it might be called, which constitutes the difference between the works of nature and the works of art. As these waters flow down the sides of the mts., they constantly deposit more or less of this calcareous sediment in almost every possible variety of form. Underneath the sides of many of these pools are rows of stalactites of all sizes, many of them exquisitely ornamented, formed by the dripping of the water over the margins of the basins. One of the most attractive features of this remarkable scene are the old ruins, which indicate the former existence of a far greater number of hot springs than are found at the present time, with here and there a dead geyser-mound.

About 21 m. above the Mammoth Hot Springs is the lower end of the Grand Cañon and Tower Falls. Layers of basalt have been poured out over the basic rocks, of whatever age they may be, at different periods, and at the same time vast quantities of fragments of rocks which were cemented together with a kind of volcanic dust and tufa, forming thick beds of breccia. In the process of erosion by water, hundreds of curious pinnacles and columns, resembling groups of Gothic spires, were carved out of the solid beds of basalt and breccia. About 300 yards above its entrance into the Yellowstone, Tower Creek pours over an abrupt descent of 150 ft., forming one of the most beautiful and picturesque views to be found in any country. It is surrounded with pinnacle-like columns composed of volcanic breccia, rising 50 ft. above the falls and extending down to the foot. The Grand Cañon is about 30 m. in length, carved out of the igneous rocks, with walls varying from 1500 to 2000 ft. in vertical height. The sides of the walls are worn into an almost unlimited variety of forms, as pinnacles, towers,



spires, etc. But the most striking features are the variety and brilliancy of the coloring. The pure whites of the decomposed feldspar are mingled with the sulphur-yellows and streaked with bands of bright red, colored with iron.

Beside the Grand Cañon, the objects of the deepest interest to the traveller are the Upper and Lower falls of the Yellowstone. The two falls are not more than  $\frac{1}{4}$  m. apart. Above the Upper Falls the Yellowstone flows through a grassy meadow-like valley with a calm, steady current, giving no warning until very near the falls that it is about to rush over a precipice 112 ft., and then, within a quarter of a mile, again to leap down a distance of 300 ft. or more. The yellow, nearly vertical wall on the W. side is covered, for 300 ft. or more in height from the bottom, with a dense matting of mosses, sedges, grasses, and other vegetation of the most vivid green, which have sent their roots into the softened rocks, and are nourished by the ever-ascending spray.

At the very source of Yellowstone River is one of the most beautiful sheets of water in the W. — Yellowstone Lake. It is about 22 m. in length and from 12 to 15 in breadth. Its greatest depth was found to be 300 ft. The elevation of the lake above sea-level is 7788 ft. The shoreline of Yellowstone Lake measures over 300 m. The west side of the lake is covered with pine forests, as in the S. end, where also there are many lakelets and considerable marshy ground. The E. side of the lake is also well wooded, but more broken by small open prairies. The country on this side soon rises into a grand mt.-range, from which numerous volcanic peaks rise; prominent among them are Mts. Stevenson and Doane. On the S. W. arm also is an interesting group of springs. At Steam Point, beside the springs, are several steam-jets. At Turbid Lake, 2 m. E. of the lake and back of Steam Point, the springs are mud-springs and sulphur-vents.

**Geyser Basins of Fire-Hole River.**—The geyser basins of the Upper Madison include, altogether, about 75 sq. m. In this area are thousands of springs and geysers, ranging in temperature from the boiling point to cold. The springs are divisible into 3 classes: (1) True geysers, which are agitated at stated intervals, and from which the water is projected. (2) Those which are constantly agitated or always boiling. They rarely have eruptions; most of the mud-springs can also be included under this division. (3) Those which are always tranquil. In the latter the water is generally of a lower temperature, and has a beautiful blue color or often a green tint like that of the beryl. Some of the springs of the Lower Basin merit the title of small lakes.

**Upper Geyser Basin.**—The Upper Geyser Basin has been called the Great Basin, because it contains the prin. geysers. It is about 2 m. long, and will probably average  $\frac{1}{2}$  m. in width. The best view is obtained from the crater of "Old Faithful," at the upper end. Through the Lower Basin the course of the river is almost due N., while in the upper it flows W. of N. Its banks are made of geyserite, the siliceous deposit of the springs, which is literally honey-combed with springs, pools, and geysers that are constantly gurgling, spitting, steaming, roaring, and exploding. Entering the Upper Basin from the N., the traveller passes a series of rapids, at the upper end of which he enters the gateway, as it were, guarded by 2 sentinel geysers, one on either side of the river, that on the left being the most active. Following the river for about 250 yards, he reaches the "Fan Geyser," where there are several orifices from which the water radiates, the streams crossing each other and producing a fan-shaped eruption. A short distance above, on the opposite side of the river, is the "Grotto Geyser," which is easily recognized by the peculiar form of its crater, from which it takes its name. The "Giant" is about 400 ft. S. E. of the Grotto. It has a rough, cone-like crater 10 ft. high, with one side broken down. The orifice from which the water is expelled is about 5 ft. in diameter. This curious crater is near the river's edge, on a platform of deposit measuring 342 yards in circumference. It has seldom been seen in eruption. Following up the river on the S. W. side, the next geyser observed is the "Castle." It is a cone rising a little over 11 ft. above an irregular platform of slinter that measures 75 by 100 ft. and is 3 ft. high. The orifice of the geyser-tube is 3 ft. in diameter and circular, and its throat is lined with large orange-colored globular masses. Near the "Castle" is a beautiful blue hot spring, which has been given the fanciful name of "Circe's Boudoir." The water is perfectly transparent, and so intensely blue that one involuntarily plunges his hand in to see if it is water. The basin is of pure white silica, looking like marble. "Old Faithful," standing at the heading of the valley, is so named from the regularity of its spouting. Its mouth is 6 ft. by 2, in a siliceous mound that rises 11 ft. above the general level. On this mound are small basins whose edges are ornamented with bead-like silica. The eruptions commence with a few abortive attempts, followed by a rapid succession of jets, which soon reach the maximum and then subside, only steam escaping from the orifice. Farther down the river and opposite the "Castle," from which it is distant 460 yards, is the "Grand Geyser." One would scarcely take it for an important geyser unless he witnessed one of its spoutings; for, unlike the others, it has no raised crater. Its basin, which is 52 ft. in diameter, is depressed a foot below the general level. The mouth of the geyser-tube in the centre measures 4 by 2 ft., and from this, about once in 24 hours, a column is thrown to the height of from 175 to 250 ft. The eruption generally consists of 3 periods, after each of which the water sinks completely out of sight.

In the Shoshone Basin, on the W. side of the Great Divide, there is a group of geyser and hot springs not surpassed in beauty and hardly less active than those already noticed in the Fire-Hole. They are located at the extreme W. end of the W. arm of Shoshone Lake, on Shoshone Creek, up which they extend on either side for about  $\frac{1}{2}$  m. [From orig. art. in *J.'s Univ. Cyc.*, by F. V. HAYDEN, LL.D.]

**Yellowthroat**, the *Geothlypis trichas*, a very common warbler of the family Sylvioidae. This familiar little bird is found in nearly every part of N. Amer. Its throat and breast are yellow, and its song is quite pleasant.

**Yellow-wood**, the valuable yellow timber of *Oxleya zanthoxyla*, a noble cederaceous tree of E. Australia. Also the wood of *Cladrastis tinctoria* (once called *Virgilia*), a beautiful leguminous tree, a native of Tenn. and Ky.

**Yem'en** [Ar. *Yaman*, signifying (1) "the right hand or side;" (2) "the south," to one looking E.; (3) "fortunate, happy," corresponding to the Gr. *Εὐδαίμων*, and the Lat. *Felix*], the S. W. prov. of the Ar. peninsula, bounded N. by Hedjaz (including Mecca and Medina), E. by Hadramaut and the great central desert, S. by the Indian Ocean, and W. by the Red Sea. The earliest inhabs. are supposed to have been of the Hamitic race, descended perhaps from Seba and Sheba, son and grandson of Cush (Gen. x. 7). Descendants of the Semitic Sheba (Gen. x. 28) came in afterward; and out of the amalgamation of these 2 peoples grew up the famous Himyarite kingdom, which dates probably from about 700 B. C. The kingdom was conquered by the Abyssinians 325 A. D., by the Pers. 575-97 A. D., and in 628 A. D. submitted to Mohammed. The Turks have been there with but little interruption since 1588 A. D.

**Yenisei**, or **Jenisei**, the prin. river of N. Asia, rises in Mongolia in lat. 51° N., lon. 98° E., flows N. through Siberia, and enters the Arctic Ocean in lat. 72° 30' N., lon. 85° E. Its length is about 3500 m.

**Yes'so**, an island of Japan, between lat. 41° 24' and 45° 31' N., and lon. 139° 40' and 146° 7' E., separated N. from Saghalien by La Pérouse Strait, and S. from the main island by the Strait of Tsugaru. Its area is estimated at 30,000 sq. m.; pop. at 125,000. The surface is mountainous and the soil volcanic. Active volcanoes, solfataras, and hot springs are frequent; coal, petroleum, salt, sulphur, etc. abound. The mts. are covered with forests containing excellent timber and swarming with bears, wolves, and deer. The prin. towns are Matsmai, the cap., and Hakodadi.

**Yew** [A.-S. *eow*], the common name of evergreen coniferous trees of the genus *Taxus*, and sometimes extended to others of the family Taxaceae. Thus, TORREYA (which see) is called stinking yew, etc. The common yew tree (*T. baccata*) of Europe and N. W. Amer. is often planted in churchyards, and, like the cypress and willow, has a funeral character, well supported by its gloomy appearance. Its leaves and seeds are poisonous. Its tough wood was once in great repute for bows; it is very hard, elastic, and durable. The tree is famous for its longevity. Of its varieties, the Irish yew is the finest. Among Amer. yews, *T. floridana* considerably resembles the foregoing. It grows wild in W. Fla. *T. canadensis* is a prostrate sort, very common northward.

**Yezidees**. See DEVIL-WORSHIPERS.

**Ygdrasil**, ig-drah-sil', in Scandinavian mythology, the name of a wonderful world-tree, an ash, whose roots were fastened in the deepest bottom-ground of the universe, while its branches spread far above the highest heavens. Under its 3 roots sprang 3 sacred fountains, the sources of all virtues, and from its leaves fell drops of honey-dew, the sweetest of all blessings. In its top sat an eagle; at its foot lay a serpent; up and down its trunk ran a squirrel trying to make strife between the eagle and the serpent.

**Yokohama**. See JAPAN.

**Yon'kers**, city, on R. R., Westchester co., N. Y., located on the E. bank of Hudson River, 17 m. from New York; steamboats land each way daily. The Nepperhan gives valuable water-power for wool-hat, carpet, and silk factories, etc. The city proper is mainly occupied with first-class residences, and private residences crown the heights on the N. side of the city. The prosperity of the city arises from its large manufacturing interests. Pop. 1870, 18,357; 1880, 18,892.

**York** [Lat. *Eboracum*], cap. of Yorkshire, at the confluence of the Ouse and the Foss, is one of the oldest and—on account of its monuments—most interesting cities of Eng. It is surrounded with walls, and generally closely built, with narrow streets and curious, old-fashioned houses. Its cathedral, built from the 11th to the 14th century, is one of the finest specimens of Gothic arch. In the world. Many of its other chs. and public buildings are also fine edifices, and it has good educational, scientific, and literary insts. Its manufactures and trade are not important. It is the seat of the abp. of York, whose residence is at Bishopthorpe, a short distance from the city, while the old archiepiscopal palace, N. of the cathedral and built in the 12th century, is used as a library. Pop. 54,198.

**York**, city, on R. R., cap. of York co., Neb., 52 m. W. of Lincoln. Pop. 1880, 1259.

**York**, city, on R. R. centre, cap. of York co., Pa., on both sides of Codorus Creek, 100 m. W. of Phila., contains a public library, an acad., collegiate inst., and an orphan asylum. Pop. 1870, 11,003; 1880, 13,940.

**York, Cardinal**. See STUART (HENRY BENEDICT).

**York** (DUKES OF), a title formerly conferred upon younger sons of the kings of Eng., some of whom have come to the throne through the decease of their elder brothers. The first duke was Edmund Plantagenet, fifth son of Edward III., and from him were descended the princes who became kings under the titles of Edward IV., Edward V., and Richard III. The title was held by Charles I. and James II. before their accession to the throne, and was last held by Frederick, second son of George III. (b. Aug. 16, 1763, d. Jan. 5, 1827).

**York and Lancaster, Wars of**. See ROSES, WAR OF THE.

**York River**, the noble tidal estuary of Mattaponi and Pamunkey rivers, which unite at W. Pt., Va., whence it extends E. 40 m. to Chesapeake Bay. On York Spit, at its entrance, stands an iron screw-pile light-house.

**Yorktown**, cap. of York co., Va., situated on R. R. and York River, notable from the 2 sieges which it has sus-



tained. Pop. 1880, 250. On Aug. 1, 1781, Lord Cornwallis posted himself here with a force of something more than 8000 men. In the latter part of Sept. the combined Amer. and Fr. forces under Washington and La Fayette, numbering about 16,000 men, invested Y. On Oct. 9 the siege was opened, and on the 19th Cornwallis surrendered his whole force. This surrender virtually brought the war of the Revolution to a close. The centennial of the surrender was celebrated with great display, the Fr. govt. taking part in the festivities. The second siege of Y. was during the c. war. Gen. Magruder, with about 15,000 Confeds., had taken possession of Y. early in the spring of 1862, and Gen. McClellan, who had about 112,000, opened a siege commencing Apr. 5. The Confeds. were soon largely reinforced by Gen. Johnston, but on May 4 Johnston secretly evacuated the works.

**Yorkville, S. C.** See APPENDIX.

**Yoruba, or Yarriba**, country of W. Afr., in Upper Guinea, bet. lat. 6° and 9° N., and lon. 2° and 6° E., bounded W. by Dahomey, and comprising an area of 70,000 sq. m., with about 3,000,000 inhabs. The surface is an undulating plain. Extensive forests are found of teak, sassawood, ebony, figs, and different kinds of palms, such as the oil, wine, coconut, and fan palm. Elephants, rhinoceroses, lions, panthers, buffaloes, wild-hogs, monkeys, numerous kinds of birds, but only few fish, and serpents of huge size, abound. European animals, cereals, and vegetables have been introduced, but most of them undergo changes when acclimatized; thus, the sheep becomes covered with hair instead of wool. The country contains many large cities, such as Katunga, Adu, Larro, and Janna.

**Yosemite Valley** is a region of remarkable scenic attraction, situated in the Sierra Nevada of Cal. about 150 m. in a direct line a little S. of E. from the city of San Francisco. It was discovered in 1851.

The Y. V. is nearly in the centre of the State of Cal., N. and S., and about midway between the E. and W. bases of the Sierra. It is a level area, about 6 m. in length, and from  $\frac{1}{2}$  m. to 1 m. in width, and is sunk nearly 1 m. in depth below the general level of the adjacent region. This gorge has not a regular form, but while its general direction remains nearly the same, its sides advance and retreat, with angular projections and recesses, thus giving a great variety of outline to the inclosing masses. The river Merced, which heads in the Sierra some 15 m. higher up than the head of the valley, in the group of mts. of which Mt. Lyell is the dominating peak, runs through the Y. with many graceful windings, and gives rise at the head of the valley to remarkable waterfalls. Two branches of the main Merced also enter the valley near its head: one, the Tenaya Fork, which rises in a beautiful mt.-lake of the same name, comes in from the N. E.; the other, the Illilouette, enters from the S. These tributaries join the Merced through deep cañons, as the mt.-gorges in the Sierra are always called; but there are several other smaller streams which also enter the valley, leaping over its walls, and giving rise in almost every instance to interesting falls.

In noticing the details of the scenery of the Y. the valley proper may first be considered. The prominent features here are, the great elevation of the walls which inclose it, the remarkable approach to verticality in these walls, their great height and their wonderful variety and beauty of form. To these features may also be added the attractions of the magnificent waterfalls which occur at various points on both sides of the valley. In entering the Y. the visitor sees before him, on the N. side of the valley, the mass of rock called El Capitan, and, exactly opposite, the Bridal Veil and Cathedral Rocks. At this point the distance across the valley is only 1 m., measured from the summit of the Bridal Veil Rock to that of El Capitan, and at the base of these cliffs there is only just room for the river to pass. El Capitan is an immense block of granite projecting squarely out into the valley, and presenting 2 almost vertical faces, which meet in a sharp edge 3900 ft. in perpendicular elevation. The sides or walls of this mass are bare, smooth, and entirely destitute of vegetation. On the opposite side of the valley is the grand mass of the Cathedral Rocks, divided into 2 parts by a deep notch between them. The most striking face of the larger Cathedral Rock is turned up the valley, but on the side facing the entrance there is a feature of great beauty—namely, the Bridal Veil Falls, made by the creek of the same name, which, as it enters the valley, descends in a vertical sheet of 630 ft. perpendicular, striking there a pile of *débbris*, down which it rushes in a series of cascades, with a vertical descent of nearly 900 ft. more, the total height of the fall being 900 ft. Passing up the valley after entering between the Cathedral Rocks and El Capitan, the level area or river-bottom increases to nearly  $\frac{1}{2}$  m. in width. The walls of the valley continue lofty and broken into the most picturesque forms. Of these the Three Brothers and the Sentinel Rock are the most conspicuous. Nearly opposite the Sentinel Rock is the fall made by the descent of Yosemite Creek down the wall on the N. side of the valley. The vertical elevation of the edge of this fall is 2600 ft., but the descent is not in one unbroken sheet. There is first a vertical fall of 1500 ft., then a descent of 636 ft. in a series of cascades, and finally one plunge of 400 ft. on to a low talus of rocks at the foot of the precipice. At the head of the valley the falls of the Merced River are of great interest. There are 3 of them, with beautiful intervening rapids. The lower one is called the Vernal Fall, and is about 400 ft. in vertical height. The upper, the Nevada Fall, is about 600 ft. in elevation.

The dome-shaped masses of granite which characterize the vicinity of the Y. are also extremely grand. The North Dome, on the N. side of the valley, lends itself to beautiful combinations of scenery. The Sentinel Dome affords a magnificent view from its summit of the valley and its surroundings, and especially of the high Sierras. A projecting cliff, called Glacier Point, a little lower than this, and just on the edge of the valley, is much visited for the sake of

the grand view which it offers of the whole region, but especially on account of its favorable situation with reference to the Half Dome, of which it commands a wonderful view.

The Y. V. was given by Cong. to the State of Cal. in 1864, to be "held for public use, resort, and recreation," to be also "inalienable for all time," with the condition that portions of the valley might be leased, the income arising from such leases to be expended "in the preservation and improvement of the property or the roads leading thereto." The grant is managed by coms. appointed by the gov. of the State. [From orig. art. in *J.'s Univ. Cyc.*, by Prof. J. D. WHITNEY, LL.D.]

**Youatt (WILLIAM)**, b. in Eng. in 1777, was for many yrs. prof. in the Royal Veterinarian Coll., and proprietor and co-editor of *The Veterinarian*, established in 1828. Wrote *The Horse; Sheep, their Breeds, Management, and Diseases; Cattle, etc.*, and *The Complete Grazier*. D. Jan. 9, 1847.

**Youmans (EDWARD LIVINGSTON)**, M. D., b. at Coeymans, N. Y., June 3, 1821, studied chem., physics, and med., although, on account of an attack of ophthalmia which made him blind for several yrs., he could pursue his studies only by the aid of his sister, ELIZA ANNE YOUNG, known by her educational publications. Beside delivering a number of lectures, he pub. *Correlation and Conservation of Forces, Observations on the Scientific Study of Human Nature, The Culture demanded by Modern Life*, etc. In 1871 he founded the "International Scientific Series," and in 1872 the *Popular Science Monthly*.

**Young (ALEXANDER)**, D. D., b. at Boston, Mass., Sept. 22, 1800, grad. at Harvard 1820; taught in the Boston Lat. School 1821-24; studied theol. at Cambridge Divinity School, and was pastor of a Unit. ch. at Boston from 1825 to his death, Mar. 16, 1854. He edited the *Library of Old Eng. Prose-Writers*, the *Chronicles of the Pilgrim Fathers of the Colony of Plymouth*, and the *Chronicles of the First Planters of the Colony of Mass. Bay*.

**Young (ANDREW W.)**, b. at Carlisle, N. Y., in 1802, became ed. of the *Warsaw Sentinel* 1830-31, the *Republican Advocate* 1832-35, and the *Amer. Citizen* 1836. Author of a widely circulated *Introduction to the Science of Govt.*, *The Amer. Statesman, National Economy*, etc.

**Young (ARTHUR)**, b. at Bradfield, Suffolk, Eng., Sept. 7, 1741, managed a large farm at Samford Hall, Essex, 1765-70; travelled through most of the counties of Eng. and Ire. in quest of information on the current methods of farming; made a careful tour through France for a similar purpose; was engaged in practical husbandry from 1779; conducted through 45 vols. the *Annals of Agriculture*, established by him in 1784 at Bury St. Edmund's, and issued at Lond. after 1808, a publication to which George III. sometimes contributed under the name of Ralph Robinson; was sec. to the board of agriculture from 1789 to his death, Apr. 13, 1830. Among his many works may be specified *A Six Weeks' Tour through the S. Counties of Eng. and Wales; Travels, etc., with a View of Ascertaining the Cultivation, Wealth, Resources, and National Prosperity of the Kingdom of Fr.; The Progressive Value of Money as marked by the Price of Agricultural Products, and The Rise of Prices in Europe, etc.* He was one of the most eminent of writers on agriculture.

**Young (BRIAN)**, b. at Whitingham, Vt., June 1, 1891, the son of a farmer; was ed. in the Bap. ch., and trained as a painter and glazier, but joined in 1832 the Mormons at Kirtland, O., and started in 1835 on his first missionary journey. He rose to the highest dignities and acquired an almost boundless influence within the sect by his energy and shrewdness, and by the power of his personality. After the death of Joseph Smith in 1844, he was chosen pres. of the Ch. by the apostles, and from 1846 to 1848 he led the host of the Mormons from Nauvoo across the prairies to Great Salt Lake Valley, where he founded Salt Lake City. In Mar. 1849 a convention was held in that city, a const. was framed, and a State was organized. Cong., however, refused to admit the new State, but the Terr. of Ut. was organized, and Y. was appointed gov. for 4 yrs. Conflicts soon arose with the Federal govt., and the U. S. officers were expelled from the Terr. On Aug. 29, 1852, Y. introduced polygamy as an inst., as the celestial law of marriage, and he carried it through in spite of considerable resistance from a division of the Ch. itself. D. Aug. 29, 1877.

**Young (CHARLES AGUSTUS)**, Ph. D., LL.D., b. at Hanover, N. H., Dec. 15, 1834, grad. at Dartmouth Coll. 1853; was assistant teacher in Phillips Acad., Andover, Mass., 1854-55; studied theol. in Andover Sem. 1855-56; was prof. of math. and natural philos. in W. Reserve Coll., O., 1856-66; was called in the latter yr. to the professorship of natural philos. and astron. at Dartmouth. Prof. Y. was the discoverer, associated with Harkness, of the spectrum of the corona, of the reversal of the solar spectrum by the presence of lower strata of the sun's atmosphere, and of the presence of sulphur, cerium, and strontium in the sun. He was chosen an associate fellow of the Amer. Acad. of Arts and Sciences at Boston in 1871, and a member of the National Acad. of Sciences in 1872. Since 1877 prof. of astron. in the Coll. of N. J. at Princeton.

**Young (EDWARD)**, LL.D., b. at Upham, Hampshire, Eng., in 1684, ed. at Winchester School and at Corpus Christi Coll., Ox.; was tutor to Lord Burleigh, son of the earl of Exeter; took orders in the Ch. of Eng. 1727; was appointed a royal chaplain 1728; became rector of Welwyn, Hertfordshire, 1730. Wrote several successful satires and dramas, and a religious poem, *Night Thoughts*. D. Apr. 13, 1755.

**Young (JAMES)**, LL.D., F. R. S., b. at Glasgow, Scot., July 1811, analyzed about 1847 petroleum from a spring in coal-mines in Derbyshire; obtained from it a lubricating oil for machinery and a lighter oil for burning in lamps; was led thereby to undertake the slow distillation of coal by a process for which he took out a patent, thus created a new and important industry, permanently cheapening the price of light; established coal-oil works at Bathgate, and subsequently at Addiewell, Scot.; acquired a large fortune,



and contributed indirectly to the rise of the vast petroleum industry in Amer.; sent out at his own expense in 1872 an expedition to Central Afr. in search of his early and intimate friend, Dr. Livingston. D. May, 1883.

**Young (JOHN)**, b. at Chelsea, Vt., in 1802, removed in childhood to Livingston co., N. Y.; became a lawyer; sat in the legislature 1831 and 1844-45; was a Whig M. C. 1841-43, gov. of N. Y. 1847-49, and U. S. assistant treas. at New York 1849-52. D. Apr. 23, 1852.

**Young (JOHN)**, G. C. B., **BARON LISGAR**, b. at Baillieborough, co. Cavan, Ire., Apr. 30, 1807, grad. at Corpus Christi Coll., Ox., 1829; was a lord of the treas. under Sir Robert Peel 1841-44, and sec. of the treas. 1844-46; became a privy councillor 1852; was chief sec. to the lord lieut. of Ire. 1852-55, lord high com. of the Ionian Islands 1855-59, gov. of New S. Wales 1861-67; was gov.-gen. of Canada from Sept. 18, 1868, to June 1872.

**Young (JOHN CLARKE)**, D. D., b. at Greencastle, Pa., Aug. 12, 1803, grad. at Dickinson Coll. 1823; studied theol. at Princeton Sem. 1824-26; was a tutor in the Coll. of N. J. at Princeton 1826-28; became pastor of a Presb. ch. at Lexington, Ky., 1828, and was pres. of Centre Coll., Danville, Ky., from 1830 until his death, June 23, 1857. Author of *An Address to the Presb. of Ky., proposing a Plan for the Instruction and Emancipation of their Slaves*; *Universal Education a Pecuniary Gain to a Nation*, etc.

**Young (JOHN RUSSELL)**, b. at Downingtown, Pa., 1841, ed. at the high school in New Orleans; was afterward compositor, reporter, and news ed. in succession on the Phila. Press. Attracting the attention of Horace Greeley, he was offered a position on the New York Tribune, which he accepted in 1863, and became managing ed. He resigned his place on the Tribune at the instance of the Associated Press, whose rules he was said to have violated. Started the *Standard* in 1869; joined the *Herald* staff 1872, and travelled as the special correspondent of that paper with Gen. Grant around the world, about which journey he wrote a book; became minister to China 1882.

**Young (JOSUE MARIE)**, b. at Sanford, Me., in Aug. 1808, became a printer at Portland, Me., and at Chn., O.; was converted to Roman Catholicism 1827; studied for the ministry at Mt. St. Mary's Coll., Emmitsburg, Md.; was ordained 1837; labored many yrs. near Chn.; declined the bishopric of Pittsburgh 1853, and was consecrated, Apr. 23, 1854, bp. of Erie, Pa., where d. Sept. 18, 1866.

**Young (PIERCE)**, M. B., b. in Spartanburg, S. C., in 1838, removed to Ga.; grad. at the military inst. of that State 1857; cadet at W. Ft. 1858; resigned in 1861, and entered the Confed. military service; for gallant and distinguished services rose by successive promotions to the rank of maj.-gen.; in 1863 was elected to Cong. from Ga., and re-elected 1870 and 1872.

**Young (ROBERT ANDERSON)**, D. D., b. at Campbell's Station, Knox co., Tenn., Jan. 23, 1824, grad. at Washington Coll., E. Tenn.; was licensed to preach Jan. 1845; was ordained by Bn.; Paine at Clarksville, Tenn., 1848, and elder by Bp. Andrew at Athens, Ala., in 1850; he filled important stations in the Tenn. conference of the M. E. Ch. S.; was 7 yrs. in the St. Louis conference, and 3 yrs. pres. of Florence Univ., Ala.; has been since May 1873 sec. of board of trust of Vanderbilt Univ.; wrote *Personages*.

**Young Men's Christian Associations** originated in 1844 in Lond., where George Williams invited his fellow-clerks to a meeting and organized the first association. The example was soon imitated in other cities of the country, and at present G. Brit. and Ire. number about 300 associations; Ger. has 200, Hol. 300, Fr. 40, Switz. 30, Belg. 18, etc. In 1851 the Y. M. C. A. was first formed in Montreal, and the growth of these insts. was still more rapid on this continent. The associations in the U. S. and Canada form an international convention, organized in 1854, and State and provincial conventions. Seven conferences of associations of all lands have been held; that of Paris in 1855 limited active membership to "young men who, regarding Jesus Christ as their God and Saviour according to the Holy Scriptures, desire to be his disciples in their doctrine and in their life." The practical test for admission to the Amer. associations is membership of some evangelical ch., a rule adopted in 1869 by the international convention of Portland. Young men of good moral conduct may be admitted, though not members of any ch., but only as associate members—that is, they enjoy all the privileges of active members, but have no influence on the business of the society. The aim of the associations is to be intermediate agents between the chs. and the young men. In 1857 the Ladies' Christian Union of New York was formed, and in 1866 the Young Women's Chr. Association of Boston. There are 47 women's Chr. associations in the U. S. and Canada.

**Youngstown**, city and R. R. centre, cap. of Mahoning co., O., on Mahoning River, 65 m. S. E. of Cleveland, and the same distance N. W. of Pittsburg, contains an endowed acad. There are about 80 coal-mining cos., and the prosperity of the city depends largely upon its coal and iron industries. Pop. 1870, 8075; 1880, 15,435.

**Ypsilanti**, ip-se-lan'ti, city and R. R. centre, Washenaw co., Mich., 90 m. from Detroit, on both banks of the Huron River. In 1807 the first trading-post was established here for the purpose of bartering with the Indians. It contains the State normal school. Pop. 1880, 4984; 1884, 5302.

**Ypsilanti**, the name of a wealthy Gr. family of princely rank, several members of which have become very prominent as enthusiastic champions of the emancipation of the Gr. nation. **CONSTANTINE YPSILANTI** (b. at Constantinople in 1760) was appointed hospodar of Moldavia in 1799, and of Wallachia in 1802, but was dismissed in 1806 on account of his sympathy with Rus. Reinstated in 1807 by Rus. influence, he incited the Servians to revolt, but, unable to carry through the revolution, fled to Rus., and d. at Kiev July 28, 1816.—His eldest son, **ALEXANDER YPSILANTI** (b. at Constantinople in 1783), served in the Rus. army. As chief of the

*Hetaria*, a secret association for the liberation of the Gr. Chrs. in Tur., he raised a revolution in Moldavia in 1821, but was defeated at Dragashan June 19, 1821; fled to Transylvania; was kept for several yrs. in an Aus. dungeon, and d. at Vienna Jan. 31, 1828.—A younger brother of his, **DEMETRIUS YPSILANTI** (b. at Constantinople Dec. 25, 1793), joined the revolution in the Morea in 1821, and distinguished himself at the capture of Tripolizza, the defence of Argos, and the encounter with Ibrahim Pasha at the mills of Lerna. In 1827 he was made commander-in-chief of the whole Gr. army, but some disagreement between him and the pres., Capo d'Istria, caused him to resign his command in 1830. D. at Napoli di Romania Aug. 16, 1832.

**Yre'ka**, city and tp., cap. of Siskiyou co., Cal. Pop. 1870, 1063; 1880, 1059.

**Yu'ba**, city, on R. R., cap. of Sutter co., Cal. Pop. 1870, 998; 1880, 1304.

**Yucatan**, a state and peninsula of Mex., extending between lat. 17° 20' and 21° 30' N., and lon. 87° and 92° 30' W., bounded W. and N. by the Gulf of Mex., E. by the Caribbean Sea, and S. and S. E. by Guatemala, the state of Tabasco, and Brit. Honduras. The peninsula comprises an area of about 60,000 sq. m., with a pop. of about 400,000, and is divided into two states, Yucatan (area, 29,567 sq. m.; pop., 302,319) and Campeachy (area 25,892 sq. m.; pop. 90,413). The E. coast along the Caribbean Sea is rocky, bold, much indented, and presents several good harbors, but both the N. and S. coasts are generally low, sandy, swampy, destitute of harbors, and frequently visited by yellow fever. The interior is hilly and high, gradually sloping down to the coasts, but here the soil is very productive, and the climate, although hot, is salubrious. The rivers are insignificant, with the exception of the Usumasinta, which rises in Guatemala, forms part of the S. boundary, and sends one branch to the Laguna de Terminos. Immense forests cover a large part of the country, and excellent timber, fine cabinet woods, dyewoods, and gums form the prin. items of export. The chief occupation is agriculture, and maize, rice, cotton, indigo, tobacco, hemp, etc., are raised, besides all kinds of tropical fruits.

**Yuc'a**, the name of a peculiar genus of liliaceous plants, natives of N. Amer. from N. J. and from Ia. to Yucatan, but most abundant between the 25th and 35th degrees of N. lat. About a dozen species are well characterized. The stems of the more N. species are subterranean, so that the tuft of dagger-shaped leaves is next the ground, and the more S., arborescent and palm-like in some species, forming a trunk 10 to 20 ft. high, crowned by a dense tuft of prickly-pointed leaves. The root-stocks are replete with mucilaginous and saponaceous matter which, under the name of "amole," serves as a substitute for soap in many Mex. households, is also used by the negroes of the U. S. S., and gives the common name of soap-plant to *Y. angustifolia*, which abounds between the Miss. and the Rocky Mts. A stalk rising from the centre of the crown of foliage bears an ample panicle of large and white lily-like blossoms, showy at all hours, but most so at evening, when the blossoms fully spread. The fruit is dry and capsular in some species, fleshy and baccate in others. The latter are edible and savory. That of *Y. aloifolia*, the "Spanish bayonet," is eaten by the negroes of the coast of S. C. and Ga. under the name of banana, which it somewhat resembles in appearance. A. GRAY.

**Yuk'on River**. See APPENDIX.

**Yule**, a name sometimes given to Christmas. It was originally the name of a heathen festival celebrated at the winter solstice. The burning of the Christmas log, or Y. clog, and the decoration of churches and firesides with green branches, are parts of the old Y. ceremony.

**Yuma**, cap. of Yuma co., Ari. Terr., on the E. shore of Col. River. Prin. business, trade with the interior, mining, and navigation. Pop. 1880, 1200.

**Yus'ef ben Abdel-Rah'man Al-Fehr'i**, last emir of Sp. for caliphs of Bagdad, appointed to this office in 746. But in 753 the Ommiyade dynasty was overthrown in the E., and shortly after a revolution also broke out in Sp. In 755, however, the Arab chieftains assembled at Cordova, and agreed to put an end to the anarchy by electing Abdel-Rah'man ben Moawiyah as king. Y. took arms against this decision, but was killed in the battle of Loxa, in 759.

**Yus'ef ben Taxy'n**, the second prince of the dynasty of the Almoravids in Afr., and the founder of Morocco, was b. at Velad Sahara in 1006. In 1066 he was invited to Sp. by the Moorish king to aid him against Alfonso VI. of Castile. But after the defeat of Alfonso, Y. began to turn his arms against his own countrymen, and by degrees came into possession of the kingdoms of Malaga, Granada, Murcia, Cordova, Seville, Almeria, Badajoz, and Valencia, and in 1103 his son, Aly, was acknowledged as his successor both in Afr. and in Sp. D. in 1106, 100 yrs. old.

**Yu'thia**, city of Siam, Farther India, on the Menam, 40 m. N. of Bangkok, in lat. 14° 40' N., has between 30,000 and 40,000 inhabs., among whom are many Chi. and Burmese. The river, which entirely encircles the city, abounds in fish, and fishing is one of the prin. occupations of the inhabs. Close by is the famous Golden Mountain, a pyramid 400 ft. high and rising in sections, of which the third contains a huge vault, 150 ft. high, in which is placed a golden or gilded statue of Buddha of colossal size.

## Z.

**Z**, the last letter in many alphabets, stands in Eng. for a vocalized sibilant *s*-sound. In Eng. it is named *zed*, in the U. S. *zed* and *zee*. In Scot. *z* was used for *y* up to 1543, as *ze*, *zow*, *zies*, for *ye*, *yow*, *yours*.

**Zabism**. See SABAIISM.

**Zacate'cas**, one of the central states of the Mex. confederation, bounded E. by San Luis Potosi, comprises an area of 22,998 sq. m. It forms part of the large Mex. pla-



teau, and its surface is a vast arid plain, elevated 6000 ft. above the sea, almost destitute of water, unfit for agriculture, but affording pastures for large herds of sheep and goats. This plain is traversed by the Sierra Madre Mts., which are still more barren, but which contain perhaps the richest silver-mines in the world. Pop. 422,006.

**Zacatecas**, town of Mex., cap. of the state of the same name, in a narrow valley between steep precipices, at an elevation of 7746 ft. above the level of the sea. It is generally poorly built, but it contains many elegant residences and several fine chs. Pop. 32,000.

**Zacharias**, pope 741-752, increased the authority and power of the see of Rome very much by persuading Luitprand, king of the Longobards, to cede to him all that he had conquered of the exarchate; by consecrating Pepin le Bref king of the Franks; and by the manner in which he co-operated with Boniface in regulating and consolidating the Ch. in Ger. Personally, he was kind and possessed of literary taste. He bought multitudes of Chr. slaves and liberated them, and translated the dialogues of Gregory the Great into Greek.

**Zacynthus**. See ZANTE.

**Zaire**. See CONGO.

**Zaleucus**, the lawgiver of the Epizephyrian Locrians in Magna Græcia, flourished in the middle of the 7th century B. C., and his code, which was severe, is said to have been the first collection of written laws which the Grs. ever possessed. Of his personal life and of his legislation nothing certain is known.

**Zaluski** (JÓZEF ANDRZEJ), b. at Rawa, present govt. of Warsaw, Poland, in 1701, was a partisan of Stanislaus Leszczyński, who sent him as ambassador to Rome to Pope Clement XII.; was made bishop of Kiew by Augustus III.; spoke with great vehemence in the diet of 1766 against the Dissidents; was arrested at the instance of the Rus. ambassador, and banished to Kaluga, where he died Jan. 9, 1774. On his death he bequeathed his library, over 230,000 vols., to the Polish people, but in 1795 Rus. carried it to St. Petersburg, where it was incorporated with the imperial library.

**Zama** (now *Jama*), town of Numidia, near the Carthaginian frontier, was a very strong place in the time of the Punic wars. Here was fought, on Oct. 19, 202 B. C., the famous battle in which Publius Cornelius Scipio defeated Hannibal, thereby bringing the second Punic war to an end.

**Zambezi**, river of E. Afr., drains an immense terr. extending between lat. 8° and 21° S., and between lon. 14° and 37° E., and enters into the Channel of Mozambique between lat. 18° and 19° S. through several mouths, of which, however, only the Quillimane is navigable.

**Zamia**, a genus of cycadaceous plants, partly tree-like and partly stemless. *Z. integrifolia*, the Coontie (which see) of Fla., produces abundant starch in its root-like stem.

**Zamojski**, the name of a celebrated Polish family of old nobility and immense wealth, of which many members have been prominent in the hist. of Poland since the beginning of the 16th century: (1) JAN ZAMOJSKI, b. Apr. 1, 1541; in 1572 he succeeded in extending the elective franchise so that every nobleman who was able to serve personally in the army, with his own equipment and at his own expense, was entitled to participate in the election of the king; and this manœuvre enabled him to carry the election of Henry of Anjou; when Henry ran away from Poland, Z. established Stephen Báthori, prince of Transylvania, on the throne in 1576. Z. was made commander-in-chief of the Polish army, and fought with brilliant success along the frontiers of the empire against the Tartars, Cossacks, etc. On the death of Báthori in 1586, Sigismund III., son of Johann III. of Swe. and Catharina Jagellonica, was elected king. But Sigismund was weak and suspicious, and Z. was soon superseded by incompetent favorites. The rest of his life he spent away from the court. He d. June 3, 1605, at Zamosc, which he had founded. He wrote *De Senatu Romano*, *Testamentum Joannis Zamorij*, etc.—(2) ANDRZEJ ZAMOJSKI, COUNT, b. in 1716, was made a maj.-gen. in 1754, subsequently a senator, commander-in-chief, and finally, in 1764, grand-chancellor. But in 1767 Z. retired to his estates. Here he introduced many reforms, and even abolished serfdom, which raised a bitter enmity against him among other noblemen. On the invitation of the diet of 1776 he drew up a code of law, comprising an elaborate roved too liberal, however, for the moment. It was not adopted until by the const. of May 3, 1791. D. Feb. 10, 1792.—(3) His grandson, COUNT ANDRZEJ ZAMOJSKI, b. Apr. 2, 1800, was minister of the interior during the revolution of 1830. After the fall of Warsaw he retired to his estates, where he abolished serfdom, founded schools, established the first private bank, introduced steam navigation on the Vistula, issued a periodical, *Annals of Agriculture*, and formed a great agricultural association which held its meetings in Warsaw. Z. was banished and settled in Paris.

**Zane** (EBENEZER), b. in Berkeley co., Va., Oct. 7, 1747, was of Dan. descent; settled on the present site of Wheeling 1770; built there a blockhouse called Ft. Henry, from which he repulsed several assaults made by the Indians during the Revolution; was a disbursing officer under Lord Dunmore; held several other civil and military posts, gaining the rank of col., and became owner of the land where the city of Zanesville, O., now stands. D. in 1811.

**Zanesville**, city and R. R. centre, cap. of Muskingum co., O., on the National Road, at the junction of Licking and Muskingum rivers, 170 m. from Cin., 137 from Cleveland, and 59 from Columbus. Muskingum River S. is navigable for steamboats of light draught to the Ohio the year round. Z. has extensive and various manufactures. In the early hist. of O. (1810-12) Z. was its cap., and the first State-house was erected there. Pop. 1870, 10,011; 1880, 18,113.

**Zanguebar**. See ZANZIBAR.

**Zante** [anc. *Zacynthus*], one of the largest of the Ionian Islands, comprises an area of 164 sq. m., with 39,367 inhabs.

It is of volcanic origin, and earthquakes are frequent, but the plain which occupies the greatest part of its surface is very fertile and produces currants in large quantities, wine of superior quality, citrons, pomegranates, and melons. A peculiar feature are the pitch-wells in the neighborhood of the cap. Zante, which has a good harbor protected by a mole, and carries on a considerable trade. Pop. 16,250.

**Zanzibar**, or **Zanguebar**, the name (1) of a large portion of the E. coast of Afr.; (2) of an island lying 25 m. off this coast; and (3) of a city, the cap. of the island—all belonging to the dominions of the sultan of Zanzibar. The Z. of the mainland extends from lat. 2° N., where it is bounded by the terrs. of the Galias tribes, to Cape Delgado, in lat. 10° 42' S., where it is bounded by the Port. prov. of Mozambique. It is inhabited by heathen tribes of negroes, who in the interior live perfectly independent, while along the coast they acknowledge the authority of the sultan. The products are those common in the tropical zones. The heat is excessive.—The island of Z., 48 m. long and 30 m. broad, is in lat. 6° S. It is of coral formation, low, flat, but exceedingly fertile, well watered by numerous rivulets, and with a healthy and equable climate. The inhabs., numbering about 250,000, consist partly of Arabs, partly of free negroes, who carry on its trade. The whole island is cultivated like a garden, and rice, sugar, coconuts, cloves, and fruit of the finest quality are raised in abundance.—The city of Z., the residence of the sultan, contains about 65,000 inhabs., and carries on a considerable trade, exporting gum-copal, cloves, ivory, coconuts, and oil-seeds, and importing iron and cotton goods.

**Zapolya**, the name of a powerful Hungarian family which at one time maintained a protracted contest with the house of Hapsburg for the possession of the Hungarian crown: JOHANN ZAPOLYA, b. in 1487, was proclaimed king of Hungary in 1526. D. in 1540.—His son, JOHANN II. ZAPOLYA, b. a short time before the death of the father, was recognized by Solymán II. as king of Hungary; with his death in 1570 the male line of the family of Z. became extinct.

**Zarathustra**. See ZOROASTER.

**Zelots**, zel'uta, a fanatical Jewish sect which struggled desperately against the Romans, from about 6 A. D., when Judas the Gaulonite headed a revolt, till the fall of Jerusalem, in the yr. 70.

**Zebu** [im] [Heb. "gazelles" or "hyænas"], one of the 5 "cities of the plain" (Gen. xiv. 2), 4 of which were destroyed (Gen. xiv. 28, 29). See ZOAR.

**Zebra**, the *Asinus zebra*, (1) a wild ass of the mountainous parts of S. Afr., but now nearly extinct. It is of a creamy-white color, striped with a rich black on the head, trunk, and legs; the nose is reddish; the tail blackish at end; the hoofs are narrow and deeply concave beneath. (2) The name is also used as group-term for the *A. zebra* and related forms characterized by a similar style of ornamentation. Thus, the dwarf is sometimes called Burchell's zebra. The quagga is another species.

**Zebra-Wood**, a beautiful striped wood used for veneering, is produced in Guiana by *Omphalobium Lambertii*, a large tree of the order Connaraceæ, and in the W. I. by *Eugenia fragrans* of the order Myrtaceæ.

**Zebu**, or **Brahman Bull**, the common domesticated ox of India, found also in China and E. Afr. It differs from the common ox of Europe and Amer. in having one, or more rarely two, humps of fat on the shoulders, and in having 18 caudal vertebrae, while our cattle have 21. The Z. is of several breeds, varying much in size. The beef is of fair quality, and the hump is prized. Z. are trained to draw carriages to plough, and to serve as beasts of burden. To this stock belong the sacred bulls of Siva.

**Zebulun** [Heb. "dwelling"], the tenth of the 12 sons of Jacob, the sixth and last by Leah. In the exodus from Egypt the tribe of Z. marched in the van, next after Judah and Issachar, just ahead of the 6 wagons which carried the hangings, planks, and pillars of the tabernacle. The tribe of the tribe in Pal. was bounded on the E. by the S. half of the Lake of Galilee, beginning just above the site of Tiberias, and included Nazareth and Kimmion, but especially the fertile plain of Buttauf.

**Zecharias**, the eleventh in order of the 12 minor prophets of the Heb. canon. Whether the first 8 chaps. and the last 6 chaps. were written by the same author, critics are not agreed. The weight of authority on this point is very evenly balanced.

**Zedekiah**. See JEWS.

**Zedoary** [Ar. *jadear*], the warm aromatic root (rhizome) of certain E. I. plants of the order Zingiberaceæ. The best is long Z., from *Cureuma Zedoria*. Z., like cassimunia, galangale, and zerumbet, considerably resembles ginger, but the latter is so much superior to them all as to have crowded them entirely out of general commerce.

**Zelsberger** (DAVID), b. at Zauchenthal, Moravia, Apr. 11, 1721, was ed. in the Moravian settlements in Sax. and Hol., and joined them his parents, who some yrs. previously had emigrated to Ga. In 1749 he began his missionary work among the Indians. In 1781 the settlements of Chr. Indians which he had formed on the Tuscarawas, O., were broken up by a body of Wyandot warriors, and the settlers were compelled to remove to Sandusky; and when, next yr., some 96 of them returned to gather their corn, they were murdered by the neighboring white settlers. Z., however, did not lose courage, and when, in 1796, Cong. granted to the Moravian Indians the tract of land in the valley of the Tuscarawas which they had formerly occupied, he returned to the place with a considerable number of converts and built the town of Goshen, where he d. Nov. 17, 1808.

**Zeller** (EDUARD), b. at Kleinbottwar, a v. of Württemberg, Jan. 23, 1814; studied theol. and philos. at Tübingen under Bauer and Strauss; began to lecture on philos. and theol. at Tübingen in 1840; founded in 1842 the *Theologische Jahrbücher*, which formed the prin. organ of the new Tübingen



gen school of theologians; was appointed prof. of theol. at Berne in 1847, of philos. at Heidelberg in 1849, at Marburg in 1862, and at Berlin in 1872. Among his prin. works are *Die Philosophie der Griechen*, *Die Apostelgeschichte*, *David Friedrich Strauss*, etc.

**Zend-Avesta**, the collective name of the sacred books of the Parsees, contains the doctrines of the anc. Per. religion founded by Zoroaster. The collection consists of various parts, of which the most remarkable are—the *Vendidad*, or "Law-Book," giving the rules for avoiding and the means of expiating sin and impurity; the *Yagna*, containing prayers and songs of praise; the *Yashts*, the *Nyayish*, etc. It is evident, not only that the writings comprised in the Z.-A. belong to various periods, but also that they are only fragments of a rich sacred lit. which has been lost.

**Zend Language**. See ZEND-AVESTA.

**Zenick**. See SURICATE.

**Zeno**, emp. of the E. empire (474-491), was an Isaurian by birth, but married in 469 Ariadne, a daughter of the emp. Leo I. As Leo I. had no male children, he proposed to leave the crown to Z., but the imperial proposition caused such a commotion that it had to be given up. The succession was then fixed on Leo II., a son of Z. and Ariadne, but as Leo II. died in the same yr. as Leo I., in 474, Z. actually came into possession of the crown. During his reign revolts within alternated with miserable wars without. The attacks of the Goths were bought off with enormous sums. Basiliscus, who was proclaimed emp. in Constantinople in 475, was overthrown by buying his 2 gens. The insurrection of Marcian in 479 was suppressed by buying his soldiers. At last Z. was buried alive by his own wife, who married his successor, Anastasius.

**Zeno** (Apostolo), b. at Venice Dec. 11, 1668, devoted himself to lit., and acquired great fame by his dramatic compositions; founded in 1716 the celebrated periodical, *Giornale de Letterati d'Italia*; went in 1715 to Vienna as court-poet and historiographer; returned in 1729 to Venice, and d. there Nov. 11, 1750. Wrote *istoria delle cose Veneziane*, *Dissertazioni istoriche e Epistole*.

**Zeno of Elea**, b. about 490 b. c. at Elea, a friend and disciple of Parmenides, whose doctrines he supported. Aristotle names him as the father of dialectics, from the circumstance that his arguments in favor of the Eleatic doctrine of Being were based upon the self-refutation of its opposite. It is asserted that he was put to a cruel death by a tyrant.

**Zeno the Stole**, b. about 350 b. c., son of a Phœnician merchant residing in Citium. Near his 30th yr. a shipwreck caused him to visit Athens, where he became a disciple of Crates the Cynic. About the yr. 310 b. c. founded his school in the *Stoa poikilê*, whence the name "Stole" arose. He taught 58 yrs., dying about 258 b. c.

**Zeno'bia**, the daughter of a Syrian chieftain, married in a second wedlock Odenathus, prince of Palmyra, who after his brilliant campaigns against the Pers. was declared augustus and co-regent of the empire by Gallienus. In 267 Odenathus was murdered, and Z. ascended the throne, assumed the title of "queen of the East," declared herself independent of Rome, extended her authority over all Syria, parts of Asia Minor, Mesopotamia, and Egypt, and governed her realm with prudence and energy. But in 271 Aurelian marched against her. Her armies, commanded by herself, were defeated at Antioch and Emesa, and she was shut up in Palmyra. She attempted to escape, was captured, and with her hands in chains walked before the emp.'s chariot on his triumphal entry into Rome in 274. She afterward lived in elegant style in a villa near Tibur.

**Ze'olite** (Gr. *ζέω*, to "boil"), the name of many minerals which fuse under the blowpipe, whence the name. They are generally impure hydrated silicates, containing alkaline earths or alkalis, often alumina, and rarely magnesia. They are mostly crystalline or sub-crystalline.

**Zephaniah** (Heb. "watchman of the Lord"), the 9th in order of the minor Heb. prophets, was of noble birth. His ancestors for 4 generations are mentioned, ending with Hezekiah, probably the king of that name. He lived in the reign of Josiah (640-610 b. c.).

**Zeram**. See CERAM.

**Ze'ro** [It. zero], in common lang., *nothing*; in arithmetical lang., *no number*; and in the lang. of analysis, a *quantity less than any assignable quantity*. If we subtract *a* from *a*, the remainder is absolutely 0, and the result is purely *numerical*; the zero thus found is the *naught* of arithmetic.

Again, if we take the fraction  $\frac{a}{a}$ , in which *a* has a constant value, *x* being arbitrary, it is obvious that the value of the fraction will diminish as the value of *x* increases; if *x* is made exceedingly great with respect to *a*, the value of the fraction will be exceedingly small; and finally, if *x* is made greater than any assignable quantity, the value of the fraction will be less than any assignable quantity, or *zero*. The zero thus found is the zero of analysis. In the analytical sense, zero may be regarded as a quantity; and as such it is said to be an *infinitesimal*.

**Zerub'babel** (Heb. "begotten in Babylon"), the prince of the tribe of Judah and civil head of the first Jewish colony returning from the captivity in Babylon by permission of Cyrus, 536 b. c. His exact pedigree is uncertain, but in any case he was descended from David in the line of Nathan. He lived to see the temple finished, 516 a. c., but when or where he died cannot be determined. He is most honored for his place in the genealogy of Christ.

**Zerumbet**, the rhizome of *Zingiber zerumbet*, an E. I. ginger-plant. By some it is considered identical with cassimunar, the product of *Zingiber cassimunar*, and by others erroneously confounded with round zedoary. It has disappeared from commerce, being inferior to true ginger.

**Zetland**. See SHETLAND ISLANDS.

**Zeus**. See JUPITER.

**Zeux'is**, date of birth uncertain, but flourished in latter

part of 5th century; lived to a great age, the latter part of his life in Ephesus; was celebrated for the grace, sweetness, and dignity of his feminine figures, for the skill of his technical drawing and color, and for his lifelike delineation of men and animals. His greatest works were *Helen*, *Penelope*, *The Infant Hercules strangling the serpents*, *Jupiter*, *Mene-laos*, *Marsyas*, *Cupid*. The date of his death is unknown.

**Zidon**. See SIDON.

**Zie'then, von** (HANS JOACHIM), b. on his paternal estate of Wustrau, Prus. prov. of Brandenburg, May 13, 1699, received a military education. During the second Silesian war he made his famous march to Jägerndorf through the Aus. lines; distinguished himself at Hohenfriedberg June 4, 1745, and at Hennesdorf Nov. 23, and was made a major. In the Seven Years' war he took a most brilliant part, as commander of the cav., in the battles of Prague, Kollin, Leuthen, Liegnitz, and Torgau; and after the peace he retired as the most popular and one of the most celebrated of the gens. of Frederick the Great. D. Jan. 26, 1786.

**Zim'mermann, von** (JOHANN GEORG), b. at Brugg, canton of Berne, Switz., Dec. 8, 1728, studied med. at Göttingen; began to practise at Brugg in 1751, and was appointed court-phys. at Hanover in 1768. D. Oct. 7, 1795. He enjoyed a great reputation as a phys.; was invited to the court of Catharine II. His *Vom Nationalstolze und Ueber die Einsamkeit* made his name celebrated.

**Zinc** [Ger., Swe., and Dan. *Zink*], sometimes called **Spelter**, one of the metallic elements, very abundantly distributed, comparable in this respect to lead. It was not known in metallic form to the anc., though they knew how to make alloys of it with copper (common brass) by adding zinc ores to melted copper. Z. being one of those metals, however, which must be procured by a process of *distillation*, was doubtless beyond the skill of the metallurgists of old. It was first, and for a long time, brought into Europe from the East, and it is not much more than 100 yrs. since Z. was first smelted in Europe. The ores of Z. are not numerous, there being only 6 mineral species which furnish all the Z. and Z.-whites of commerce. These are *blende*, *calamine*, *willmannite*, *smithsonite*, *franklinite*, and *zincite*, including sulphide, silicates, carbonate, and oxide.

The *metal zinc* is one of much hardness, with a bluish color, with a brilliant lustre when freshly cut, but soon taking a tarnish, from the formation of a film of suboxide or carbonate, which protects it quite strongly from further oxidation, so that it is an extremely durable metal, resisting both air and water very persistently. When cast it is highly crystalline in structure, and somewhat brittle, though at the same time sectile; but by heating to a temperature somewhat below 300° F. it may be rolled into very thin plates, passing into a modification which is quite malleable, so that sheets as thin as tin-foil may be obtained. It melts at about 780° F., and boils at about 1000° F., yielding a vapor which takes fire in the air and burns with a dazzling light to Z.-oxide.

**Zinc Alloys of**. Almost all the other common metals, except *lead* and *bismuth*, alloy readily with Z., forming alloys that generally partake of the hardness of the Z., and, when the latter is in excess, of its brittleness also. Under Brass will be found mention of the important alloys with *copper*, these being by far the most valuable of Z. alloys. In making brass and other Z. alloys care must be taken that the heat does not rise too high, to avoid volatilization of the Z.

**Zinc Compounds of**. Z. forms a number of compounds which are useful in the arts, and several of its native mineral compounds are of much interest.

For the *oxide* see ZINC-WHITE.

The *sulphide* of Z. is found constituting 2 mineral species, identical in composition, but differing in crystalline form, *blende* or *sphalerite*, which is of the regular system, and *wurtzite*, which is hexagonal. Blende has a peculiar brilliant resinous lustre, sometimes black, but also sometimes transparent, brownish, yellowish, or even colorless. Hardness between calcite and fluor-spar. The localities are very numerous. A colorless variety is found at Franklin, N. J. (which was called by Nuttall *cleiophane*); handsome crystals at the Wheatley and Piekdomen mines in Pa., also at Austin's lead-mines in Wythe co., Va., and in a multitude of other places.

**WILLEMITE**.—(See this head.)

**Calamine**.—This is one of the commonest ores of Z. It is right-rhombic in crystallization, of the hardness of apatite, generally white in color, brilliant in lustre when crystalline, particularly on the cleavage surfaces. Its density varies from 3.164 to 3.871, and one modification may be regarded as a hydrated willemite. This mineral constitutes an abundant ore of Z. in many countries. Enormous quantities have been mined at Friedensville, Pa. In Europe there are several rich mines.

**Smithsonite**, carbonate of Z., named after the Eng. chemist Smithson, the illustrious founder of the Smithsonian Inst. at Wash.—Rhombic, with a hardness the same as calamine; white or light in color, and with vitreous lustre. The range of densities not so great as in the case of calamine. The Z.-molecules are enormously condensed.

**Franklinite**.—This occurs in N. J., at the Sussex Z.-mines, in immense quantities. Franklinite is regular in crystallization, black and opaque, slightly magnetic, with metallic lustre, indistinct octahedral cleavage, of the hardness of feldspar, and a density somewhat over 5. Infusible before the blowpipe, contains about 30 per cent. of Z.-oxide, and 13-14 per cent. of manganic oxide, the rest being ferric oxide. It yields, when smelted, a species of *spiegel-iron*.

**Gahnite—Zinc-Spinel**.—Also called *Automolite*.—Regular, like other spinels; hard as topaz; very variable in color, and generally opaque, but sometimes translucent. Densities from 4 to 4.91. Found also near Franklin Furnace, N. J., with the willemite and franklinite.

**Zinc-Vitriol, White Vitriol, Zinc Sulphate, Goularite**.—This is a familiar commercial compound, also occurring in nature



as *gosdurite*. At the Rammelsberg mine, near Goslar, in the Hartz, it is abundant, but not common elsewhere. For commercial use it is prepared by roasting and then lixiviating blende, or by dissolving metallic Z. in dilute sulphuric acid, and crystallizing. Crystals right-rhombic, efflorescing in the air, with loss of part of their crystal-water.

**Zinc-Chloride**, *Butter of Zinc*.—Z. combines powerfully with chlorine, thin foil taking fire therein spontaneously. The substance formed is whitish, translucent, of the consistency of wax, melts at a low temperature, and sublimes at a red heat, condensing in white needles. It is highly deliquescent, and soluble in water and alcohol.

**Organic Compounds of Zinc**, "*Zinc Radicals*."—By heating the compounds formed by the action of iodine on the marsh-gas homologues with Z. under pressure, a curious class of colorless liquid organic compounds, containing Z. in their constitution, is formed, called "methylide," "ethylide," "amylide," and so on, of Z. Z. "methylide" and "ethylide" take fire in the air spontaneously. [From *orig. art. in J. A. Univ. Cyc.*, by PROF. HENRY WURTZ, Ph. D.]

**Zinc-Green**. See RINMANN'S GREEN.

**Zincite**, or **Red Zinc Ore**, a highly interesting mineral species, very rare in Europe, but found in one dist. in N. J. in such profusion as to constitute an extremely valuable ore of zinc. Its range runs through Stirling Hill and Mine Hill in Sussex co., where it is found imbedded in calcite, associated largely also with *franklinite* and *willemite*. Its color, in the mass, is a peculiar and beautiful deep orange-red, and in powder orange-yellow. In thin scales it is translucent and deep yellow.

**Zincing of Metals**, the plating of metals with a thin layer of zinc, by which they are protected from the oxidizing action of the air. Iron is the metal oftenest coated, but copper is also sometimes treated in the same manner.

**Zincography** [*zinc*, and *γράφειν*, "to engrave"], the art of producing impressions of prints and other designs on zinc, from which a fac-simile on paper can be made. It embraces *anastatic printing* (*anastasis*, "resuscitation"), *zinc-printing*, *pneumatography*, and *photozincography*.

**Zinc-White** is the name of a very large commercial product used as a pigment, of late yrs. obtained directly from zinc ores by a process which combines the reduction of the zinc from the ore to a metallic vapor, and the subsequent burning of this vapor in the same apparatus. This operation is conducted in several large establishments in this country on an immense scale, the commercial demand for this pigment having advanced very rapidly of late yrs. This advance has proceeded from its extensive substitution for *white-lead* in painting wood-work—a substitution due to an increasing appreciation among painters of the deleterious effects of handling the latter pigment.

**Zinzendorf, von** (NIKOLAUS LUDWIG), COUNT, b. in Dresden May 26, 1700, was ed. at Hennersdorf in Lusatia by his grandmother, an intimate friend of Spener, and afterward (1710-16) in the pedagogium at Halle under the special supervision of Francke. From 1716 to 1719 he frequented the Univ. of Wittenberg, where he studied law; undertook then a journey through Hol., France, and Switz., and received in 1721 an appointment in the civil service of the Sax. govt., but resigned this office in 1727. In 1728 he bought the estate of Berthelsdorf, near Hennersdorf, and here founded a colony of Moravian Brethren who had emigrated from Bohemia on account of religious persecutions. The place, which was called Herrnhut, prospered very much. Z. went in 1734 to Stralsund, passed the theological examination, was ordained in the same yr. at Tübingen, and began to preach. In 1736 he was banished from Sax. as a dangerous innovator, and was not allowed to return until 1747. In the mean time he visited Santa Cruz and St. Thomas 1740, N. Amer. 1741, Livonia and Esthonia 1743, Hol. and Eng. 1745, preaching, forming congregations, and founding missions. In 1747 he returned to Herrnhut, and d. there May 9, 1760. Wrote hymns and *Das gute Wort des Herrn*.

**Zion**, or **Sion**, a mt. of Pal., rises 2337 ft. above the level of the sea. W. and S. it faces the valley of Hinnom with a steep precipice 300 ft. high. On the N. slope stands that part of Jerusalem which was called the "city of David" or the "upper city."

**Zircon** (Cingalese), a silicate of zirconia, occurs in crystals, generally 4-sided prisms terminated by 4-sided pyramids, and also in grains of a white, red, brown, yellow, and green color.

**Zirconia**, the earthy oxide contained in the mineral zircon, the dioxide of the metal zirconium. Z. forms compounds with bases analogous to silicates, and zirconfluorides analogous to silicofluorides. It is quite as well entitled to be called *zirconic acid* as silica to be called *silicic acid*.

**Zirconic "Hydrates"**.—The gelatinous gummy mass, which, like the ammonia dries to a yellowish precipitate formed by the "hydrates" of silica, varies in composition. This is soluble in 5000 parts of water.

**Zirconium**, an element having characters approaching those of a metal, found principally in the mineral called zircon. Its chemical relations are very close and parallel to the great mineral element *silicon*, which gives to its study great interest. Like silicon—and carbon, which also belongs to the same natural group—it assumes different allotropic forms, widely varying in their physical characters. The amorphous allotrope of Z. assumes a graphite-like lustre under the burnisher. It is unchanched by ignition apart from the air, but in air burns to zirconia. Its density has not been determined. *Adamantoid* Z. resembles metallic antimony in appearance, and is very brittle and hard. It is incombustible except by Hare's blowpipe, and soluble with difficulty in acids, except hydrofluoric and *aqua regia*. Density = 4.15.

**Zirknitz** (or **Czirknicz**). **Lake of**, in a deep valley in Carniola, Aus., between Laibach and Trieste, is famous on account of the occasional disappearance of its waters. It is 6 m. long, 3 m. broad, and 56 ft. deep. At intervals its

waters are entirely drawn off through a number of fissures in its bottom, and a harvest of hay, or even of buckwheat, is gathered in its bed. After the lapse of 4 or 6 weeks, or when the wet season sets in, the water begins to pour into the lake from a number of other fissures; but while it generally takes from 22 to 25 days to empty the lake, it takes often only 24 hours to fill it.

**Zis'ka** (JOHN), b. at Trocznow, Bohemia, in 1360, was ed. at the court of Prague, and fought with the Teutonic Knights against the Lithuanians and Poles, in Hungary against the Turks, and on the Eng. side in the wars between Eng. and Fr. He had embraced the doctrines of Huss, and was conspicuous in the great commotion which was caused by the execution of Huss and Jerome. He was present on the famous 30th of July, 1419, when the commotion suddenly burst out into open violence, and under his leadership the Hussites formed a fortified camp on the top of Mt. Tabor. They were in possession of the city of Prague, and in order to defend it against the emp. Sigismund, who approached with an army of 30,000 men, Z. took up a position on the hill of Witkow, just outside the city. He had only 4000 men, but the emp. was unable to remove them, and had to retire with an immense loss after a most sanguinary struggle, July 14, 1430. In the autumn of the same yr. Z. conquered the castle of Prague, but in the next yr. became blind. He continued, nevertheless, to command. In 1422 the emp. returned with another great army, and on Jan. 18 the battle took place at Deutschbrod. The emp. was completely routed, and now began to negotiate. He was willing to grant liberty of conscience, to make Z. gov. of Bohemia, etc., but before the negotiations could be brought to a close Z. d. at Przbislaw Oct. 12, 1434.

**Zo'an** [Heb. "going out," indicating a frontier city; Coptic *Gami* or *Dechane*; Ar. *Sân*], the *Acaris* of Manetho and the *Tanis* of the Grs. and Romans, an anc. city of the Egyptian Delta, in N. lat. 31° and E. lon. 31° 55', on the right bank of the Tanitic arm of the Nile, some 25 m. from the Mediterranean, and about 40 m. W. of Pelusium. It was probably the residence of the Pharaoh of the Exodus, and consequently the scene of the "marvelous things" that were done "in the field of Zoan" (Ps. lxxviii. 12), a geographical designation which corresponds exactly to a recently discovered hieroglyphic inscription. The famous Museum at Boolak, near Cairo, has been immensely enriched by the antiquities discovered at Sâ.

**Zo'ar** [Heb. "the little"], the only one that was spared of the five "cities of the plain." Originally it was called *Bela* (Heb. "swallowed, devoured," Gen. xiv. 2). Jerome says, because, according to Heb. tradition, it was destroyed for the third time by an earthquake (*Com. in Isaiam*, xv. 5). The four cities that perished were Sodom, Gomorrah, Admah, and Zeboim. It has generally been supposed that these five cities stood at or toward the S. end of what is now the Dead Sea. The principal objections are that this locality is not visible as Z. appears to have been, from the hill near Bethel (Gen. xlii. 10); nor does it answer to the description (Gen. xix. 28) of what was in sight from Hebron; nor could Moses have seen it (Deut. xxiv. 8) from the top of Pisgah. Accordingly, George Grove one of the eds. of Smith's *Bible Dict.*, argued in favor of locating the cities of the plain at the N. end of the Dead Sea. And in 1876 Selah Merrill discovered there what he takes to be the remains of the five cities.

R. D. HITCHCOCK.

**Zo'diac** (Gr. *ζωδιακός*), an imaginary zone or belt in the heavens, extending from 9° N. to 9° S. of the ecliptic, and comprising that region of the heavens within which the apparent motions of the sun, moon, and all the greater planets are confined. It is divided into 12 equal parts, called "signs," which are designated by the names of the constellations Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpio, Sagittarius, Capricornus, Aquarius, and Pisces.

**Zodiacal Light**. A faint illumination, not wholly unlike an aurora-borealis, which, at certain seasons especially, is visible soon after sunset, or also a little before sunrise, in the region of the *zodiac*; whence its name. In our lats. it is most conspicuous when the plane of the ecliptic in the region in which the light is visible, and also the plane of the sun's equator, make the greatest angle with the horizon. Hence it is most distinctly seen in the evening in the months of Apr. and May, and at the opposite seasons of the yr., before sunrise. The apparent distance of its vertex from the sun is found to vary according to circumstances from 40° to 90° or 100°; and sometimes, indeed, it has been seen to extend entirely across the heavens. Its breadth at its visible base, in a direction perpendicular to its axis, varies from 8° to 30°. It is best seen in tropical countries. The Z. L. appears to many observers to be of a reddish hue, especially at its base, where also it is by far the most bright.

**Zol'ticoff** (FELIX K.), b. in Maury co., Tenn., May 19, 1812, received an academical education; became a printer; edited the leading Whig paper of the State, the *Nashville Banner*, from 1842; was State comptroller 1845-49. State senator 1849, M. C. 1853-59; was an advocate of extreme Southern views, but served as a delegate to the Peace conference of Feb. 1861; became a brig.-gen. in the Confed. service, commanding in E. Tenn. Aug. 8, 1861; was defeated at Camp Wild Cat, Ky., Oct. 21, and at the battle of Mill Spring, Ky., where he was killed Jan. 19, 1862.

ZOLA (EMIL). See ARTHUR.

**Zoll'verein** is the Ger. name of a toll-union between the various states of the Ger. empire, according to which all custom duties along the internal frontiers of the states belonging to the union are abolished, and the revenues proceeding from the custom duties levied along the external frontiers of the union are partitioned among the members according to population. The union was proposed by Prus. in 1827, but was not accomplished until 1827.

**Zon'aras** (JOHANNES), b. in Constantinople toward the close of the 11th century, was private sec. to Alexis Comnenus, but retired during the reign of Calo-Joannes to the



monastery of Mt. Athos, where he became a monk, and d. it is said, in the 88th yr. of his age. Wrote *Chronicon* or *Annales*, a hist. of the world from its creation to 1118.

**Zone** [Gr. *ζώνη*], a part of the surface of a sphere included between two parallel planes. If the planes are secant, the zone has two bases; if one is secant and the other tangent, the zone has but one base; if both are tangent, the zone is equal to the surface of the sphere. If an arc of any curve is revolved about a line exterior to it, the surface generated is called a zone.

**Zones.** See EARTH, IV., by PROF. A. GUYOT, LL.D.

**Zoological Geography** is that dept. of science which treats of the zoological peculiarities of the various regions into which the globe may be divided, or, in other words, its faunas or combinations of animals. The term was employed first by Van der Hoeven, and later by Andrew Murray and other authors, with this signification, and in contrast with *geographical zoology*, which treats of the range of animal forms. On a consideration of the geographical range of various animals it soon becomes evident that they are mostly combined in groups which are more or less distinctive of certain regions of varying extent.

**Zoology** [Gr. *ζωον*, "animal," and *λόγος*, "discourse"], that part of biology which relates to animal life, and, as generally understood, the science which treats of the structure, classification, distribution, habits, and derivation of living animals. In its broadest sense, however, Z. includes the structure, relations, and histories of extinct as well as living forms, but the former are generally considered by themselves under a special dept. known as "palaeontology." The 2 divisions are, however, so inseparably connected that they can only be properly studied or fully and systematically stated together. Some of the prin. subdivisions of Z. are MAMMALOGY, ORNITHOLOGY, HERPETOLOGY, ICHTHYOLOGY, ENTOMOLOGY, CONCHOLOGY, etc., under which, or the families, genera, and species belonging to the larger groups, as well as under COMPARATIVE ANATOMY, EVOLUTION, OSTEOLOGY, PALAEONTOLOGY, etc., much information bearing on the general subject of Z. will be found.

**Zorilla** ["little fox," a name given in Sp. Amer. to certain skunks, but in many books transferred as a popular name to *Ictonyx* or *Rhombodactylus*], a genus of S. Afr. mustelids, somewhat resembling the skunk.

**Zorn-dorf**, v. of Prus., prov. of Brandenburg, is famous for the battle fought here on Aug. 25, 1758, between the Rus. under Fermor and the Prus. under Frederick the Great; the Rus. were defeated.

**Zoroaster**, zor-o-as'ter [the corrupt Gr. and Lat. version of the old Per. name *Zarathustra*, which the later Pers. altered to *Zerdusht*], the founder of the anc. Per. religion. He was b. in Bactria; his father's name was Pourushaspa, and he had a daughter by the name of Pouruchista. What the old Per. or Gr. authors tell about him is mere myth. The religious system which he developed is a complete dualism, Ormuzd being the creator and ruler of all that is bright and good, Ahriman the chief of that which is dark and evil. To each of these supreme beings belongs a number of subordinate spirits, Ameshaspentas to Ormuzd, Devas to Ahriman; and all that exists is divided between these 2 realms. Man has to choose, and according to his choice he will after death go to Ormuzd or to Ahriman; the way to the first is pure thought, pure speech, and pure actions. The only object of worship was fire, the symbol of that which is bright and good, and to fire all temples and altars were dedicated. The priests which maintained the fire and conducted the worship were the Magi.

**Zoroaster, Religion of.** See ZOROASTER.

**Zorilla y Moral** (José), b. at Valladolid, Sp., Feb. 21, 1817, ed. in the Coll. of Nobles at Madrid; became widely known as a poet by his verses read at the funeral of Larra, Feb. 15, 1837; pub. *Cantos del Trovador*, *Floras Perdidas*, and *Granada*.

**Zosimus**, a Gr. historian of the 5th century, of whose personal life nothing is known, but whose work, a hist. of the Rom. empire from Augustus to 410, is still extant.

**Zosimus**, pope 417-18; first declared Pelagius orthodox, reproached the Afr. bps. for their opposition, and summoned their leader, the deacon Paulinus, to Rome; but afterward, when the bps. procured a rescript against Pelagius from the emp. Honorius, Z. turned round and condemned him in an *Epistola Tractatoria*.

**Zouaves**, zoo-ahvz' [from the *Zouaoua*, a Kabyle tribe of Algiers], originally bodies of Kabyle inf. mercenaries in the service of the Barbary states; in this sense the name is still employed, Tripoli having some 5000 such Z. in her service. After the Fr. conquest, the Fr. incorporated in 1830 into the same battalions companies of Frenchmen and Kabyles, dressed in Algerine costume. But afterward the Z. of the two nationalities were separated. The native Afrs. are called *Turcos*, and the Fr. in modified Afr. costume are called *zouaves*.

**Zrinyi**, zreen'ye (Miklós), COUNT, b. in 1508 of an illustrious Slovak family, fought with great distinction in the Austrian army against the Magyars under Zapolya and the Turks under Solymán II., and became celebrated by his defence of Sziget in 1586. The final capture of the castle, Sept. 7, 1586, cost the Turks over 20,000 men. Z. was shot while fighting on the last bastion.

**Zschokke**, tshok'ke (JOHANN HEINRICH DANIEL), b. at Magdeburg Mar. 22, 1771, was ed. in the gymnasium of his native city, but left it in 1788, and accompanied for some time a band of strolling actors as their play-writer. Shortly after, however, he went to the Univ. of Frankfurt-on-the-Oder, where he pursued various lines of study, and began to give lectures in 1792. Meanwhile his dramatic compositions, *Abdülino*, *Julius von Sassen*, etc., attracted considerable attention; but in 1795 he wrote against certain religious edicts of the Prus. govt., and when he in 1796 applied for a professorship, he was rejected. Leaving Prus. immediately, he settled at Reichenau, canton of the Grisons, Switz., and

took charge of a large educational inst. Soon he also began to take a most active and influential part in the politics of the country, acting, however, as a mediator rather than as a partisan. In 1798 he removed to Aarau, and was made chief of the dept. of public education, but in 1801 he retired from public life. In 1808 he was recalled and made a member of the board of forests and mines, and from that time to his death, at Biberstein June 27, 1848, he continued to hold various positions in the govt. of the republic. His most celebrated work is *Stunden der Andacht*.

**Zuider Zee.** See ZUYDER ZEE.

**Zwinglius.** See ZWINGLI.

**Zu'land**, the name generally given to the country extending along the Indian Ocean on the S. E. coast of Afr., from the colony of Natal in the S. to the Bay of Delagoa in the N., from lat. 29° 10' S. to lat. 26° S., and bounded W. by the Orange River Free State and the Transvaal Republic. The country consists of a low coast-land 120 m. broad, marshy and swampy in the N. part, but presenting excellent pasture-plains in the S. part. Behind this coast-land the ground rises through undulating slopes, often covered with forests of timber-yielding trees, into a mt.-range from 6000 to 7000 ft. high, which separates the lowland from the high inland plateaus. The soil is generally exceedingly fertile. Rice, sugar, cotton, and all kinds of tropical fruits can be grown advantageously, and it is only in the N. part that the climate is unhealthy and injurious to Europeans. The country is inhabited by independent tribes of Zulu Kaffirs. A war broke out between the Eng. and the Zulus in 1879, resulting in the subjugation of the latter during that year.

**Zumpt**, tsoompt (KARL GOTTLÖB), b. in Berlin Mar. 20, 1792, studied classical langs. and lit. at Heidelberg and Berlin, and was appointed prof. extraord. of Rom. lit. at the Univ. of Berlin in 1827 and prof. 1838. D. June 25, 1849. He pub. much esteemed eds. of Curtius, Cicero de *Officiis*, and (with Spalding) of Quintilian, etc.; wrote Lat. gram., pub. numerous essays relating to Rom. antiquities and hist.—His nephew, AUGUST WILHELM ZUMPT, b. at Königsberg Dec. 4, 1815, was appointed prof. at the Friedrich-Wilhelm Gymnasium in Berlin in 1851, and wrote, beside other works, *Ueber die Entstehung und historische Entwicklung des Colonials, Commentationes Epigraphicae, Das Criminalrecht der römischen Republik*. D. Apr. 28, 1877.

**Zurich**, zur'ik, town of Switz., cap. of canton of Zurich, on the Limmat, where it issues from the Lake of Zurich, has a univ., a public library, a botanical garden, several museums of nat. hist., and a noted federal polytechnic school. Its manufactures of silk, cotton, leather, ribbons, lace, etc. are extensive. Pop. 25,102; with suburbs, 75,956.

**Zurich, Lake of**, lake of Switz., 23 m. long and 2½ m. broad, is bounded by the cantons of Zurich, Schwytz, and St. Gall, and is celebrated for its picturesque beauty.

**Zuyder Zee** (i. e. "South Sea"), a gulf of the N. Sea, land-bound by the provs. of Hol., Friesland, Overysse, Gelderland, Utrecht, and N. Hol. It is 80 m. long and 40 in greatest breadth. The islands Texel, Vlieland, Terschelling, and Ameland, continuations of the general coast-line, lie across its mouth, the communications with the N. Sea passing between. The sea is quite shallow, especially in its S. part, and to avoid the difficulties of its navigation to Amsterdam the N. Hol. Canal was constructed. The Z. Z. receives the water of the Guedrian Yssel and of the Amstel, both delta-branches of the Rhine; at the entrance of the latter into the Y arm, the city of Amsterdam, thus deriving its name (the *Dam of the Amstel*), is situated.

**Zwingli**, zwing'glee (ULRICH or HULDRICH), the Swiss reformer and patriot, b. in a lowly shepherd's cot at Wildhaus, Toggenburg (canton of St. Gall), of honorable and pious parents, Jan. 1, 1484 (7 weeks after Luther); studied at Wesen, Vienna, 1499-1501, and Bale 1502-06; was carried away with the enthusiasm for classical learning, and got an insight into the corruptions of the Ch.; was ordained priest by the bp. of Constance, and elected pastor of Glarus 1506. He studied the Gr. N. T. very carefully, and copied it with his own hand; preached against the mercenary service of his countrymen; in 1516 accepted a call to St. Mary's at Einsiedeln, and began to attack superstitious practices. In Dec. 1518 he was called to the cathedral at Zurich, where he labored till his death. He preached "Christ from the fountains" and "inserted the pure Christ into the hearts;" introduced the Ref. in Zurich 1524; led the Reform movement in the other Ger. cantons of Switz.; attended the conference at Berne 1528, which resulted in the abolition of the mass. He was invited to a personal conference with Luther and Melancthon at Marburg Sept. 1529, to adjust the only serious doctrinal difference between them on the Eucharistic Presence. He counselled energetic measures for the promotion of the Reform in his native land. But he was cut down in the midst of his career. At the outbreak of the war between the R. Cath. and Prot. cantons he accompanied the Zurich regiment as chaplain, and was pierced by a lance in the disastrous battle at Cappel, Oct. 11, 1531, while stooping to comfort a dying soldier. His last audible words were, "What of that? They can kill the body, but they cannot kill the soul." His remains were burned, and the ashes scattered to the four winds. A plain monument in granite erected in 1838 marks the spot where he died. (See Z.'s Works, ed. by Schuler and Schulthess; Mörfkofer, *Ulrich Zwingli*, 1869.) PHILIP SCHAFF.

**Zwinglius.** See ZWINGLI.

**Zygadenus**, or, less correctly, **Zygabenus** (EUTHYMUS), a Byzantine theologian of the 12th century, and "the last of the Gr. commentators." He was monk of a convent dedicated to the Virgin Mary near Constantinople, and flourished under Alexis Comnenus (1081-1118 A. D.), at whose request he wrote his *Zenophy against all Heresies*. His commentaries on the Psalms and Gospels are still referred to by scholars. Other commentaries (on the Pauline and Catholic Epistles), and other works (including letters), are extant in MS. in the Vatican.



# APPENDIX.

EMBRACING SUPPLEMENTARY ARTICLES AND THOSE RECEIVED TOO LATE FOR INSERTION IN THEIR ORDER, ALSO INTEREST AND STATISTICAL TABLES, CHARTS, ETC., ETC.

## A.

**Ab'bott** (CHARLES CONRAD), M. D., b. at Trenton, N. J., June 4, 1843, took his degree of M. D. at the Univ. of Pa. in 1865, and pub. *A Naturalist's Rambles about Home* (a collection of articles contributed to various scientific journals), *Primitive Industry*, proving that palæolithic man existed in N. J., etc.

**Ab'erdeen**, R. R. centre, Brown co., Dak., on Chicago, Milwaukee, and St. Paul and Chicago and Northwestern R. Rs. Pop. about 2500.

**Ab'le'ne**, Taylor co., Tex., on Tex. and Pacific R. R., 161 m. W. by S. of Ft. Worth, is connected by stages with Ft. Concho. Pop. not in census.

**Ab'ington**, Plymouth co., Mass., on Old Colony R. R., 19 m. S. by E. of Boston, has manufactures of boots, shoes and tacks. Pop. 1880, 3697.

**About** (EDMOND), b. at Dieuze, in the dept. of Meurthe, Fr., Feb. 14, 1828; embraced journalism and lit.; pub. *Grèce contemporaine* (1855), *La Question romaine* (1860), *Nouvelle carte de l'Europe*, etc., besides a number of novels and dramas. Founded *Le XIX. Siècle* (1872). D. in Paris Jan. 17, 1885.

**Achard** (FRANZ KARL), b. in Berlin Apr. 28, 1753; made extensive researches and experiments with reference to the production of sugar from the beet-root; established a successful beet-root sugar factory at Cunern, Silesia, and pub. *Die europäische Zuckerfabrikation aus Runkelrüben*, 3 vols. (1809). D. Apr. 20, 1821.

**A'da**, cap. of Norman co., Minn., on St. Paul, Minneapolis and Manitoba R. R., 29 m. N. of Glynndon. Pop. 1880, 138.

**A'del**, on R. R., cap. of Dallas co., Ia., has a fine water-power. Pop. 1870, 711; 1880, 980.

**Ad'ler** (FELIX), b. at Alzey, Hesse, Ger., Aug. 13, 1851, grad. from Columbia Coll., N. Y.; studied in Berlin and Heidelberg; was appointed prof. of Heb. in Cornell Univ. 1874, and founded in 1876 the Society for Ethical Culture, which has its centre in N. Y. and a branch in Chicago. Pub. *Creed and Deed* (1877).

**Ag'assiz** (ALEXANDER), b. in Switz. 1805, a son of Louis Agassiz; grad. from Harvard Coll. 1825; went to Cal. in 1859 as an assistant on the coast survey; was an assistant in the museum of comparative zoology at Harvard 1860-65; engaged in mining business, and assisted in developing the rich copper mines at Lake Superior; succeeded his father in 1873 as curator of the Harvard museum of comparative zoology, but retired in 1885 on account of ill-health; pub. *Marine Animals of Massachusetts Bay* (1871), *Revision of the Echini* (1872), *North American Starfishes* (1877), besides several monographs, the results of his extensive deep-sea dredgings, etc.

**Agnost'icism** means, philosophically, a denial of the possibility of acquiring any knowledge whatever of the infinite on account of the natural and necessary bounds of the human mind, and, theologically, a denial of the possibility of a divine revelation to a created intelligence.

**Al'bany**, R. R. junc., cap. of Gentry co., Mo., 52 m. N. E. of St. Joseph, has a variety of manufactures. Pop. 1870, 607; 1880, 979.

**Albany**, on R. R., cap. of Shackelford co., Tex. Pop. 1880, 129.

**Al'bion**, on R. R., cap. of Boone co., Neb. Pop. 1880, 330.

**Albuquerque**, R. R. junc., cap. of Bernalillo co., N. M. Pop. 1880, 2315.

**Ald'rich** (NELSON W.), b. at Foster, R. I., Nov. 6, 1841, received an acad. education, and took an active part in the political affairs of his native State; was elected a M. C. of the Forty-sixth Cong. and re-elected, and was elected U. S. senator in 1881.

**Alexan'dria**, on R. R., cap. of Hanson co., Dak. Pop. 1880, 99.

**Alfred Centre**, Alfred tp., Allegany co., N. Y. Pop. 1880, 518.

**Al'ten** (JOEL ASAPH), b. at Springfield, Mass., 1838, studied zoology in the Lawrence scientific school of Cambridge; was appointed assistant in ornithology at the museum of comparative zoology in Cambridge 1870; took part in various scientific expeditions to Brazil, the Rocky Mts., Fla., etc., and pub. *Monographs of North American Rodents* (1877), *History of North American Pinnipeds* (1880), etc. He is editor of *The Auk*.

**American Indians**. The Amer. race presents in all respects and throughout all its branches as distinct racial traits as the white or the black, the Mongolian or the Malayan races: a peculiar reddish or coppery hue of the skin; straight hair, coarse and abundant on the head, but very sparse on other parts of the body; low and laterally compressed forehead; black and straight eyes; prominent cheek-bones; strong but not protruding jaws; small and rounding chin, and usually a heavy expression, but no common shape of skull and no prevailing measure of height and weight. As the differences between the various tribes are too slight to permit of a classification by physical characteristics, ethnologists have adopted a classification by linguistic stocks, grouping under one general name all

tribes which speak dialects of the same tongue. The prin. groups are: the Eskimos in the Arctic regions; the Athapascas or Tinné, in Brit. Amer.; the Algonkins, with whom the whites first came in contact when settling in N. Amer.; the Iroquois or Five Nations, who formerly occupied the central part of the State of N. Y.; and the Dakotas in the U. S.; the Aztecs in central Mex.; the Mayas in Yucatan; the Incas in Peru; the Araucanians along the S. Pacific coast, and the Guaranay in Brazil. The generally accepted idea has always been that the number of Indians living within the boundaries of the U. S. is steadily decreasing, and that the total extinction of the race is only a question of time. The census of 1880 gives their number as 303,248, which probably differs very little from that living in the same terr. at the first arrival of the Europeans. They are distributed as follows: Ala., 170; Ari., 24,753; Ark., 144; Cal., 16,581; Col., 4316; Conn., 230; Dak., 31,707; id., 6248; Ill., 104; Ind., 186; Ind. Terr., 78,142; Ia., 801; Kan., 693; La., 807; Me., 603; Mass., 341; Mich., 17,045; Minn., 17,893; Miss., 1811; Mont., 20,825; Neb., 4494; Nev., 7728; N. M., 22,860; N. Y., 5820; N. C., 1152; Or., 5854; Pa., 156; S. C., 113; Tenn., 238; Tex., 869; Ut., 1166; Wash. T., 16,786; Wis., 10,340; Wyo., 2,272. With every yr., however, a greater number of Indians is brought under the influence of civilization. According to the report of the sec. of the interior, there were in 1884, under the control of the govt., 81 boarding-schools, 76 day-schools, and 6 industrial or manual-labor schools, in which Indian children are educated and instructed, with a view to making them self-supporting individuals, besides 14 boarding-schools and 4 day-schools, which were supplied with teachers by some religious denomination, the govt. paying a certain stipulated sum for each child in the school, and 23 schools maintained by chs. and associations without any expense to the govt.

**Angel'ica**, on R. R., cap. of Allegany co., N. Y., has excellent water-power and a beautiful park. Pop. 1870, 901; 1880, 705.

**An'niston**, R. R. junc., Calhoun co., Ala. Pop. 1880, 942.

**An'thony**, city, cap. of Harper co., Kan. Pop. 1880, 345.

**An'tigo**, cap. of Langlade co., Wis., is on the Milwaukee, Lake Shore and Western R. R. Pop. not in census of 1880.

**Ar'nold** (EDWIN), b. at Rochester, Eng., June 10, 1832, grad. at Oxford 1854, and was subsequently appointed prin. of the govt. Sans. Coll. at Poona, in the Bombay Presidency, but resigned in 1861, and entered upon the editorial staff of the *Daily Telegraph*. He is the author of *The Light of Asia* (1879) and other poems.

**Ash'land**, Jackson co., Or., on Or. and Cal. R. R., has stage line to Delta. Pop. 1880, 542.

**Ashland**, important R. R. junc., cap. of Ashland co., Wis., is situated on Chagwaganego Bay, Lake Superior; has extensive ore docks, and is connected by steamers with all ports on Lake Superior. Pop. of tp. 1880, 951.

**As'pen**, cap. of Pitkin co., Col. Pop. 1883, about 750.

**Asto'ria**, on R. R., Fulton co., Ill. Pop. 1880, 1280.

**Ath'ens**, on R. R., cap. of Limestone co., Ala., 27 m. W. N. W. of Huntsville, Ala. Pop. 1870, 887; 1880, 1011.

**Athens**, on R. R., cap. of McMinn co., Tenn., 55 m. S. W. of Knoxville, is the seat of E. Tenn. Wesleyan Univ. Pop. 1870, 974; 1880, 1100.

**Au'dubon**, R. R. junc., cap. of Audubon co., Ia. Pop. 1880, 792.

**Augus'ta**, city and R. R. junc., Butler co., Kan. Pop. 1880, 922.

**Ax'minster**, a small town of Eng. in Devonshire, gave its name to an excellent imitation of Per. and Tur. carpets, though the so-called A. carpets are also made elsewhere. Pop. 2872.

## B.

**Bab'cock** (ORVILLE E.), b. in Berkshire, Vt., Dec. 25, 1835, grad. from the U. S. Military Acad. 1861, and was promoted first lieut. 1861, capt. 1863, maj. 1867, and lieut.-col. 1884. In 1864 he was appointed aide-de-camp to Gen. Grant, and when the latter was inaugurated pres. he was assigned to duty as his sec. In 1877 he was made light-house inspector of the fifth dist. D. June 2, 1884.

**Ba'te'bridge**, on R. R., Chenango co., N. Y., 32 m. E. of Binghamton. Pop. 1870, 681; 1880, 781.

**Ba'ku**, a town of Asiatic Russ., on R. R. and the W. shore of the Caspian sea, is noted for its naphtha springs and for its oil wells, which in 1870 produced 8,500,000 gals., but 200,000,000 in 1882. Pop. 15,004.

**Bards'town**, on R. R., cap. of Nelson co., Ky., 30 m. S. E. of Louisville, is situated on an elevated plain and has several acads. and St. Joseph's R. Cath. Coll. Pop. 1870, 1835; 1880, 1803.

**Barnes'ville**, R. R. junc., Pike co., Ga., 60 m. S. by E. of Atlanta. Pop. 1870, 754; 1880, 1962.

**Bar'try**, city, on R. R., Pike co., Ill. Pork-packing is an important industry here. Pop. 1880, 1392.



**Bartholdi** (FRÉDÉRIC AUGUSTE), b. at Colmar, in Alsace-Lorraine, Apr. 2, 1834, studied modelling in Paris, and began to exhibit in 1847. He received the decoration of the Legion of Honor in 1865. Prominent among his numerous works

are the "Lion of Belfort," the statue of Lafayette in Union Square, New York City, and the famous figure "Liberty Enlightening the World."

This colossal statue, illuminated by electric light, was pre-



Bartholdi's Statue of "Liberty Enlightening the World."

sented, July 4, 1884, by the people of France to the people of the U. S. in commemoration of the one hundredth anniversary of their national independence. Its height from its base to top of torch is 151.14 ft. ; to top of diadem, 116.44 ft. The height of pedestal above its base is about 90 ft., and the total height of the structure, statue and all, above the water is precisely 305 ft. 11 in. The pedestal was built

by the people of the U. S., and the statue was erected in 1885. The U. S. govt. relinquished Bedloe's Island for it, and is to maintain it forever. The pedestal was designed by Richard M. Hunt, N. Y. Gen. Charles P. Stone, U.S.A., had charge of its construction and the erection of the statue. A reduced copy of the latter was presented to Paris May 13, 1885, by its American residents.



**Barye** (ANTOINE LOUIS), b. in Paris Sept. 24, 1795, studied modelling under Bosio; began to exhibit in 1827; achieved great fame, especially as an animalist, and d. in Paris June 25, 1875. Copious collections of his works may be seen in the Corcoran Art Gallery in Wash., in Baltimore, and in New York.

**Batesville**, cap. of Independence co., Ark., on R. R. and White River, 90 m. N. E. of Little Rock, is the seat of Batesville Acad. and of Soulesbury Inst. It has woollen manufactures and flouring mills. Pop. 1870, 881; 1880, 1264.

**Bea'dle** (WILLIAM HENRY), b. at Liberty, Park co., Ind., Jan. 1, 1838, was educated at Rockville and in the Univ. of Mich.; entered the army in 1861, served throughout the war, and was brevetted a brig.-gen. in 1864. In 1869 he was appointed surveyor-gen. of the Dak. Terr., and in 1879 supt.-gen. of public instruction.

**Beaumont**, R. R. junc., cap. of Jefferson co., Tex., is 68 m. N. E. of Galveston, and at head of tide-water navigation on Neches River, which is navigable for 331 m. from the sea by steamers. B. has considerable trade in lumber. Pop. not in census.

**Bel Air**, on R. R., cap. of Harford co., Md., 22½ m. N. of Baltimore, has an acad. Pop. of election dist. 1870, 5650; 1880, 6586.

**Bellevue**, Alturas co., Id., on Wood River Branch, Id. division (Or. short line), Union Pacific R. R. Pop. not in census.

**Bellevue**, city and R. R. junc., Jackson co., Ia., is on Miss. River, 24 m. below Dubuque, and has an extensive trade in grain, stock, etc. Pop. 1870, 1353; 1880, 1581.

**Bel'fows** (ALBERT F.), b. at Milford, Mass., Nov. 29, 1823, studied first architecture, afterward painting; visited Europe in 1843 and 1867, acquired great reputation as a landscape and genre painter both in oil and water-colors—*Coaching in New England, A Country Bypass, The New England Homestead*—and d. at Auburndale, Mass., Nov. 23, 1893.

**Bement**, R. R. junc., Platt co., Ill. Pop. 1880, 963.

**Bergen Point**, on R. R., in city of Bayonne, Hudson co., N. J., is 8 m. S. W. of Jersey City. Pop. not in census.

**Berrien Springs**, cap. of Berrien co., Mich., on R. R. and St. Joseph's River, 15 m. from Lake Michigan and 160 m. W. S. W. of Lansing. Pop. 1870, 662; 1880, 758.

**Berryville**, on R. R., cap. of Clarke co., Va., is 10½ m. E. of Winchester, and has an acad. Pop. 1870, 560; 1880, not in census.

**Bert** (PAUL), b. at Auxerre, in the dept. of Yonne, Fr., Oct. 17, 1833, studied med. in Paris; was appointed prof. of physiology in Coll. de Fr. in 1869, and is famous for his researches on the conditions of human existence at different altitudes (*La Pression Barometrique* 1877); engaged in politics, was a member of the Chamber of Deputies and of the cabinet of Gambetta; spoke especially on the subject of public instruction (*La Morale des Jeunes* 1880).

**Bethany**, on R. R., cap. of Harrison co., Mo., 62 m. N. E. of St. Joseph. Pop. 1880, 994.

**Bethel**, R. R. junc., Fairfield co., Conn. Pop. 1880, 1767.

**Bil'ings**, cap. of Yellowstone co., Mont., on Northern Pacific R. R. and Yellowstone River. Pop. not in census.

**Bird'sall** (WILLIAM RANDALL), b. at Greene, Chenango co., N. Y., Jan. 1, 1852, studied med. in the Univ. of Mich.; prosecuted neurological studies in Europe, began to practise med. in the city of N. Y. in 1876; has been steadily engaged as a clinical teacher on diseases of the nervous system in the various colls. and hospitals of N. Y.; is the author of a work on *Electrotherapeutics and Electrodiagnosis*, and has contributed articles on neurological subjects to various med. journals.

**Blairsville**, R. R. junc., Ind. co., Pa., on the Cone-maugh River, 56 m. E. of Pittsburg. Pop. 1870, 1054; 1880, 1162.

**Blossburg**, on R. R. and Tioga River, Tioga co., Pa., 41 m. S. of Corning, N. Y., has mines of semi-bituminous coal and of iron. Pop. 1880, 2140.

**Blue Books** is the name applied to the reports and papers printed by the Brit. parl. and derived from the circumstances that those publications were generally covered with blue paper. Hence the custom arose to designate those printed collections of diplomatic documents which the govts. use to lay before the representative assemblies, by the color of the cover, as blue, red, yellow, or white books.

**Blue Earth City**, on R. R. and Blue Earth River, cap. of Faribault co., Minn. Pop. 1880, 1066.

**Blue Springs**, Gage co., Neb., on Omaha and Rep. Valley branch of U. Pacific R. R. Pop. 1880, 513.

**Blunt**, Hughes co., Dak., on Chicago and N. W. R. R. Pop. not in census.

**Bolivar**, on R. R., Allegany co., N. Y. Pop. 1880, 180.

**Boston University**, chartered by the legislature of Mass. in 1869, is unique in its organization. It was the first univ. in the world to be organized from the start and throughout without respect to sex, and it was the first univ. in Amer. to present in theol., law, and med. uniform graded courses of three yrs.' duration, and require, in order to grad., the completion of these courses. There are, however, 3 depts., the admission to which does not presuppose a preliminary collegiate education, and these are called the colls. of liberal arts, music, and agriculture. All the colls. and schools have separate faculties and separate administrations.

**Bowditch** (HENRY PICKERING), b. at Boston, Mass., Apr. 4, 1840, grad. from Harvard coll. 1861; entered the army as second lieut., served throughout the war, and was commissioned a maj.; entered the med. school of Harvard in 1865, and took his degree, further prosecuted his studies in Ger. and Fr., and was in 1871 appointed prof. of physiology at Harvard, and has pub. a number of papers on physiological subjects.

**Bowles** (FRANCIS TIFFANY), U. S. N., b. at Springfield, Mass., Oct. 7, 1858, entered navy in 1875 as cadet engineer,

and graduating from the naval acad. of Annapolis with distinction, was admitted to the Royal Naval Coll. at Greenwich, Eng. On Nov. 1, 1881, he was appointed assistant naval constructor in the U. S. N., and assigned to duty as sec. to the naval advisory board at Wash.

**Bowling Green**, on R. R., cap. of Pike co., Mo., 12 m. S. W. of city of Louisiana, Mo. Pop. 1870, 509; 1880, 1067.

**Bowling Green**, R. R. junc., cap. of Wood co., O. Pop. 1870, 906; 1880, 1539.

**Brad'ock**, on R. R. and Monongahela River, Allegheny co., Pa., 10 m. S. E. of Pittsburg. Pop. 1870, 1200; 1880, 3310.

**Brehm** (ALFRED EDMOND), b. at Reuthendorf, Saxe-Weimar, Feb. 2, 1829, studied nat. hist.: travelled in Egypt, Nubia, and Soudan; in Sp. and Nor.; was appointed director of the zoological garden in Hamburg 1863, and removed in 1867 to Berlin, where he established the grand aquarium. He is the author of *Illustrirtes Thierleben*, 6 vols., 1863, which was trans. into Fr., and of which a second ed. appeared, in 10 vols., in 1868.

**Brick Church**, on R. R., in E. Orange tp., Essex co., N. J. Pop. not in census.

**Brinton** (DANIEL GARRISON), b. in Chester co., Pa., May 13, 1837, grad. at Yale Coll. in 1858, and M. D. at Jefferson Med. Coll. in 1861; served in the army throughout the war; became ed. of the *Philadelphia Medical and Surgical Reporter* in 1867, and prof. of ethnology and archaeology at the Acad. of Nat. Sciences in Phila. He pub. *The Floridan Peninsula, The Myths of the New World*, etc., and is ed. of the *Library of Aboriginal American Literature*.

**Brookville**, on R. R., cap. of Brookings co., Dak. Pop. not in census.

**Brooks** (WILLIAM KEITH), b. at Cleveland, O., 1848, grad. from Williams Coll. 1870; took the degree Ph. D. at Harvard Univ. in 1874; became associate in Johns Hopkins Univ. in 1876; organized the Johns Hopkins Marine Summer Laboratory, and wrote *Hand-books of Invertebrate Zoology* (1881), *Hereditry* (1883), *The Development and Protection of the Oyster in Maryland*, etc.

**Brookville**, on R. R., cap. of Franklin co., Ind., contains Brookville Coll., and has great water-power, paper mills, flouring mills, etc. Pop. 1880, 1813.

**Brownsville**, Saline co., Mo., on Mo. Pacific R. R., 23 m. N. W. of Sedalia. Pop. 1880, 1182.

**Brownwood**, cap. of Brown co., Tex. Pop. 1880, 725.

**Brugsch** (HEINRICH KARL), b. in Berlin Feb. 18, 1827, was appointed Prus. consul at Cairo in 1864, and in 1868 made director of the museum of Boulak by the khedive. He pub. a gram. and a dict. of the Demotic lang., and wrote a *History of Egypt from the Monuments*, which was translated into Eng. in 1879.

**Bucksport**, on R. R. and Penobscot River, Hancock co., Me., 18 m. S. of Bangor, is the seat of E. Me. Conference Sem., and has ship-building, fisheries, commerce, and manufactures. Pop. 1880, 1458.

**Bue'na Vista**, R. R. junc., cap. of Chaffee co., Col. Pop. 1880, 2141.

**Burlingame**, city and R. R. junc., Osage co., Kan., 24 m. S. S. W. of Topeka. Coal is found here in abundance, also fire-clay of fine quality. Pop. 1870, 635; 1880, 1370.

**Burnet**, on R. R., cap. of Burnet co., Tex., 45 m. N. W. of Austin. Pop. 1870, 280; 1880, 400.

**Butler**, R. R. junc., De Kalb co., Ind. Pop. 1880, 1056.

**By'erly** (WILLIAM ELWOOD), b. in Phila., Pa., Dec. 13, 1849, grad. from Harvard Coll. in 1871; was appointed prof. of math. at Cornell Univ. (1873) and at Harvard (1875), and pub. *Elements of Differential Calculus* (1879), *Elements of Integral Calculus* (1881), etc.

## C.

**Cable** (GEORGE W.), b. at New Orleans, La., in 1845, grew up under very straitened circumstances, fought in the Confed. army, held some small position in a cotton house, but created quite a sensation in 1879 by his *Old Creole Days*, which was followed in 1880 by *The Grandisseries*, in 1881 by *Maitame Delphine*, etc.

**Cald'well**, city, Sumner co., Kan., on Caldwell branch of Atchison, Topeka and Santa Fé R. R., 63 m. S. by W. of Wichita. Pop. 1880, 1005.

**California**, on R. R., cap. of Montevideo co., Mo., 170 m. W. of St. Louis, is surrounded by a rich agricultural dist., abounding in lead and other minerals. Pop. 1880, 1427.

**Cam'bridge**, on R. R. and Choptank River, cap. of Dorchester co., Md., is 50 m. S. E. of Annapolis, and has acads., flouring mill, tobacco factory, etc. Pop. 1870, 1642; 1880, 2262.

**Cam'den**, R. R. junc., cap. of Ouachita co., Ark., is on the Washita or Ouachita River, 110 m. S. by W. from Little Rock. Pop. 1870, 1612; 1880, 1503.

**Cam'pello**, on Old Colony R. R., Plymouth co., Mass., 21 m. S. of Boston, is now part of Brockton.

**Canonsburg**, on R. R., Wash. co., Pa., 22 m. S. W. of Pittsburg, is the seat of Jefferson Coll. The Pa. Reform School is near the v. Pop. 1870, 641; 1880, 699.

**Can'tlever Bridge**. The is thus called from the principle on which it is constructed. The principle of a cantilever is that of a beam, supported at its centre, with arms branching both ways. The one arm is depressed by a weight, and firmly anchored in the ground, and thereby is produced in the other arm an uplifting power. If the 2 cantilevers stretching out toward each other from the opposite sides of the chasm to be bridged do not reach each other, they are connected by a simple truss-bridge. The first of this kind of bridges built in the U. S. was that across the Niagara River, completed in 1883, and having a clear span of 500 ft. from tower to tower, and a height of 245 ft. above the surface of the river.

**Can'ton**, R. R. junc., cap. of Lincoln co., Dak., is on the Sioux River, and has good water-power. Pop. 1880, 675.



**Canton**, on R. R., Bradford co., Pa. Pop. 1870, 710; 1880, 1194.

**Cape Cod Ship-Canal.** The passage around Cape Cod is the great highway for the coastwise commerce between the N. E. and S. E. ports and for many foreign steamers, which touch at Boston, bound for N. Y. and other ports. The whole traffic engages annually about 80,000 vessels of 12,000,000 tons. The peninsula of Cape Cod is about 50 m. long, and S. of it, in the track of commerce, lie the islands of Martha's Vineyard and Nantucket, with many intermediate and surrounding shoals. There are 4 routes around the cape, varying in length, from Boston to N. Y., from 386 to 380 m. The distance by the canal will be 240 m., thus saving from 96 to 140 m. But the distance is not the prin. gain. The voyage now for sailing vessels is often lengthened many days by contrary winds, making it impossible to double the cape; and off the whole outer coast are numerous reefs, shoals, and islands, rendering navigation at all times dangerous, and in foggy weather or storms almost impracticable. In his report in 1870 Gen. Foster states that in the 17 yrs. prior to 1860 no less than 827 vessels were wrecked at the cape, namely, 4 steamers, 40 ships, 71 barks, 191 brigs, 492 schooners, and 29 sloops. Of these 500 proved a total loss. The loss of life amounted to 510, an average of 30 each yr. The loss of property was not less than \$10,000,000. The approved route for a canal lies between Sandwich on the N. coast and Monument on the S. coast, a distance of about 8 m. It follows a natural depression between the low-lying sand-hills, the two sluggish streams, one flowing N. and the other S., having almost a common source in the intervening marshes. This depression is the bed of an old sea channel, and, indeed, within half a century the storm-tides have met each other across the neck. The valley is from 200 to 500 yards in width between the sand-hills, which rise from 50 to 150 ft. in height. The material consists of sand and sand mixed with clay, with some scattered granite boulders from the glacial epoch. The desirableness of a canal across the isthmus from Buzzard's Bay to Barnstable Bay was felt as early as the beginning of the 17th century, and a plan for a canal was mentioned in 1676. Nothing was actually done, however, until within the last decade. In 1873 a charter was granted by the Mass. legislature, a company was formed under it, and the work has been commenced.

**Cardondale**, city and R. R. junc., Osage co., Kan., 67 m. S. W. of Atchison, has extensive coal mines. Pop. 1880, 710.

**Carlisle**, on R. R., cap. of Nicholas co., Ky., 35 m. N. E. of Lexington, has a normal school. Pop. 1870, 606; 1880, 909.

**Carlisle**, cap. of Clinton co., Ill., on R. R. and Kaskaskia River, 47 m. E. of St. Louis, has a female sem., a public library of 5000 vols., and considerable iron manufactures. Pop. 1870, 1364; 1880, 2017.

**Casey** (THOMAS LINCOLN), b. at Madison Barracks, N. Y., May 10, 1831, was grad. at the U. S. Military Acad. in 1852, and assigned to the corps of engineers, in which he rose to the rank of col. In 1884, having been in charge of construction of fortifications on the coast of Me. and N. H., 1851-67; assistant to chief of engineers 1867-79; in charge of public buildings and grounds in D. C., of the construction of the Wash. monument, completed in 1885, etc.

**Cassington**, R. R. junc., Cass co., Dak., on N. Pacific R. R., 21 m. E. by N. of Fargo. Pop. 1880, 361.

**Cassopolis**, R. R. junc., cap. of Cass co., Mich., 98 m. S. W. of Lansing. Pop. 1870, 728; 1880, 912.

**Catlettsburg**, R. R. junc., cap. of Boyd co., Ky., on Ohio River, at mouth of Big Sandy River, about 150 m. E. N. E. of Frankfurt, has a State normal school. Pop. 1870, 1019; 1880, 1225.

**Cedar Keys**, on R. R. and the Gulf of Mex., is a seaport of Levy co., Fla., and has steamship lines to Tampa, Key West, etc. Lumber-trade is the chief industry. Pop. not in census.

**Cellina**, R. R. junc., cap. of Mercer co., O., is on N. W. bank of the Great Reservoir. Pop. 1870, 859; 1880, 1346.

**Centre of U. S. Population.** The centre of pop., as defined in the *U. S. Statistical Atlas* of 1874, "is the point at which equilibrium would be reached were the country taken as a plane surface, itself without weight, but capable of sustaining weight, and loaded with its inhabs, in number and position, as they are found at the period under consideration, each individual being assumed to be of the same gravity as every other, and consequently to exert pressure on the pivotal point directly proportioned to his distance therefrom." In brief, it is the centre of gravity of the pop. of the whole country.

The following table, with the accompanying map (from U. S. census of 1880), shows this movement of the centre of pop. since 1790. The movement has followed very closely the parallel of 39° N. lat.

*Position of the Centre of Population.*

Date.	N. Lat.	W. Lon.	Approximate Location by Important Towns.	Westward movement during preceding decade. Miles.
1790	39° 16.5' 76° 11.9'	23 m. E. of Baltimore, Md.		
1800	39° 16.1' 76° 56.5'	18 m. W. of "		41
1810	39° 15.5' 77° 37.2'	40 m. N. W. by W. of Washington, D. C.		36
1820	39° 5.7' 78° 33' 16"	N. of Woodstock, Va.		50
1830	38° 57.9' 79° 16.9'	16 m. S. W. of Moorefield, W. Va.		39
1840	39° 02' 80° 18'	S. of Clarkburg, W. Va.		55
1850	38° 59' 81° 19'	23 m. S. E. of Parkersburg, W. Va.		55
1860	38° 04' 82° 48.8'	20 m. S. of Chillicothe, O.		81
1870	39° 12' 83° 35.7'	48 m. E. by N. of Cincinnati, O.		42
1880	39° 41' 84° 39.7'	8 m. W. by S. "		58
Total.....				457

**Centre ville**, on R. R., cap. of Queen Anne co., Md., 30 m. E. by N. of Annapolis, is in a large peach-growing

region, has an acad., and steamboat connection with Baltimore. Pop. 1870, 915; 1880, 1196.

**Chagrin Falls**, on R. R. and Chagrin River, Cuyahoga co., O., 17 m. E. S. E. of Cleveland, has iron foundries, paper-mills, etc. Pop. 1870, 1016; 1880, 1211.

**Chamberlain**, cap. of Brulé co., Dak., on Ia. and Dak. division, Chicago, Milwaukee, and St. Paul R. R., and on the Mo. River, is a thriving place. Pop. not in census.

**Charidon**, on R. R., cap. of Geauga co., O., has a fine c-h. and school building. Pop. 1870, 885; 1880, 1081.

**Chassepot**, a breech-loading rifle-musket, having in its cartridge a mass of fulminating material, which is exploded by means of a needle thrust into it along the axis of the bore. It has taken its name from its inventor, Antoine Alphonse Chassepot, a Fr. officer and inspector of arms, whose first model was brought out in 1863. In an improved form it was introduced in the Fr. army before 1870.

**Chatfield**, on R. R., Fillmore co., Minn., is near Root River, lies partly in Olmsted co., and has an acad. Pop. 1880, 1166.

**Chauvinisme**, a Fr. term derived from Chauvin, a character in a popular comedy from the time of the Restoration—a veteran from Napoleon's army talking much of Austerlitz and Jena, and vowing revenge for Waterloo. A Chauvinist is thus a person who has exaggerated and ridiculous sentiments of patriotism, is warlike and quarrelsome, etc.

**Chel'sea**, Washtenaw co., Mich., on Mich. Central R. R., 22 m. E. by N. of Jackson. Pop. 1870, 1013; 1880, 1160.

**Cherokee**, city and R. R. junc., Crawford co., Kan. Pop. 1880, 556.

**Cherry Vale**, city and R. R. junc., Montgomery co., Kan. Pop. 1880, 690.

**Cis'co**, Eastland co., Tex., at junc. of Houston and Tex. Central, and Tex. and Pacific R. R., 315 m. W. by S. of Ft. Worth. Pop. not in census.

**City Island**, Westchester co., N. Y., is situated in L. I. Sound, a few m. E. of N. Y., and is occupied by that city for public insts. Pop. 1880, 989.

**Clar'ion**, on R. R., cap. of Wright co., Ia., about 85 m. N. of Des Moines. Pop. 1870, 37; 1880, 147.

**Clark**, on R. R., cap. of Clark co., Dak. Pop. 1880, 25.

**Clark** (THOMAS MARSH), D. D., L.L.D., Prot. Epis. bp. of R. I., was b. at Newburyport, Mass., in 1812, grad. at Yale in 1831; received holy orders in 1836, and became bp. in 1854. He has pub. several religious works.

**Clark'son** (R. REV. ROBERT A.), b. at Gettysburg, Pa., in 1836, grad. from a Pa. coll., and in 1848 from theol. school of St. James Coll., Md.; soon after became rector of St. James Epis. Ch., Chicago, Ill., and held that position until 1865, when he became bp. of Neb. and Dak. D. Mar. 10, 1884.

**Clarks'ville**, on R. R., cap. of Red River co., Tex., 350 m. N. of Galveston, is the centre of a very rich country. Pop. 1870, 613; 1880, not in census.

**Clayton-Bulwer Treaty** (The) was concluded between Eng. and the U. S., and signed in Wash. Apr. 19, 1850. It related to the establishment of communication between the Atlantic and Pacific oceans by means of a ship-canal across the Isthmus of Panama, and consisted of nine articles; but opposite and contradictory constructions having been put upon it by the two contracting parties, the Pres., in his message of 1857, recommended its abrogation.

**Clear Lake**, Cerro Gordo co., Ia., on R. R. and E. shore of Clear Lake, 10 m. W. of Mason, is a summer resort. Pop. 1870, 775; 1880, 1095.

**Clifton**, Graham co., Ari., on the Ari. and N. M. R. R., 71 m. N. W. of Lordsburg, N. M. Pop. not in census.

**Clyde**, city, Cloud co., Kan., on R. R. and Republican River. Pop. 1880, 956.

**Col'linsville**, city, on R. R., Madison co., Ill., 11 m. E. by N. of St. Louis. Pop. 1880, 2387.

**Colorado**, cap. of Mitchell co., Tex., on Tex. and Pacific R. R., 230 m. W. by S. of Ft. Worth. Pop. not in census.

**Colorado College**, at Colorado Springs, Co., was founded in 1874 by the Col. Association of Congl. chs., and is under the management of a board of trustees, representing different denominations, and filling its own vacancies. The ground (100 acres) was given to the coll. by the Col. Springs Co., and the building was erected by the contributions of citizens of Col. Springs. The faculty consists of the pres. and six profs., and the plan of instructions corresponds, in general, to the academic course of E. institutions, though with considerable freedom in the choice of studies. The location of the coll. is especially advantageous for the practical study of geology and mineralogy, and of mining and metallurgy.

**Columbia**, cap. of Brown co., Dak., is on the Chicago and N. W. R. R. and the James or Dak. River. Pop. 1880, 133.

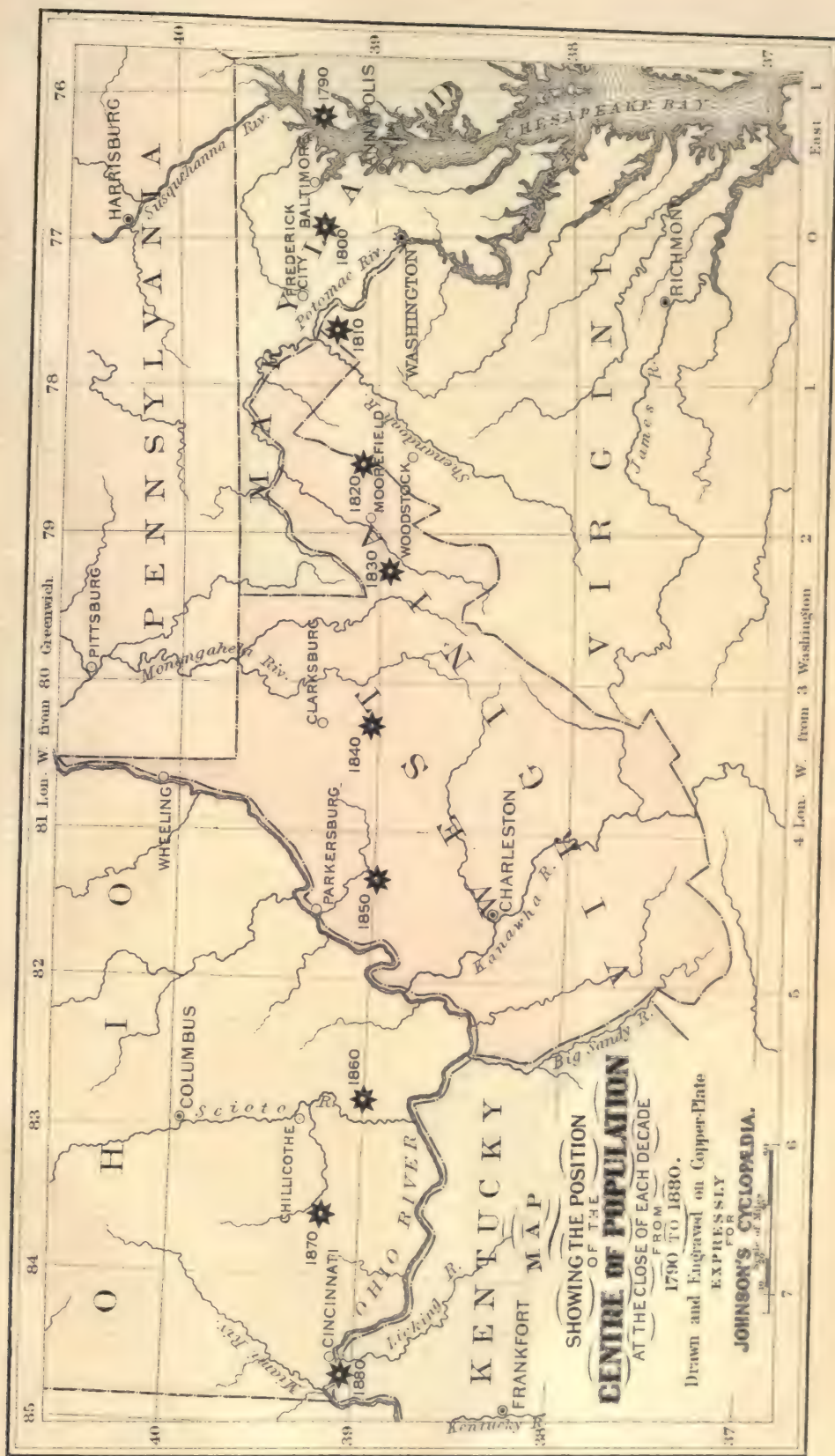
**Columbus Grove**, on R. R., Putnam co., O., 64 m. N. of Dayton. Pop. 1870, 578; 1880, 1392.

**Columbus Junction**, Louisa co., Ia., on Ia. River, at intersection of Burlington, Cedar Rapids, and N. and Chicago, Rock Island and Pacific R. R., 49 m. S. W. by W. of Davenport. Pop. 1870, 850; 1880, 793.

**Commenda** (Lat. "Trust") meant originally the conferring of a vacant benefice for temporary administration on a clergyman already provided with one, but came afterward to mean the bestowal of such a benefice for a long period or for a lifetime, and became thus one of the worst abuses of the R. Cath. Ch. In the Ch. of Eng. the holding of a benefice in *commendam* was continued after the separation from Rome, but was afterward abolished by law.

**Com'stock** (JOHN HENRY), b. Feb. 24, 1849, at Janesville, Wis., grad. B. S. at Cornell Univ. in 1874; was appointed U. S. entomologist in 1879, and prof. of entomology in Cornell Univ. in 1881, and pub. *Report on Cotton Insects*, *Monograph of the Diapinae*, etc.











**Con'go, The Free State of.** At the cong. of Afr. travellers, which gathered in Brussels in 1876 on the invitation of King Leopold of Belg., it was resolved that a systematic and scientific exploration should be undertaken of the region stretching along the line of the equator across the Afr. continent from the Atlantic to the Indian Ocean, and that a series of stations or settlements should be established forming an uninterrupted pathway of civilization from one coast to the other. Accordingly, in 1877, was formed the International Afr. Association, composed of reps. from Belg., Ger., Fr., Sp., the U. S., It., the Netherlands, and Switz., and the work of carrying out its object was entrusted to an executive committee, of which the king of Belg. is the head. Since that date vast and complicated operations, involving great expenditure and even loss of life, have been carried on, directed by Henry M. Stanley, under a general flag of the association. In order to provide for that security to life and property which is indispensable to the success of the undertaking, 79 treaties have been made with the independent chiefs, which covenants cover 2000 m. of the river banks of the Congo and its affluents. Furthermore, 23 stations or settlements have been established, extending from the mouth of the Congo to the equator, a distance of about 700 m. The first station is Vivi, 115 m. from the mouth of the Congo, which distance is now plied by 2 steamers. Seven m. above Vivi the river is obstructed, for a distance of about 40 m., by 30 cataracts, to overcome which a road has been constructed for land-travel to Insaugalla, a distance of 52 m. From that point the river is again navigable for 73 m. to Manyanga, upon which distance the association has also placed a steamer. From Manyanga the river is again obstructed for 35 m., along which another road has been constructed to the fourth station, Leopoldville, upon Stanley Pool, 135 m. from Manyanga, where the river forms a great basin, 25 m. long and 16 m. wide, with 17 islands. From this point there is uninterrupted navigation through a magnificent and thickly populated country for a distance of 940 m., where the organization now has 3 steamers. Below the equator, at Stanley Fall, the river is again obstructed for about 16 m., after which the navigation again is uninterrupted for 220 m. When Stanley arrived in July, 1881, at the lake where the navigable part of the Congo commences, he found that the Fr. explorer, de Brazza, had concluded a treaty with the chief Makoko, who had ceded to Fr. the sovereignty of the N. shore of the lake; and this was the occasion of the international conference on the condition of the Congo region in its relation to the Western powers, which convened in Berlin in Nov. 1884, under the presidency of Prince Bismarck. This convention agreed that the commerce of all nations shall enjoy complete freedom in all the terr. drained by the Congo and its tributaries, including among these Lake Tanganyika and its E. tributaries.

**Conneautville,** on R. R., Crawford co., Pa., 35 m. S. S. W. of Erie. Pop. 1870, 1000; 1880, 941.

**Convocation** is a meeting of the clergy of the Ch. of Eng. to discuss ecclesiastical matters in time of parl. There is one C. for the prov. of Canterbury and one for the prov. of York, and each C. consists of two houses, the upper house composed of bps. and the lower composed of deans, archdeacons, and proctors. Since the time of Henry VIII., however, the acts of C. have lost much of their original importance.

**Corcoran** (W. W.), b. at Georgetown, D. C., Dec. 27, 1798, began banking business in Wash., 1823, amassed great wealth, and became famous for his magnificent charities and splendid gifts to the public. In 1847 he presented the Oak Hill Cemetery to his native city, and in 1857 the Temple of Art—generally called the Corcoran Gallery—to the city of Wash.; and in 1870 he founded in the latter place the Louise Home for indigent women.

**Corthell** (E. L.), C. E., b. Sept. 30, 1840, broke off his studies in Brown Univ. in 1861 in order to enlist in the army, and returned at the end of the war as commander of a light battery, with the full rank of capt.; finished his studies in the univ., and then entered the office of a C. E. in Providence; was appointed chief engineer of the Sky Island levee 1871; chief assistant engineer in the construction of the jetties at the mouth of the Miss. 1874; chief engineer in the construction of the N. Y., W. Shore, and Buffalo R. R. 1881; chief engineer of the Tehuantepec ship-railway 1883; and pub. *History of the Jetties at the Mouth of the Miss. River*, 1881.

**Cosmogony** means a theory of the origin of the universe. The oldest of such theories are those of the E. Indians, Hesiod, the Ionic philosophers, the Bible, etc. Great differences prevail among those theories, according as the universe is supposed to be eternal both with respect to matter and form (Aristotle), or only with respect to matter (Lucretius), or in neither respect (the Bible).

**Cotton-Seed Oil.** Although the cotton plant has been cultivated for over 1000 yrs., no use has been made of its products, except the cotton fibre, until comparatively recently. It has been found that the fibre of the plant stalk can be made into a coarse bagging, and that the seeds will be of use in dyeing and pharmacy, and that the seeds will yield as a prin. product the oil, besides several valuable by-products. In the preparation of the oil 2 difficulties presented themselves: the lint or short fibre surrounding the seed retained much of the oil when the seed was crushed and pressed, and, after expression, the oil had a strong color. The first attempts made in the U. S. to extract the oil as a merchantable product were unsuccessful, but after the introduction, in 1855, of the decorticating machine, which separates the hulls from the kernels, the industry has grown rapidly. Cotton seed oil is principally used as linseed oil or as a substitute for various oils, such as linseed, olive, almond oil, etc. It has been stated that  $\frac{9}{10}$  of all the salad oil consumed in the U. S. consists of cotton-seed oil. But it is difficult to obtain absolutely re-

liable statistics regarding the industry. Of its growth in this country, however, an idea can be formed from the increase in the number of mills engaged in crushing the seeds. They numbered 24 in 1876, 45 in 1880, and 119 in 1884. The quantity of seed crushed in 1883 is estimated at 600,000 tons. Reckoning half a ton of seed to the bale of cotton, this would imply that only about half the seed grown had been utilized. The oil obtainable from the above amount of seed would amount to about 250,000 barrels, worth nearly \$4,000,000. The barrel of oil averages 45 to 48 gals. The oil is usually sold by weight,  $\frac{7}{8}$  pounds being reckoned to the gal. The oil is largely exported to European ports. The amounts exported have varied very much in different yrs. The largest amount for any one yr. was in 1881, when the exports were put at about 150,000 barrels, over  $\frac{1}{2}$  of which was shipped to Fr. and Mediterranean ports. The annual home consumption was estimated a few yrs. ago at 2,000,000 gals. (over 40,000 barrels). Of the by-products in the manufacture of cotton-seed oil, the prin. are lint, hulls, and cotton-seed cake. Lint is used in the manufacture of paper of excellent quality. The hulls are used for fuel, or are ground in with the meal for fodder. The annual exports of cotton-seed cake and meal have varied during the past few yrs. from 100,000 tons to more than twice that amount. The value of this material has been put at about \$6,000,000 annually.

**Coudersport,** on R. R., cap. of Potter co., Pa., 174 m. W. N. W. of Harrisburg. Pop. 1870, 471; 1880, 677.

**Cones** (ELLIOTT), b. at Portsmouth, N. H., Sept. 9, 1842, grad. in 1861 from Columbian Univ., Wash., D. C.; was assistant surgeon U. S. A. 1863-81; held various positions on govt. surveys and in govt. med. insts., and was in 1877 appointed prof. of anat. in Columbian Univ. Is principally known as an ornithologist. He is the author of a *Key to North American Birds* (1872; new edition 1884), *Field Ornithology* (1874), etc., but wrote, besides, a great number of monographs on various subjects.

**Covington,** on R. R., Miami co., O., 79 m. W. of Columbus. Pop. 1870, 1010; 1880, 1468.

**Cra'ven** (ALFRED W.), C. E., b. in city of N. Y., grad. from Columbia Coll.; studied engineering; became in 1849 prominently connected with Croton aqueduct, and afterward took full charge of it as engineer-in-chief and com. He planned and carried out the system of sewerage now in use in the city of N. Y., and was one of the projectors and the first pres. of the Amer. Society of Civil Engineers. D. Mar. 29, 1879.

**Crested Butte,** Gunnison co., Col., on branch of Denver and Rio Grande R. R., 15 m. N. of Gunnison. Pop. about 1000.

**Crock'ett,** city, on R. R., cap. of Houston co., Tex., has a male and female sem. Pop. 1870, 588; 1880, 569.

**Croes** (JOHN), first Prot. Epis. bp. of the diocese of N. J., was b. at Elizabeth, N. J., June 1, 1762; served in the continental army 1778-81; engaged in teaching in Newark, and was ordained in 1790; was appointed rector of Trinity Ch., Swedesborough, 1790, and of Christ Ch., N. B., 1801, and was elected bp. in 1815. D. July 26, 1832. Pub. addresses and sermons.

**Crooks'ton,** R. R. junc., cap. of Polk co., Minn. Pop. 1880, 1237.

**Cros'by** (JOHN SCHUYLER), b. at Albany, N. Y., Sept. 19, 1839; entered the regular army as second lieut. of artil. in 1861; was appointed assistant adjutant-gen. to Gen. Sheridan; but resigned his position in the army in 1872, and was made U. S. consul at Florence in 1876, gov. of Mont. in 1882, and first assistant P. M. in 1884.

**Cum'berland,** on R. R., Barron co., Wis. Pop. 1880, 246.

**Cur'wensville,** on R. R., Clearfield co., Pa. Iron ore and coal are abundant. Pop. 1870, 556; 1880, 706.

## D.

**Dal'ton,** on R. R., Berkshire co., Mass., 146 m. W. of Boston, has important manufactures of paper, machinery, woollens, and cotton goods. Pop. of tp. 1870, 1252; 1880, 2052.

**Dam'rosch** (LEOPOLD), b. at Posen, E. Prus., Oct. 22, 1832, studied med. in Berlin, and took his degree in 1854, but cultivated music at the same time; made his first public appearance as a violin virtuoso in Magdeburg 1856, and became in 1858 leader of the Philharmonic Society in Breslau. Having accepted in 1871 a call from the Arion Society of N. Y. to become its conductor, he founded there the Oratorio Society in 1873, and the Symphony Society in 1878, and became in 1884 director of the Metropolitan Opera House. D. Feb. 15, 1885. He pub. several pieces for the violin, a *Fest Overture*, etc.

**Dan'iel** (WILLIAM), b. in Deal's Island, Somerset co., Md., Jan. 24, 1826, grad. from Dickinson Coll.; studied law; was admitted to the bar in 1856. He is the pres. of the Md. Temperance Society, has been chiefly instrumental in the enactment of the so-called option law in that State, and was the candidate of the Prohibition party for V.-P. in 1884.

**Dar'danelle,** one of the caps. of Yell co., Ark., is on Ark. River, about 80 m. above Little Rock. Pop. 1870, 926; 1880, 748.

**Da'vid City,** R. R. junc., cap. of Butler co., Neb., is 56 m. N. W. of Lincoln. Pop. 1880, 1000.

**Decatur,** R. R. junc., Morgan co., Ala., on Tenn. River, 122 m. S. of Nashville, Tenn. Pop. 1870, 671; 1880, 1063.

**Decatur,** R. R. centre, cap. of Adams co., Ind., is 21 m. S. S. E. of Ft. Wayne. Pop. 1870, 858; 1880, 1905.

**Decatur,** on R. R., cap. of Wise co., Tex., 200 m. N. of Austin. Pop. 1880, 579.

**Deep River,** Middlesex co., Conn., on R. R. and Conn. River, 34 m. S. E. of Hartford. Pop. not in census.

**De Land,** city, on R. R., Volusia co., Fla., 5 m. E. of



landing on St. John's River, is in centre of great orange belt and about 25 m. from Atlantic Ocean. It has several chs. and an acad. Pop. not in census.

**Del'hi**, Del. co., la., near Maquoketa River, about 40 m. W. of Dubuque, has flouring mills, nurseries, fine stone quarries, etc. Pop. 1870, 413; 1880, 524.

**Del Rapids**, Minnehaha co., Dak., on R. R. and Big Sioux River. Pop. 1880, 260.

**De Long** (GEORGE WASHINGTON), b. in N. Y. Aug. 22, 1844, entered the U. S. Naval Acad. in 1861; grad. in 1865; served in the Juniata on her trip to Greenland in 1873, and led the Jeannette expedition, starting from San Francisco, on July 8, 1879. But on June 13, 1881, the Jeannette sunk, crushed by the ice, in lat. 77° 15' N., long. 155° 50' E., and D. L., with a number of the party, perished on the banks of the delta of the Lena in Siberia. See *The Voyage of the Jeannette*, by Mrs. Emma De Long, Boston, 2 vols., 1884.

**Den'ing**, R. R. junc., Grant co., N. M. Pop. not in census.

**Demop'olis**, city, Marengo co., Ala., on R. R. and Tombigbee River, 50 m. W. of Selma, has a cotton and a woollen factory and an active trade in cotton. Pop. 1870, 1339; 1880, 1389.

**Den'ton**, city, on R. R., cap. of Denton co., Tex., 45 m. S. W. of Sherman. Pop. 1870, 361; 1880, 1194.

**De Pauw University**. In 1832 the Ind. Conference of the M. E. ch. determined to establish an inst. of advanced instruction. Two yrs. afterward this was founded at Greencastle, Putnam co., under the name of the Ind. Asbury Univ. Sept. 23, 1839, the first faculty of instruction and govt. was constituted; the first class was grad. in 1840.

But the inst., which thus began in a small hired building of but 2 rooms, now possesses 9 large buildings. At the beginning it did not own a ft. of land; now its grounds embrace 150 acres. Its faculty of 4 members has grown into one of 35 profs. and teachers, besides occasional lecturers, with libraries, biological, chem., and phys. laboratories, and all the appliances of advanced instruction. Beginning with 39 students, its attendance now exceeds 600; and it is now so well endowed as to afford instruction, without any charge for tuition, in its preparatory school, its Asbury coll. of liberal arts, and its theological sem., while the charges in the law school, conservatory of music, etc., are very moderate.

This advancement of the inst. during the last few yrs. has been mainly due to the princely liberality of Hon. W. C. De Pauw, whose name it now bears.

#### ALEXANDER MARTIN.

**Der'by**, R. R. junc., New Haven co., Conn., at the confluence of the Naugatuck and the Housatonic rivers, has extensive and varied manufactures. Pop. of tp. 1870, including Derby v., Ansonia, and Birmingham, 8020; 1880, 11,650.

**De Smet**, cap. of Kingsbury co., Dak., on Chicago and N. W. R. R. Pop. 1880, 116.

**Des'to**, city, on R. R., Jefferson co., Mo., 43 m. S. W. of St. Louis. Pop. 1880, 1889.

**Detroit City**, cap. of Becker co., Minn., on N. Pacific R. R. Pop. 1880, 554.

**Dev'ls Lake**, on R. R., cap. of Ramsey co., Dak. Pop. not in census.

**Dillon**, cap. of Beaver Head co., Mont., on Union Pacific R. R. Pop. not in census.

**Dim'ity** (ALEXANDER), b. in New Orleans, La., Feb. 7, 1805, of Gr. descent; grad. from Georgetown Coll., D. C.; was in 1845 appointed State Supt. of public schools in La.; in 1856 translator to the State dept. in Wash., and in 1858 U. S. minister to Nicaragua and Costa Rica. Entering the service of the govt. at Richmond, he returned in 1861, and was in 1870 made prof. of anc. langs. in Christian Coll. at Pass Christian. D. in New Orleans Jan. 30, 1883.

#### ABERT M. LUSHER.

**Dobb's Ferry**, Westchester co., N. Y., on R. R. and Hudson River, 20 m. N. of N. Y., is a place of summer residence, and has remains of military works erected during revolutionary war. Pop. not in census.

**Dodgeville**, on R. R., cap. of Iowa co., Wis., 45 m. W. by S. from Madison. Pop. 1870, 1407; 1880, 1547.

**Dors'heimer** (WILLIAM), b. at Lyons, Wayne co., N. Y., Feb. 5, 1832, was ed. at Harvard Univ., studied law, and was admitted to the bar in 1854; served in 1861 as aide-de-camp to Gen. Fremont in Mo.; was appointed U. S. dist. atty. for the State of N. Y. in 1867, and became lieut. gov. in 1877.

**Down'ngton**, R. R. junc., Chester co., Pa., 32 m. W. of Phila., has a young ladies' acad. and the Chester Valley Acad. for young men and boys. Pop. 1870, 1077; 1880, 1480.

**Du Bois**, on R. R., Clearfield co., Pa. Pop. 1880, 2718.

**Du'dee**, on R. R., Yates co., N. Y., 32 m. N. by W. from Elmira, has an acad., furnaces, mills, etc. Pop. 1870, 730; 1880, 1025.

**Dupan'loup** (FELIX ANTOINE PHILBERT), b. at Saint-Félix, in Savoy, Jan. 3, 1802; was ordained a priest in 1825; became bp. of Orleans in 1849; was elected a member of the National Assembly in 1871, and d. at Paris Oct. 11, 1878. He was one of the leaders of the Gallican party, and wrote much on popular education.

**Du Plessis-Mornay** (PHILLIPS), b. at Baky, Normandy, Nov. 5, 1549, one of the leaders of the Fr. Prots., an intimate friend of Henry IV.; pub. a violent attack on the papacy, *Le mystère d'iniquité*, and a number of other tracts, some of which were translated into Eng. D. at La Forêt-sur-Sèvre Nov. 1, 1623.

**Duran'go**, cap. of La Plata co., Col., is on Denver and Rio Grande R. R. Pop. not in census.

**Durant** (HENRY F.), b. at Lowell, Mass., in 1822, grad. from Harvard Univ.; studied law and practised in Boston till 1863, when he suddenly became a lay evangelist; founded Wellesley Coll. for the higher education of women, and d. in Boston Oct. 5, 1881.

**Dwight** (WILLIAM BUCK), b. at Constantinople May 23, 1833; came to the U. S. in 1849; grad. from Yale Coll. in 1854, from Union Theological Sem. in N. Y. 1857, and from Yale Scientific School in 1859. In 1878 he was appointed prof. of nat. hist. and curator of the museum in Vassar Coll., Poughkeepsie, N. Y., and in 1879 he began a series of original explorations in the little-known limestones of the Wappinger Valley, Dutchess co., N. Y., the results of which have been partially pub. in the *Proceedings of the American Association for the Advance of Science* and in *American Journal of Science*.

**Dy'ersburgh**, on R. R., cap. of Dyer co., Tenn., is on Forked Deer River, about 160 m. W. of Nashville. Pop. 1870, 683; 1880, 1010.

## E.

**Ee'ce Ho'mo**—"Behold the Man"—the words uttered by Pilate (John xix. 5) when he brought Jesus forth to the people. Hence the name of all those pictures of Chr. which represent him suffering and crowned with thorns, and hence also the name of Seelye's famous book, which appeared in 1864.

**Ed'da** (Icelandic "Great Grandmother"), a collection of anc. Scandinavian poems and tales, illustrating the mythology and early hist. of the N. nations. There are 2 such collections: the old, poetic, or Sæmundic E., named from its compiler, Sæmund Sigfusson Frodi (1054-1133), and the new, prose, or Snorro's E., ascribed to Snorro Sturleson (1178-1241). The E. were translated into Eng. by Benjamin Thorpe, 1866.

**Ed'gar**, on R. R., Clay co., Neb. Pop. 1880, 577.

**Edg'erton**, on R. R., Rock co., Wis., 25 m. S. E. of Madison. Pop. 1880, 869.

**Ed'ina**, on R. R., cap. of Knox co., Mo., 40 m. N. W. of Quincy, Ill. Pop. 1870, 807; 1880, 1156.

**Ed'more**, R. R. junc., Montcalm co., Mich., 33 m. N. of Ionia, Mich. Pop. 1880, 704.

**El'dred**, R. R. junc., McKean co., Pa., 24 m. E. of Bradford, Pa. Pop. 1880, 1165.

**Elizabeth City**, cap. of Pasquotank co., N. C., on Norfolk S. R. R. and Pasquotank River, 46 m. S. of Norfolk, Va., has steamboat connection with various points. Pop. 1870, 930; 1880, 2315.

**Elizabethtown**, cap. of Essex co., N. Y., on Bouquet River, about 125 m. N. of Albany, has extensive iron mines and iron works. Pop. 1880, 445.

**Elk'horn**, R. R. junc., cap. of Walworth co., Wis., 45 m. S. W. of Milwaukee, is in one of the richest farming dists. in the State. Pop. 1870, 1205; 1880, 1122.

**El Pa'so**, an important R. R. centre, cap. of El Paso co., Tex., on the Rio Grande. Near this place the river passes through a gap or gorge in a mountain called El Paso del Norte ("North Pass"), which is the chief thoroughfare between Mex. and N. M. Pop. 1880, 736.

**Em'er'ton** (EPHRAIM), b. at Salem, Mass., Feb. 18, 1857, grad. from Harvard Coll. in 1871; studied in Berlin and Leipzig 1873-76, and was in 1882 appointed prof. of ch. hist. in Harvard Univ. He pub. *The Study of Church History*, *Sir William Temple* and *Die Tripelallianz*, and other papers.

**Emerton** (JAMES HENRY), b. at Salem, Mass., 1847, began his nat. hist. studies at the museum of the Essex Inst. in his native city 1862, and was in 1880 appointed an assistant at the Yale Coll. museum, New Haven, Conn., and also an assistant on the U. S. Fish Commission. He is the author of *Structure and Habits of Spiders* (1877), *Life on the Seashore* (1880), and a number of minor papers. He has also a name as a nat. hist. artist.

**Em'ott** (JAMES), an eminent jurist, b. at Albany in 1770, was a member of State assembly, a M. C., county judge, circuit judge. D. in Poughkeepsie, N. Y., Apr. 7, 1850.—His son, JAMES EMOTT, JR., b. in 1821, studied law, was pres. Merchants' Bank 1852-54, first mayor of Poughkeepsie, N. Y., 1849, dist. atty., judge of supreme court, lawyer in the city of N. Y. D. in Poughkeepsie Sept. 11, 1884.

**Empo'rium**, R. R. junc., cap. of Cameron co., Pa., 99 m. W. N. W. of Williamsport, Pa., has an important lumber trade. Valuable salt wells abound in the vicinity. Pop. 1870, 898; 1880, 1156.

**En'dicott** (WILLIAM CROWNSHIELD), a lineal descendant of John Endicott, first gov. of Mass., under the charter of 1629, and of Jacob Crownshield, the sec. of navy in the cabinet of Jefferson, 1805-09, was b. at Salem, Mass., in 1827; studied law, and was admitted to the Mass. bar in 1850; was a judge of the supreme court 1873-82; was appointed sec. of war in the cabinet of Cleveland 1885, and is one of the board of overseers of Harvard Coll.

**Ep'igram** meant originally simply an inscription, generally in metrical form, on a monument or statue, but became afterward the name of a kind of short poem or piece of verse, ending with a witty or ingenious turn of thought—an interesting idea happily expressed. Among the anc. Martial is the typical E. writer; among modern nations the Fr. have succeeded best in this line.

**Eure'ka**, R. R. junc., Woodford co., Ill., 19 m. E. of Peoria, is the seat of Eureka Coll., connected with which is a normal school and a biblical school of the Disciples of Chr. Pop. 1870, 1233; 1880, 1185.

**Eureka Springs**, cap. of Carroll co., Ark., on Eureka Springs R. R., 19 m. E. by S. of Sellaigman, Mo., which is on St. Louis and San Francisco R. R. Pop. 1880, 3964.

**Eus'tis**, Orange Co., Fla., is on Lake Eustis and near Ft. Mason, which is on St. John's and Lake Eustis R. R. Pop. not in census.

**Ev'erett**, Middlesex co., Mass., on R. R., is separated on the S. from the Charlestown dist. of Boston by the Mystic River. Pop. tp. 1870, 2230; 1880, 4159.

**Everett**, on R. R., Bedford co., Pa., 9 m. E. of Bedford. Pop. 1880, 1247.



**Everett** (CHARLES CARROLL), b. at Brunswick, Me., 1829, studied in Ger. and in Harvard Divinity School; was settled over a Unit. ch. in Bangor, and became prof. of theol. in Harvard Divinity School in 1869, and dean in 1878. He is the author of *The Science of Thought* (1869), *Religions Before Christianity* (1889), etc.

## F.

**Fair Haven**, Bristol co., Mass., on R. R. and E. side of New Bedford harbor, 60 m. S. of Boston, has various manufactures, besides oil-refineries and some fishing interests. Pop. tp. 1870, 2626; 1880, 2875, including 1269 in v.

**Fairmont**, cap. of Marion co., W. Va., on Baltimore and O. R. R., and at the head of navigation on the Monongahela River, 77 m. W. of Wheeling, has a State normal school, several large mills, and a number of coal mines. Prin. business mining. Pop. 1870, 621; 1880, 900.

**Farrow** (WILLIAM GILSON), b. in Boston, Mass., Dec. 14, 1844, took his degree M. D. at Harvard med. school in 1870; studied 2½ yrs. in Europe, and was in 1874 appointed assistant prof. of bot. at Harvard Univ., and in 1879 prof. of cryptogamic bot. He is the author of *Marine Algae of New England* (1881), *Reports on Water Supply*, and numerous papers on the diseases of plants.

**Fayetteville**, cap. of Lincoln co., Tenn., on R. R. and Elk River, 82 m. S. of Nashville, has woollen manufactures, etc., 2 acads., and a large trade in cotton, corn, wheat, hogs, etc. Pop. 1870, 1806; 1880, 2104.

**Fisheries**. Fish is certainly one of the most valuable food resources to mankind. The extent, however, to which that resource has been made available is very different in the different countries, as shown by the following table:

Countries.	Value of Products.
United States.....	\$43,046,053
Great Britain.....	40,000,000
British North America.....	27,000,000
Russia.....	22,000,000
France.....	17,000,000
Norway.....	12,000,000
Portugal.....	3,400,000
Spain.....	2,500,000
Netherlands.....	2,350,000
Sweden.....	1,500,000
Italy.....	1,200,000
Denmark.....	988,000
Belgium.....	425,000
Germany.....	350,000

The States most heavily engaged in F. are:

States.	Per-sons.	Ves-sels.	Boats.	Capital.	Income.
Maine.....	11,071	606	5,920	\$3,375,994	\$3,614,178
Maryland.....	26,008	1,450	2,825	6,342,448	5,221,715
Massachusetts.....	20,117	1,054	6,749	14,394,450	8,141,750
Virginia.....	18,864	1,446	6,618	1,914,119	3,124,444

The products of the F. vary considerably in the different States.

States.	General Fisheries.	Oysters.	Whale.
Maine.....	\$3,576,678	\$37,500	....
Maryland.....	491,239	4,730,476	....
Massachusetts.....	5,642,973	405,550	\$2,089,397
Virginia.....	906,068	2,218,376	....

According to the census of 1880, the value of the products of the oyster F. was in that yr. \$13,439,000; of the cod F., \$4,000,000; salmon, \$3,322,000; mackerel and shad, \$1,500,000 each; herring, \$1,130,000; clam, \$1,014,000; whitefish, \$900,000; lobster, \$732,000; crab, \$370,000; haddock, \$295,000; sturgeon, \$237,000; eel, \$190,000; scallop, \$50,000; smelt, \$48,000; turtle, \$45,000, etc.

**Fitch** (BENJAMIN), b. in N. Y. June 13, 1802, founded during the war a home for soldiers' orphans at his residence at Darien, Conn., which afterward was turned into a home for old soldiers; founded in 1880, at Buffalo, the Fitch Creche and the Fitch Inst. on the same plan as the Cooper Inst. in N. Y. D. Nov. 7, 1883.

**Fitch** (JABEZ W.), b. at Cleveland, O., May 1823, studied law, and was admitted to the bar in 1846; was soon after elected city solicitor; marshal of N. dist. of O. under Pres. Pierce. When the war broke out he was appointed brigadier of militia, and established Camp Taylor, but soon after resigned his commission and enlisted as a private soldier, and was made quartermaster. In 1875 he was elected lieutenant of O. D. Apr. 5, 1884.

**Flamboyant** (Fr. "flaming"), a style of Gothic arch, which originated in Fr. after the decline of the art had commenced. It took its name from the somewhat flame-shaped tracery which is so frequent in this style; but as it was marked by a minute attention to the details of ornamentation and a too general neglect of the total effect, the style is regarded as debased.

**Flatoña**, Fayette co., Tex., on Galveston, Harrisburg and San Antonio R. R., 103 m. W. of Houston. Pop. 1880, 866.

**Flint** (ROBERT), b. near Dumfries, Scot., in 1833, studied in the Univ. of Glasgow, and became prof. of moral philos. and political economy at the Univ. of St. Andrews in 1864, and in 1876 prof. of divinity in the Univ. of Edinburgh. He

is the author of the *Philosophy of History in France and Germany* (1874), *Theism* (1870, 3d ed. 1880), *Antitheistic Theories* (1879).

R. D. HITCHCOCK.

**Florence**, R. R. junc., Darlington co., S. C., 103 m. N. of Charleston, has a large trade in cotton, etc. Pop. 1880, 1914.

**Florence**, cap. of Florence co., Wis., on Menominee River branch of Chicago and N. W. R. R., 135 m. N. by W. from Ft. Howard. Pop. 1880, 207.

**Fonda**, R. R. junc., cap. of Montgomery co., N. Y., on Mohawk River. Prin. business farming and dairying. Pop. 1870, 1092; 1880, 944.

**Forestry** is the art of insuring, by means of human efforts, the permanency of forests, of developing and increasing their productive capacity, and of planting and artificially rearing forests in regions deprived of natural forests by the agency of man. Forests play an important part in the economy of nature, and it is the first duty of F. to regulate the position and assure the permanency of such portions of the natural forests of any country as are essential to preserve the integrity of its surface and water-supply. But forests are also necessary to man for the materials which they yield, and it is the second duty of F. to produce on the smallest possible area an abundant permanent supply of the products of the forest through well-considered systems of planting, thinning, pruning, and felling trees, by protecting forests from fires, browsing animals, and the other dangers to which trees, even among the most enlightened people, are subjected.

F. is a development of modern civilization. The publication in Fr. of Colbert's famous forest ordinance in 1669 was the earliest serious attempt at scientific forest management. Previous to that time the management of forests belonging to the crown, to ecclesiastics, or to private individuals was left to chance in every European country, and the result was that the area of forest was everywhere rapidly diminishing, while fire-wood and timber-trees became exceedingly scarce. By Colbert's ordinance detailed methods of forest management were prescribed, not only for the forests belonging to the crown, but also for those belonging to insts. or private individuals; and the example of Fr. was soon followed by Ger. and other European countries. Technical instruction in forest management was first given in the Hartz forests in Ger., but acads. of the kind are now found in every European country.

In the U. S. no system of forest management has ever been attempted. The forests have been cut away without any thought of their necessity or future condition, and every yr. immense forests are destroyed in every part of the country by fires. The result is that, at the present time, the condition of the Amer. forests is almost identical with that which existed in Europe before the middle of the 17th century, and there is great and imminent danger that the dry interior region of this continent will soon be permanently deprived of all forest growth, unless some wise and comprehensive measures of forest policy can be adopted in the U. S. (See the articles on **TIMBER** and **TIMBER TREES**, and the comprehensive article on **FORESTRY**, by C. S. Sargent, in *Johnson's Univ. Cyc.*)

**Forest City**, R. R. junc., cap. of St. Francis co., Ark., 45 m. W. by S. of Memphis, Tenn. Pop. 1880, 903.

**Fort Gratiot**, St. Clair co., Mich., a v. and military post at the outlet of Lake Huron, opposite Point Edward, Ont., Can. Pop. of tp. 1870, 1093; 1880, 1902; 1884, 2770.

**Fort Leavenworth**, Leavenworth co., Kan., a v. and U. S. military post, on R. R. and Mo. River, situated on a bluff 150 ft. high, 2 m. above Leavenworth. Pop. of reservation in 1870, 1975; 1880, 1112.

**Fowler**, on R. R., cap. of Benton co., Ind., 28 m. N. W. of Lafayette. Pop. 1880, 967.

**Fowlerville**, on R. R., Livingston co., Mich., 60 m. N. W. of Detroit. Pop. 1880, 1051.

**Frankfort**, Marshall co., Kan., on R. R. and Vermillion River, 78 m. W. of Atchison, has good water-power. Pop. not in census.

**Franklin**, on R. R., cap. of Simpson co., Ky., 51 m. N. of Nashville, Tenn., has woollen factory and flour mills, etc. Pop. 1870, 1808; 1880, 1698.

**Franklin**, cap. of St. Mary's parish, La., on R. R. and Bayou Teche, 80 m. W. of Morgan City. Pop. 1870, 1265; 1880, 1702.

**Franklin Grove**, on R. R., Lee co., Ill. Pop. 1870, 757; 1880, 720.

**Franklinville**, on R. R., Cattaraugus co., N. Y., has a free acad. and several mills. Pop. 1880, 672.

**Freeport**, R. R. junc., Armstrong co., Pa., on N. bank of Allegheny River, 23 m. N. of Pittsburgh, has various manufactures. Pop. 1870, 1640; 1880, 1614.

**Fremont**, on R. R., Newaygo co., Mich., 23 m. N. E. of Muskegon. Pop. 1880, 902.

**Freycinet** (CHARLES LOUIS DE SAULCES DE), b. at Foix Nov. 14, 1828, was ed. in the École Polytechnique in Paris, and re-organized, as director of the S. system of Fr. railways (1854-61), the whole railway administration in Fr. He was chief of the war dept. under Gambetta (1870-71), minister of public works in the cabinets of Dufaure and Waddington, and premier from Dec. 1879 to Sept. 1880. In Jan. 1882 he was recalled to power and became pres. of the council and minister for foreign affairs, until July 29, 1882. He pub. *La guerre en province*, besides various mathematical and mechanical works.

**Freytag** (GUSTAV), b. at Kreuzberg, Prus., Silesia, July 13, 1816, studied philos. at Berlin and Breslau; was ed. of the *Leipzig Grenzboten* (1848-70), and acquired a great reputation as a writer of novels. Translated into Eng. are *Debit and Credit* (*Sollen und Haben*) and *The Lost Manuscript* (*Die verlorene Handschrift*).

**Friend**, on R. R., Salline co., Neb. Pop. 1880, 555.

**Fulton**, city and R. R. junc., Fulton co., Ky., has 2 sems, and various manufactures. Pop. 1880, 826.



## G.

**Gadsden**, cap. of Etowah co., Ala., 120 m. N. E. of Montgomery, is on the N. bank of Coosa River, in the midst of the Coosa coal-field and iron deposit, and has extensive yellow pine lumber mills. Pop. 1880, 1697.

**Galeana**, city and R. R. junc., Cherokee co., Kan. Pop. 1880, 1463.

**Gallatin**, R. R. junc., cap. of Daviess co., Mo., on Grand River. Pop. 1880, 1141.

**Garret** (HENRY HIGHLAND), D. D., b. a slave in Chester-town, Md., Dec. 23, 1815, escaped and came in 1827 to N. Y.; grad. in 1839 at Oneida Inst., Whitestown, N. Y.; spent 10 yrs. preaching and teaching at Troy, N. Y.; lectured 3 yrs. in Eng. and Ire. on slavery; went to Jamaica as a missionary for the Scotch Presb. Ch.; was pastor of Shiloh Presb. Ch. in N. Y. 1855-81; was appointed U. S. consul-gen. to Liberia, where he d. Feb. 13, 1882.

**Garrettsville**, on R. R., Portage co., O., 37 m. S. E. of Cleveland. Prin. business, farming and dairying. Pop. 1870, 658; 1880, 969.

**Gatesville**, on R. R., cap. of Coryell co., Tex. Pop. 1880, 494.

**German Reformed Church in America**. Of the G. R. C., which occupies an intermediate position between the Lutheran and the Calvinistic chs., and is represented by the Heidelberg catechism, the first members came to Amer. in 1634, and the first minister was settled among them in 1720. In 1747 there were 5 ordained ministers and 46 congregations or chs., which in the same yr. were organized into a *consistory* or synod under the care of the Reformed Classis of Amsterdam. At present there are 817 ordained ministers, 1426 congregations, and 163,669 communicant members, with a general synod as the highest judicatory authority, with several colls. and theological sems., 15 Eng. and 6 Ger. periodicals, 2 orphan's homes taking care of 108 orphans, and missionary work is being done in Japan, Ind., and among the N.-Amer. Indians. See Lewis Mayer's *History of the German Reformed Church*, Phila., 1851.

**Gerard**, R. R. junc., Macoupin co., Ill., 25 m. S. by W. of Springfield. Pop. 1880, 1024.

**Glen Allen**, on R. R., Henrico co., Va., near the city of Richmond. Pop. not in census.

**Glen drive**, cap. of Dawson co., Mont., is on N. Pacific R. R., near the Yellowstone River. Pop. not in census.

**Globe**, cap. of Gila co., Ariz. Pop. 1880, 704.

**Gluco**se is the commercial name given in the U. S. to the liquid varieties of the sugar made from corn-starch, the solid varieties being known as grape-sugar. Its manufacture has within a few yrs. become an important industry in the U. S., it being used in the manufacture of table syrup, for which purpose it is mixed with the molasses of the cane-sugar refineries; as a substitute for barley-malt in brewing ale and beer, and for cane-sugar in confectionery, in canning fruit, etc.; as a means of adulterating cane-sugar, honey, etc.; for making liquor-coloring, vinegar, cakes, sauces, wine, chewing tobacco, ink, etc. In Europe this industry has long flourished. Payen in 1855 estimated the quantity of G. made in Fr. at 5500 tons per annum. In 1882 there were 39 factories in Ger., producing 18,000 tons of solid grape-sugar, 19,000 tons of G. (liquid), and 2000 tons of sugar-color. There are at present 29 factories in the U. S., with a capacity ranging from 500 to 8000 bushels of corn per day, and with a total capacity of 43,000 bushels per day. A committee appointed by the National Acad. of Science to ascertain whether there were any dangers attending the use of G. as an article of food, gave a favorable report. C. F. CHANDLER.

**Goode** (GEORGE BROWN), b. at New Albany, Ind., Feb. 13, 1851, grad. from the Wesleyan Univ. in 1870; was appointed curator in the U. S. National Museum in 1877, and in 1881 assistant director. He is the author of *The Game Fishes of North America*, *History of the American Menhaden*, *Natural History of the American Menhaden*, etc.

**Gordonsville**, R. R. junc., Orange co., Va., 87 m. S. W. of Wash., D. C. Pop. 1880, 919.

**Gorham**, Coos co., N. H., on Grand Trunk R. R., 91 m. N. W. of Portland, is the N. gate to the White Mts., and is a favorite place of summer resort. The scenery is admirable. Pop. tp. 1870, 1167; 1880, 1383.

**Gorham Controversy** (The), arose when, in 1847, the queen presented the Rev. B. C. Gorham to the vicarage of Bramford Speke, in the diocese of Exeter, and Bp. Philpot refused to institute him because, "contrary to the teachings of the Ch. of Eng., he held 'that spiritual regeneration is not given in baptism.'" Mr. Gorham brought suit in the Arches Court in Canterbury, but the court sustained the bp. The case was then heard before the judicial committee of the Privy Council, and the verdict of the Arches Court was reversed. But that decision led many persons to leave the Ch. of Eng., because she did not maintain the Catholic faith.

**Gowan'da**, Cattaraugus and Erie cos., N. Y., on R. R. and Cattaraugus Creek, 30 m. S. of Buffalo, has fine water-power and various manufactures. Pop. 1870, 994; 1880, 1243.

**Grafton**, cap. of Walsh co., Dak., is on R. R. and Park River. Pop. not in census.

**Grand Army of the Republic**, a fraternal, charitable, and loyal association, exclusively composed of soldiers and sailors of the U. S. A., navy, or marine corps who served during the late c. war, and those having been honorably discharged therefrom after such service. The constituted bodies of the association consist of precinct organizations, known as Posts; State organizations, known as Depts., and a national organization, known as the Encampment of the Grand Army of the Republic, in which the supreme power is lodged. The 30th day of May in each yr. is established a memorial day to be observed by the members in commemoration of their fallen comrades.

**Grand Cross'ing**, Cook co., Ill., at intersection of Ill. Central, Lake Shore, and Mich. S., N. Y., Chicago and St. Louis, and Pittsburg, Ft. Wayne and Chicago R. R., is 10 m. S. of Chicago. Pop. not in census.

**Grand Forks**, R. R. junc., cap. of Grand Forks co., Dak., is on the Red River of the N., in the N. E. part of the terr. Pop. 1880, 1705.

**Grand Junction**, cap. of Mesa co., Col., on Denver and Rio Grande R. R., at junction of Grand and Gunnison rivers. Pop. not in census.

**Grand Rapids**, city and R. R. junc., cap. of Wood co., Wis., on the Wisconsin River, 200 m. N. W. of Milwaukee, has several lumber mills, etc. Large beds of pure kaolin are found in close proximity. Pop. 1870, 1118; 1880, 1350.

**Granite Falls**, city, cap. of Yellow Medicine co., Minn., is on Chicago, Milwaukee and St. Paul R. R., and Minn. River. Pop. 1880, 578.

**Granville**, on R. R., Wash. co., N. Y., 65 m. N. of Albany. The tp. contains several v., among them N. G., which has a female sem. Prin. business of tp. is agriculture and the quarrying and manufacture of roofing slate, mantels, and all articles of marbleized slate. Pop. tp. 1870, 4003; 1880, 4149.

**Gray** (COL. ISAAC PUSEY), b. in Chester co., Pa., Oct. 18, 1828, studied law; settled in 1855 in Union City, Ind.; served in the war as col. of the 4th Ind. cav., and was in 1868 elected State senator, in 1876 lieut.-gov., and in 1884 gov.

**Greely** (ADOLPHUS W.), b. Mar. 27, 1844, at Newburyport, Mass., enlisted in the army in 1861; was detailed for duty in U. S. signal service in 1867; commanded the expedition sent into the Arctic regions by the U. S. govt. in 1879; reached lat. 83° 24' N., the highest N. point yet attained, and was rescued, together with 6 of his crew, by the U. S. relief expedition in June 1884.

**Green castle**, Franklin co., Pa., on R. R., 63 m. S. of Harrisburg, has some manufactures. Prin. business, agriculture and huckstering. Pop. 1870, 1650; 1880, 1735.

**Greene**, on R. R., Butler co., Ia., 35 m. N. W. of Cedar Falls. Pop. 1880, 711.

**Greenfield**, on R. R., cap. of Adair co., Ia. Pop. 1880, 684.

**Greenville**, R. R. junc., cap. of Hunt co., Tex., 53 m. S. E. of Denison. Pop. not in census.

**Gresham** (WALTER Q.), b. at Corydon, Ind., Mar. 17, 1833, grad. from Bloomington Univ.; studied law; served in the army 1861-65, and was brevetted a maj.-gen.; settled at New Albany, and was appointed P. M.-gen. in 1883, sec. of treas. in 1884, and in the same yr. U. S. circuit judge for the 7th circuit.

**Grieg** (EDWARD HAGERUP), b. at Bergen, June 15, 1843, studied music in Leipzig under Moscheles and in Copenhagen under Gade; founded in 1867 a musical society in Christiania, of which he is still director; has a name as a pianist, and has pub. some concertos, sonatas, and songs which are very popular.

**Groton**, on R. R., Brown co., Dak. Pop. not in census.

**Groton**, on R. R., Tompkins co., N. Y., 26 m. S. of Auburn, has various important manufactures. Pop. 1870, 863; 1880, 913.

**Gunnison**, R. R. junc., cap. of Gunnison co., Col., on Gunnison River, 170 m. W. by N. of Pueblo. Pop. 1880, 888.

**Guthrie Centre**, on R. R., cap. of Guthrie co., Ia., 60 m. W. of Des Moines. Pop. 1880, 571.

**Gwynn** (NELL), b. in Lond. about 1650, in the most abject poverty; sold oranges in the taverns, sang and danced for money, and became the mistress of the actors Hart and Lacy. In her 16th yr. she went upon the stage, and became much applauded in numerous and lascivious parts, and became the mistress of Lord Buckhurst. In 1669 Lord Buckhurst sold her to the king, and in 1671 she was appointed lady of the private chamber to Queen Catherine. She bore 2 sons to the king, of whom the elder d. very early; the younger was created duke of St. Albans. After the death of Charles II. she lived in retirement, and d. about 1690.

## H.

**Hailey**, on R. R., cap. of Alturas co., Id., on Wood River branch of Id. Division (Or. Short Line) Union Pacific R. R. Pop. not in census.

**Ham**, a town of Fr. in the dept. of Somme, on the Somme. Its old fortress, built in 1470, is now used as a State prison. Louis Napoleon was held there from 1840 to 1846. Pop. 3043.

**Hamilton**, on R. R., Caldwell co., Mo., 50 m. E. of St. Joseph, is centre of a fine agricultural region, and is an important shipping point for cattle, horses, hogs, and grain. Pop. 1870, 975; 1880, 1290.

**Hammondsport**, Steuben co., N. Y., on R. R., and at head of Keuka Lake, is a great centre of grape culture and wine manufacture, and has a line of steamers to Penn. Yan. Pop. 1870, 602; 1880, 755.

**Hamonton**, on R. R., Atlantic co., N. J., half way between Phila., Pa., and Atlantic City, N. J., is noted for its fruit, wheat, corn, and root crops. Pop. 1870, 1404; 1880, 1776.

**Hanford**, Tulare co., Cal., on Goshen Division of S. Pacific R. R., 13 m. W. of Goshen. Pop. 1880, 269.

**Harlan** (JOHN M.), b. in Ky. about 1834, in 1855 was Whig candidate for Cong., but was defeated; entered U. army at commencement of late c. war, and served 2 yrs. as col. of 10th Ky. infantry; in 1863 was elected State atty.-gen. on U. ticket; at end of his term practised law in Louisville, Ky.; unsuccessful candidate for gov. of Ky. in 1871 and 1875; became associate justice of U. S. Supreme Court in 1877.

**Harper**, Harper co., Kan., on S. Kan. R. R., 36 m. W. of Wellington. Pop. tp. 1880, 747.

**Harrison**, on R. R., cap. of Clare co., Mich. Pop. 1880, 129.



**Hartford City**, R. R. junc., cap. of Blackford co., Ind., 40 m. S. of Ft. Wayne, has a variety of manufactures. Pop. 1870, 878; 1880, 1470.

**Hav'lock**, on R. R., Cook co., Ill., about 7 m. N. of Chicago, near Lake Mich. Pop. not in census.

**Hawkinsville**, city, on R. R., cap. of Pulaski co., Ga., 40 m. S. of Macon, has large cotton factory, several cotton warehouses, etc. Pop. 1870, 813; 1880, 1542.

**Hawley**, R. R. junc., Wayne co., Pa., 8 m. S. E. of Honesdale. Pop. 1880, 1882.

**Ha'zlehurst**, on R. R., cap. of Copiah co., Miss. Pop. 1870, 662; 1880, 463.

**Hazlitt** (WILLIAM), b. at Maidstone, Eng., Apr. 10, 1778, studied at Hackney Coll.; devoted himself to lit., and became noted as a contributor to journals and periodicals, writing chiefly on theatrical and literary topics. D. in Lond. Sept. 18, 1830. Author of *Memoirs of Holcroft* (1809), *Characters of Shakespeare* (1817), *View of the English Stage* (1818), *English Poets* (1818), *Comic Writers* (1819), *Literature of the Elizabethan Age* (1821), *Life of Napoleon* (1827), etc.

**He'bron**, cap. of Thayer co., Neb., on R. R. and on Little Blue River, 65 m. S. W. of Lincoln. Pop. 1880, 466.

**Hempstead**, R. R. junc., Queen's co., N. Y., 21 m. E. of N. Y. City, has flour mill, patent-leather factory, etc. Pop. 1870, 2316; 1880, 2521.

**Henderson**, R. R. junc., cap. of Vance co., N. C. Pop. 1870, 545; 1880, 1421.

**Henderson**, R. R. junc., cap. of Chester co., Tenn. Pop. 1880, 493.

**Honrietta**, cap. of Clay co., Tex., on Ft. Worth and Denver City R. R., 95 m. N. W. of Ft. Worth. Pop. not in census.

**Herpetology**, from the Gr. *ἑρπῆς*, a "creeping thing," and *λογία*, a "treatise," is that branch of zool. which is dedicated to the nat. hist. of REPTILES and AMPHIBIA, which two articles see (in CYCLOPEDIA) for information respecting the characters of the several groups. Of all the branches of zool. H. is the latest developed; indeed, it did not reach its present systematization until the second decade of the present century.

**Herrnhut** ("Protected by the Lord"), a town of Ger., in the kingdom of Sax., was founded in 1723 by a colony of Moravian brethren who were driven from their homes by the Jesuits, but were received and settled there by Count Zinzendorf. The colored paper and linen fabrics manufactured there are very celebrated. Pop. about 1000.

**Hickman**, city, cap. of Fulton co., Ky., on R. R. and Miss. River, has 2 acads. and several steam flouring mills, etc. Pop. 1870, 1120; 1880, 1264.

**Hickory**, on R. R., Catawba co., N. C., has tobacco factory, flour mill, etc. Pop. 1870, 1591; 1880, 3071.

**Hicksville**, on R. R., DeWitt co., O. Pop. 1880, 1212.

**Higginsville**, R. R. junc., La Fayette co., Mo. Pop. 1880, 797.

**High Point**, on R. R., Guilford co., N. C. Pop. 1880, 991.

**Hillsborough**, on R. R., cap. of Hill co., Tex., has an acad. Pop. 1870, 313; 1880, not in census.

**Hingham**, on R. R., Plymouth co., Mass., has steamboat communication with Boston, and manufactures of wooden ware, cordage, etc. Pop. 1870, 4429; 1880, 4485.

**Hiram**, Portage co., O., 4 m. N. W. of Garrettsville, is the seat of Hiram Coll. Pop. 1880, 144.

**Holbach** (PAUL HENRI THYER), **Baron von**, b. at Hildesheim, in the Palatinate, in 1723; removed early to Fr., and spent most of his life in Paris, where he d. Jan. 21, 1789. He was rich, and in his elegant house he gathered a large circle of literary men of the most advanced type. His own writings were among the most radical productions of the age, *Le Christianisme dévoilé*, *De l'imposture sacerdotale*, *Système de la nature*, *Système social*, etc.

**Holberg** (LUDVIG), b. Nov. 6, 1684, in Bergen, Nor., studied in the univ. of Copenhagen; travelled much in Ger., Fr., Hol., and Eng.; was appointed prof. of philos. in Copenhagen in 1718; founded and endowed the acad. of Sorø; was created a baron in 1747, and d. Jan. 27, 1754. By his comedies, satires, historical and moral writings, he became the father of the Dan. lit.

**Holloway's College**, the largest woman's coll. or female univ. hitherto established, founded and endowed by Thomas Holloway at a cost of more than \$5,000,000, is situated at Mount Lee, on the S. E. terminus of Windsor Park, near Lond., and occupies grounds of 96 acres and a building 520 ft. by 376 ft., of great architectural merit and magnificent outfit. The object of the coll. is to afford a suitable education to women of the middle and especially of the upper middle classes.

**Honey Grove**, Fannin co., Tex., on Tex. and Pacific R. R., 16 m. E. of Bonham. Pop. 1870, 382; 1880, 884.

**Howard**, cap. of Elk co., Kan., on Howard branch of Atchison, Topeka, and Santa Fé R. R., 76 m. S. of Emporia. Pop. 1880, 683.

**Howard City**, on R. R., Montcalm co., Mich., 33 m. N. of Grand Rapids. Pop. 1880, 924.

**Howell** (EUGENE N.), b. at Philadelphia, Pa., Jan. 10, 1849; educated in his native city; engaged in early life in banking, R. R., and local enterprises in Pa.; afterward in mining and iron interests on Pacific coast; subsequently engaged extensively in shoe manufacturing in Poughkeepsie, N. Y., and became prominent in telegraph affairs.

**Humanists** (**The**) is the name of that party in the 16th century which represented the Renaissance in the field of lit. proper. The task which the H. originally set before themselves was simply the restoration of the Lat. lang. But with the lang. followed the lit., and the H., at first mere grammarians and philologists, became critics and historians, and teachers of polite lit. And again, with the anc. lit. awakened the anc. spirit, and thus the H. became reps. of views, æsthetic, moral, and philosophical, which were directly opposed to the R. Cath. Ch.

**Humboldt**, on R. R., Humboldt co., Ia., is the seat of Humboldt Coll. Pop. 1870, 335; 1880, 606.

**Huntsville**, on R. R., cap. of Randolph co., Mo., 153 m. N. W. from St. Louis, has a coll. for both sexes, important coal mines, woolen mill, flour mill, etc. Pop. 1880, 1527.

**Huron**, cap. of Beadle co., Dak., on R. R. and Dak. River. Pop. 1880, 164.

**Hyatt** (ALPHEUS), b. Apr. 5, 1838, in Wash., D. C., was ed. in Yale Coll. and Lawrence Scientific School, and was appointed custodian of the Boston Society of Natural Science in 1870, and curator of the same in 1881. He has written *Fresh Water Polyzoa*, *Genera of Fossil Cephalopoda*, etc., besides a series of *Guides to Science Teaching*, for the purpose of popularizing science and introducing it into the public schools.

## I.

**Ida Grove**, on R. R., cap. of Ida co., Ia. Pop. 1870, 30; 1880, 759.

**Idaho Springs**, on R. R., Clear Creek co., Col., 34 m. W. of Denver, is noted for its hot and cold mineral springs, and is a great resort for restoration of health. Pop. 1880, 733.

**Ig'natieff** (NICHOLAS PAULOVITCH), b. in St. Petersburg Jan. 29, 1832, was ed. among the imperial pages; entered upon a diplomatic career; was sent to Khiva and Bokhara in 1858, to Peking in 1860, to Constantinople in 1864, and was minister of interior from 1878 to 1882.

**Indian Agencies**, U. S. ARIZONA, Col. River (P. O., Parker, Yuma co., Ari.), Pima and Maricopa and Papago (P. O., Pima and Maricopa Agency, Ari., via Casa Grande), San Carlos (P. O., San Carlos Agency, Ari.).

CALIFORNIA, Hoopa Valley (P. O., Hoopa Valley, Humboldt co., Cal.), Mission (P. O., San Bernardino, Cal.), Round Valley (P. O., Covelo, Mendocino co., Cal.), Tule River (P. O., Porterville, Tulare co., Cal.).

COLORADO, S. Ute (P. O., Ignacio, La Plata co., Col.).

DAKOTA, Cheyenne River (P. O., Cheyenne River Agency, Ft. Bennett, Dak.), Devil's Lake (P. O., Ft. Totten, Ramsey co., Dak.), Ft. Berthold (P. O., Ft. Berthold Agency, Stevens co., Dak.), Crow Creek and Lower Brulé (P. O., Crow Creek Agency, Dak., via Chamberlain), Pine Ridge (P. O., Pine Ridge Agency, Dak.), Rosebud (Spotted Tail) (P. O., Rosebud Agency, Dak., via Ft. Niobrara, Neb.), Sisseton (P. O., Sisseton Agency, Dak., via St. Paul, Minn.), Standing Rock (P. O., Standing Rock Agency, Ft. Yates, Dak.), Yankton (P. O., Yankton Agency, Greenwood, Dak.).

IDAHO, Ft. Hall (P. O., Ross Fork, Oneida co., Id.), Lemhi (P. O., Lemhi Agency, Id.), Nez Percés (P. O., Nez Percés Agency, Id.).

INDIAN TERRITORY, Cheyenne and Arapaho (P. O., Darlington, Ind. Terr., via Caldwell, Kan.), Kiowa, Comanche, and Wichita (P. O., Anadarko, Ind. Terr.), Osage (P. O., Pawhuska, Ind. Terr.), Ponca, Pawnee, and Otoe (P. O., Ponca, Pawnee, and Otoe Agency, Ind. Terr., via Arkansas City, Kan.), Quapaw (P. O., Seneca, Newton co., Mo.), Sac and Fox (P. O., Sac and Fox Agency, Ind. Terr., via Tulsa), Union (P. O., Muscogee, Ind. Terr.).

IOWA, Sac and Fox (P. O., Tama City, Tama co., Ia.). KANSAS, Pottawatomie and Great Nemaha (P. O., St. Mary's, Pottawatomie co., Kan.).

MICHIGAN, Mackinac (P. O., Ypsilanti, Washtenaw co., Mich.).

MINNESOTA, White Earth (consolidated) (P. O., White Earth Agency, Becker co., Minn.).

MONTANA, Blackfeet (P. O., Blackfeet Agency), Piegan (P. O., Choteau co., Mont.), Crow (P. O., Crow Agency, Ft. Custer, Mont.), Flathead (P. O., Flathead Agency, Mont.), Ft. Belknap (P. O., Ft. Belknap, Mont.), Ft. Peck (P. O., Ft. Peck Agency, Poplar Creek, Mont.).

NEBRASKA, Omaha, and Winnebago (P. O., Winnebago Agency, Dak. co., Neb.), Santee and Flandreau (P. O., Santee Agency, Knox co., Neb.).

NEVADA, Nev. (P. O., Wadsworth, Washoe co., Nev.), Western Shoshone (P. O., White Rock, Elko co., Nev.).

NEW MEXICO, Mesquero (P. O., South Ft., Lincoln co., N. M.), Navajo (P. O., Navajo Agency, Manuelito Station, Valencia co., N. M.), Pueblo (P. O., Pueblo Agency, Santa Fé, N. M.).

NEW YORK (P. O., Randolph, Cattaraugus co., N. Y.). NORTH CAROLINA, E. Cherokee (P. O., Nantahala, Swain co., N. C.).

OREGON, Grande Ronde (P. O., Grande Ronde, Polk co., Or.), Klamath (P. O., Klamath Agency, Lake co., Or.), Siletz (P. O., Toledo, Benton co., Or.), Umatilla (P. O., Pendleton, Umatilla co., Or.), Warm Springs (P. O., Warm Springs, Crook co., Or.).

TEXAS, Tonkawa Special Agency (P. O., Ft. Griffin, Tex.). UTAH, Ouray (P. O., Ouray, via Green River City, Wyo.), Uintah Valley (P. O., Uintah Valley Agency, White Rocks, Ut., via Green River City, Wyo.).

WASHINGTON TERRITORY, Colville (P. O., Chewelah, Stevens co., Wash. Terr.), Neah Bay (P. O., Neah Bay, Clallam co., Wash. Terr.), Quinalt (P. O., Peterson's Point, Chehalis co., Wash. Terr.), Nisqually and S'Kokomish (P. O., Tacoma, Wash. Terr.), Tulalip (P. O., Tulalip, Snohomish co., Wash. Terr.), Yakama (P. O., Ft. Simcoe, Yakama co., Wash. Terr.).

WISCONSIN, Green Bay (P. O., Keshena, Shawano co., Wis.), La Pointe (P. O., Ashland, Wis.).

WYOMING TERRITORY, Shoshone (P. O., Shoshone Agency, Wyo.).

INDIAN TRAINING AND INDUSTRIAL SCHOOLS: Carlisle Training School (P. O., Carlisle, Pa.), Chilocco Industrial School (P. O., Chilocco, Ind. Terr., via Arkansas City, Kan.), Forest Grove Training School (P. O., Forest Grove, Or.), Genoa Industrial School (P. O., Genoa, Neb.), Hampton Normal and Agricultural Institute (P. O., Hampton, Va.), Lawrence Industrial School (P. O., Lawrence, Kan.).



**Ingersoll** (ROBERT J.), b. Aug. 24, 1833, at Dryden, N. Y., removed early to Ill.; studied law and practised for several yrs. at Peoria, but is now established in Wash. He has acquired a great reputation as a public lecturer, though following a strongly anti-biblical and antichristian course. See *The Gods, and Other Lectures, The Ghosts, Some Mistakes of Moses, What Shall I do to be Saved?* etc.

**Interest Table.** See page 1546.

**Iron Mountain,** Menominee co., Mich., on Menominee River R. R. (Peninsular Division of Chicago and N. W. R. R.), in N. W. part of the State, near Wis. boundary. Pop. not in census.

**Irvington,** Westchester co., N. Y., on Hudson River and the Hudson River R. R., 22 m. N. of N. Y. The residence of the late Washington Irving was in the immediate vicinity. Pop. 1880, 1904.

**Irwin,** Westmoreland co., Pa., on Pa. R. R., 22 m. S. E. of Pittsburgh. Pop. 1870, 833; 1880, 1444.

**Ischia,** a mountainous island, about 24 sq. m., and situated in the Mediterranean, near Naples. It is remarkable for the beauty of its scenery, the fertility of its soil, the perfection of its climate, its mineral springs, its fruits, etc. But it is of volcanic origin, and has often suffered severely from earthquakes. One of the most violent and destructive on record was that of July 23, 1883. The towns of Casamicciola, Lacco, and Forio were completely destroyed, and more than 4000 persons perished.

**Ithaca,** on R. R., cap. of Gratiot co., Mich. Prin. business, farming. Pop. 1880, 600; 1884, 1412.

## J.

**Jack'sonville,** cap. of Jackson co., Or., on Rogue River, is in a good agricultural and mining region. Pop. 1880, 839.

**James'town,** R. R. junc., cap. of Stutsman co., Dak., on Dak. River and N. Pacific R. R., 93 m. W. of Fargo. Pop. 1880, 393.

**Janes** (EDWARD H.), M. D., b. at Northfield, Mass., Oct. 3, 1830, and grad. M. D. from Berkshire Med. Coll. in 1847; settled in 1850 in the city of N. Y., and was in 1866 appointed sanitary inspector by the Metropolitan Board of Health, in 1872 prof. of hygiene in the Woman's Med. Coll. of the N. Y. Infirmary, and in 1873 assistant supt. of the N. Y. Health Dept. He has pub. *Report on Condensed Milk* (1858), *Report on the Sanitary Condition of the 20th Ward* (1865), etc.

**Jasper,** R. R. junc., cap. of Dubois co., Ind., on Patoka River, in centre of an important block-coal region, has lumber, coal, and tobacco trade, etc. Pop. 1870, 547; 1880, 1040.

**Jersey Shore,** Lycoming co., Pa., on R. R. and the W. branch of the Susquehanna River, 12 m. W. of Williamsport. Chief industries, farming, lumber trade, and tobacco business. Pop. 1870, 1894; 1880, 1411.

**Johnson** (FRANK GRANT), M. D., b. Jan. 30, 1825, in East Windsor, Conn., grad. from Wesleyan Univ. 1849, studied in Med. Coll. in Vt., and practised med. in Brooklyn, N. Y., 1852-56. Between 1852-81 he patented about 100 new inventions, and pub. *Johnson's Philosophical Charts* (1856), *Aid to Teachers and Students in Natural Philosophy* (1856), *The Water Meter and the Actual Measurement System of Charging for Public Water* (1862), *The Nicholson Pavement and Pavements in General* (1867), etc.

**Johnson** (JOHN), LL.D., b. Aug. 23, 1806, in Bristol, Me., and grad. in 1832 from Bowdoin Coll. From 1837 to 1879 he was prof. of nat. science at Wesleyan Univ., and wrote, besides many articles in scientific periodicals, *A Manual of Chemistry, A Manual of Natural Philosophy*, etc. D. Dec. 2, 1879.

**Jonesborough,** R. R. junc., cap. of Craighead co., Ark., 49 m. N. W. of Memphis, Tenn. Pop. tp. 1870, 2094; 1880, 2650.

**Jonesborough,** on R. R., cap. of Washington co., Tenn., 100 m. E. by N. of Knoxville, is the oldest town in the State, and was the first State cap.; has a female coll. and a male inst. Pop. 1880, 895.

**Jordan** (DAVID STARR), b. Jan. 19, 1851, at Gainesville, N. Y., grad. from Cornell Univ. 1875; studied in the Ind. Univ. Med. Coll., and was appointed prof. of biology there in 1879. He has written a *Manual of Vertebrates* (1876), *Synopsis of the Fishes of North America* (1883), besides numerous contributions to scientific papers.

## K.

**Kalkas'ka,** on R. R., cap. of Kalkaska co., Mich., 137 m. N. of Grand Rapids, in the centre of a vast lumber region. Pop. 1880, 496.

**Ken'nebunk,** York co., Me., on R. R. and the Kennebunk River, 3 m. from the Atlantic, has a good coasting trade and manufactures of shipping, twine, lumber, etc. Pop. tp. 1870, 2603; 1880, 2852.

**Ken'nett Square,** on R. R., Chester co., Pa., in a rich agricultural dist. Pop. 1870, 884; 1880, 1021.

**Kentland,** on R. R., cap. of Newton co., Ind., on the Grand Prairie in the N. W. part of the State, in a rich agricultural region. Pop. 1870, 802; 1880, 982.

**Ketch'um,** Alturas co., Id., on Wood River branch (Or. Short Line) Union Pacific R. R. Pop. not in census.

**Keyes** (EMERSON W.), b. at Jamestown, Chautauqua co., N. Y., June 30, 1823, grad. from State Normal School, Albany, 1848; was teacher for several yrs.; became deputy supt. of public instruction 1857 and supt. 1861; was deputy supt. of banking dept. of State of N. Y. 1865-70, and exercised great influence on the organization of its present banking system. Wrote *History of Savings Banks in the United States* (1876) and *Code of Public Instruction of State of New York* (1879).

**Key'port,** Monmouth co., N. J., on R. R. and Raritan Bay, 25 m. from N. Y. City, is a summer resort, an impor-

tant centre of the oyster, clam, and fish trade, and has steamboat communication with N. Y. city. Pop. not in census.

**Khar'toom,** a town of Egypt, was founded by Mehemet Ali in 1823, and is now the chief town in Egyptian Soudan. It stands at the confluence of the Blue and the White Nile, in a level but very fertile plain, and has a considerable trade, being the centre of several caravan routes. It was taken by El Mahdi Jan. 27, 1885, and made the scene of a frightful massacre. Pop. about 50,000.

**Kiddermin'ster,** town of Eng., in the co. of Worcester, on both sides of the Stour, near its influx in the Severn. Its carpet manufactures are very celebrated. They were established in 1735. At first only Scotch carpets were made, but in the course of 10 years the manufacture of Wilton and Brussels was also introduced. That which has given the K. carpets their great name is the permanency of their colors, due to peculiar properties of the water of the Stour. Pop. 24,270.

**Kil'bourn City,** Columbia co., Wis., on R. R. and Wis. River, 108 m. N. W. from Milwaukee, has a fine inst., is surrounded by a rich farming dist., is the centre of the hop trade of the N. W., and is a noted summer resort. Pop. 1870, 1114; 1880, 945.

**Kim'ball,** Brulé co., Dak., on Ia. and Dak. Division of Chicago, Milwaukee and St. Paul R. R., 47 m. W. of Mitchell. Pop. not in census.

**Kincaid** (EUGENIO), D. D., b. at Westfield, Conn., in 1798, studied theol. and had charge first of the Bap. ch. in Galway, N. Y., then of that at Milton, Pa., but was in 1830 appointed missionary to Burmah, where he worked with much success till 1842. The next 12 yrs. he spent at home, endeavoring to rouse a spirit of mission throughout the ch., but in 1854 he again went to Burmah, and remained till 1865. D. at Glard, Kan., Apr. 3, 1883.

**King** (MOSES), b. in Lond., Eng., Apr. 13, 1854, came to the U. S. in 1860, entered an insurance office in St. Louis in 1866, edited and pub. *The St. Louis Temperance Monthly* (1873), compiled and pub. an *Authentic List of the Banks and Bankers of Newport City* (1877), entered Harvard Coll. in 1877, and settled after graduation at Cambridge, as a pub., having in the mean time compiled and pub. *King's Handbook of Boston, King's Dictionary of Boston, New Guide to Harvard University*, etc.

**King'man,** cap. of Kingman co., Kan., on Wichita and W. branch of Atchison, Topeka, and Santa Fé R. R., 45 m. W. of Wichita. Pop. tp. 1880, 970.

**Kin'ston,** on R. R., cap. of Lenoir co., N. C., 35 m. W. of New Bern. Pop. 1870, 1103; 1880, 1216.

**Koscius'ko,** on R. R., cap. of Attala co., Miss., near the centre of the State. Prin. business, raising cotton, of which about 25,000 bales are shipped yearly. Pop. 1870, 577; 1880, 1126.

**Kuenen** (ABRAHAM), b. at Haarlem Sept. 9, 1823, was appointed prof. of theol. at Leyden in 1852, and pub. *Investigation into the Origin of the Old Testament Books* (1861-65), *The Religion of Israel* (1874-75), *The Prophets and Prophecy* (1877), etc., which were translated into Eng., Fr., Ger., and Dan.

**Kug'ler** (FRANZ THEODOR), b. at Stettin Jan. 19, 1808, was appointed prof. in the fine arts at Berlin in 1833, and d. there Mar. 18, 1858. His *Handbook of the History of Painting* (2 vols., Berlin, 1837) and *Handbook of the History of Art* (3 vols., Stuttgart, 1841-42) have both been translated into Eng.

## L.

**Lake Charles,** cap. of Calcasieu parish, La., on R. R., Lake Charles, and Calcasieu River (navigable), 60 m. N. of Gulf of Mex. and 200 m. W. of New Orleans, has extensive lumber mills and trade. Pop. 1880, 888.

**Lamar,** R. R. junc., cap. of Barton co., Mo., 20 m. from Kan. line, has steam flouring mill, etc. Pop. 1880, 907.

**Lampa'sas,** cap. of Lampasas co., Tex., on Gulf, Col. and Santa Fé R. R., 47 m. W. of Belton. Pop. 1880, 653.

**Lancaster,** on R. R., cap. of Garrard co., Ky., 112 m. S. E. of Louisville, is in the "blue-grass region," and is noted for fine corn and wheat. Pop. 1870, 741; 1880, 1234.

**Land Law and Ownership in the United States.** The fundamental conceptions in regard to the ownership, acquisition, and transfer of lands in the U. S., while natural and exceedingly simple, form an important and peculiar element of Amer. jurisprudence, and are most intimately related to the national progress. Originating among the early colonists, these notions have reacted most powerfully upon the habits of thought, mode of life, and insts. of the entire people, have aided their material and social development, and have contributed much to the successful establishment of a democratic republic. The object of the present article is to show the practical operation and results of this theory in the commercial activities of the country and in the constitution of society. The peculiarities of our Amer. system can be best perceived and understood by placing it in contrast with that which exists in Eng., the country from which a great part of our jurisprudence was originally derived.

The manners, customs, and insts. of feudalism left deeply imbedded in the common law the principles from which the entire body of doctrines and rules concerning real property were logically deduced by the courts. While these anc. doctrines and rules have been greatly modified by modern parliamentary legislation, the effects which had been wrought upon society during the domination of feudal notions cannot be obliterated by statutes; they remain, and doubtless will remain until the Eng. national character undergoes a radical change. The feudal system's fundamental conception was the double ownership of land and the doctrine of *tenure*, the ultimate absolute property residing in a superior, from whom the beneficial owner held his estate, his right being thus derived and subordinate.



The practical rules which were deduced from this principle need not be recapitulated. It is sufficient to say that, according to the common-law theory, no occupant or possessor, no owner of the fee even, is clothed with a complete and absolute property in the soil; in the king alone, as the original source, is this right finally vested. The most remarkable and important of the social effects wrought by feudalism are the preference given to land as an object of property, the personal distinction conferred by its ownership, and the consequent desire to hold it in large quantities, and to perpetuate such acquisitions undiminished from generation to generation in the same families. These motives, operating in G. Brit. for centuries, have greatly reduced the number of proprietors, have favored the growth of enormous private estates, have impeded the free transmission of land, and practically withdrawn a large part of it from the operations of trade and commerce, and have upheld the overwhelming social and political power of the landed aristocracy. Opposed to the complex and artificial rules of feudalism is the simple and apparently natural mode of ownership termed "allodial." Wherever it prevails, every proprietor owns his tract of land absolutely in his personal right, and not as a tenant from, or subordinate to, any superior. The notion of "tenure" is utterly foreign to the system. Even the State is not regarded as possessing the ultimate right and as the source of title in the feudal sense, but only in a political sense and from reasons of public policy. When all private property in a certain parcel of land fails, the ownership must of course pass to some one, and a political necessity requires that it should at once vest in the State and not in the first occupant of the vacant soil. For this reason and to this extent the allodial theory regards the State as the final proprietor in case of escheat, but not as the original source from which the right of property was derived by the doctrine of tenure. It also admits the right of eminent domain; but this right is political, and not feudal, in its nature; from it is derived the power to take private property by taxation, and for public uses upon making just compensation. (See EMINENT DOMAIN, in CYCLOPEDIA.) The feudal theory of landed property has exerted, and still continues to exert, a most powerful influence not only upon legal lit., but upon the conceptions and habits of thought of the entire legal profession, upon the judicial opinions of courts, and even upon the form and lang. of statutes. Although the common law of real estate, as derived from the feudal insts., has been much modified in its details by modern acts of Parl., yet the underlying principles of the system have never been abolished in Eng. Allodial ownership is there unknown; the doctrine of tenure is still retained, and extends to every private estate in the kingdom. The Eng. legal writers necessarily discuss and expound these dogmas. Their works are constantly consulted by the Amer. lawyers and judges, many of them being regarded as treatises of the highest authority; indeed, it is from Blackstone, who sets forth the feudal elements of the common law unaffected by legislation, that a vast majority of our bar obtain their first knowledge of jurisprudence, and his account enters into and colors all their conceptions and opinions. The same mode of treatment is pursued by the leading Amer. writers upon the law of real property.

The very basis of the land laws prevailing throughout the U. S. is the legislation which abolishes the theory of a double ownership, abrogates the doctrine of tenure, and creates an absolute, personal, undivided right in every individual proprietor. It has been expressly adopted by the statutes of many States, and in some of them has even been incorporated into the const., which form their organic law. Although these statutes and constitutional provisions may differ somewhat in their lang., their meaning and legal effect are everywhere the same. They utterly repudiate the feudal conceptions and notions upon which the common-law rules were constructed, and declare all property in the soil to be purely allodial. The abolition of tenure and the substitution of allodial in the place of feudal ownership have worked a change in every dept. of the law concerning land, but this change is the most radical and complete in the following general branches or subdivisions of the system: escheat, the doctrine of seizin, inheritance, the liability of land to be taken for debt, and conveyancing, which last branch includes mortgages, land-contracts, and the statutory methods of registration or recording.

Before proceeding to describe the practical operation and social effects of the law, I shall briefly explain the "public-law" system of the U. S. govt. The importance of this system as an element of our national development cannot be over-estimated. The greater part of the soil throughout the O. and Miss. valleys, and stretching across the continent to the Pacific Ocean, was once or is now the public domain of the U. S., and the U. S. is therefore the source of title to the great majority of private owners in the States and Terrs. which have been formed within that vast area. There are, however, some exceptions to this general statement. The Fr., Sp., and Mex. private grants in the La. purchase, in Tex., in Cal., and in some other States of the Pacific slope, were protected by the various treaties of cession, so that the present owners of such grants do not derive their titles directly from the U. S. A few of the original 13 States, claiming to be proprietors of the unoccupied soil lying west of their boundaries, had granted some portions thereof to private purchasers before they surrendered their rights to the nation; and, finally, large gifts of the public lands have from time to time been made to individual States. With all these exceptions, a very great majority of the private ownerships in the States occupying the O. and Miss. basins, and in the terr. extending to the Pacific, are derived from the national govt. as the first proprietor. At an early day Cong. adopted an exceedingly

simple and beautiful method of dividing and laying out the public domain, which, with a few local changes, has been pursued to the present time. The following are the general features of this system: Certain "prin. meridians" and parallels of lat. are first carefully established by astronomical measurement for the purpose of being used as "base-lines." The entire domain is laid out into squares of 6 m. on each side by means of meridians and parallels of lat. 6 m. apart. Each of these squares, containing 36 square m., or 23,040 acres, "as nearly as may be," is termed a "tp." All the tps. situated N. and S. of each other constitute 1 "range;" and it is plain that the land would thus be divided into contiguous ranges each 6 m. wide, and containing a greater or less number of tps. according to its length. These ranges are numbered in order I., II., III., etc., E. and W. from the "prin. meridians," which meridians are designated by particular names. The tps. in each range are also numbered in order 1, 2, 3, etc., N. and S. from a parallel of lat. established as a "base-line." Thus, taking any given "prin. meridian," the ranges would be R. I. E., R. II. E., R. I. W., R. II. W., etc., and in each of these ranges the tps. would be T. 1 N., T. 2 N., T. 1 S., T. 2 S., etc. A tp. is divided by parallels of lat. and lon. 1 m. apart into 36 squares called "sections," each containing 1 square m., or 640 acres, "as nearly as may be." The sections in every tp. are numbered from 1 to 36, always commencing at the N. E. corner of the tp. and going W. from 1 to 6, then going E. from 7 to 12, then W. from 13 to 18, and so on alternately to No. 36, which is always at the S. E. corner of the tp. These sections are divided into "quarter sections" half a m. square, and containing 160 acres. The quarter sections are sometimes subdivided into halves of 80 acres, and even into quarters of 40 acres. This system of measurement is so simple and perfect that not only may the smallest subdivision be accurately described, but may be readily found and located from the description. Thus, the N. W. quarter of Section 7 in Tp. 3, N., in Range 4, W., of — Meridian, describes a certain 160 acres of land without any possibility of doubt, and this 160 acres can be located by the purchaser without any possibility of mistake. The statute provides means for correcting the errors which result from the "convergency" of meridians as they run northwardly, and also special modes for surveying lands bordering upon rivers and the shores of lakes and of the ocean; but as these provisions are somewhat complicated and technical, and do not affect the general features of the system, it is unnecessary to attempt their explanation. The management of the public lands under the various acts of Cong. is committed to a bureau of the dept. of the interior called the general land-office, which is presided over by a com. Each of the W. States and Terrs. in which the lands are situated is divided into 1 or more "distts.," and in every dist. is established a "land-office," with 2 officials, a "register" and a "receiver;" and if any public lands are situated in States where there is no land office, entries may be made in the general land-office. The prin. duties of the register are the supervision of sales and the entry and location of tracts selected by purchasers or by the holders of warrants and scrip. All payments of purchase-money are made to the receiver. The system as now established by law, and which extends generally to all unappropriated domain except mining and saline regions and the portions within the limits of cities and villages, contemplates public and private sales, the pre-emption of tracts by actual settlers, and the donation of homesteads. The general price fixed for private sale and for the minimum at public sale is \$1.25 per acre; but for land situated in tps. alternating with those granted to railroads the price is \$2.50 per acre, except in the case of such lands of this kind as were put into market before Jan. 1861, the price of which has been reduced to \$1.25 per acre. No sale is ever made upon credit. The purchaser either at public or private sale must pay the price immediately. Upon presenting the "receiver's" receipt for this payment to the register, that officer locates and enters the land in the purchaser's name by its range, tp., section, and quarter section numbers, and delivers a certificate of such location and entry. This certificate confers an equitable title which is recognized and protected by the courts. The legal title is conveyed by a "patent," which is issued by the com. of the land-office in the name of the Pres. Any citizen, or foreigner who has declared his intention to become a citizen, if 21 yrs. of age, who has actually settled upon an unappropriated quarter section and has erected a dwelling-house thereon, acquires a right of "pre-emption"—that is, he acquires the right to purchase that specific 160 acres at the minimum price, although he had not applied to the dist. office or located the tract before his settlement. Finally, such an actual resident is permitted to take up, without payment of any price except certain fees, 160 acres of public land as a homestead; and this may include land within the limits of grants to R. R. cos., as well as other lands; but, except in special cases, the patent for homestead lands will not be issued to the occupant until he has resided upon the land for a period of 5 yrs. He may, however, obtain title before the expiration of 5 yrs. by paying the govt. price for the lands. In case of his death before the 5 yrs. have expired, the privilege extends to his heirs. Any person who has settled on public lands under the pre-emption laws may change his filing to a homestead entry, and the time for perfecting his homestead title will date from his original settlement. In addition to its sales and homestead gifts, the govt. has also adopted the policy of making extensive donations to others than actual occupants. This policy, which was at first acted upon with caution and for very special objects, has of late yrs. been pursued to such an extent that a large portion of the most valuable lands have been recklessly squandered, and vast amounts have fallen into the hands of private owners, who hold them for purposes of speculation. These donations have been made in 2 forms: (1) of



specific tracts, ascertained and described in the statute itself; and (2) of scrip and warrants, which are written instruments issued by the govt. entitling the holder to a designated number of acres, which may be located by him out of any lands remaining unappropriated. Of the former kind are the cessions made to various W. and S. States for educational and other purposes, and the grants made to R. R.; of the latter are the military-bounty warrants issued to soldiers and sailors on account of services during war, and the scrip which was a few yrs. ago distributed in proportional quantities among all the States for the endowment of agricultural schools and colls. The R. R. grants have generally conveyed to the corporations the alternate tps. lying on both sides of their projected routes, and as these routes, excepting the Pacific roads, usually run through regions at least partially settled and improved, the lands thus alienated have always been valuable and of a character that would most readily have found a market. Military-bounty warrants and agricultural scrip before location simply represent a right to obtain the designated amounts of land; they do not confer even an equitable title to any specific tracts, but are merely things in action. Upon the presentation of a warrant or scrip to a register the number of acres called for are selected, and the certificate of location and entry is issued, which is consummated by a patent as in cases of ordinary purchase. The original policy of the general govt. was well adapted to prevent the accumulation of large tracts in the hands of single owners. To this end the statutes provide that at public sales the land must be offered in quarter sections, at private sales in sections or their subdivisions; that no person can obtain a pre-emptive right who already owns 320 acres; and that the right of pre-emption cannot be exercised more than once. It is to be feared that the beneficial effects of these restrictions have been seriously interfered with by the extensive donations to R. R. cos. and the enormous issue of bounty warrants and land scrip. But as from time to time there has been complaint that individuals or bodies of men were making extensive inclosures of public lands, without proceeding in good faith to acquire title in the modes prescribed by the land-laws, all such inclosures have been declared unlawful, and are prohibited.

As a preliminary or introduction to an explanation of the practical operation of this Amer. theory of land-ownership, I insert a table of exceedingly interesting facts taken from the U. S. census of 1880. It contains for each State the number of farms, the number of acres of improved and of unimproved land therein, the average size of these farms, and the assessed value of all the real estate belonging to private owners. The true value of the latter item would probably be at least one half greater. The census returns do not furnish the total number of private ownerships occupied and used for manufacturing and business purposes, for dwellings, and the like, nor the amount or value of the public domain belonging to the U. S. Although it is impossible, therefore, to present the complete results of the national land-system, its necessary and beneficial effects are clearly and sufficiently illustrated by subjoined statistics concerning the present condition of agricultural property:

Table of Farms in the U. S., with the Amount of their Improved and Unimproved Land, and their Average Size—compiled from the Census Returns of 1880.

STATES AND TERRITORIES.	Number of farms.	Total number of acres.	Do. improved.	Do. not improved.	Average size of farms.	Total value of real estate (assessed).
Alabama.....	135,864	18,855,334	6,375,706	12,479,628	139	\$77,374,008
Arizona.....	767	185,573	56,071	79,502	177	2,922,961
Arkansas.....	94,432	19,061,547	3,596,930	8,465,944	128	55,760,388
California.....	53,834	16,553,742	10,699,623	5,854,119	469	486,273,585
Colorado.....	29,428	6,119,371	616,169	5,503,202	208	35,694,197
Connecticut.....	30,598	2,453,541	1,642,183	811,358	80	228,791,267
Dakota.....	17,425	8,800,656	1,150,413	2,650,243	218	13,333,918
Delaware.....	8,749	1,090,245	746,958	343,287	125	50,302,739
D. of Columbia.....	435	18,146	12,632	5,514	42	87,980,866
Florida.....	23,428	3,297,524	947,640	2,349,884	140	26,449,913
Georgia.....	138,626	26,043,282	8,904,720	17,338,562	188	139,983,941
Idaho.....	1,885	327,798	197,407	130,391	174	2,291,526
Illinois.....	255,741	31,673,645	26,115,154	5,558,491	124	575,441,053
Indiana.....	194,013	30,420,893	13,939,739	6,487,246	105	538,663,399
Iowa.....	185,261	24,752,700	19,866,541	4,886,159	134	297,424,342
Kansas.....	138,561	21,417,468	10,739,566	10,677,902	155	108,429,049
Kentucky.....	166,433	21,495,240	10,731,643	10,763,597	129	265,085,908
Louisiana.....	48,292	8,273,606	2,739,972	5,533,634	172	129,362,997
Maine.....	64,309	6,522,573	3,494,308	3,028,265	101	173,856,242
Maryland.....	40,617	5,119,371	3,345,719	1,773,652	126	368,449,913
Massachusetts.....	38,406	3,259,079	2,128,311	1,230,768	87	1,111,160,072
Michigan.....	154,008	12,807,240	8,296,562	5,510,678	90	492,861,884
Minnesota.....	92,386	10,430,019	7,546,993	2,883,026	115	203,446,781
Mississippi.....	101,772	15,855,469	5,216,397	10,639,072	156	79,469,530
Missouri.....	215,478	29,299,729	16,745,031	11,244,698	129	381,985,112
Montana.....	1,519	405,683	262,611	143,072	267	5,077,162
Nebraska.....	63,387	9,944,896	5,504,702	4,440,194	157	55,073,735
Nevada.....	1,404	500,862	244,423	256,439	378	17,941,030
N. Hampshire.....	82,181	8,721,173	8,008,112	1,413,061	116	122,733,194
New Jersey.....	34,207	9,299,279	9,096,291	202,988	269	442,632,638
New Mexico.....	5,033	631,131	237,392	393,739	125	4,758,764
New York.....	241,058	22,780,754	17,717,862	6,062,892	99	2,329,282,359
N. Carolina.....	157,609	22,363,528	6,481,191	15,882,337	142	101,709,326
Ohio.....	347,189	24,939,226	18,051,091	6,448,135	99	1,092,677,705
Oregon.....	16,416	1,193,373	2,189,645	2,040,067	260	20,584,969
Pennsylvania.....	213,542	19,791,341	13,423,007	6,368,334	93	1,540,007,957
Rhode Island.....	6,216	514,813	296,486	218,327	83	188,224,459
S. Carolina.....	95,864	12,457,613	4,132,050	9,325,563	143	77,461,670
Tennessee.....	165,650	20,666,915	8,496,556	12,170,359	125	195,644,900
Texas.....	174,194	36,299,279	13,650,314	22,648,965	182	14,779,544
Utah.....	9,459	659,592	416,105	243,487	139	7,038,623
Vermont.....	25,592	4,682,588	3,286,481	1,396,107	137	21,436,623
Virginia.....	118,517	19,835,785	6,510,113	13,325,672	167	93,601,599
Washington.....	6,529	1,409,429	484,246	925,183	216	11,335,932
W. Virginia.....	14,910	7,792,327	2,189,645	5,602,682	126	108,000,306
Wisconsin.....	134,392	16,533,118	9,162,598	6,190,520	114	244,788,721
Wyoming.....	457	124,433	88,122	41,311	272	4,435,291
<b>Totals.....</b>	<b>4,008,907</b>	<b>536,081,826</b>	<b>274,771,042</b>	<b>261,310,784</b>	<b>134</b>	<b>\$13,038,766,925</b>

This table exhibits at one view, more clearly than can be done by any commentary, the surprising results of a free ownership and commerce in lands—results which are identified with our material development, the stability of our political insts., and our very national life. It appears that in 1880 there were throughout all the States and Terrs. 4,008,907 separate farms. (The census also shows that the farmers and planters were 4,225,945.) This enormous number does not include town and city lots for dwellings, tracts devoted to mining, manufacturing, and business, nor any other lands not exclusively agricultural. With very few exceptions these farms are all owned in fee (either legally or equitably) by their occupants. Only a small proportional part of them is held by lessees, while a very few comparatively are possessed by life-tenants. The average size throughout the whole country is 134 acres. By far the largest average is found in Cal., 462 acres; the smallest among the States occur in Conn., 80; R. I., 83; N. J., 85; among the Terrs., in Ut., 60. The average through the S. States is somewhat greater than through the N., but the difference in this respect is less than it has been usually supposed to be. Ala., 139; Ark., 128; Ga., 188; Miss., 156; S. C., 143; Tenn., 125; may be contrasted with Wis., 114; Vt., 137; Or., 260; N. H., 116; Mich., 90; Minn., 145; Ill., 124; N. Y., 99. The census discloses in this connection another very important fact, which demonstrates the irresistible workings of our free system. It has been generally supposed that in the N. and W. States, especially in the oldest and most populous, the size of individual farms was gradually increasing; that smaller estates were absorbed in the greater; and that the number of separate ownerships was thus growing less as the rich and prosperous became richer and the poor and unsuccessful were obliged to succumb to their more powerful neighbors. The tables tell a very different story. In every State, with 6 exceptions, the average size of farms has decreased or remained the same during the period between 1870 and 1880. The exceptional 6 are Cal., where there has been an increase from 184 to 259; Kan., from 148 to 155; Me., from 98 to 102; Minn., from 139 to 145; Nev., from 201 to 378; Vt., from 134 to 137. In most of these cases the increase is inconsiderable. In 2 States only has the average remained the same, Ia. (134 acres) and Wis. (114 acres). In all the other States there has been a decrease. In 6 of the Terrs. there has been an increase, and in some cases the increase is a large one, owing to the taking up of extensive tracts of public lands. Thus, in Ari., there has been an increase from 127 to 177 acres; in Dak., from 176 to 218; in Mont., from 164 to 267; in Ut., from 30 to 69; in Wash., from 208 to 216; in Wyo., from 25 to 272. The decrease has been the greatest throughout the S. States, owing to the subdivision of the plantations into smaller holdings by sale and otherwise. The following are the averages in many of these States for the yrs. 1860, 1870, and 1880: Va., 324, 246, 167; N. C., 316, 212, 142; S. C., 483, 233, 143; Ga., 430, 368, 188; Fla., 444, 232, 141; Ala., 346, 222, 139; Miss., 370, 193, 156; La., 536, 247, 171; Tex., 591, 301, 208; Ky., 211, 158, 129; Tenn., 251, 166, 125. Some other examples of this decrease between 1870 and 1880 are: Mass., 103, 87; Conn., 93, 80; N. Y., 103, 99; N. J., 98, 85; Pa., 103, 93; Md., 167, 126; O., 111, 99; Ind., 112, 105; Ill., 128, 124; Mich., 101, 90; Mo., 146, 129; Ark., 154, 128; Cal., 482, 462; Or., 315, 260. The changes in the S. States within 20 yrs. have been most surprising, and the average size of farms in that part of the country has been rapidly approaching that of the N. States. This rapid division of the great landed estates of the S. among a largely increased number of owners is one of the most fortunate results that could have happened to insure the future prosperity of the S. and to promote the development of its great material resources, and to the whole country. And the statistics above given show as to the whole country that, notwithstanding all the power of wealth to accumulate and retain, and notwithstanding all the opportunities offered by Congressional grants to mere speculative investors, the social and commercial law of free exchange has thus far proved irresistible in its operation: the tendency to multiplication of owners and diminution of estates has not been overcome, and it probably cannot be overcome until there is a radical change in the customs and habits of thought of the Amer. people or in the circumstances by which they are surrounded.

The effect of this free system of land ownership and transfer upon the business and social activities, the habits of thought, and general plan of life of the Amer. people, cannot be over-estimated. In the opinion of many foreign statesmen, among whom was Macaulay, the vast supplies of virgin soil open to cultivation, and the ease with which it may be acquired, have been the chief elements of security to our political insts. Without accepting these extreme opinions, it is certain that the democratic rep. principles of our govt., and the theory of our land-law and ownership, mutually correlate and support each other: both are essential to our conception of a free, self-governing people and to the organization of a free society. The feudal customs of entailing inheritances, of accumulating vast estates, and retaining them from generation to generation in the same families, of granting peculiar privileges to landed proprietors, and of withdrawing any considerable portion of the soil from active commerce, would long ago have arrested the national development, and would probably have undermined and overthrown our democratic insts. In describing the practical operations of the system, the first important feature to be noticed is the fact that land has been brought within the domain of commerce, and, as far as is possible from its physical nature, has been assimilated to personal property. This result is produced by the law and the popular habits of thought working upon each other. There is no tendency to the accumulation of family estates on account of the pre-eminence or social superiority which real property confers upon its possessor. No such



pre-eminence and superiority exist. There is no worship of land as land. It is regarded like chattels, as a commodity merely. It is bought and used as a means of production or of habitation or of speculation, but most owners are ready to sell at a profit. It is seldom that a farmer or a householder can be found who is not willing to dispose of his estate if he can gain thereby a reasonable advance upon his investment. This assimilation of land to chattels, this mode of treating it as an article of commerce, produces the utmost activity among the people themselves; it prevents stagnation; it affords constant opportunities for individuals to change their residence in order to improve their personal, domestic, or social condition. No communities or persons are rooted to the soil; everything is life, change, improvement, or at least the desire and anticipation of improvement. This is a picture of society which many Eng. writers, under the influence of feudal and aristocratic notions, have severely criticised and harshly condemned; but every intelligent Amer. knows that this very social condition has developed and contained the freedom, enterprise, and energy which subdued the wide domains of the Miss. Valley and the Pacific slope to civilization, and within the period of 50 yrs. built up populous commonwealths out of an unbroken wilderness. It should be particularly remarked that the freedom in the commerce of lands, and the absence of any tendency to their accumulation in families, which characterize the Amer. social life, are not the results of any compulsory enactment or legal necessity. We have no law, as in Fr., restraining the owner in the disposition of his property and compelling the equal distribution of his land among his heirs. The great family estates in Eng., handed down from father to eldest son, are not, as a matter of fact, the result of anc. entails nor of the rule of primogeniture. They are invariably created and preserved by voluntary family settlements, by which the power of alienation may be suspended during lives or being. The same law prevails in every State of the U., with the single modification in some of them that the suspension must be during two lives in being. The statutes, however, are a dead letter so far as they have produced any appreciable effect upon the ownership of land. The national habits of thought and customs, and the democratic principles which form a part of our social life, are opposed to the withdrawal of land from the activities of trade and commerce. These habits and principles have been efficient to prevent the evil, which has grown to such an enormous extent in Eng. that the only adequate remedy which can be suggested for it by the most thoughtful economists and statesmen is legislation which shall deprive owners of their power of free disposition, and shall prevent the creation of any partial or future estates. The ease and frequency of transfer which characterize the ownership of land in the U. S. is a remarkable and necessary effect of our land system, as is also the enormous number of owners. The statistics already quoted show that in 1880 there were 4,008,907 farms, and that their average size had somewhat decreased, while their aggregate number had steadily and rapidly increased, during the last 3 decades. The law of free property has wrought the same result in the ownership of land occupied and used for all other purposes besides agricultural. In G. Brit. a very few hundred thousand persons hold the fee of the entire kingdom; the millions are content to occupy the soil as tenants for life or for yrs.; no one, as a general rule, acquires an absolute title by ordinary purchase unless he is already wealthy and wishes to enlarge his ancestral domain, or is ambitious to found a family which shall take its place among the landed gentry. In the U. S. a widely different sentiment pervades all ranks and classes of society. Although land is regarded as an article of commerce, the desire to obtain its absolute ownership is widespread. Farmers, merchants, professional men, mechanics, and even the common laborers, become proprietors, and the number of landowners multiplies greatly from decade to decade.

GEORGE CHASE.

**Laporte' City**, Black Hawk co., Ia., on R. R. and Wolf Creek, 40 m. N. W. of Cedar Rapids, is in a fine agricultural country. Pop. 1880, 1006.

**Larimore**, R. R. junc., Grand Forks co., Dak., 29 m. W. of Grand Forks. Pop. not in census.

**Lassalle** (FERDINAND), b. at Breslau in 1825, studied philology and philos. in his native city and in Berlin, and acquired a name by his *Die Philosophie Herakleitos* and *System der erworbenen Rechte*; threw himself into politics 1862, and became the originator and leader of the social-democratic movement in Ger. He is the author of *Ueber Verfassungsverwehen, Arbeiterprogramm, Capital und Arbeit*, etc. D. at Geneva Aug. 28, 1864, mortally wounded in a duel.

**Laughlin** (JAMES LAWRENCE), Ph. D., b. at Deerfield, O., in 1850, grad. from Harvard Coll. in 1873; was appointed teacher of political economy at Harvard in 1878, and assistant prof. in 1883. He has pub. *Essays on Anglo-Saxon Law*, a new annotated ed. of Mill's *Political Economy*, and numerous contributions to scientific papers.

**Law Forms**. See page 1552.

**Lazarus** (EMMA), b. in the city of N. Y. July 22, 1849; pub. her first vol. of poems in 1866, the second, *Admetus and other Poems*, in 1871; a prose work, *Alide: An Episode of Goethe's Life*, in 1874; a vol. of translations from Heine in 1881; *Songs of a Semite* in 1882, etc.

**Lebanon**, city, on R. R., St. Clair co., Ill., 24 m. E. of St. Louis, is the seat of McKendree Coll. (Meth.), and is a summer resort for St. Louis. Pop. 1880, 1924.

**Leetsonia**, R. R. junc., Columbiana co., O., 65 m. N. W. of Pittsburg, has several blast furnaces, extensive coal mines and coke ovens, etc. Pop. 1870, 1200; 1880, 2552.

**Lehigh University**, founded and endowed by the late Asa Packer of Mauch Chunk, is at S. Bethlehem, Pa., and includes the school of general lit. and the school of technology. The univ. has magnificent buildings, and on account of its location has unusual facilities for combining practical

and theoretical instruction. Instruction is free to young men from any part of the world, owing to the generosity of its founder, who, in addition to gifts made during his lifetime, left \$1,500,000 to the univ. and \$500,000 to the library, which contains over 40,000 vols.

**Levite**, on R. R., Ingham co., Mich., 24 m. S. of Lansing, has 6 magnetic artesian wells of great flow, several steam mills, etc. Pop. 1880, 1115.

**Le Sueur**, Le Sueur co., Minn., on R. R. and Minn. River, 63 m. S. W. of St. Paul. Pop. 1880, 1414.

**Lewisburgh**, cap. of Greenbrier co., W. Va., 4 m. N. of Chesapeake and O. R. R., and 9 m. from Greenbrier White Sulphur Springs, is in a fine blue-grass country. Pop. 1870, 875; 1880, 985.

**Libraries**. The number of L. in the U. S. returned as containing 10,000 vols. or upward was 408, according to the census of 1880. The following table exhibits all the L. of the world known to contain 100,000 vols. or upward at the latest dates. The figures given are for 1880-82, except for the L. of the U. S., which are corrected to Jan. 1, 1884.

City.	Library.	Volumes.
Aix, France.....	Méjanes.....	150,000.
Albany, U. S. A.....	N. Y. State.....	116,000.
Amsterdam, Netherlands.....	University.....	100,000.
Athens, Greece.....	University.....	150,000.
Augsburg, Germany.....	Royal and City.....	150,000.
Bamberg, Germany.....	Royal.....	135,000.
Bâle, Switzerland.....	Public University.....	120,000.
Berlin, Germany.....	Royal.....	750,000.
Besançon, France.....	University.....	200,000.
Birmingham, England.....	City.....	130,000.
Bologna, Italy.....	Free.....	100,000.
Bologna, Italy.....	University.....	160,000.
Bologna, Italy.....	Communal.....	120,000.
Bon, Germany.....	University.....	250,000.
Bordeaux, France.....	City.....	190,000.
Boston, U. S. A.....	Public.....	391,338.
Bremen, Germany.....	Athenaeum.....	122,000.
Breslau, Germany.....	City.....	100,000.
Breslau, Germany.....	Royal and University.....	350,000.
Bruges, Belgium.....	City.....	200,000.
Bruges, Belgium.....	Public.....	100,000.
Brussels, Belgium.....	Royal.....	350,000.
Buda-Pesth, Austria.....	National.....	400,000.
Buda-Pesth, Austria.....	University.....	186,000.
Cambridge, England.....	University.....	200,000.
Cambridge, U. S. A.....	Harvard College.....	259,000.
Carlsruhe, Germany.....	Grand Ducal.....	134,400.
Cassel, Germany.....	National.....	165,000.
Christiania, Norway.....	University.....	230,000.
Cincinnati, U. S. A.....	Public.....	122,930.
Copenhagen, Denmark.....	Royal.....	482,000.
Copenhagen, Denmark.....	University.....	250,000.
Cracow, Austria.....	University.....	201,831.
Darmstadt, Germany.....	Grand Ducal.....	450,000.
Dorpat, Russia.....	University.....	143,500.
Douai, France.....	Public.....	100,000.
Dresden, Germany.....	Royal Public.....	450,000.
Dublin, Ireland.....	Trinity College.....	192,000.
Edinburgh, Scotland.....	Faculty of Advocates.....	265,000.
Edinburgh, Scotland.....	University.....	140,000.
Erlangen, Germany.....	University.....	147,000.
Ferrara, Italy.....	Communal.....	100,000.
Florence, Italy.....	Marcucellian.....	136,500.
Florence, Italy.....	National.....	400,000.
Frankfort, Germany.....	City.....	150,000.
Freiburg, Germany.....	University.....	270,000.
Geneva, Switzerland.....	Public.....	110,000.
Genoa, Italy.....	University.....	116,492.
Ghent, Belgium.....	University.....	250,000.
Giessen, Germany.....	University.....	160,000.
Glasgow, Scotland.....	University.....	125,000.
Gotha, Germany.....	Ducal.....	245,000.
Göttingen, Germany.....	Royal University.....	400,000.
Graz, Austria.....	University.....	120,000.
Greifswald, Germany.....	Royal University.....	120,000.
Grenoble, France.....	Grenoble.....	170,000.
Hague, Netherlands.....	Royal.....	200,000.
Halle, Germany.....	University.....	220,000.
Hamburg, Germany.....	City.....	350,000.
Hanover, Germany.....	Royal Public.....	170,000.
Heidelberg, Germany.....	University.....	300,000.
Helsingfors, Russia.....	University.....	140,000.
Jena, Germany.....	University.....	180,000.
Kieff, Russia.....	University.....	110,000.
Kiel, Germany.....	University.....	180,000.
Königsberg, Germany.....	Royal and University.....	184,000.
Leeds, England.....	Public.....	109,202.
Leipzig, Germany.....	City.....	100,000.
Leipzig, Germany.....	University.....	400,000.
Leyden, Netherlands.....	Academic.....	160,000.
Liège, Belgium.....	University.....	105,746.
Lisbon, Portugal.....	National.....	200,000.
Liverpool, England.....	Public.....	115,691.
London, England.....	British Museum.....	1,500,000.
London, England.....	University College.....	100,000.
Louvain, Belgium.....	University.....	250,000.
Lübeck, Germany.....	City.....	100,000.
Lund, Sweden.....	University.....	120,000.
Lyons, France.....	City.....	120,000.
Madrid, Spain.....	National.....	400,000.
Manchester, England.....	Free Public.....	150,000.
Marburg, Germany.....	University.....	140,000.
Melbourne, Australia.....	Ducal Public.....	160,000.
Melbourne, Australia.....	Public.....	111,644.
Mentz, Germany.....	City.....	150,000.
Mexico, Mexico.....	National.....	100,000.
Milan, Italy.....	Ambrosian.....	164,400.
Milan, Italy.....	National Brera.....	102,123.
Modena, Italy.....	Estl.....	100,000.



City.	Library.	Volumes.
Moscow, Russia.	University	170,000
	Public Museum.	300,000
Munich, Germany.	Royal, incl. pamphlets.	800,000
	University.	322,800
Münster, Germany.	Royal Paul.	123,175
Nantes, France.	Library.	150,800
Naples, Italy.	National.	275,000
	University.	150,000
	Brancaccian.	150,000
New Haven, U. S. A.	Yale College.	125,000
New York, U. S. A.	Astor.	192,547
	Mercantile.	193,000
Oldenburg, Germany.	Grand Ducal.	100,000
Oporto, Portugal.	Public Municipal.	100,000
Ottawa, Canada.	Parliament.	100,000
Oxford, England.	Bodleian.	400,000
Padua, Italy.	University.	158,240
Palermo, Italy.	National.	110,000
	Communal.	140,941
Paris, France.	National.	2,290,000
	Arsenal.	200,000
	St. Geneviève.	120,000
	Sorbonne.	125,000
	Mazarin.	150,000
	Institute.	100,000
Parma, Italy.	Royal Public.	212,995
Pavia, Italy.	University.	185,000
Philadelphia, U. S. A.	Library Company.	112,000
	Mercantile.	141,000
Plisa, Italy.	Royal University.	120,000
Prague, Bohemia.	National Museum.	125,000
Rio Janeiro, Brazil.	Royal.	120,000
Rome, Italy.	Vatican.	220,000
	Casanata.	130,000
	Victor Emmanuel.	300,000
Rouen, France.	Public.	122,500
Rostock, Germany.	University.	140,000
St. Petersburg, Russia.	Imperial Public.	1,000,000
	Academy of Sciences.	150,000
	University.	138,677
Stockholm, Sweden.	Royal.	250,000
Strasbourg, Germany.	University.	513,000
Stuttgart, Germany.	Royal Public.	425,000
Troyes, France.	Communal.	120,000
Tübingen, Germany.	University.	285,000
Turin, Italy.	University.	240,000
	National.	170,000
Upsala, Sweden.	University.	220,000
Utrecht, Netherlands.	University.	150,000
Venice, Italy.	St. Mark's.	260,000
Verona, Italy.	Communal Archives.	124,300
Vicenza, Italy.	Bertolani.	105,000
Vienna, Austria.	Imperial Public.	440,000
	University.	271,970
Washington, U. S. A.	Library of Congress.	398,788
Weimar, Germany.	Grand Ducal.	180,000
Wiesbaden, Germany.	Royal National.	100,000
Wolfenbüttel, Germany.	Brunswick Ducal.	300,000
Würzburg, Germany.	University.	250,000
Zürich, Switzerland.	City.	100,000

A. R. SPOFFORD.

**Lindsborg**, city, McPherson co., Kan., on R. R. and Smoky Hill River, 21 m. S. of Salina. Pop. 1880, 466.

**Lisbon**, cap. of Ransom co., Dak., on Sheyenne River and Fargo and S. W. branch of N. Pacific R. R., 56 m. S. W. of Fargo. Pop. not in census.

**Lititz**, on R. R., Lancaster co., Pa., 8 m. N. of Lancaster, has a celebrated Moravian school, Lititz Acad. for boys, and another, Linden Hall, for young women, and is the seat of Sunnyside Coll. for ladies. L. was founded in 1756 by the Moravians. Pop. 1880, 1113.

**Little Falls**, cap. of Morrison co., Minn., R. R. junc., on E. bank of Miss. River, 107 m. N. W. of St. Paul. Pop. 1880, 508.

**Liturgy** (from the Gr., "a public service") means, in a general sense, any prescribed form of public worship, and, in a more strictly ecclesiastical sense, that form which was peculiar to the first Chr. congregation. Although there are many differences in the many L. which have come down to us from former ages, yet there is a similarity between them which enables us to trace them all back to a few sources. There are 5 families: (1) That of St. James or Jerusalem; (2) of St. Mark or Alexandria; (3) of St. Thaddeus or the E.; (4) of St. Peter or Rome; (5) of St. John or Ephesus, and these 5 families of L. suggest, by their common structure, a common origin. (See the article by W. F. Brand in *J.'s Univ. Cyc.*)

**Livingston**, Gallatin co., Mont., on Yellowstone River and N. Pacific R. R., at the junc. of the Rocky Mt. R. R. (Yellowstone Park branch). Pop. not in census.

**Liveonia Station**, on R. R., Livingston co., N. Y. Pop. tp. 1870, 2705; 1880, 3119.

**Lodge** (HENRY CABOT), b. in Boston, Mass., May 12, 1850, and grad. from Harvard law school in 1875; took an active part in politics, and pub. lives of *George Cabot, Alexander Hamilton*, and *Daniel Webster*; *Short History of English Colonies, Studies in History*, etc.

**Lo'gan**, cap. of Harrison co., Ia., on R. R. and Bayes River, 30 m. from Council Bluffs, has excellent water-power, limestone, and abundance of hard-wood timber. Pop. 1880, 644.

**Logan**, city, on R. R., cap. of Cache co., Ut., 58 m. N. by E. of Ogden. Pop. 1870, 1757; 1880, 3396.

**Long Branch Village**, on R. R., Monmouth co., N. J., 30 m. S. of N. Y. City, is a noted watering-place. Pop. 1880, 3833.

**Loomis** (LAFAYETTE CHARLES), A. M., M. D., b. July 7, 1824, at Coventry, Conn., and grad. from Wesleyan Univ. in 1844; held various positions as teacher of science in various

colls., and was for many yrs. a pub. lecturer on art. He pub. *Mizpah* (1838), *Mental Culture* (1867), *Index Guide to Travel and Art Study in Europe* (1882), etc.

**Loomis** (SILAS LAWRENCE), M. D., b. May 22, 1832, at Coventry, Conn.; grad. from Wesleyan Univ. in 1844; held various positions as teacher of science in different colls., and, later on, other positions as pres. of manufacturing enterprises. In 1878 he discovered a process and invented machinery for producing a textile fabric from palmetto; in 1880 he invented an improvement of areometers, etc. He is the author of *Normal Arithmetic* (1859), *Analytical Arithmetic* (1860), etc.

**Lo'rain**, R. R. junc., Lorain co., O., 26 m. W. of Cleveland. Pop. 1880, 1595.

**Lotze** (HERMANN RUDOLF), b. at Bautzen, in Sax., May 21, 1817; studied med., natural science, and metaphysics; was appointed prof. of mental philos. at Göttingen in 1844; removed to Berlin in 1881, and d. there on July 1, same yr. He was one of the most prominent leaders in Ger. in the movement against materialism and atheism. Of his works—*System of Philosophy, Microcosmos*, etc.—none have as yet been translated into Eng.

**Lou'donville**, Ashland co., O., on R. R. and Black Fork of Mohican River, 18 m. S. E. of Mansfield. Pop. 1870, 811; 1880, 1497.

**Loveland**, on R. R., Larimer co., Col., 75 m. N. of Denver. Pop. 1880, 236; 1883 about 750.

**Low** (SETH), b. in Brooklyn, N. Y., Jan. 1850, and grad. from Columbia Coll.; travelled; entered upon a business career; became an active member of the Chamber of Commerce and prominent in the organization of the Brooklyn Bureau of Charities, and was elected mayor of Brooklyn in 1881 and re-elected in 1883.

**Lud'low**, on R. R., Windsor co., Vt. 25 m. E. of Rutland, has an acad., soythe-stone manufactories, etc. Pop. 1880, 1179.

**Lu'ing**, Caldwell co., Tex., on Galveston, Harrisburg and San Antonio R. R., 153 m. W. of Houston. Pop. 1880, 1114.

**Luray' Cavern**, in Page co., Va., 1 m. W. of the v. of Luray, on the Shenandoah Valley R. R.; was discovered on Aug. 13, 1878. The whole area occupied by the cavern, with its innumerable chambers, often arranged in tiers, is about 100 acres, of which, however, only a comparatively small part is as yet fully explored; but such parts as have been opened to the public by the Luray Cave Co. are now illuminated by electric lamps, and the effect of the stalactitic display exceeds that of any other cave known. The temperature is uniformly 54° Fahr., the same as in the Mammoth Cave, Ky., and the air is very pure. The cavern has no streams or true springs, but numerous basins, varying in compass and depth, with very pure water, but destitute of life.

**Ly'man** (THEODORE), b. Aug. 23, 1833, at Waltham, Mass., and grad. from Harvard Coll. in 1855; studied zool. and geol. under Louis Agassiz in the Lawrence Scientific School and in Europe; served in the war as lieut.-col.; was in 1885 appointed com. of inland fisheries of Mass., and instituted the first scientific experiments in fish-culture undertaken by any State. He wrote *Ophiodidea of the Challenger Expedition* (1882) and a number of papers on the radiata.

**Ly'ons**, city, cap. of Rice co., Kan., on McPherson branch of Atchison, Topeka, and Santa Fé R. R., 30 m. W. by S. of McPherson. Pop. 1880, 509.

**Lyr'ic Poetry**. While epic and dramatic poetry can be sung, and among the Gr. they were in fact sung, at least in part, L. P. is expressly made to be sung, is song in its nature and essence. Epic poetry is national, general, universal, like hist., and has to do with the past. L. P. is subjective, and forgets the past in the love or hate of the present and in the hope or fear of the future. Epic poetry resembles sculpture, while L. P. is more like music; the former stands fixed in sublime dignity and eternal repose; the latter is ever changing, trembling, thrilling.

## M.

**Mach'as**, cap. of Washington co., Me., at head of nav. of Machias River, 12 m. from its mouth. Lumbering and ship-building are prin. industries here. Pop. tp. 1870, 2525; 1880, 2303.

**MacLeans'borough**, R. R. junc., cap. of Hamilton co., Ill., 41 m. N. W. of Shawneetown. Prin. industry, agriculture. Pop. 1870, 683; 1880, 1341.

**Macomb'**, city, cap. of McDonough co., Ill., 200 m. S. W. of Chicago, contains the McDonough Normal Coll. Pop. 1870, 2748; 1880, 3140.

**Ma'con**, on R. R., cap. of Noxubee co., Miss., 198 m. N. of Mobile, has one of the finest c.-hs. in the State. Pop. 1870, 975; 1880, 2074.

**Mad'ison**, on R. R., cap. of Lake co., Dak., about 60 m. by rail N. W. of Sioux Falls. Pop. 1880, 96; since 1880 largely increased.

**Mad'isonville**, R. R. junc., cap. of Hopkins co., Ky., 38 m. S. by W. of Henderson, in the great tobacco dist. and centre of large coal fields. Pop. 1870, 1022; 1880, 1544.

**Mah'di**, El, the latest prophet of Islam, was b. at Dongola, on the Nile, between the third and fourth cataract, close by the Nubian desert. His true name is Mohammed Achmet, and he is said to have pure Arab blood in his veins. He studied Mohammedan theol. at Khartoum and Berber, and soon acquired a great name for learning and holiness. In 1881 he openly announced himself to be the Mahdi foretold by Mohammed, and sent messages to all the sheiks and fakirs of Egyptian Soudan. At Cairo, Constantinople, and Mecca he was laughed at, but the whole Soudan was in uproar, and it was evident that its separation from Egypt would be the first result of the movement. The grand sheriff of Mecca, the highest of the high-priests of Islam, issued a proclamation declaring the Mahdi to be an impostor; but the



proclamation had no effect at all. Next the khedive of Egypt sent out an expedition against the Mahdi, under the leadership of Hicks Pasha, an Englishman. It came to an encounter at El Obeid, W. of the White Nile, and Hicks Pasha and his army were not simply defeated, but completely massacred. At that moment Eng. felt compelled to interfere; but Jan. 28, 1885, he took Khartoum, and Gen. Gordon was assassinated.

**Malvern**, R. R. junc., Mills co., Ia., 23 m. S. E. of Council Bluffs, is in a rich agricultural dist. Pop. 1880, 748.

**Manchester**, R. R. junc., Washtenaw co., Mich., 55 m. W. of Detroit, has medicinal springs and various manufactures. Pop. 1880, 1156.

**Mandan**, cap. of Morton co., Dak., on N. Pacific R. R., 5 m. W. of Bismarck, has extensive cattle trade. Pop. 1880, 239; 1884 about 700.

**Manderson** (CHARLES F.), b. in Phila., Pa.; removed to Canton, O., 1856; became city solicitor; entered U. army 1861 as capt. in 19th O. regiment; served through the war bravely, and became brig.-gen.; removed to Omaha, Neb., 1869, and practised law; was elected U. S. senator Jan. 31, 1883.

**Man'ning** (DANIEL), b. at Albany, N. Y., in Aug. 1831; entered the office of the Albany *Argus* as an apprentice in 1842, and rose through all the stages of the service till he in 1865 became associate ed., and in 1873 controlling proprietor. At the same time he took a very active part in politics; has been a member of the Democratic State Committee since 1876, and was appointed sec. of treas. in 1885 in the cabinet of Pres. Cleveland.

**Mansfield**, Tioga co., Pa., on R. R. and Tioga River, 31 m. S. by W. of Corning, N. Y., has State normal school and a school for soldiers' orphans. Pop. 1870, 616; 1880, 1611.

**Manson**, on R. R., Calhoun co., Ia., 18 m. W. of Ft. Dodge. Pop. 1880, 377.

**Mapleton**, on R. R., Monona co., Ia., about 40 m. S. E. of Sioux City. Pop. 1880, 379.

**Marion**, city, on R. R., cap. of Marion co., Kan., 55 m. W. of Emporia. Pop. 1880, 857.

**Marion C. H.**, on R. R., cap. of Marion co., S. C., 85 m. W. of Wilmington, N. C. Pop. 1870, 968; 1880, 824.

**Marmier** (XAVIER), b. at Pontarlier, in the dept. of Doubs, Fr., June 24, 1809; travelled much in Ger., the Scandinavian countries, Hol., Eng., and Amer., and attracted much attention by his sketches from the various countries he visited; was made librarian at Sainte Geneviève in 1846, and member of the acad. in 1870. Among his numerous works are: *Lettres sur l'Amérique* (2 vols., 1852), *En Amérique et en Europe* (1859), etc.

**Marshfield**, on R. R., Wood co., Wis., 32 m. N. W. of Stevens Pt. Pop. 1880, 669.

**Martin** (JOHN A.), b. at Brownsville, Pa., Mar. 10, 1839; learned the printer's trade in the office of the Brownsville *Clipper*, where he became foreman and local ed.; removed in 1857 to Atchison, Kan.; bought the *Squatter Sovereign*, changed its name to the *Daily Champion*, and made it one of the leading papers of the State; served in the war, and returned in 1865 as brig.-gen. to again assume control of his paper; took a very active part in the political development of Kan., and was elected mayor of Atchison in 1865 and gov. of the State in 1884.

**Martin's Ferry**, Belmont co., O., on R. R. and O. River, about 3 m. N. of Wheeling, W. Va., has extensive manufactures of glass, iron, etc. Pop. 1880, 3819.

**Mascarene's Isles** is the collective name of a group of islands in the Indian Ocean, belonging to Fr., and comprising Bourbon, Rodrigues, Mauritius, etc.

**Matthews** (STANLEY), b. July 21, 1824, at Cincinnati, O., and grad. in 1840 at Kenyon Coll.; studied law and began to practise in Tenn., but soon returned to Cincinnati; was elected a judge of the court of common pleas in 1851, and a member of the state senate in 1855; was appointed U. S. dist. atty. for the S. dist. of O. in 1858; fought in the Union army during the C. war; acted as counsel before the electoral commission in 1877; was elected to the U. S. senate in the same yr., and was appointed associate judge of the supreme court of the U. S. in 1881.

**Mayfield**, city, cap. of Graves co., Ky., on R. R. and Mayfield Creek, 23 m. S. of Paducah, has an inst., flouring-mills, woollen mill, etc. Pop. 1870, 779; 1880, 1839.

**Mayville**, on R. R., Trall co., Dak., a thriving town, about 50 m. N. W. of Fargo. Pop. not in census.

**Mechanicsburg**, on R. R., Champaign co., O., 17 m. N. W. of Springfield. Prin. business, farming, dairying, and stock-raising. Pop. 1870, 940; 1880, 1522.

**Mechanicville**, R. R. junc., Saratoga co., N. Y., 18 m. N. E. of Schenectady, has manufactures of linen thread. Pop. 1870, 1075; 1880, 1265.

**Medford**, on R. R., cap. of Taylor co., Wis., about 60 m. W. by N. of Chippewa Falls. Pop. 1880, 1020.

**Medicine Lodge**, city, cap. of Barber co., Kan., on Medicine Lodge Creek, about 60 m. W. of Wellington. Pop. 1880, 373.

**Mendon**, St. Joseph co., Mich., on R. R. and St. Joseph River, 21 m. S. S. E. of Kalamazoo, has water-power and manufactures. Pop. 1870, 660; 1880, 854.

**Mephistopheles** is the name of that sneering demon who attends Faust in the old legends. In mediæval demonology he was one of the 7 chief devils and the second of the fallen archangels. In Goethe's drama and other modern treatments of the legend he is identical with Satan.

**Merill**, on R. R., cap. of Lincoln co., Wis., 47 m. N. W. of Junction City. Pop. 1880, 1336.

**Merriam**, on R. R., Essex co., Mass., 40 m. by rail N. by E. of Boston. Pop. 1880, 2237.

**Messalina** or **Messallina** (VÁLERIA), b. in Rome, 23 A. D., was a daughter of Marcus Valerius Messala Barbatus and Domitia Lepida. In 38 she was married to Clau-

dus, who became emp. in 41, and in 48 she was put to death. She was a monster of profligacy and atrocity.

**Meyersdale**, R. R. junc., Somerset co., Pa., 113 m. S. E. of Pittsburgh. Pop. 1880, 1423.

**Milan**, on R. R., cap. of Sullivan co., Mo., 250 m. N. W. of St. Louis. Prin. business, farming. Pop. 1870, 319; 1880, 1117.

**Miles City**, cap. of Custer co., Mont., on N. Pacific R. R. and Yellowstone River, at junc. of Tongue River. Pop. 1880, 620.

**Milford**, on R. R., Oakland co., Mich., 35 m. N. W. of Detroit. Pop. 1880, 1251.

**Milbank**, R. R. junc., an important town, cap. of Grant co., Dak., 97 m. E. by S. of Aberdeen. Pop. not in census.

**Milner**, on R. R., cap. of Hand co., Dak., a thriving town, 78 m. E. of Pierre, which is on R. R. and the Mo. River. Pop. not in census.

**Milfersburg**, R. R. junc., Dauphin co., Pa., on Susquehanna River, 26 m. above Harrisburg. Pop. 1870, 1518; 1880, 1440.

**Milferton**, R. R. junc., Dutchess co., N. Y., 92 m. N. by E. of N. Y. City, has important manufactures of iron, which is mined in the vicinity. Pop. 1880, 600.

**Millington**, on R. R., Morris co., N. J., about 8 m. S. of Morristown. Pop. 1880, 112.

**Minaret** (from the Arab *menarah*, a "lantern") is a slender turret, which is found near every Mohammedan mosque. It corresponds to the campanile or belfry of the Chr. ch. The bell, however, being a chr. device, is forbidden by the Moslem religion. In its stead the blind muezzin calls by his chant from the platform of the M. the faithful to prayer.

**Mineral**, R. R. junc., Wood co., Tex., 103 m. S. E. of Denison. Pop. 1880, 1175.

**Mineral Wool**. When in the molten state, vitreous or scoriaceous substances may be converted into fibres by the force of steam or air under pressure. These thread-like filaments have the appearance of wool or cotton; hence the names "mineral wool" or "silicate cotton." It derives its importance from being a non-conductor, and its indestructible character makes it available for all purposes of insulation. As an article of commercial value it first came into use in 1871, in which yr. it was produced on a working scale at Osnabrück, Ger. In the U. S. it is now produced at Greenwood, N. Y., and at Stanhope, N. J.

**Mitchell**, important R. R. centre, cap. of Davison co., Dak., about 70 m. N. W. of Yankton; has Meth. coll. Pop. 1880, 320; 1884 about 3000.

**Mitchell**, R. R. junc., Lawrence co., Ind., 63 m. N. W. of New Albany, is engaged in the produce trade. Pop. 1870, 1087; 1880, 1439.

**Mitchell** (ISIDORE HYACINTHE MARIE LOUIS ROBERT), b. at Bayonne May 21, 1839; his father was an Englishman, his mother Sp.; his godfather was Don Carlos, and at his baptism he was made a capt. in the Carlist army. He devoted himself to journalism, was a firm adherent of the second empire, of the party of Emile Olivier; bought in 1874 *Le Soir*; was elected a member of the Chamber of Deputies in 1876 and re-elected, and is one of the most prominent leaders of the Bonapartist party in Fr.

**Mitre** designates in the R. Cath. ch. the official head-dress of bps. and of certain abbots and other dignitaries. It has 2 points, and symbolizes the cloven tongues of fire which sat upon the apostles' heads at the Pentecostal miracle. It is generally made of the richest and most costly materials.

**Mobettie**, cap. of Wheeler co., Tex., in the "pan-handle" or N. W. part of the State, near Ind. Terr. W. boundary. Pop. not in census.

**Monroe City**, R. R. junc., Monroe co., Mo., 30 m. S. W. of Quincy, Ill. Pop. 1870, 353; 1880, 640.

**Montalembert** (CHARLES F. R. COUNT DE), b. in Lond. May 29, 1810; was ed. in Paris, and became in 1830, together with Lacordaire and Lamennais, ed. of *L'Avenir*, a democratic paper. The disapproval of the pope, however, caused him to retire from the paper. In the same way he opposed the doctrine of the infallibility of the pope, but submitted after its proclamation. D. Mar. 18, 1870. His prin. work is *The Monks of the West* (6 vols.), translated into Eng. 1869.

**Montefiore** (SIR MOSES), b. at Leghorn Oct. 26, 1784; came early to Lond., where he engaged successfully in business, served the offices of sheriff of Lond. in 1837 and high-sheriff of Kent in 1846; acquired great fame for his magnificent charities and disinterested zeal in the cause of his Jewish co-religionists; was knighted in 1837, and raised to the baronetcy in 1846. (See his *Centennial Biography*, 1884.)

**Montevideo**, cap. of Chippewa co., Minn., on R. R. and Minn. River, at the mouth of the Chippewa. Pop. 1880, 862.

**Montezuma**, on R. R., cap. of Poweshiek co., Ia., about 60 m. E. of Des Moines, is the centre of a fine agricultural section and in the vicinity of extensive coal deposits. Pop. 1870, 555; 1880, 921.

**Montgomery City**, on R. R., Montgomery co., Mo., 82 m. W. of St. Louis, has a coll. and a public library. Pop. 1880, 1165.

**Monticello**, on R. R., cap. of Sullivan co., N. Y., 24 m. N. of Port Jervis, has an acad. Pop. 1870, 912; 1880, 941.

**Moorestown**, on R. R., Burlington co., N. J., 10 m. E. of Phila., Pa. Pop. 1880, 1407.

**Morenai**, on R. R., Lenawee co., Mich., 25 m. S. W. of Adrian. Prin. business, farming. Pop. 1880, 1309.

**Morgantown**, cap. of Monongalia co., W. Va., 100 m. S. of Pittsburg, Pa., has State univ., a female sem., and several manufactures. Pop. 1870, 797; 1880, 745.

**Morgue** (Fr., *La Morgue*) meant originally the outer court or entry of a prison, but came to be applied more especially to that building on *Quai de Marché Neuf* in Paris, where the bodies and clothing of unknown persons found dead are exposed for identification. From that inst. the name was extended to similar insts. in other cities.



**Morrison** (JOHN I.), b. near Chambersburg, Pa., in 1806; became a teacher at 15; removed to Salem, Ind., in 1824; became head of its gram. school 1825; grad. in 1 yr. at Miami Univ., O., in 1828, and returned to Salem school as teacher; became a leading educator in S. Ind.; was afterward prof. of math. and of Lat. and Gr. in State univ.; became State senator, treasurer, etc. D. 1882.

**Morristown**, R. R. junc., cap. of Hamblen co., Tenn., 42 m. N. E. of Knoxville, has 2 colls., extensive quarries of variegated marble, etc. Pop. 1880, 1850.

**Mortmain**, in its widest sense, may be used to describe any property the owners of which do not change, and which does not pass from hand to hand by sale or by inheritance. The word, however, is generally used in a narrower sense, and is applied solely to the lands of the ch., of religious corporations, and pious foundations. The Lat. expression, *manus mortua* (Fr. *mortmain*, Eng., "dead hand"), which occurs in pub. docs. as early as the middle of the 9th century, is derived either from the fact that land owned in this manner was inalienable and, figuratively speaking, as if held by dead hands, or from the fact that persons who became members of ecclesiastical corporations and religious communities were civilly dead—that is, were regarded in the law as dead.

**Mound City**, on R. R. Holt co., Mo. Pop. 1880, 678.

**Moundsville**, cap. of Marshall co., W. Va., on R. R. and the O. River, 11 m. S. of Wheeling, has large rolling mills, coal banks, and an immense ind. mound. Pop. 1870, 1500; 1880, 1774.

**Mountains and Rivers of the World.** See chart immediately following.

**Mount Ayr**, on R. R., cap. of Ringgold co., Ia., about 75 m. S. W. of Des Moines. Pop. 1870, 422; 1880, 1275.

**Mount Carmel**, city and R. R. junc., cap. of Wabash co., Ill., on Wabash River, 134 m. N. E. of Cairo. Pop. 1870, 1640; 1880, 2047.

**Mount Carmel**, R. R. junc., Northumberland co., Pa., has important coal mines. Pop. 1870, 1289; 1880, 2378.

**Mount Pleasant**, cap. of Isabella co., Mich., on branch of Flint and Pere Marquette R. R., is the centre of a considerable lumber trade. Pop. 1880, 1115.

**Munkacsy** (MICHAEL), b. at Munkacs, Hungary, in 1844; studied painting in Pesth, Vienna, Munich, and Paris, and began to exhibit in the last place in 1870. Among his most celebrated pictures are *Condemned to Death*, *The War in Hungary*, *Milton Dictating Paradise Lost*, etc.

## N.

**Nanticoke**, Luzerne co., Pa., on R. R. and E. branch of the Susquehanna, 10 m. W. of Wilkesbarre, has important coal mines. Pop. 1880, 3884.

**Naples**, Ont. co., N. Y., on R. R., and at the head of Canandaigua Lake, has an acad. and is in a fine fruit-growing section. Pop. 1880, 1360.

### National Cemeteries, U. S.:

ALABAMA, Mobile (P. O., Mobile).

ARKANSAS, Fayetteville (P. O., Fayetteville), Ft. Smith (P. O., Ft. Smith), Little Rock (P. O., Little Rock).

DISTRICT OF COLUMBIA, Battle Ground (P. O., Brightwood), Soldiers' Home (P. O., Wash.).

FLORIDA, Barrancas (P. O., Warrington), St. Augustine (P. O., St. Augustine).

GEORGIA, Andersonville (P. O., Andersonville), Marietta (P. O., Marietta).

ILLINOIS, Camp Butler (P. O., Riverton), Mound City (P. O., Mound City), Quincy (P. O., Quincy), Rock Island (P. O., Rock Island).

INDIANA, Crown Hill (P. O., Indianapolis), New Albany (P. O., New Albany).

INDIAN TERRITORY, Ft. Gibson (P. O., Ft. Gibson).

IOWA, Keokuk (P. O., Keokuk).

KANSAS, Ft. Leavenworth (P. O., Ft. Leavenworth), Ft. Scott (P. O., Ft. Scott).

KENTUCKY, Camp Nelson (P. O., Hanly), Cave Hill (P. O., Louisville), Danville (P. O., Danville), Lebanon (P. O., Lebanon), Lexington (P. O., Lexington), Mill Springs (P. O., Somerset).

LOUISIANA, Alexandria (P. O., Pineville), Baton Rouge (P. O., Baton Rouge), Chalmette (P. O., Arabi), Port Hudson (P. O., Port Hudson).

MARYLAND, Annapolis (P. O., Annapolis), Antietam (P. O., Sharpsburg), Loudon Park (P. O., Carroll).

MISSISSIPPI, Corinth (P. O., Corinth), Natchez (P. O., Natchez), Vicksburg (P. O., Vicksburg).

MISSOURI, Jefferson Barracks (P. O., Jefferson Barracks), Jefferson City (P. O., Jefferson City), Springfield (P. O., Springfield).

MONTANA, Custer Battlefield (P. O., Ft. Custer).

NEBRASKA, Ft. McPherson (P. O., Ft. McPherson).

NEW JERSEY, Beverly (P. O., Beverly), Finn's Point (P. O., Salem).

NEW YORK, Cypress Hills (P. O., E. N. Y.), Woodlawn (P. O., Elmira).

NORTH CAROLINA, New Berne (P. O., New Berne), Raleigh (P. O., Raleigh), Salisbury (P. O., Salisbury), Wilmington (P. O., Wilmington).

PENNSYLVANIA, Germantown (P. O., Germantown), Gettysburg (P. O., Gettysburg), Phila. (P. O., Phila.).

SOUTH CAROLINA, Beaufort (P. O., Beaufort), Florence (P. O., Florence).

TENNESSEE, Chattanooga (P. O., Chattanooga), Ft. Donelson (P. O., Dover), Knoxville (P. O., Knoxville), Memphis (P. O., Cemetery Station), Nashville (P. O., Madison), Pittsburg Landing (P. O., Hamburg), Stones River (P. O., Murfreesborough).

VIRGINIA, Alexandria (P. O., Alexandria), Arlington (P. O., Georgetown, D. C.), Ball's Bluff (P. O., Leesburgh), City Point (P. O., City Point), Cold Harbor (P. O., Richmond),

Culpeper (P. O., Culpeper), Danville (P. O., Danville), Ft. Harrison (P. O., Richmond), Fredericksburgh (P. O., Fredericksburgh), Glendale (P. O., Glendale), Hampton (P. O., Hampton), Poplar Grove (P. O., Petersburg), Richmond (P. O., Richmond), Seven Pines (P. O., Richmond), Staunton (P. O., Staunton), Winchester (P. O., Winchester), Yorktown (P. O., Yorktown).

WEST VIRGINIA, Grafton (P. O., West Grafton).

MEXICO, Mex. (P. O., City of Mex., Mex.).

**National Military Home**, Dayton, Montgomery co., O., has an admirable hospital, a library of 4000 vols., and extensive grounds—600 acres.

**National Stock Yards**, St. Clair co., Ill., on R. R. and E. bank of Miss. River, about 4 m. N. E. of St. Louis.

**Naturalization** means the conferment by a State or nation upon an alien of rights and privileges, both civil and political, which are vested in native-born citizens or subjects; or the admission of an alien by due public authority to the rights of citizenship. It is effected in various modes in various countries—either by letters-patent of the sovereign, as, for instance, in Rus., or by special legislative act conferring citizenship upon a particular individual, as, for instance, in Den., or under the provisions of general laws, which establish special regulations for the removal of the disabilities of foreigners upon their application, as, for instance, in the U. S. In the U. S. the whole power of legislation concerning N. is vested in Cong. by a clause in the U. S. const. providing that "Cong. shall have power to establish a uniform rule of N." The prin. provisions of the U. S. N. laws are as follows: The alien must declare on oath before a circuit or dist. court of the U. S., or a dist. or supreme court of the Terrs., or a court of record of any of the States having common law jurisdiction and a seal and clerk, 2 yrs., at least, prior to his admission, that it is *bona fide* his intention to become a citizen of the U. S., and to renounce forever all allegiance and fidelity to any foreign prince, state, or sovereignty, and particularly by name to the prince, state, or sovereignty of which the alien may be at the time a citizen or subject. But his full admission to citizenship cannot take place until he has resided within the U. S. for the continuous term of 5 yrs. next preceding his admission, and 1 yr. at least within the State or Terr. where the court is held to which he makes application. At the time of his application to be admitted, he must declare on oath before some one of the courts above mentioned that he will support the const. of the U. S., and that he absolutely and entirely renounces and abjures all allegiance to every foreign power, and particularly to that State of which he was before a citizen. These proceedings are duly recorded by the clerk of the court. (See the comprehensive article on the subject revised by PROF. T. W. DWIGHT, LL.D., in *J.'s Univ. Cyc.*)

**Naval War College**, established by order of the sec. of the navy Oct. 6, 1884. The prin. building on Coaster's Harbor Island, near Newport, R. I., has been assigned to its use. A course of study, embracing the higher professional branches, has been arranged, the prin. of which are the science and art of naval warfare and international law. It is designed to make it a school of application also, where naval officers may practically apply those rules the theory of which they have acquired at the Naval Acad. This applies more particularly to ordnance, under which is included the manufacture of explosives, the use of torpedoes, and the management of torpedo boats; navigation, nautical astron., and hydrography, and the use of the instruments belonging to those branches; and the practical naval tactics. One of the objects of the W. C. will be the formation of a naval staff—a corps rendered necessary by the military character of modern naval warfare. S. B. LUCE.

### Navy Yards and Shore Stations, U. S.:

NAVY YARDS: Boston, Mass.; League Island, Phila., Pa.; Mare Island, Cal.; New York, N. Y.; Norfolk, Va.; Pensacola, Fla.; Portsmouth, N. H.; Washington, D. C.

SHORE STATIONS: Apprentice Training Station, Coaster's Harbor Island, Newport, R. I.; Key West, Fla.; Naval Acad., Annapolis, Md.; Naval Asylum, Phila., Pa.; Naval War Coll.; Coaster's Harbor Island, Newport, R. I.; New London, Conn.; Port Royal, Beaufort, S. C.; Torpedo Station, Newport, R. I.

**Nece'dah**, Juneau co., Wis., on R. R., 12 m. N. of New Lisbon. Pop. 1870, 944; 1880, 1475.

**Ne'igh**, cap. of Antelope co., Neb., on Sioux City and Pacific R. R., 33 m. W. by N. of Norfolk. Pop. 1880, 336.

**Nel'sonville**, Athens co., O., on R. R. and Hocking River, 60 m. S. E. of Columbus, in the midst of the great coal region of O. Pop. 1870, 1080; 1880, 3095.

**Neodesha**, city, Wilson co., Kan., on R. R. and Verdigris River, has good water-power. Pop. 1880, 924.

**Neo'sho**, on R. R., cap. of Newton co., Mo., 315 m. S. W. of St. Louis, is in the heart of the S. W. lead mines of the State. Pop. 1870, 875; 1880, 1631.

**New'ark**, Newcastle co., Del., on R. R., 39 m. S. W. of Phila., Pa., is the seat of Del. Coll. and Del. Agricultural Coll., and has an acad. Pop. 1870, 915; 1880, 1148.

**New Hart'ford**, on R. R., Litchfield co., Conn., 29 m. N. W. of Hartford. Pop. 1880, 1670.

**New Lebanon**, on R. R., Columbia co., N. Y., about 25 m. S. E. of Albany. The tp. includes Lebanon Springs. Pop. tp. 1870, 2124; 1880, 2245.

**New Lexington**, on R. R., cap. of Perry co., O., 22 m. S. W. of Zanesville. Pop. 1870, 953; 1880, 1357.

**New Market**, on R. R., Rockingham co., N. H., 88 m. S. E. of Concord, has a public library, several cotton mills, etc. Pop. tp. 1870, 1987; 1880, 2368.

**Newport**, Jackson co., Ark., 83 m. N. E. of Little Rock, is on St. Louis, Iron Mt. and S. R. R., at junc. of White River Branch R. R. to Batesville. Pop. 1880, 683.

**Newport**, R. R. junc., Orleans co., Vt., at head of Lake Memphremagog. Pop. 1880, 920.

**Newport News**, Warwick co., Va., a terminus of the



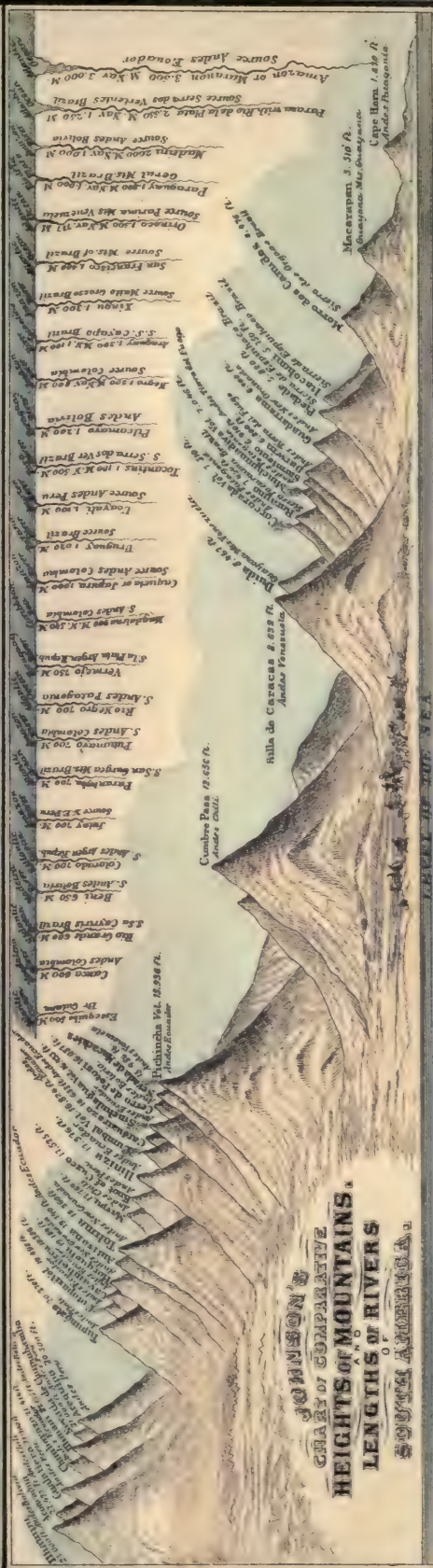






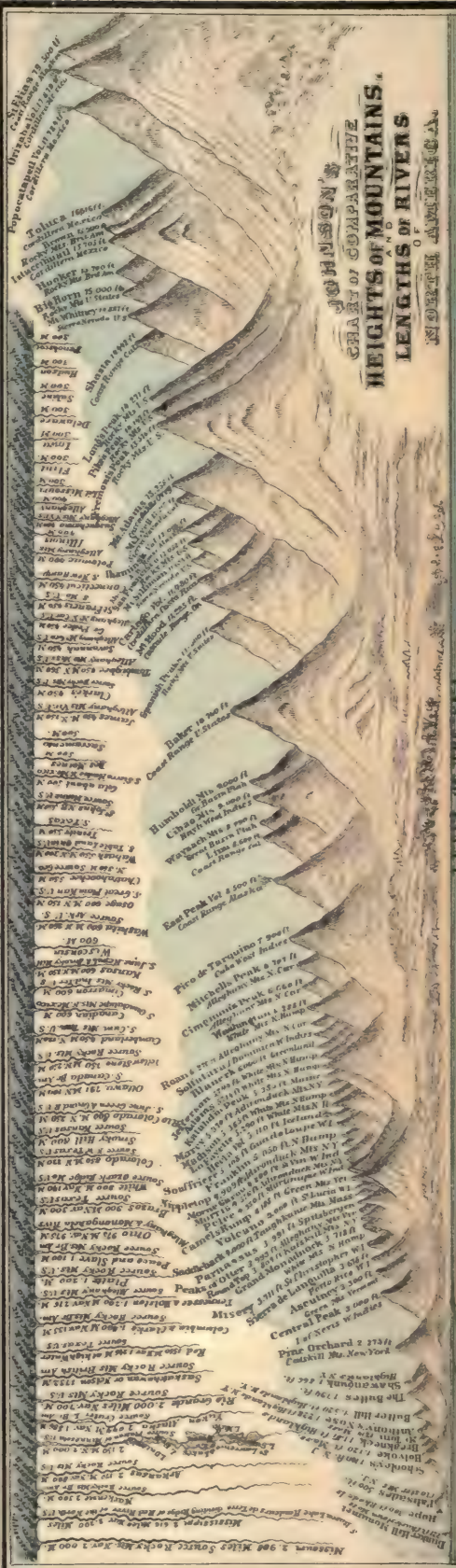


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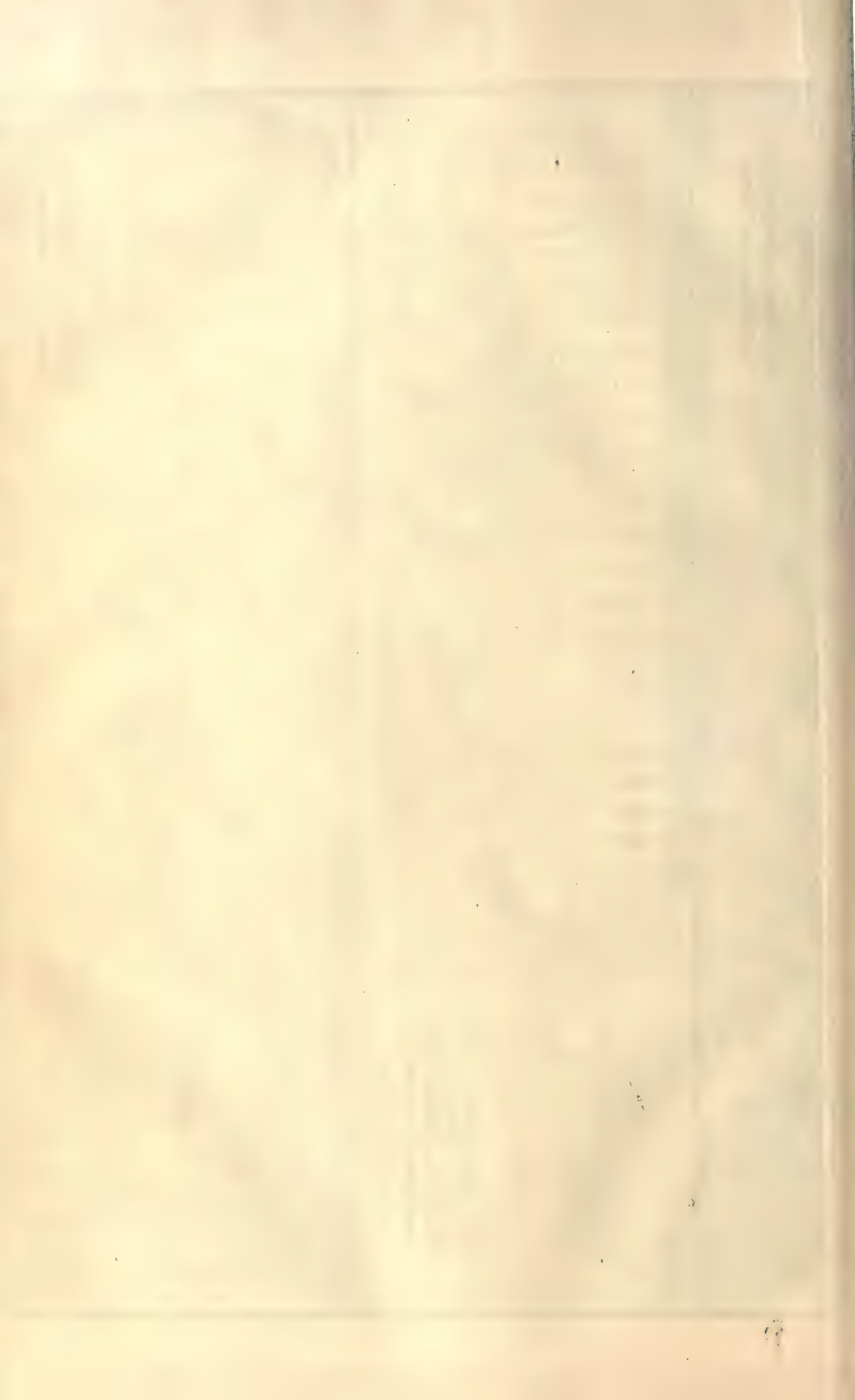


JOHNSON'S  
CHART OF COMPARATIVE  
HEIGHTS OF MOUNTAINS,  
LENGTHS OF RIVERS  
AND  
SOUTHERN AMERICA.

JOHN MASON,  
 CHART OF COMPARATIVE  
 HEIGHTS OF MOUNTAINS,  
 AND  
 LENGTHS OF RIVERS  
 IN THE UNITED STATES.









Chesapeake and O. R. R., has an immense grain-elevator with all modern improvements and a capacity of 1,600,000 bushels. The harbor is especially fine and always free from ice. The largest sea-going vessels can come directly alongside the elevator. Pop. dist. 1870, 733; 1880, 948.

**New Richmond**, R. R. junc., St. Croix co., Wis., 39 m. E. by N. of St. Paul. Pop. 1880, 729.

**Newton**, R. R. junc., cap. of Jasper co., Ill., 53 m. N. by W. of Grayville, which is on Wabash River. Pop. 1880, 1168.

**Newtown**, on R. R., Bucks co., Pa., 23 m. N. E. of Pa., has a boarding school, manufactures of agricultural tools, etc. Pop. 1870, 859; 1880, 1001.

**Newville**, on R. R., Cumberland co., Pa., 30 m. W. of Harrisburg, has several flour mills and a paper mill. Pop. 1870, 907; 1880, 1547.

**Nicholasville**, on R. R., cap. of Jessamine co., Ky., 12 m. S. W. of Lexington, has an acad., a sem., and several mills. Pop. 1870, 1089; 1880, 2303.

**Nokomis**, Montgomery co., Ill., on Indianapolis and St. Louis R. R., 84 m. N. E. of St. Louis, has large flouring mills and grain elevators. Pop. 1870, 893; 1880, 1062.

**Norfolk**, R. R. junc., Madison co., Neb., on Elkhorn River. Pop. 1880, 547.

**North Bend**, Dodge co., Neb., on U. Pacific R. R., 62 m. W. by N. of Omaha. Pop. 1880, 415.

**North Clarendon**, Warren co., Pa., about 6 m. S. E. of Warren. Pop. not in census.

**Northford**, New Haven co., Conn., on Air Line Division of N. Y., New Haven and Hartford R. R., 8 m. N. E. of New Haven. Pop. not in census.

**North La Crosse**, La Crosse co., Wis., on Chicago, Milwaukee, and St. Paul R. R., 1 m. N. of La Crosse. Pop. not in census.

**North Manchester**, Hartford co., Conn., on Hockanum River, 8 m. E. by N. of Hartford, is a v. in the very important manufacturing tp. of Manchester. Pop. not in census.

**North Manchester**, R. R. junc., Wabash co., Ind., 14 m. N. E. of Wabash, has an acad. and some manufactures. Pop. 1880, 1585.

**Northport**, on R. R. and Northport harbor, an arm of I. I. Sound, Suffolk co., N. Y., has ship-yards, brick-yards, etc. Pop. 1880, 1381.

**North Springfield**, R. R. junc., Greene co., Mo., on St. Louis and San Francisco R. R., 238 m. S. W. of St. Louis. Pop. 1880, 994.

**Northumberland**, R. R. junc., Northumberland co., Pa., at the confluence of the N. and W. branches of the Susquehanna River, has rolling-mill, nail factory, large furnace, etc. Pop. 1870, 1788; 1880, 2293.

**North Vernon**, city and R. R. junc., Jennings co., Ind., 72 m. W. of Cincinnati, has a large acad. and a variety of manufactures. Pop. 1870, 1758; 1880, 1842.

## O.

**Oakland**, formerly W. Waterville, R. R. junc., Kennebec co., Me., 6 m. S. W. of Waterville. Pop. 1880, 764.

**Oak Park**, Cook co., Ill., on Chicago and N. W. R. R., 8 m. W. of Chicago. Pop. 1880, 1883.

**Ocala**, R. R. junc., cap. of Marion co., Fla., 41 m. S. by E. of Gainesville. Pop. 1880, 803.

**Ocean Grove**, Monmouth co., N. J., on R. R. and the sea-coast, 6 m. S. of Long Branch, is a noted watering-place. Pop. 1880, 620.

**Ode**, from the Gr. ὕμνος, a "song," was originally used by the anc. in a general sense, comprising all kinds of lyric poems, while in modern times it is applied more specially to lyric pieces of a more dignified character, or such as are expressive of profound feelings.

**Ogden**, R. R. junc., Boone co., Ia., 51 m. N. W. of Des Moines. Pop. 1880, 568.

**Onawa**, city, cap. of Monona co., Ia., on Ia. division Sioux City and Pacific R. R., 27 m. S. by E. of Sioux City. Prin. business, farming. Pop. 1870, 478; 1880, 882.

**O'Neill**, city, cap. of Holt co., Neb., on Sioux City and Pacific R. R., 73 m. N. W. of Norfolk. Pop. 1880, 57; has largely increased since that date.

**Opelousas**, on R. R., cap. of St. Landry Parish, La., 166 m. N. W. of New Orleans, has an acad. Pop. 1870, 1546; 1880, 1676.

**Orange Valley**, a v. of Essex co., N. J., about 14 m. W. of N. Y. City. Pop. not in census.

**Orlando**, on R. R., cap. of Orange co., Fla., near the central part of the State. Pop. not in census.

**Orrville**, R. R. junc., Wayne co., O., is in a fine farming region. Pop. 1870, 745; 1880, 1441.

**Osa Mission**, city, on R. R., Neosho co., Kan., 390 m. S. W. of St. Louis, has an acad., extensive flouring mills, wagon and plough factories, etc. Pop. 1870, 791; 1880, 1306.

**Osborne**, city, cap. of Osborne co., Kan., on Mo. Pacific R. R. and S. Fork of Solomon River. Pop. 1880, 719.

**Oscoda**, Iosco co., Mich., on R. R. and Lake Mich., at mouth of River Au Sable, has a large trade in lumber. Pop. tp. 1880, 1998, including 1951 in v.; 1884, tp., 3149.

**Otsego**, on P. R., Allegan co., Mich., 15 m. N. W. of Kalamazoo. Pop. tp. 1880, 2340, including 1000 in v.; 1884, tp., 2555.

**Oxford**, on R. R., cap. of Granville co., N. C., 46 m. N. of Raleigh, is the centre of a tobacco-growing region, and has numerous tobacco manufactures. Pop. 1870, 916; 1880, 1349.

**Ozanam** (ANTOINE FRÉDÉRIC), b. at Milan Feb. 23, 1813; studied in Lyons and Paris, and was appointed prof. of foreign lit. in the Sorbonne in 1844. His great aim was to write a counterpart to Gibbon's *Decline and Fall of the Roman Empire*, vindicating the R. Cath. ch. in the form of a hist. of Chr. civilization. But he realized it only in fragments. His

best work is his *Histoire de la Civilisation au V. Siècle*, translated into Eng. by A. C. Glyn, Lond., 1868, 2 vols. D. Sept. 8, 1853.

## P.

**Palatka**, R. R. junc., cap. of Putnam co., Fla., on St. John's River, 56 m. S. of Jacksonville. Pop. 1870, 720; 1880, 1616.

**Pangborn** (Z. K.), b. at Peacham, Vt., July 31, 1829; grad. at the Univ. of Vt. in 1850; became ed. of the Boston *Daily Bee*; served during the war as paymaster of volunteers; visited Europe in 1864; became editor of the Jersey City *Daily Times*, and established in 1867 the *Evening Journal*.

**Paris**, on R. R., cap. of Monroe co., Mo., 44 m. S. W. of Hannibal. Pop. 1870, 865; 1880, 1253.

**Paris**, cap. of Henry co., Tenn., on R. R. and W. Sandy River, 131 m. N. E. of Memphis. Pop. 1880, 1767.

**Park City**, Summit co., Vt., on Echo and Park City Branch of U. Pacific R. R., 27 m. S. of Echo. Pop. 1880, 1542.

**Parker**, R. R. junc., Turner co., Dak., in S. E. part of the Terr. Pop. 1880, 113.

**Parkhurst** (CHARLES HENRY), D. D., b. in Ashland, Mass., Apr. 17, 1842; grad. at Amherst 1866; studied theol. in Halle and Leipzig, Ger., 1869-70, and again 1872-74; was settled over the Congl. Ch. of Lenox, Mass., 1874-80, and became in 1880 pastor of the Madison Square Presb. Ch. in N. Y. He has published *The Blind Man's Creed*, and *Other Sermons* (1883).

R. D. HITCHCOCK.

**Parnell** (CHARLES STEWART), b. at Avondale, Wicklow co., Ire., in 1846; was ed. at Cambridge, and entered Parl. in 1875 as a member for Meath. In 1877 he introduced the Irish Ch. Act Amendment bill to facilitate the purchase of their holdings by the tenantry of the disestablished Irish Ch., but the bill was thrown out by 150 to 110 votes. He then became the leader of the obstructionists in the Parl., and in 1879 he founded the Irish National Land League, whose purposes were to bring about a reduction of rack rents and to facilitate the obtaining of the ownership of the soil by the occupiers. In this same yr. he visited Amer., and lectured in all the large cities in order to raise funds for the organization. In 1880 he was returned to Parl. for Cork, but informations were laid against him by the atty.-gen. of Ire.; the trial, however, resulted in a disagreement of the jury. The Land League having been declared an illegal association, he was arrested and conveyed to Kilmainham jail, but was soon released, and was very active during the next sessions in procuring the passing of the Arrears act and the Tramways and Laborers acts.

**Pasteur** (LOUIS), b. at Dôle, dept. of Jura, Fr., Dec. 27, 1822; was appointed prof. of chem. in Paris in 1857; received a pension from the Fr. gov't. in 1874, and laid before the Inst. in 1884 a method of curing or preventing hydrophobia by inoculating with the poisonous virus in an attenuated form. He is the author of *Études sur la Vin* (1866), *Études sur la Maladie des Vers de Soie* (1870), *Les Microbes* (1878), etc.

**Patchogue**, Suffolk co., N. Y., on L. I. R. and Great S. Bay, 54 m. E. of Brooklyn, has a fish and oyster trade. Pop. 1880, 2503.

**Pawnee City**, cap. of Pawnee co., Neb., on R. R. in S. E. part of State. Prin. business, farming. Pop. 1880, 763.

**Pelree** (BENJAMIN OSGOOD), Ph. D., b. at Beverley, Mass., Feb. 11, 1854; grad. from Harvard Coll. in 1876; studied natural science at Leipzig and Berlin (Helmholtz's laboratory) 1876-79; has taught math. and physics in Harvard Univ. since 1881, and is the author of several important papers on phys. subjects.

**Pembina**, cap. of Pembina co., Dak., on Red River of the N., in N. E. corner of the Terr. Pop. 1880, 287.

**Pen'dleton**, cap. of Umatilla co., Or., on R. R. and Umatilla River, in N. E. part of State. Pop. 1880, 730.

**Pentwater**, Oceana co., Mich., on R. R. and Lake Mich. Pop. tp. 1880, 1278; 1884, 1621.

**Peshtigo**, Marinette co., Wis., on R. R. and Peshtigo River, near Green Bay. Pop. tp. 1880, 3517.

**Peyton** (JOHN LEWIS), b. in Va. Sept. 15, 1824; was ed. in the Va. Military Acad.; went in 1861 to Europe as agent for the S. States, and returned in 1876 to his estates in Va., principally occupying himself with literary and scientific pursuits. He pub. *The American Crisis*, or *Pages of the Note-Book of a State Agent during the Civil War* (Lond., 1867, 2 vols.), *Memoirs of W. M. Peyton* (1870), etc.

**Phelps** (EDWARD J.), LL.D., b. in Vt. July 11, 1822; grad. at Middlebury Coll. 1840; was at Yale Law School 1842-43; second comptroller of the treas. 1851-53; member of Vt. constitutional convention 1870; Democratic candidate for gov. of Vt. 1880; became Kent prof. of law in Yale Coll. 1881, and lecturer on constitutional law in Boston Univ. Law School 1882; was appointed U. S. minister to G. Brit. 1885.

**Pierre**, cap. of Hughes co., Dak., on Chicago and N. W. R. R. and Miss. River; has a coll. Pop. 1883, about 2500.

**Pipestone**, R. R. junc., cap. of Pipestone co., Minn., in S. W. part of State. Pop. 1880, 222.

**Pitkin**, on R. R., Gunnison co., Col., 27 m. E. by N. of Gunnison. Pop. 1880, 1891.

**Pittsburg**, on R. R., Crawford co., Kan., in S. E. part of State. Pop. 1880, 624.

**Pittsfield**, on R. R., Merrimack co., N. H., 15 m. E. of Concord, has an acad. and cotton factory, etc. Pop. tp. 1870, 1600; 1880, 1974.

**Plainville**, R. R. junc., Hartford co., Conn., 13 m. S. W. of Hartford, has fine water power and numerous manufactures. Pop. tp. 1870, 1433; 1880, 1930.

**Plankinton**, cap. of Aurora co., Dak., on Chicago, Milwaukee, and St. Paul R. R., in S. E. part of the Terr. Pop. not in census.

**Platt** (THOMAS C.), b. at Owego, N. Y., July 15, 1833; was ed. at Yale Coll.; entered into business; was pres. of the



Tioga National Bank, and afterward of the U. S. Express Co.; took an active part in politics; was clerk of the county of Tioga 1859-61, and M. C. 1873 and 1875. On Jan. 18, 1881, he was chosen U. S. senator, but resigned his seat on May 14, same yr.

**Pleasanton**, city, on R. R., Linn co., Kan., 75 m. S. of Kan. City, has rich deposits of lead and coal. Pop. 1880, 709.

**Plum Creek**, cap. of Dawson co., Neb., on U. Pacific R. R., 230 m. W. of Omaha. Pop. 1880, 344.

**Point Pleasant**, cap. of Mason co., W. Va., on R. R. and the O. River, near the junction of the Kanawha, has an extensive trade in coal and salt. Pop. 1870, 773; 1880, 1036.

**Pomerania**, a prov. of Prus. bordering N. on the Baltic and bounded W. by Mecklenburg and S. and E. by the provs. of Brandenburg and W. Prus. Area, 12,130 square m.; pop. 1,462,290. It formed during the middle ages an independent Wendish dukedom; by the peace of Westphalia it was ceded to Swe.; after the downfall of Charles XII. it was conquered by Prus.

**Pomona**, on R. R., Los Angeles co., Cal., 83 m. E. of Los Angeles. Pop. not in census.

**Port Byron**, Cayuga co., N. Y., on R. R. and Erie Canal, 26 m. W. of Syracuse. Pop. 1870, 1089; 1880, 1146.

**Port Clinton**, cap. of Ottawa co., O., on R. R. and Lake Erie, at the mouth of Portage River, 14 m. W. of Sandusky. Pop. 1870, 543; 1880, 1600.

**Port Deposit**, Cecil co., Md., on R. R. and Susquehanna River, in N. E. part of State, has extensive lumber and granite trade. Pop. 1870, 1839; 1880, 1950.

**Port Townsend**, cap. of Jefferson co., Wash. Terr., on Port Townsend Bay and the Strait of Juan de Fuca, has a large lumber trade. Pop. 1880, 917.

**Porter** (ALBERT G.), b. at Lawrenceburg, Dearborn co., Ind., Apr. 20, 1824; grad. from Asbury Univ. in 1843; began to practise law in Indianapolis in 1846; received the appointment of reporter of the Supreme Court of the State in 1853; was elected to Cong. in 1858 and re-elected in 1860. He was appointed first comptroller of the U. S. treas. in 1878, and served until nominated by the Rep. convention of 1880 for the office of gov. He was elected, and served till 1885.

**Post** (GEORGE EDWARD), M. D., b. in N. Y. City Dec. 17, 1838, and grad. at U. Theological Sem. 1861; served as chaplain in the U. S. A. 1861-63; went as a missionary to Tripoli, Syria, 1863, and removed in 1868 to Beirut, where he is prof. in the Amer. Prot. Coll. He has pub. several works in Arabic. R. D. HITCHCOCK.

**Pres'ton**, on R. R., cap. of Fillmore co., Minn., in S. E. part of State. Pop. 1870, 600; 1880, 939.

**Princeton**, on R. R., cap. of Caldwell co., Ky., 46 m. E. of Paducah, has a coll., woollen mill, etc., and is in a rich coal, iron ore, and lead-bearing section. Pop. 1870, 1012; 1880, 1234.

**Princeton**, on R. R., cap. of Mercer co., Mo., in N. part of State, has fine water-power, flouring mill, etc. Pop. 1870, 889; 1880, 1240.

**Provence**, an old prov. of Fr., bounded E. by the Alps and S. by the Mediterranean, and now divided into the depts. of Var, Bouches-du-Rhône, Basses-Alpes, and Vaucluse; derived its name from the Lat. *provincia*, by which the Romans pre-eminently designated it. After the fall of the Rom. empire P. came into contact with the Goths and the Arabs, and during the middle ages it was ruled by independent counts. In the 12th century this land, celebrated for its delightful climate, its beautiful sky, its roses, and its fruit, produced the famous Provencal songs. In 1481 it was annexed to the Fr. crown by Louis XI.

**Proverbs**, from the Lat. *proverbium*, are popular sayings which give a general idea in a concentrated, pithy, and striking form. On account of their peculiar form they are invaluable as materials for the study of langs., while on the other side their contents gives them a great historical interest. They first attracted general attention when Erasmus pub. his *Adagia* (Paris, 1500). Soon after collections were made in It., Ger., Den., etc. In the 19th century such collections have multiplied and increased to an enormous extent. Of the *Deutsche Sprichwörter Lexicon* the first vol. was printed in 1867, containing 45,000 Ger. P., with 15,000 corresponding adages in Bohemian, Dan., Eng., Fr., etc.

**Provo City**, cap. of Ut. co., Ut., R. R. junc., on Ut. Lake, 48 m. S. by E. of Salt Lake City. Pop. 1870, 2384; 1880, 3432.

**Pullman**, on R. R., Cook co., Ill., about 10 m. S. of Chicago, is extensively engaged in the manufacture of P. R. cars. Pop. not in census.

Q.

**Quatrefages de Bréau** (JEAN LOUIS ARMAND DE), b. at Berthezème, in the dept. of Gard, Fr., Feb. 10, 1810; was appointed prof. of nat. hist. at the Lycée Napoléon in 1850, and in 1855 at the Historical Museum of Anat. and Ethnology. Several of his works have been translated into Eng.—*Métamorphose de l'Homme* (1862, Lond., by H. Lawson, 1864), *Histoire de l'Homme* (1869, N. Y., by Miss E. Youmans, 1875), etc.

**Quitman**, on R. R., cap. of Brooks co., Ga., 174 m. W. of Savannah, has large cotton and woollen factory, etc. Pop. 1870, 784; 1880, 1400.

R.

**Rapid City**, cap. of Pennington co., Dak., in S. W. part of terr. Pop. 1880, 292.

**Raton**, Colfax co., N. M., near N. boundary, on Atchison, Topeka, and Santa Fé R. R., 111 m. N. by E. of Las Vegas. Pop. not in census.

**Rau** (CHARLES), b. at Verviers, in Belg., but ed. in Ger.; came to the U. S. in 1848; was in 1875 called to Wash. to ar-

range the archaeological and ethnological collection of the Smithsonian Inst., and was in 1876 made curator of the dept. of antiquities in the National Museum. He is the author of *Early Man in Europe* (1876), *Prehistoric Fishing in Europe and North America* (1885), etc.

**Rawlins**, cap. of Carbon co., Wyo., on U. Pacific R. R., 195 m. W. by N. of Cheyenne. Pop. 1880, 1451.

**Redding**, Shasta co., Cal., on Or. division of Central Pacific R. R., 170 m. N. by W. of Sacramento. Pop. 1880, 600.

**Redfield**, R. R. junc., cap. of Spink co., Dak. Pop. not in census.

**Red Hook**, on R. R., Duchesse co., N. Y., 3 m. from Hudson River. Pop. 1880, 936.

**Redwood Falls**, cap. of Redwood co., Minn., on R. R. and Redwood River. Pop. 1880, 981.

**Reed City**, R. R. junc., Osceola co., Mich., 49 m. E. by S. of Ludington, which is on Lake Mich. Pop. 1880, 1091.

**Rees** (JOHN KROM), A. M., E. M., b. in New York City Oct. 27, 1851; grad. from Columbia Coll. in 1872 and School of Mines in 1875; was appointed prof. of math. and astron. at Wash. Univ., St. Louis, Mo., in 1876; director of the observatory and prof. of geodesy and practical astron. at Columbia Coll. in 1884; managing ed. of *The School of Mines Quarterly*, and has pub. *International Time System* (1882), *Observations of the Transit of Venus, Dec. 6, 1882, Standard Time* (1884), etc.

**Refrigerators**. That fruit, vegetables, and fresh meat may be preserved for indefinite periods by reducing their temperature nearly to the freezing-point, has long been known. Nevertheless, the use of refrigeration in the transportation of perishable articles of food, both by rail and steamer, is of quite recent date, though it promises to initiate a most important change in this branch of traffic. The great object is to produce not only coolness, but also dryness of the air in the preserving chamber, and the first device which successfully solved the problem was that patented by Axel S. Lyman in 1852.

**Reidsville**, Rockingham co., N. C., on Richmond and Danville R. R., has numerous tobacco factories. Pop. 1880, 1316.

**Rensselaer**, cap. of Jasper co., Ind., on Louisville, New Albany and Chicago R. R., 72 m. S. E. of Chicago. Pop. 1870, 617; 1880, 968.

**Reynoldsville**, Jefferson co., Pa., on Low Grade division of Allegheny Valley R. R., 120 m. N. E. of Pittsburg. Pop. 1880, 1410.

**Richards** (T. ADDISON), Amer. landscape painter, b. in Lond. Dec. 1820; corresponding sec. of the Acad. of Design in New York since 1852, and prof. of art in the Univ. of New York since 1867; has pub. *Georgia Illustrated* (1854), *Pictures and Painters* (1870), etc.

**Rich'burgh**, on R. R., Allegany co., N. Y., 20 m. E. of Olean. Pop. not in census.

**Rich Hill**, R. R. junc., Bates co., Mo., on Osage River, in W. part of State. Pop. 1880, 86.

**Richland Centre**, cap. of Richland co., Wis., on Chicago, Milwaukee, and St. Paul R. R., 69 m. W. by N. of Madison, has several flouring mills, etc. Pop. 1880, 1327.

**Richwood**, on R. R., Union co., O., 100 m. N. W. of Cincinnati. Prin. business, farming. Pop. 1870, 436; 1880, 1317.

**Rico**, cap. of Dolores co., Col., in S. W. part of State. Pop. 1880, 894.

**Ridge way** (ROBERT), b. at Mount Carmel, Wabash co., Ind., July 2, 1850; was appointed zoologist to the U. S. geological exploration of the 4th parallel (1867-69), and afterward curator of birds at the National Museum. He wrote the technical part of Baird's *History of North American Birds*, and a number of minor papers on ornithology.

**Rising Sun**, city, cap. of Ohio co., Ind., on Ohio River, 3 m. below Cincinnati, has various manufactures. Pop. 1870, 1760; 1880, 1506.

**Rit'ter** (FREDERICK LOUIS), b. at Strasburg in 1834; studied music in Paris; came early to the U. S.; settled in Cincinnati, where he founded the Cecilia and the Philharmonic societies; removed to New York as leader of the Arion society; was in 1867 appointed prof. of music at Vassar Coll., Poughkeepsie, N. Y., and is the author of a *History of Music* (Boston, 1870-74, 2 vols.).

**Riverside**, San Bernardino co., Cal., on Cal. S. R. R., 118 m. N. of San Diego. Pop. of precinct 1880, 1358.

**Roanoke**, Roanoke co., Va., at junc. of the Norfolk and W. and the Shenandoah Valley R. R., 258 m. W. by N. of Norfolk. Pop. not in census.

**Robert's** (FREDERICK SLEIGH), b. in 1832; entered the Bengal artil. as second lieu., and passing successively through the various other grades, was made a lieu.-gen. in 1879. He was commander-in-chief in the Afghan war 1879-80; gained a brilliant victory over Ayoub Khan; was made a baronet, and in 1881 appointed a member of the council of Madras, and commander of the troops of the presidency.

**Robinson**, R. R. junc., cap. of Crawford co., Ill., in S. E. part of the State, has an acad, etc. Pop. 1880, 1880.

**Robinson** (CHARLES S.), D. D., b. at Bennington, Vt., Mar. 31, 1829; was grad. from Williams Coll. in 1849; studied theol. in the U. Theol. Sem. in New York and at Princeton; had charge of the Park Presb. ch. in Troy, the First Presb. ch. in Brooklyn, the Amer. chapel in Paris, etc., and was settled over the Memorial Presb. ch. in New York. He has pub. several collections of hymns—*The Songs of the Church, Songs for the Sanctuary, Psalms and Hymns and Spiritual Songs*, etc.; 2 vols. of sermons—*Studies of Neglected Texts*, etc.

**Robinson** (GEORGE D.), LL.D., b. at Lexington, Mass., Jan. 20, 1834; grad. at Harvard Univ.; studied law, and was admitted to the bar in 1866; became a member of the Mass. House of Representatives in 1874, and of the State Senate in 1876; was elected to the 45th, 46th, 47th, and 48th Congs., and became gov. of Mass. in 1884.

**Rockford**, Floyd co., Ia., on Burlington, Cedar Rapids, and N. R. and Shell Rock River. Pop. 1880, 739.



**Rock Hill**, York co., S. C., on Charlotte, Columbia, and Augusta R. R. Pop. 1880, 809.

**Rock Rapids**, cap. of Lyon co., Ia., on R. R. and Rock River, in N. W. corner of the State. Pop. not in census.

**Roodhouse**, R. R. jun., Greene co., Ill., 21 m. S. of Jacksonville, has coal-shafts, stock-yards, etc. Pop. of precinct 1880, 3214.

**Roosevelt** (THEODORE), b. in the city of New York Oct. 27, 1858; was grad. from Harvard Coll. in 1880; was a member of the State Legislature 1882-84; introduced and finally had passed the State Civil Service Reform law and a number of other laws establishing great reforms in the govt. of the city of New York, and pub. *The Naval War of 1812*, *Hunting Trips of a Rancher*, etc.

**Roquefort**, a small town in S. Fr., on a mt. 4800 ft. high, about 85 m. W. of Avignon; famous for its cheese made from ewe milk. This cheese, the choicest made in Fr., was one of the old Rom. delicacies, highly praised by Pliny (*Hist. Nat.* XI, 42). The limestone mt. is honeycombed with caverns, in which the cheeses are kept through the summer. About 10,000 cheeses are produced annually, requiring large flocks of sheep. Pop. about 1700.

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**Roseburgh**, city, cap. of Douglas co., Or., on Or. and Cal. R. R., in S. W. part of State. Pop. 1880, 822.

**Rossi** (PELLEGRINO) COUNT, b. at Carrara, near Modena, It., July 13, 1787; was prof. of jurisprudence at Bologna, but left it. In 1815, after the downfall of Fr. authority in the country; settled at Geneva; removed in 1834 to Paris; was made prof. of political economy in the Collège de France, a peer in 1839, and Fr. ambassador to Rome in 1845. When the revolution broke out in Paris in 1848 Plus IX. made him prime-minister, and he felt confident that he could save Rome and It. from a revolution; but on Nov. 15, 1848, he was assassinated on his way to Paris.

**Rossi**, de (GIOVANNI BATTISTA), b. in Rome Feb. 23, 1822; devoted himself to the study of archaeology and Chr. antiquities, and made discoveries of the greatest importance in the Catacombs, particularly in the cemetery of St. Calixtus. His 2 prin. works are *Inscriptiones Christiane Urbis Romæ* (1857-61) and *Roma Sotterranea Christiana* (1864).

**Roudaire** (FRANÇOIS ELIE), b. at Guéret, in the dept. of Creuse, Fr., in 1836; was ed. at Saint-Cyr; became a lieutenant in 1858, a capt. in 1861, etc. He originated the scheme of transforming parts of Sahara into a sea by piercing the dunes and letting in the Mediterranean. See his *Une Mer intérieure en Algérie et Rapport sur la mission des chotts en Algérie*. D. Jan. 13, 1885.

**Roulette** (Fr., "a little wheel"), a game of chance played on a table in whose centre is a cavity. The sides of the cavity are firm and painted at equal distances with the first 36 numbers, which are repeated along the edge of the table. The bottom of the cavity is movable by the aid of a handle in the form of a cross. When the *tailleur* puts the bottom in motion he throws down in the cavity a small ivory ball, and when the movement stops the ball drops into one of the painted compartments. The number which the ball strikes wins, and is paid 36 times the stake which was put on it.

**Rugby**, a town of Eng., in the co. of Warwick, on the Avon, 83 m. N. W. of Lond., has important horses, cattle, wool, and cheese fairs. Its celebrated gram-school, founded in 1567 by Lawrence Sheriff, and of which Dr. Thomas Arnold was head-master 1828-42, has 14 teachers and about 500 students, and an income from endowment of nearly £5000. Pop. 1880, 989.

**Rulers, Population, Religion and Areas of the Principal Nations of the World.** See page 1558.

**Rye**, Westchester co., N. Y., on N. Y., New Haven, and Hartford R. R. and L. I. Sound. Pop. of tp., including v. of Port Chester, 1870, 7150; 1880, 6576.

## S.

**Sabetha**, city, Nemaha co., Kan., on St. Joseph and W. R. R., 61 m. W. by N. of St. Joseph, Mo. Pop. 1880, 849.

**Sac City**, on R. R., cap. of Sac co., Ia., 45 m. W. of Ft. Dodge. Pop. 1870, 156; 1880, 595.

**Saccarappa**, on R. R., Cumberland co., Me., 6 m. N. W. of Portland. Pop. 1880, 2487.

**Saint Clair**, city and R. R. jun., St. Clair co., Mich., 45 m. N. E. of Detroit, has important manufactures of brick, leather, flour, etc. Pop. 1880, 1923; 1884, 2031.

**Saint Clairsville**, cap. of Belmont co., O., on R. R. and National Road, about 10 m. W. of Wheeling, W. Va. Pop. 1870, 1036; 1880, 1128.

**Saint Ignace**, city, cap. of Mackinac co., Mich., on R. R. and N. side of Straits of Mackinac, was the seat of an early Jesuit mission, and was the rendezvous of many exploring expeditions. Pop. 1884, 2336.

**Saint Johnsville**, Montgomery co., N. Y., on R. R. and Mohawk River, has fine scenery and important manufactures. Pop. 1870, 1376; 1880, 1072.

**Saint Mary's**, city, Pottawatomie co., Kan., on Kan. division of U. Pacific R. R., 90 m. W. of Kan. City, Mo. Pop. 1880, 884.

**Saint Mary's**, on R. R., Elk co., Pa., has a convent and sem. Prin. business, coal-mining. Pop. 1870, 1084; 1880, 1501.

**Saint Paul**, cap. of Howard co., Neb., on R. R. and Loup Fork of Platte River. Pop. 1880, 482.

**Salem**, on R. R., cap. of Dent co., Mo., 130 m. S. W. of St. Louis, has an acad., iron-ore banks, etc. Pop. 1870, 280; 1880, 1624.

**Salem**, on R. R., Forsyth co., N. C., 112 m. W. of Raleigh, contains Salem Female Acad., cotton and woollen mills, etc. Pop. 1880, 1340.

**Sall'da**, R. R. jun., Chaffee co., Col., on Denver and Rio Grande R. R. Pop. not in census.

**Saltsburg**, Ind. co., Pa., on Pa. R. R. and Conemaugh River. Pop. 1870, 659; 1880, 855.

**San Angelo**, cap. of Tom Green co., Tex., on Concho River, near the centre of the State. Pop. not in census.

**Sanborn**, on R. R., O'Brien co., Ia. Pop. 1880, 364.

**Sandwich**, on R. R., Barnstable co., Mass., 60 m. S. E. of Boston, has some manufactures and is a summer resort. Pop. 1880, 1369.

**Sanford**, Orange co., Fla., on R. R. and St. John's River, at the head of large steamer navigation. Pop. not in census.

**San Marcos**, on R. R., cap. of Hays co., Tex., 25 m. N. W. of Austin. A series of boiling springs, forming a great natural curiosity and affording fine water-power, are located here. Pop. 1870, 742; 1880, 1232.

**San'ta Ana**, on R. R., Los Angeles co., Cal., 34 m. S. E. of Los Angeles. Pop. 1880, 711.

**Sauk Centre**, R. R. jun., Stearns co., Minn., on Sauk Lake, 45 m. W. of Miss. River, has flouring mills, etc. Pop. 1880, 1201.

**Sault de St. Marie**, cap. of Chippewa co., Mich., at the foot of the rapids or falls from which it derives its name, on St. Mary's River, near the outlet of Lake Superior, was famous in 17th century as one of the headquarters of Jesuit explorations. It is a place of summer resort. Pop. 1880, 1947.

**Savan'na**, city, Carroll co., Ill., on R. R. and Miss. River. Pop. 1870, 971; 1880, 1000.

**Say** (JEAN BAPTISTE), b. at Lyons Jan. 5, 1767; was ed. for a commercial career, and spent a part of his youth in Eng.; pub. in 1803 his *Traité d'Économie politique*, but found no employment in public life on account of his thorough disagreement with the policy of Nap.; pub. in 1815 his *Catéchisme d'Économie politique*, and was in 1819 made prof. at the school of "Arts et Métiers." D. in Paris Nov. 15, 1832.

**Say** (JEAN BAPTISTE LÉON), b. in Paris June 6, 1826; studied political economy; was appointed prefect of the dept. of Seine in 1871, and was minister of finance in 1872, 1875, and 1877; minister to Eng. in 1880, and pres. of the senate. He has pub. *Théorie des changes étrangers* (translated into Eng.), several explanations of the financial state of city of Paris, etc.

**Sayce** (REV. ARCHIBALD HENRY), b. at Shirehampton, near Bristol, in Eng., Sept. 25, 1846; was appointed prof. of comparative philology at Ox. in 1870, and has pub. *An Assyrian Grammar* (1872), *An Elementary Assyrian Grammar and Reading-Book* (1875), *Introduction to the Science of Language* (2 vols., 1880), *The Ancient Epics of the East* (1884), *Decipherment of Hittite Inscriptions* in William Wright's *The Empire of the Hittites* (1884), etc.

R. D. HITCHCOCK.

**Scandia**, city, Republic co., Kan., on R. R. and Republican River, in N. part of the State. Pop. 1880, 573.

**Seaborough** (JOHN), D. D., b. in the State of N. Y. about 1826; was ed. at Trinity Coll., Hartford, Conn., and grad. at the General Theological Sem. of the Prot. Epis. Ch. in N. Y.; was settled as a minister first at Foughkeepsie, N. Y., and subsequently at Pittsburg, Pa., and was elected bp. of the diocese of N. J. Nov. 12, 1874.

**Schaghticoke**, Rensselaer co., N. Y., on Boston, Hoosac Tunnel and Western, and Troy and Boston R. Rs., 12 m. N. by E. of Troy. The tp. is on Hudson River; has important manufactures. Pop. tp. 1870, 3125; 1880, 3591.

**Schley** (WINFIELD SCOTT), U. S. N., b. Oct. 9, 1839; became mdpn. in 1856, lieutenant in 1862, commander 1874; took part in all the engagements which led to the capture of Port Hudson in 1863; was in command of the Essex, S. Atlantic station, 1877-79, and led the expedition for Greely's relief in 1884. Author (with Prof. J. R. Soley, U. S. N.) of *The Rescue of Greely*, 1885.

**Schuylkill Haven**, R. R. jun., Schuylkill co., Pa., on Schuylkill River and Canal. Pop. 1870, 2940; 1880, 3052.

**Scottsdale**, on R. R., Westmoreland co., Pa., about 40 m. S. E. of Pittsburg. Pop. 1880, 1275.

**Scud'der** (SAMUEL HUBARD), b. in Boston, Mass., Apr. 13, 1837, and grad. from the Lawrence Scientific School in 1862; is pres. of the Boston Society of Nat. Hist. since 1880, and ed. of *Science* since 1883, and has pub. a great number of papers and books on insects and butterflies—*Catalogue of North American Orthoptera* (1867), *Paleozoic Cockroaches* (1870), *Butterflies* (1881), etc.

**Sedan**, city, cap. of Chautauqua co., Kan., on Cana Creek, in a fine agricultural dist. of S. E. Kan. Pop. 1880, 665.

**Sewickley**, Allegheny co., Pa., on R. R. and O. River, about 12 m. N. W. of Pittsburgh. Pop. 1870, 1473; 1880, 2053.

**Sheffield**, R. R. jun., Warren co., Pa., on Tionesta Creek, in N. W. part of State. Pop. 1880, 684.

**Shelbi'na**, on R. R., Shelby co., Mo., has considerable trade in tobacco and stock. Pop. 1870, 1145; 1880, 1289.

**Sheldon**, R. R. jun., Iroquois co., Ill., in N. E. part of State, near Ind. line. Pop. 1870, 231; 1880, 947.

**Sheldon** (EDWARD STEVENS), A. B., b. at Waterville, Me., Nov. 21, 1851; grad. from Harvard Univ. in 1873; studied at Leipzig and Berlin, and was in 1884 appointed assistant prof. of philology at Harvard. He has pub. *A Short German Grammar* (1879), which is much used as a text-book.

**Shepard** (E. M.), b. in the city of N. Y. Sept. 16, 1843; grad. at the Naval Acad. in 1861; served with the naval battery at the siege of Port Hudson; became a lieutenant in 1864, a lieutenant commander in 1866, and a commander in 1882.

**Shere-All**, b. in 1825; succeeded his father as ameer of Afghanistan in 1863, and seemed at first to be open to Eng. influence, introducing numerous reforms after Eng. models, but was subsequently compelled, by a revolt of the conservative party, headed by his own son, Yakooob Khan, to change his policy completely and submit to the Rus. influence. As he now declined to receive an Eng. embassy, though a Rus. embassy lived in Cabul in great state, the Eng. invaded the country in the last months of 1878. S.-A. fled across the frontier, and d. suddenly at Mezaricheff, a place under Rus. authority, Feb. 21, 1879.

**Sibley**, on R. R., cap. of Osceola co., Ia., in N. W. part of State, 76 m. N. E. of Sioux City. Pop. 1880, 301.



**Silber** (WILLIAM BEINHAEUER), b. in the city of N. Y. Nov. 22, 1826, and grad. from Wesleyan Univ. in 1850; was made a prof. in the Coll. of the City of N. Y. in 1851, and prin. of the N. Y. Gram. School in 1880. He has pub. *Progressive Lessons in Greek* (1864), *A Latin Reader* (1867), *An Elementary Grammar of the Latin Language* (1869), *A History of St. James's Methodist Episcopal Church at Harlem* (1882), etc.

**Sla'ter**, on R. R. Saline co., Mo., about 35 m. N. by E. of Sedalia. Pop. 1880, 771.

**Sla'tington**, Lehigh co., Pa., on R. R. and Lehigh River, has extensive slate quarries. Pop. 1870, 1508; 1880, 1634.

**Slee'py Eye**, Brown co., Minn., on R. R., between Minn. and Cottonwood rivers, has large wheat elevator and store-house. Pop. not in census.

**Smeth'port**, on R. R., cap. of McKean co., Pa., has an acad. and lumber mills. Prin. business, lumbering, mining, and farming. Pop. 1870, 231; 1880, 872.

**Smith** (CLEMENT LAWRENCE), A. M., b. at Upper Danby, Pa., Apr. 13, 1844, and grad. from Harvard Coll. in 1863; was appointed assistant prof. of Lat. at Harvard in 1873, and in 1883 prof. of Lat. He is one of the eds.-in-chief of the *College Series of Latin Authors*.

**Smyth** (EGBERT COFFIN), D. D., b. at Brunswick, Me., Aug. 24, 1829, and grad. from Bangor Theological Sem. in 1853; was appointed prof. of rhetoric at Bowdoin Coll. in 1856; prof. of ecclesiastical hist. at Andover Theological Sem. in 1863, and pres. of the faculty in 1878. He is ed. of the *Andover Review*, has translated Uhlhorn's *Conflict of Christianity with Heathenism* (1879), and pub. addresses, sermons, etc.

**Snowden** (A. LOUDON), b. in Cumberland co., Pa., in 1837; was ed. at Wash. and Jefferson coll.; studied law, and became register U. S. mint, Phila., 1857, chief coiner 1866, P. M. at Phila. 1877, supt. of U. S. mint in 1879, and has delivered many valuable addresses and lectures on Silver Dollar Coinage, Single Standard, History of the Great Seal of the U. S., etc.

**Snow Shoe**, on R. R., Centre co., Pa. Pop. 1880, 400.

**Socorro**, cap. of Socorro co., N. M., on R. R. and the Rio Grande. Pop. 1880, 1272.

**Solomon City**, Dickinson co., Kan., on R. R. and Solomon River, 100 m. W. of Topeka, has manufactures of flour, salt, and gypsum. Pop. 1880, 618.

**Somerset**, on R. R., cap. of Pulaski co., Ky., is in the midst of an iron and coal-mining region. Pop. 1880, 805.

**Soudan** is the name of a vast and particularly fertile region of Afr., with vague boundary lines, situated to the S. of the great desert of Sahara, and generally laid down on the charts as extending from the Atlantic Ocean across the continent to the W. borders of Abyssinia, and farther to the N., even to the Red Sea. Indefinite as its S. extremity is, the region is for the general purposes of geog. limited by the equator. Besides to the Egyptian Soudan, which embraces 9 provs. with the capital at Khartoom, near the junct. of the Blue and White Niles, the name is, according to general acceptance, applied also to the kingdoms of Kordofan, Darfour, Wadal, Fimbucoo, Senegal, and Senegambia—in fact, to the entire belt dominated by the Mohammedan religion as opposed to the countries and peoples farther S. who practise fetishism and other heathen ceremonies. The literal meaning of the name S. is "black country," expressing the original uniformity of the pop., but at present the ruling class is Ar.—either officials from Lower Egypt, Bedouin sheiks, or black sultans, whose law is the Koran. The pop., including the Ar. and the mixed races, is very variously estimated, though of late a tendency prevails to always prefer the lowest estimates.

**Soule** (GIDEON LANE), an eminently successful teacher, was b. at Freeport, Me., July 25, 1796, and grad. from Bowdoin Coll. in 1818. In 1822 he was appointed prof. of anc. langs. in Phillips Exeter Acad.; in 1838 he became prin., and in 1873 professor emeritus. D. May 28, 1879.

**South Am'boy**, Middlesex co., N. J., on R. R. and Raritan Bay, has an acad. and some manufactures. Pop. 1870, 4525; 1880, 3648.

**South Ber'wick**, R. R. junct., York co., Me., on Salmon Falls River, has an acad. (1791) and some manufactures. Pop. 1880, 1062.

**South Chic'ago**, R. R. junct., Cook co., Ill., on Lake Mich., 13 m. S. by E. from Chicago. Pop. 1880, 1961.

**South Evan'ston**, Cook co., Ill., on Chicago and N. W. R. R. and Lake Mich., 10 m. N. of Chicago. Pop. 1880, 1517.

**Spencer**, cap. of Owen co., Ind., on R. R. and White River, 52 m. S. W. of Indianapolis, has various manufactures, also stone quarries and block and canal coal. Pop. 1870, 971; 1880, 1655.

**Spiehlagen** (FRIEDRICH), b. at Magdeburg, Prus. Sax., Feb. 24, 1829; studied philology and philos. at Berlin, Bonn, and Greifswald, but devoted himself afterward to lit., and acquired reputation as a novel-writer. Several of his novels have been translated by Prof. Seche de Vere—*Problematic Characters* (1869), *Through Night to Light* (1869), *The Hohensteins* (1870); and by W. H. Browne—*Hammer and Anvil* (1879), *What the Swallows Sang* (1879).

**Spirit Lake**, cap. of Dickinson co., Ia., on R. R., in N. W. part of State, 90 m. N. of Ft. Dodge, is surrounded by a rich agricultural region and beautiful scenery. Pop. 1870, 76; 1880, 277.

**Spokane Falls**, Spokane co., Wash. Terr., on N. Pacific R. R. and Spokane River. Pop. 1880, 350.

**Sprague**, Lincoln co., In E. part of Wash. Terr., on N. Pacific R. R. Pop. 1880, 94.

**Spring Lake**, Ottawa co., Mich., on R. R., in the centre of the "peach belt," has numerous steam saw-mills and a mineral spring. The tp. has one of the best harbors on Lake Mich. Pop. tp. in 1870, 1896, including 1156 in v.; 1880, tp. 2384, including 1572 in v.; in 1884, tp. 3411.

**Springville**, Erie co., N. Y., on R. R., 30 m. S. of Buffalo, has iron works, etc., and is the centre of one of the

finest dairying sections in the State. Pop. 1870, 1006; 1880, 1327.

**Stan'berry**, Gentry co., Mo., on R. R., in N. W. part of State. Pop. 1880, 1307.

**Standard Time**. For all places on the same meridian the mean solar time—that is, ordinary clock time—will be the same. But times will be 1 hour faster or slower than any given local time at places 15° E. or W. In the lat. of N. Y. City a displacement E. or W. of a mile will make a difference of about 4.5 seconds of time. The difference in time between the City Hall of N. Y. City and the Columbia Coll. Observatory is 7.93 seconds. We must therefore in any city or section of country adopt the time of some point as the standard for the city or section. In cities that point has heretofore been the city hall or c.-h. But now observatory centres are usually chosen, as these insts. have the instrumental equipment and skilful observers necessary for the accurate determination of the error of the standard clock and for the distribution of the standard clock signals over a large adjacent dist. Thus, the standard for the whole of G. Brit. is Greenwich Observatory time; for Ire. the standard is Dublin Observatory time, etc. On Nov. 18, 1883, a reform was accomplished in the time standards of the U. S. and Canada. The governing meridians of the new system are 60°, 75°, 90°, 105°, and 120° W. from Greenwich. As nearly as practicable the sections lying 7½° on either side of a governing meridian use the time of that meridian.

**Starkville**, cap. of Oktibbeha co., Miss., on R. R., in N. E. part of State. Pop. 1870, 475; 1880, 1500.

**Statistics of Corn, Oats, Wheat, Petroleum, Hog Products and Cotton**. See pages 1559-62.

**Sted'man** (EDMUND CLARENCE), b. at Hartford, Conn., Oct. 8, 1833; studied at Yale Coll.; was war correspondent to the N. Y. *World*, 1861-63, and private sec. to Atty.-Gen. Bates at Wash., 1863-65, and settled in 1865 in N. Y. as a stockbroker. He has pub. *Poems*, *Lyric and Idyllic* (1860), *Alice of Monmouth*, and *other Poems* (1864), *The Blemishes*, *Princess*, and *other Poems* (1868), etc., and a volume of critical essays on *The Victorian Poets* (1875).

**Steelton**, on R. R., Dauphin co., Pa., adjoining the city of Harrisburg on the S. E., was laid out in 1866 and contains the largest steel works in the U. S. It has a very fine public-school building, erected by the Steel co. Pop. 1880, 2447; 1884, about 6000.

**Stejneger** (LEONHARD), b. in Bergen, Nor., Oct. 30, 1851, and grad. from the Univ. of Christiania; came in 1881 to the U. S.; took part in an expedition to the Aleutian Islands, and was on his return made assistant curator of birds at the National Museum at Wash. He is author of numerous papers on ornithology.

**Sterling**, on R. R., Johnson co., Neb., 36 m. S. E. of Lincoln. Pop. 1880, 560.

**Stoughton**, on R. R., Norfolk co., Mass., 17 m. S. of Boston, has a public library and manufactures of boots and shoes, etc. Pop. tp. 1870, 494; 1880, 4875.

**Stove**. Previous to 1825 the use of S., generally of the box pattern, and very rude, was confined to shops and offices, bar-rooms of hotels, school-houses, c.-h.s., and ohs. in the cities and larger vs. In the country the ohs. were not usually warmed, but the matrons and older women carried their foot S., and the men protected their feet from the cold by stout leather overshoes, technically known as "boxes." Self-feeding S., which would burn Eng. or Welsh coal, were made in 1827 and 1831, and were an improvement on all previous inventions; but it was not until 1853 that anthracite coal S. became salable.

Estimate of Stove Manufacture in the U. S., 1884.

STATES.	Furnaces.	Men employed.	Tons produced.	Stoves produced.	Value.
Maine.....	2	150	1,500	13,500	\$180,000
New Hampshire.....	3	135	1,350	12,150	162,000
Massachusetts.....	19	2,157	21,570	194,130	2,588,400
Rhode Island.....	2	375	3,750	33,750	450,000
Connecticut.....	4	495	4,950	44,550	594,000
New York.....	42	10,170	101,700	915,300	12,204,600
New Jersey.....	2	370	2,700	24,300	324,000
Pennsylvania.....	34	5,496	54,960	494,640	6,595,200
Maryland.....	6	975	9,750	87,750	1,170,000
Virginia.....	1	150	1,500	13,500	180,000
West Virginia.....	3	204	2,040	18,360	244,800
Georgia.....	1	90	900	8,100	108,000
Alabama.....	1	90	900	8,100	108,000
Tennessee.....	3	750	7,500	67,500	900,000
Kentucky.....	8	1,374	13,740	123,660	1,648,800
Michigan.....	5	1,620	16,200	145,800	1,944,000
Ohio.....	52	5,952	59,520	535,680	7,142,400
Missouri.....	8	2,106	21,060	189,540	2,527,200
Illinois.....	18	2,355	23,550	211,950	2,826,000
Indiana.....	9	585	5,850	52,650	702,000
Wisconsin.....	5	429	4,290	38,610	514,800
Minnesota.....	1	30	300	2,700	36,000
Iowa.....	1	75	750	6,750	90,000
Kansas.....	3	675	6,750	60,750	810,000
California.....	1	60	600	5,400	72,000
Oregon.....	1	50	500	4,500	60,000
<b>Total.....</b>	<b>235</b>	<b>36,818</b>	<b>368,180</b>	<b>3,313,620</b>	<b>\$44,181,600</b>
Deduct for one quarter of the time not in operation.....			92,045	828,405	11,045,400
			276,135	2,485,215	\$33,136,200



**Stra'chey** (RICHARD), served in the Sutlej campaign 1845-46, on the staff of Sir Henry Smith, at battles of Alsival and Sobraon; appointed to the Bengal engineers in 1836, and promoted to maj.-gen. 1871; was nominated a member of the council of the gov.-gen. of India in 1868; acted as assistant sec. in the public works dept. 1869, and appointed member of the council of the sec. of state for India in 1875.

**Sturgeon Bay**, cap. of Door co., Wis., on an arm of Green Bay, 2 m. from Lake Mich., with which it is connected by a ship-canal. Pop. 1880, 1199.

**Sua'kim**, a town of Nubia and its only outpost on the Red Sea, is situated in lat. 19° 10' N., and forms the starting-point of the great caravan route to Berber, the shortest road from the coast to the interior, and consequently of vital commercial and strategical importance, though difficult on account of its scarcity of water and fodder. It formed the basis for the Eng. expedition into Soudan in 1884. A R. R. from S. to Berber was commenced by Eng.

**Summit**, on R. R., Union co., N. J., 21 m. W. of New York City. Pop. 1880, 1011.

**Superior**, cap. of Douglas co., Wis., on R. R., at the head of Lake Superior, has a fine harbor. Pop. tp. 15, 0, 1122; 1880, 655.

**Swampscott**, Essex co., Mass., on R. R. and Massachusetts Bay, 13 m. N. E. of Boston, is a fashionable watering-place. Pop. tp. 1870, 1846; 1880, 2500.

**Swanton**, Franklin co., Vt., on R. R. and Missisquoi River, near Lake Champlain, has an acad. and several manufacturing factories. Pop. 1880, 1900.

**Syracuse**, on R. R., Otoe co., Neb., 22 m. W. of Nebraska City. Pop. 1880, 510.

## T.

**Taco'ma**, cap. of Pierce co., Wash. Terr., on N. Pacific R. R. and Puget Sound. The Pacific Mail steamships and Puget Sound steamers stop here. Pop. 1880, 1098.

**Tade'ma** (LAURENZ ALMA), b. at Droupry, W. Friesland, Hol., Jan. 8, 1836; studied painting in the acad. of Antwerp, and settled in 1870 in Lond. Among his most celebrated pictures are *Ancient Egyptian Festival* (1862), *Ancient Roman Siesta* (1868), *The Vintage Celebration in Rome* (1872), *The Picture Gallery* (1874), etc.

**Tahoe', Lake**, is situated on the boundary-line between Cal. and Nev., precisely at the intersection of the 39th parallel of N. lat. with the 120th meridian W. of Greenwich, at an elevation of about 3000 ft. It lies embosomed between 2 arms of the Sierra Nevada, surrounded on all sides with an amphitheatre of snow-clad mts., which rise from 3000 to 4000 ft. above its surface. Its greatest length is about 21 m.; its greatest breadth about 12 m. The shores of this mt. lake afford the most beautiful sites for summer residences, but the prolonged severity of the winter, and more particularly the huge snow fall, make the location unfit for permanent habitation.

**Tampa**, city, cap. of Hillsborough co., Fla., on R. R. and Tampa Bay, has communication by steamers with ports on Gulf of Mexico. Pop. 1880, 720.

**Tarbox** (INCREASE NILES), D. D., b. at E. Windsor, Conn., Feb. 11, 1815; grad. at Yale Coll. 1839; was settled as pastor of the Congl. ch. at Framingham, Mass., 1844; became sec. of the Amer. Education Society at Boston in 1851, and pub. a number of juvenile stories—*Winnie and Walter Stories* (4 vols., 1860) and *Uncle George's Stories* (4 vols., 1865); a'so *Nineveh* (1858), *Tyre and Alexandria* (1865), *Life of Major-General Israel Putnam* (1876), etc.

**Taylor**, R. R. jun., Williamson co., Tex., 36 m. N. E. of Austin. Pop. not in census.

**Tekamah**, on R. R., cap. of Burt co., Neb., 47 m. N. W. of Omaha. Pop. 1880, 776.

**Tel'luride**, cap. of San Miguel co., Col., near the source of Rio San Miguel, in S. W. part of State. Pop. in 1883 about 400.

**Temple**, R. R. jun., Bell co., Tex., on Gulf, Col., and Santa Fe R. R., 218 m. N. W. of Galveston. Pop. not in census.

**Tennessee University**. Its foundation is connected with the earliest hist. of Tenn. In 1797 Blount Coll. was chartered by the "Territory South of the Ohio;" in 1807 E. Tenn. Coll. was chartered, and soon after the franchise and property of Blount Coll. were transferred to the new inst. In 1840 its name was changed to E. Tenn. Univ., and in 1879 to Univ. of Tenn. Since that time a full Univ. organization has been adopted. It is located at Knoxville.

**Ten'toburg Forest**, the collective name of several ranges of hills and low mts., which extend for a distance of about 80 m. through Westphalia and the principality of Lippe, with an elevation of about 1500 ft. Here the Rom. legions under Varus were routed and massacred by Hermann, the chief of the Cherusci, 9 A. D., and in 1875 a colossal monument by Bandel was raised in commemoration of that event on the summit of Gortenberg, near Detmold.

**Thompson** (HON. JOHN), b. at Rhinebeck, N. Y., July 4, 1809; studied law at Poughkeepsie, and was admitted to the New York bar in 1830; was a member of the 34th Cong., and has pub. several vols. on religious subjects.

**Thorn'town**, on R. R., Boone Co., Ind., 37 m. N. W. of Indianapolis. Pop. 1870, 1526; 1880, 1515.

**Til'ton**, Belknap co., N. H., on R. R. and Winnipiseogee Lake, 18 m. N. by W. of Concord. Pop. 1880, 691.

**Tipton**, on R. R., cap. of Tipton co., Ind., 40 m. N. by E. of Indianapolis, has various manufactures. Pop. 1870, 892; 1880, 1250.

**Tomb'stone**, cap. of Cochise co., Ariz., in S. E. part of the terr. Pop. 1880, 973.

**Tompkinsville**, a v. on N. E. shore of Staten Island, Richmond co., N. Y. A R. R. extends from here to Totten-ville in S. W. part of the island, and ferries connect it with New York City.

**Tom's River**, on R. R., cap. of Ocean co., N. J., 56 m. S. of New York City. Pop. about 3000.

**Tor'rey** (CHARLES WARREN), M. D., b. in New York City Sept. 16, 1838, and grad. at Columbia Coll.; studied med. and surgery in Paris, Göttingen, Halle, and Würzburg; served during the c. war as assistant surgeon U. S. volunteers and med. inspector in the dept. of Va. and N. C., and was subsequently ed. of the *American Gaslight and Mining Journal*.

**Torrey** (JOSEPH W.), b. at Bath, Me., Apr. 22, 1828, and grad. at Roxbury Lat. School in 1846; went in 1850 to Hong-Kong, where for a short time he was ed. of the *Hong-Kong Times*; was made rajah of Ambong and Maloodu, on the N. coast of Borneo, in 1867, governing a terr. of about 22,000 square m., with about 2,000,000 inhabs., and became pres. of the Amer. Trading Co. in Borneo.

**Torrington**, Litchfield co., Conn., on Naugatuck R. R. and river, 20 m. N. by W. of Waterbury. Pop. tp. 1870, 2893; 1880, 3327.

**Toulon'**, on R. R., cap. of Stark co., Ill., 37 m. N. W. of Peoria. Pop. 1870, 904; 1880, 967.

**Tower City**, Cass co., Dak., on N. Pacific R. R., 43 m. W. of Fargo. Pop. 1880, 159.

**Toy** (CRAWFORD HOWELL), b. at Norfolk, Va., March 23, 1836, and grad. from Univ. of Va. in 1856; studied Oriental langs. in Berlin, and was appointed prof. of Heb. in S. Bap. Theological Sem. 1869, and in Harvard Univ. 1880. He has translated and edited the vol. on Samuel in Lange's Commentary, and written *The Religion of Israel* (1882), *Quotations in the New Testament* (1884), etc.

**Tract Societies** are the most perfect organizations yet realized for the purpose of imbuing the people of all classes and lands with religious truth by means of the press. Three societies of the kind were formed before 1701 by members of the Ch. of Eng.—viz., 1 "for the propagation of the gospel in N. Eng. and Amer.," another "for foreign parts," and the 3d "for promoting Chr. knowledge." But that one which has since become the largest and most efficient in the world, the Religious Tract Society, was not organized until 1799 in Lond. The first yr. its entire receipts were £2940; now its annual income is about £210,000. It has issued 45,000 publications, large and small, and has now 10,000 in its catalogue. Its publications at home and abroad are in 142 different langs., and number 2,282,000,000 copies. In the U. S. the Meth. Book Concern (1789), the Mass. Society for Promoting Chr. Knowledge (1803), and the N. Y. Religious Tract Society (1812) were the first societies of the kind, but most of the local tract associations united afterward into the Amer. Tract Society, which has developed into an imposing inst. It has issued 6764 distinct publications, of which 1512 are vols. Of the periodicals, a total of 210,000,000 copies have been issued, or, at the present rates, 4,500,000 yearly to 230,000 subscribers.

**Tracy**, R. R. jun., Lyon co., Minn., in S. W. part of State. Pop. 1880, 322.

**Treitsch'ke** (HENRICH GOTTHARDT VON), b. in Dresden Sept. 15, 1834; was appointed prof. of hist. at Freiburg-im-Breisgau in 1863, but resigned his position in 1866 as an ardent adherent of Prus.; settled in Berlin, and was in 1874 made prof. of hist. there. He has written *Historische und Politische Aufsätze* (3 vols., 1871), *Der Socialismus und seine Gönner* (1875), *Deutsche Geschichte im 19. Jahrhundert* (5 vols., 1879-84).

**Trenton**, on R. R., cap. of Gibson co., Tenn., 59 m. S. of Columbus, Ky., has large flouring mills, etc. Pop. 1870, 1909; 1880, 1833.

**Troy**, on R. R., cap. of Lincoln co., Mo., 60 m. N. W. of St. Louis, has abundance of coal, iron, glass sand and other mineral deposits in the vicinity. Pop. 1870, 703; 1880, 839.

**Tucker** (WILLIAM JEWETT), D. D., b. at Griswold, Conn., July 13, 1839, and grad. from Andover Theological Sem. in 1866; became pastor of Franklin st. ch., Manchester, N. H., in 1867, and of Madison Square Presb. ch. in New York City in 1875, and prof. of sacred rhetoric in Andover Theological Sem. in 1879. He is one of the eds. of *Andover Review*, established in 1884.

**Tulare'**, on R. R., Tulare co., Cal., 251 m. S. E. of San Francisco. Pop. 1880, 447.

**Tullaho'ma**, R. R. jun., Coffee co., Tenn., 82 m. N. W. of Chattanooga. Pop. 1870, 589; 1880, 1063.

**Tuscomb'ia**, city and R. R. jun., cap. of Colbert co., Ala., on Tenn. River, 150 m. E. by S. of Memphis, Tenn., has a female inst. and a male acad. Prin. business, cotton handling. Pop. 1870, 1214; 1880, 1369.

## U.

**Ull'mann** (KARL), b. at Epenbach, Baden, Mar. 15, 1796; was appointed prof. of theol. at Heidelberg in 1821; founded the *Studien und Kritiken* in 1828; retired into private life in 1860, and d. at Karlsruhe Jan. 12, 1865. Of his works the following have been translated into Eng.: *The Worship of Genius* (1840), *Reformers before the Reformation* (2 vols., 1841), and *Apologetic View of the Sinless Character of Jesus* (1841).

**Unadilla**, on R. R., Otsego co., N. Y., 42 m. E. of Binghamton, has an acad., foundry, etc. Pop. 1870, 875; 1880, 922.

**Uvalde**, cap. of Uvalde co., Tex., on Galveston, Harrisburg, and San Antonio R. R., 92 m. W. by S. of San Antonio. Pop. 1880, 794.

## V.

**Vall**, Crawford co., Ia., on Chicago and N. W. R. R., 126 m. W. of Marshalltown. Pop. 1880, 511.

**Vall** (RT. REV. THOMAS H.), S. T. D., LL.D., first bp. of Kan.; b. in Richmond, Va., of Eng. parents, Oct. 21, 1812; grad. at Washington (now Trinity) Coll., Hartford, Conn., 1831, and at General Theological Sem., New York, 1835. In 1837 he became rector of Christ ch., Cambridge, Mass.; in 1839 of St. John's ch., Essex, Conn.; in 1844 of Christ ch., Wester-



ly, R. I., where he remained 14 yrs.; in 1857 became rector of St. Thomas ch., Taunton, Mass.; in 1862 of Trinity ch., Muscatine, Ia.; in Sept. 1864 he was elected bp. of Kan.; consecrated Dec. 13, 1864. Among his works are *The Comprehensive Church, Life of Lyde*, with an edition of his *Poems*, etc. Pres. and founder of Bethany Coll., Topeka. The 20th anniversary of his episcopate was celebrated at Topeka, Kan., 1885.

H. G. BATTERSON.

**Valdosta**, cap. of Lowndes co., Ga., on Savannah, Fla., and W. R. R., 147 m. S. W. of Savannah. Pop. 1870, 1199; 1880, 1515.

**Valen'ciennes**, a town of Fr., in the dept. of Nord, on the Scheldt; is fortified; contains an arsenal, barracks, hospitals, and magazines, and carries on a brisk trade in coal, timber, agricultural produce, and its own manufactures. Especially its laces and fine woven fabrics are celebrated. Pop. 27,607.

**Valley City**, cap. of Barnes co., Dak., on N. Pacific R. R. and Sheyenne River, 57 m. W. of Fargo. Pop. 1880, 302; 1884, about 800.

**Valley Falls**, city and R. R. junc., Jefferson co., Kan., 35 m. W. of Leavenworth, has excellent water-power, woolen-mill, etc. Pop. 1870, 608; 1880, 1016.

**Van Bu'ren**, cap. of Crawford co., Ark., on Arkansas River and Little Rock and Ft. Smith R. R., near W. boundary of the State, 7 m. N. E. of Ft. Smith. Pop. 1870, 985; 1880, 1029.

**Vas'sar**, Tuscola co., Mich., on R. R. and Cass River, 20 m. S. E. of Bay City, has various manufactures. Pop. 1880, 670.

**Vassar** (JOHN GUY), b. at Poughkeepsie, N. Y., June 15, 1811; founder, with his brother Matthew, of the "Old Men's Home," in Poughkeepsie; also Vassar Laboratory; donor to Vassar inst. of a fine building for literary and scientific purposes, erected in 1882; trustee of Vassar Coll. from 1861.

**Vassar** (MATTHEW), Jr., b. in Poughkeepsie, N. Y., May 11, 1809; treas. and trustee of Vassar Coll. from its beginning to his death. He, with his brother, JOHN GUY, erected Vassar Brothers' Laboratory for Vassar Coll. at a cost of \$20,000, and Vassar "Old Men's Home," in Poughkeepsie, N. Y. He held many local and important offices, and left \$264,500 to various insts., corporations, and societies, including \$85,000 for a hospital in Poughkeepsie, to be called "Vassar Brothers' Hospital," and \$130,000 to Vassar Coll. D. Aug. 10, 1881.

**Ve'to** (Lat., "I deny"), the power of the executive in constitutional govts. to interfere in his official capacity, and to prevent an act passed by the legislature from becoming a law. It may be absolute when the executive interposition of itself completely arrests the legislation; or qualified when the arrest is only partial, and the legislature may, by an increased majority—for example, of two thirds or three fourths—enact the measure notwithstanding the objections.

**Vevay**, city, cap. of Switzerland co., Ind., on Ohio River, equidistant from Cin. and Louisville. Much produce is shipped from here. Pop. 1880, 1884.

**Vilas** (WILLIAM FREEMAN), b. at Chelsea, Vt., July 9, 1840; removed in 1851 to Wis.; was ed. at the Wis. State Univ.; studied law, and began practising in Madison; fought in the war as col. of the 23d regiment of Wis. volunteers; returned to his law business after the close of the war; took an active part in politics, and was appointed P. M.-gen. in 1885.

**Vin'cent** (MARVIN RICHARDSON), b. at Poughkeepsie, N. Y., Sept. 11, 1834, and grad. from Columbia Coll. in 1854; was appointed prof. of Lat. in Troy Univ. in 1858; held various pastoral charges, and became in 1873 pastor of the Ch. of the Covenant in New York City. He has pub. *Faith and Character* (1880), *In the Shadows of the Pyrenees* (1885), *God and Bread* (1884), etc.

**Viro'qua**, cap. of Vernon co., Wis., on branch of Chicago, Milwaukee, and St. Paul R. R., 35 m. S. of Sparta. Pop. 1880, 702.

**Virus**, animal fluids produced in diseased conditions or by morbid processes, and capable of developing disease when transmitted to other animal bodies. Thus, man may be inoculated with the virus of human origin, small-pox, syphilis, etc., and with vaccinia of the cow, glanders of the horse, and rabies canina, or hydrophobia.

## W.

**Wad'dington** (WILLIAM HENRY), b. at Saint-Remi-sur-l'Avre, in the dept. of Eure-et-Loire, Fr., Dec. 11, 1826, and grad. at the univ. of Cambridge in 1849; made extensive archaeological explorations in Asia Minor; wrote *Voyage en Asie mineure, Melanges de Numismatique*, etc.; took an active part in politics, and was minister of foreign affairs 1877-79, and ambassador to the court of St. James in 1880.

**Wade'na**, R. R. junc., cap. of Wadena co., Minn., on N. Pacific R. R., 185 m. N. W. of St. Paul. Pop. 1880, 307.

**Wah'peton**, R. R. centre, cap. of Richland co., Dak., on Red River of the N., opposite Breckenridge, Minn. Pop. 1880, 400; has since largely increased.

**Wa Kee'ney**, cap. of Trego co., Kan., on Kan. division U. Pacific R. R., 254 m. W. of Topeka. Pop. 1880, 418.

**Wakeley** (JOSEPH B.), b. at Danbury, Conn., in 1804; studied for the ministry; was admitted to the New York conference in 1828; settled in 1857 at Poughkeepsie, and was subsequently appointed pastor of the Lexington Avenue ch. D. Apr. 27, 1876. He was the author of *Lost Chapters Recovered from the History of Methodism*, *The Temperance Cyclopaedia*, etc.

**Wal'den**, on R. R., Orange co., N. Y., 73 m. N. of New York City, has various manufactures. Pop. 1870, 1254; 1880, 1804.

**Wal'lace** (WILLIAM J.), LL.D., b. in Syracuse, N. Y., Apr. 14, 1837; grad. from Law School of Hamilton Coll., N. Y.; admitted to the bar in 1857, and practised law

until appointed U. S. dist. judge for N. dist. of N. Y. 1874; succeeded Judge Blatchford as U. S. circuit judge for 2d circuit; was elected mayor of Syracuse in 1873.

**Wal'ler** (ELWYN), A. M., E. M., Ph. D., b. in the city of New York Mar. 22, 1846, and grad. in 1867 from Harvard Coll. and in 1870 from the School of Mines, Columbia Coll.; was appointed assistant sanitary inspector (analyst to the Metropolitan Board of Health) in 1872, and has pub. *Disinfection and Disinfectants*, *Notes on Petroleum of San Domingo*, *New Method for the Quantitative Estimation of Carbolic Acid*, *Water Supply of New York City*, etc.

**Wal'nut**, Pottawattomie co., Ia., on Chicago, Rock Island, and Pacific R. R., 95 m. W. of Des Moines. Pop. 1880, 733.

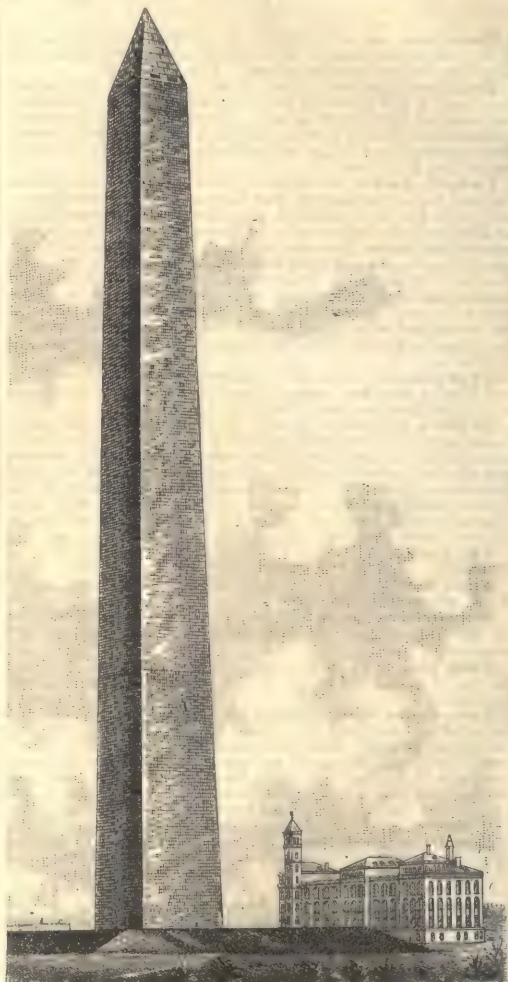
**Wal pole**, R. R. junc., Norfolk co., Mass., 19 m. S. W. of Boston. Pop. tp. 1870, 2137; 1880, 2494.

**Wal'ton**, R. R. junc., Delaware co., N. Y., 17 m. W. of Delhi. Prin. business, farming. Pop. 1870, 866; 1880, 1389.

**Ward** (LESTER FRANK), A. M., LL.B., b. June 18, 1841, at Joliet, Ill., and grad. from Columbian Univ., Wash., in 1871; held for several yrs. the position of librarian of the U. S. Bureau of Statistics, and was in 1881 appointed vegetable paleontologist for U. S. geological survey and became prof. of bot. in the new Corcoran School of Science. He has pub. *Guide to the Flora of Washington and Vicinity*, *Haeckel's Genesis of Man* (1879), *Dynamic Sociology* (1883), etc.

**Wash'ington**, cap. of Wilkes co., Ga., in N. E. part of State, on Washington branch of Ga. R. R., 18 m. N. of Barnett. Pop. 1870, 1506; 1880, 2199.

**Washington**, cap. of Beaufort co., N. C., on R. R., at the head of Pamlico River, about 80 m. from the ocean, has ship-yards, fisheries, and some manufactures. Pop. 1870, 2094; 1880, 2462.



**Washington Monument**, Wash., D. C. Its cornerstone was laid July 4, 1848, and the work commenced by an association incorporated by Cong. After an expenditure of \$280,000, raised by voluntary subscription, the monument came to a standstill for 30 yrs. It was finished in 1885, in accordance with act of Cong., and under the direction of Col. Thomas L. Casey, U. S. Engineers. It was dedicated Feb. 21, 1885.

**Wa'tertown**, R. R. junc., cap. of Codrington co., Dak., on Big Sioux River, in S. E. part of Terr. Pop. 1880, 746.

**Wat'sontown**, Northumberland co., Pa., on R. R. and W. branch of Susquehanna River, 23 m. S. of Williamsport, has various manufactures. Pop. 1870, 1181; 1880, 1481.

**Wa'verly**, R. R. junc., Morgan co., Ill., 30 m. S. W. of Springfield. Pop. 1880, 1124.



**Waverly**, R. R. junc., cap. of Pike co., O., 90 m. N. of Portsmouth, which is on Ohio River. Prin. business, farming and stock-raising. Pop. 1870, 1202; 1880, 1539.

**Weeping Water**, Cass co., Neb., in S. E. part of State. Pop. 1880, 317.

**Wellesley College**, exclusively devoted to the higher education of women, is situated in the v. of Wellesley, Mass., on Lake Waban, about 15 m. from Boston. The grounds comprise 300 acres. The building, with its wings, is 475 ft. long, 4 and 5 stories high. It is of brick, trimmed with freestone. The coll., which was opened in 1875, and has 330 students, is chartered by the State and empowered to confer all collegiate and honorary degrees that are conferred by any Mass. coll. or univ. The standard of study is the same as that of the foremost colls. for young men. The library contains 20,000 vols.; the apparatus, cabinets, and laboratories are extensive. The number of teachers is 30. The average age of the students is 20 yrs. The Coll. Aid Society spends about \$7000 a yr. in aiding poor girls to secure an education in the coll.

**Wellsburg**, cap. of Brooke co., W. Va., on R. R. and Ohio River, 16 m. N. of Wheeling. Pop. 1870, 1366; 1880, 1815.

**West Gardner**, Worcester co., Mass., a v. of Gardner tp., Worcester co., Mass. Pop. not in census.

**West Lebanon**, on R. R. Grafton co., N. H., 2 m. E. of White River junc., Vt., and the Connecticut River. Pop. 1880, 515.

**West New'ton**, Westmoreland co., Pa., on R. R. and Youghiogheny River, 33 m. S. E. of Pittsburg. Pop. 1870, 992; 1880, 1475.

**Weston**, on R. R., cap. of Lewis co., W. Va., 25 m. S. of Clarksburg, which is on Baltimore and Ohio R. R., has an acad. Pop. 1870, 1111; 1880, 1516.

**West Plains**, on R. R., cap. of Howell co., Mo., 113 m. S. E. of Springfield. Pop. 1870, 130; 1880, 351.

**Westport**, Fairfield co., Conn., on N. Y., New Haven and Hartford R. R. and L. I. Sound, 45 m. N. E. of New York City. Pop. tp. 1870, 3861; 1880, 3477, including 137 in v.

**Westville**, New Haven co., Conn., a P. O. in N. W. part of New Haven City.

**Wheeler** (FRANCIS B.), S. T. D., b. at North Adams, Mass., Sept. 9, 1818; grad. at Univ. of Vt. 1842; pastor of Congl. chs. in Jericho, Brandon, Vt., and Saco, Me., 1845-59; afterward for many yrs. pastor of First Presb. ch., Poughkeepsie, N. Y. Has contributed largely to the religious and secular press, and is author of many hymns.

**Wheeler** (HOSEA), a distinguished Pub. clergyman, b. in Dunbarton, N. H., 1791; grad. at Dartmouth Coll. 1811; ordained at Newburyport, Mass., 1818. D. at Eastport, Me., Jan. 27, 1833.

**Wheeler** (JOHN), D. D., b. at Grafton, Vt., Mar. 11, 1798; grad. at Dartmouth Coll. 1816; at Andover Theological Sem. 1819; pastor of Congl. ch., Windsor, Vt., 1821-33; pres. of Univ. of Vt. 1833-48. D. Apr. 16, 1862.

**White** (CHARLES ABIATHAB), A. M., M. D., b. at North Dighton, Mass., Jan. 26, 1826; was appointed prof. of nat. hist. in the Ia. State Univ. 1867, and at Bowdoin Coll. 1873, and paleontologist to the U. S. geological survey in 1875. He has pub. *Report on the Geological Survey of the State of Iowa* (1870), *Manual of the Physical Geography and Institutions of the State of Iowa* (1873), *Contributions to Invertebrate Paleontology* (1879-83), etc.

**White** (HON EZRA), b. at Jerusalem, Yates co., N. Y., Oct. 25, 1839; became pres. of the Eastman National Business Coll. in 1878, and was elected mayor of Poughkeepsie in 1880, and re-elected in 1882.

**White** (JOHN WILLIAMS), b. in Cin., O., Mar. 5, 1849; grad. at Ohio Wesleyan Univ. 1868; was appointed prof. of Gr. and Lat. at Willoughby Coll., O., in 1868, and at Baldwin Univ., O., in 1869; tutor in Gr. at Harvard in 1874, assistant prof. in 1877, and prof. in 1884. He has pub. *Edipus Tyrannus of Sophocles* (1873), *First Lessons in Greek* (1876), etc., and is one of the eds. of the coll. series of Gr. authors.

**White Ha'ten**, Luzerne co., Pa., on R. R. and Lehigh River, 24 m. N. of Mauch Chunk. Pop. 1870, 1321; 1880, 1408.

**Whitfield** (ROBERT PARR), b. May 27, 1828, near New Hartford, Oneida co., N. Y.; in 1856 became assistant to Prof. James Hall, Albany, N. Y., on paleontological work of N. Y. State Nat. Hist. Survey; first assistant curator N. Y. State Cabinet of Nat. Hist. 1871-76; became prof. of geology and paleontology in Rensselaer Polytechnic Inst., Troy, N. Y., 1875; in 1877 became curator of Geological Dept. of Amer. Museum of Nat. Hist., New York City; is one of the foremost paleontologists in the U. S., and has contributed largely to various scientific publications.

WILLIAM B. DWIGHT.

**Whitney** (WILLIAM COLLINS), b. at Conway, Mass., July 5, 1841, and grad. from Yale Coll. in 1863; studied law and commenced practising in the city of New York in 1865; was appointed corporation counsel in 1875 and sec. of the navy in 1885.

**Wichita Falls**, Wichita co., Tex., on Ft. Worth and Denver City R. R., 114 m. N. W. of Ft. Worth; stage routes from here to various points in the "Pan-handle" and Ind. Terr. Pop. not in census.

**Williams** (WILLIAM R.), D. D., b. in New York City Oct. 14, 1804; grad. at Columbia Coll., N. Y., 1823; studied law for 3 yrs.; was admitted to the bar, practised 1 yr. and went to Europe; on his return studied for the ministry and became pastor of Amity St. Bap. Ch. (now in W. 54th St.), New York City, Dec. 17, 1832. He continued in that position up to the time of his death, Apr. 1, 1885. Among his numerous pub. works are *Lectures on the Lord's Prayer* (1871) and *History of the Baptists* (1871).

**Willoughby**, on R. R., Lake co., O., 18 m. N. E. of Cleveland. Pop. 1870, 867; 1880, 1001.

**Willow** (Willows station), Colusa co., Cal., on R. R., 61 m. N. by W. of Sacramento. Pop. 1880, 728.

**Will's Point**, Van Zandt co., Tex., on Tex. and Pacific R. R., 47 m. E. of Dallas. Pop. 1880, 860.

**Winamac**, cap. of Pulaski co., Ind., on Chicago, St. Louis, and Pittsburg R. R., 25 m. N. W. of Logansport. Pop. 1870, 906; 1880, 835.

**Winchester**, cap. of Franklin co., Tenn., on R. R., in the S. part of the State, near the foot of the Cumberland Mts., is the site of the Univ. of the S., has some manufactures, and is a favorite resort for invalids. Pop. 1880, 1039.

**Wind'sor**, Henry co., Mo., on Mo., Kan. and Tex. division of Mo. Pacific R. R., 21 m. S. W. of Sedalia. Pop. 1880, 872.

**Winipeg**, the cap. of the Canadian prov. of Manitoba, is situated at the confluence of the Red and Assiniboine rivers, and forms the prin. station on the W. division of the Canadian Pacific R. R. Its prin. industry is as yet centred in the machine-shops, car-works, and engine-shops of the Pacific R. R., but its milling industry (producing about 1500 barrels of flour per day) is rapidly developing, and has almost unequalled opportunities. The lumber business is also important. The city contains Manitoba Coll. (Presb.), St. John's Coll. (Anglican), and the Coll. of St. Boniface (R. Cath.). Pop. 25,000.

**Winn'sborough**, city, cap. of Fairfield co., S. C., on Charlotte, Columbia, and Augusta R. R., 35 m. N. of Columbia. Pop. 1870, 1124; 1880, 1500.

**Winooski**, Chittenden co., Vt., 2 m. N. E. of Burlington, on R. R. and Winooski River, which here has a fall of 20 ft., supplying water largely used for manufacturing. Pop. 1880, 2833.

**Winslow** (JOHN F.), b. in Bennington, Vt., Nov. 5, 1810; ed. at the select schools of Albany, N. Y.; engaged in mercantile life in New York and New Orleans 1827-31; in 1831 became managing agent of N. J. Iron Co.; 1837-67 was prominently connected with the late Erastus Corning in the Albany and the Rensselaer Iron Works. Through the advocacy of Mr. Winslow the U. S. govt. contracted with his firm for the "Monitor." He retired from active business in 1867 to Poughkeepsie, N. Y.; pres. of board of trustees, and *ex-officio* of the faculty of Rensselaer Polytechnic Inst. 1863-67.

**Winthrop**, on R. R., Kennebec co., Me., about 10 m. W. of Augusta. Pop. 1880, 984.

**Wittenberg**, town of Prus., in the prov. of Sax., on the right bank of the Elbe, is famous as the place where the Ger. ref. began. The houses of Luther, Melancthon, and Lucas Cranach are still shown; also the spot, outside the Elster gate, where the papal bull was burned. In the Schlosskirche Luther and Melancthon are buried. Pop. 13,594.

**Wolf** (FRIEDRICH AUGUST), b. at Haynrode, in the Prus. prov. of Sax., Feb. 15, 1759; was appointed prof. of philology and pedagogics at Halle in 1783; at Berlin in 1807, and d. at Marseilles Aug. 8, 1824. His *Prolegomena ad Homerum*, in which he maintained that the Homeric poems were not the work of any single man, but a compilation or combination of various rhapsodies, made an immense sensation, and started a multitude of new researches of the greatest critical and antiquarian interest.

**Woodstock**, cap. of Shenandoah co., Va., on Valley branch of Baltimore and Ohio R. R., and on N. branch of Shenandoah River, has manufactures, and is engaged in farming. Pop. 1870, 859; 1880, 1000.

**Wright** (HENDRICK BRADLEY), b. at Shawnee, Pa., Apr. 24, 1808; was ed. in Dickinson Coll.; studied law, and was admitted to the bar of Luzerne co. in 1831. Besides his law business he took an active part in politics, and was several times elected to Cong. But his great reputation he earned by the disinterested sympathy with which he embraced the workingmen's cause. He pub. *A Practical Treatise on Labor*, etc. D. Sept. 3, 1881.

**Wright's Grove**, Cook co., Ill., on Lake Michigan, about 4 m. N. of Chicago. Pop. not in census.

**Wy'more**, R. R. junc., Gage co., Neb., in S. E. part of State, near Kan. boundary. Pop. not in census.

**Wyo'ming**, R. R. junc., Stark co., Ill., 31 m. N. W. of Peoria. Pop. 1870, 640; 1880, 1086.

## Y.

**Yacht**, a name of Dutch origin, which became common in the Eng. lang. in the latter part of 17th century, when, on account of its speed and buoyancy, the Y. brought every other kind of pleasure vessels into disuse. The first yachting club was formed at Cork, Ire., in 1720; the first in Amer. was formed at New York in 1844.

**Yorkville**, cap. of York co., S. C., on Chester and Lenoir division of Charlotte, Columbia, and Augusta R. R., 85 m. N. of Columbia. Pop. 1880, 1390.

**Yu'kon**, in length the 13th or 14th river of the world, being 2044 m. long, rises in lat. 59° 45' N., lon. 134° 50' W. (from Greenwich), flows N. and then N. W. until, after cutting the Arctic circle in lon. 145° 3', it suddenly turns W. S. W., and after a course of about 1000 m., it empties itself into the Behring Sea by 5 or 6 mouths. It was discovered in 1832 by Siusunoff, an officer of the Rus.-Amer. Fur Co., and it has lately been explored by Lieut. Schwatka.

## Z.

**Zo'la** (ÉMILE), b. in Paris Apr. 2, 1840, the son of an It. engineer; was ed. in Provence and Lycée St. Louis in Paris; devoted himself to journalism and lit., and acquired a great name by his novel series, *Rougon Macquart*, the nat. and social hist. of a family under the 2d empire. The most famous of the whole series is *L'assommoir*, which has been dramatized and brought on the stage under the title of *Drink*.



A TABLE OF SIMPLE INTEREST AT SIX PER CENT.,

FOR ANY AMOUNT FROM ONE CENT TO ONE THOUSAND DOLLARS, FOR ANY TIME FROM ONE DAY TO TEN YEARS.

DIRECTIONS.—The black figures at the left hand show the number of dollars or cents; those at the top, the time. The interest for any sum for any time is in the square where the perpendicular column below the time cuts the horizontal range opposite the amount. Thus: the interest on \$9 for 5 years is \$2.70. To compute the interest for cents, take that for the same number of dollars and divide by 100. For interest at rates other than 6 per cent., divide it by 6, and multiply the quotient by the rate desired.

DOLLARS OR CENTS.	YEARS.										MONTHS.											
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1	.06	.12	.18	.24	.30	.36	.42	.48	.54	.60	.01	.01	.02	.02	.03	.03	.04	.04	.05	.05	.06	.06
2	.12	.24	.36	.48	.60	.72	.84	.96	1.08	1.20	.01	.02	.03	.04	.05	.06	.07	.08	.09	.10	.11	.12
3	.18	.36	.54	.72	.90	1.08	1.26	1.44	1.62	1.80	.02	.03	.05	.06	.08	.09	.11	.12	.14	.15	.17	.18
4	.24	.48	.72	.96	1.20	1.44	1.68	1.92	2.16	2.40	.02	.04	.06	.08	.10	.12	.14	.16	.18	.20	.22	.24
5	.30	.60	.90	1.20	1.50	1.80	2.10	2.40	2.70	3.00	.03	.05	.08	.10	.13	.15	.18	.20	.23	.25	.28	.30
6	.36	.72	1.08	1.44	1.80	2.16	2.52	2.88	3.24	3.60	.03	.06	.09	.12	.15	.18	.21	.24	.27	.30	.33	.36
7	.42	.84	1.26	1.68	2.10	2.52	2.94	3.36	3.78	4.20	.04	.07	.11	.14	.18	.21	.25	.28	.32	.35	.39	.42
8	.48	.96	1.44	1.92	2.40	2.88	3.36	3.84	4.32	4.80	.04	.08	.12	.16	.20	.24	.28	.32	.36	.40	.44	.48
9	.54	1.08	1.62	2.16	2.70	3.24	3.78	4.32	4.86	5.40	.05	.09	.14	.18	.23	.27	.32	.36	.41	.45	.50	.54
10	.60	1.20	1.80	2.40	3.00	3.60	4.20	4.80	5.40	6.00	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60
11	.66	1.32	1.98	2.64	3.30	3.96	4.62	5.28	5.94	6.60	.06	.11	.17	.22	.28	.33	.39	.44	.50	.55	.61	.66
12	.72	1.44	2.16	2.88	3.60	4.32	5.04	5.76	6.48	7.20	.06	.12	.18	.24	.30	.36	.42	.48	.54	.60	.66	.72
13	.78	1.56	2.34	3.12	3.90	4.68	5.46	6.24	7.02	7.80	.07	.13	.20	.26	.33	.39	.46	.52	.59	.65	.72	.78
14	.84	1.68	2.52	3.36	4.20	5.04	5.88	6.72	7.56	8.40	.07	.14	.21	.28	.35	.42	.49	.56	.63	.70	.77	.84
15	.90	1.80	2.70	3.60	4.50	5.40	6.30	7.20	8.10	9.00	.08	.15	.23	.30	.38	.45	.53	.60	.68	.75	.83	.90
16	.96	1.92	2.88	3.84	4.80	5.76	6.72	7.68	8.64	9.60	.08	.16	.24	.32	.40	.48	.56	.64	.72	.80	.88	.96
17	1.02	2.04	3.06	4.08	5.10	6.12	7.14	8.16	9.18	10.20	.09	.17	.26	.34	.43	.51	.60	.68	.77	.85	.94	1.02
18	1.08	2.16	3.24	4.32	5.40	6.48	7.56	8.64	9.72	10.80	.09	.18	.27	.36	.45	.54	.63	.72	.81	.90	.99	1.08
19	1.14	2.28	3.42	4.56	5.70	6.84	7.98	9.12	10.26	11.40	.10	.19	.29	.38	.48	.57	.67	.76	.86	.95	1.05	1.14
20	1.20	2.40	3.60	4.80	6.00	7.20	8.40	9.60	10.80	12.00	.10	.20	.30	.40	.50	.60	.70	.80	.90	1.00	1.10	1.20
21	1.26	2.52	3.78	5.04	6.30	7.56	8.82	10.08	11.34	12.60	.11	.21	.32	.42	.53	.63	.74	.84	.95	1.05	1.16	1.26
22	1.32	2.64	3.96	5.28	6.60	7.92	9.24	10.56	11.88	13.20	.11	.22	.33	.44	.55	.66	.77	.88	.99	1.10	1.21	1.32
23	1.38	2.76	4.14	5.52	6.90	8.28	9.66	11.04	12.42	13.80	.12	.23	.35	.46	.58	.69	.81	.92	1.04	1.15	1.27	1.38
24	1.44	2.88	4.32	5.76	7.20	8.64	10.08	11.52	12.96	14.40	.12	.24	.36	.48	.60	.72	.84	.96	1.08	1.20	1.32	1.44
25	1.50	3.00	4.50	6.00	7.50	9.00	10.50	12.00	13.50	15.00	.13	.25	.38	.50	.63	.75	.88	1.00	1.13	1.25	1.38	1.50
26	1.56	3.12	4.68	6.24	7.80	9.36	10.92	12.48	14.04	15.60	.13	.26	.39	.52	.65	.78	.91	1.04	1.17	1.30	1.43	1.56
27	1.62	3.24	4.86	6.48	8.10	9.72	11.34	12.96	14.58	16.20	.14	.27	.41	.54	.68	.81	.95	1.08	1.22	1.35	1.49	1.62
28	1.68	3.36	5.04	6.72	8.40	10.08	11.76	13.44	15.12	16.80	.14	.28	.42	.56	.70	.84	.98	1.12	1.26	1.40	1.54	1.68
29	1.74	3.48	5.22	6.96	8.70	10.44	12.18	13.92	15.66	17.40	.15	.29	.44	.58	.73	.87	1.02	1.16	1.31	1.45	1.60	1.74
30	1.80	3.60	5.40	7.20	9.00	10.80	12.60	14.40	16.20	18.00	.15	.30	.45	.60	.75	.90	1.05	1.20	1.35	1.50	1.65	1.80



## YEARS.

## MONTHS.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
31	1.86	3.72	5.58	7.44	9.30	11.16	13.02	14.88	16.74	18.60	1.71	1.86
32	1.92	3.84	5.76	7.68	9.60	11.52	13.44	15.36	17.28	19.20	1.76	1.92
33	1.98	3.96	5.94	7.92	9.90	11.88	13.86	15.84	17.82	19.80	1.82	1.98
34	2.04	4.08	6.12	8.16	10.20	12.24	14.28	16.32	18.36	20.40	1.87	2.04
35	2.10	4.20	6.30	8.40	10.50	12.60	14.70	16.80	18.90	21.00	1.93	2.10
36	2.16	4.32	6.48	8.64	10.80	12.96	15.12	17.28	19.44	21.60	1.98	2.16
37	2.22	4.44	6.66	8.88	11.10	13.32	15.54	17.76	19.98	22.20	2.04	2.22
38	2.28	4.56	6.84	9.12	11.40	13.68	15.96	18.24	20.52	22.80	2.09	2.28
39	2.34	4.68	7.02	9.36	11.70	14.04	16.38	18.72	21.06	23.40	2.15	2.34
40	2.40	4.80	7.20	9.60	12.00	14.40	16.80	19.20	21.60	24.00	2.20	2.40
41	2.46	4.92	7.38	9.84	12.30	14.76	17.22	19.68	22.14	24.60	2.26	2.46
42	2.52	5.04	7.56	10.08	12.60	15.12	17.64	20.16	22.68	25.20	2.31	2.52
43	2.58	5.16	7.74	10.32	12.90	15.48	18.06	20.64	23.22	25.80	2.37	2.58
44	2.64	5.28	7.92	10.56	13.20	15.84	18.48	21.12	23.76	26.40	2.42	2.64
45	2.70	5.40	8.10	10.80	13.50	16.20	18.90	21.60	24.30	27.00	2.48	2.70
46	2.76	5.52	8.28	11.04	13.80	16.56	19.32	22.08	24.84	27.60	2.53	2.76
47	2.82	5.64	8.46	11.28	14.10	16.92	19.74	22.56	25.38	28.20	2.59	2.82
48	2.88	5.76	8.64	11.52	14.40	17.28	20.16	23.04	25.92	28.80	2.64	2.88
49	2.94	5.88	8.82	11.76	14.70	17.64	20.58	23.52	26.46	29.40	2.70	2.94
50	3.00	6.00	9.00	12.00	15.00	18.00	21.00	24.00	27.00	30.00	2.75	3.00
51	3.06	6.12	9.18	12.24	15.30	18.36	21.42	24.48	27.54	30.60	2.81	3.06
52	3.12	6.24	9.36	12.48	15.60	18.72	21.84	24.96	28.08	31.20	2.86	3.12
53	3.18	6.36	9.54	12.72	15.90	19.08	22.26	25.44	28.62	31.80	2.92	3.18
54	3.24	6.48	9.72	12.96	16.20	19.44	22.68	25.92	29.16	32.40	2.97	3.24
55	3.30	6.60	9.90	13.20	16.50	19.80	23.10	26.40	29.70	33.00	3.03	3.30
56	3.36	6.72	10.08	13.44	16.80	20.16	23.52	26.88	30.24	33.60	3.08	3.36
57	3.42	6.84	10.26	13.68	17.10	20.52	23.94	27.36	30.78	34.20	3.14	3.42
58	3.48	6.96	10.44	13.92	17.40	20.88	24.36	27.84	31.32	34.80	3.19	3.48
59	3.54	7.08	10.62	14.16	17.70	21.24	24.78	28.32	31.86	35.40	3.25	3.54
60	3.60	7.20	10.80	14.40	18.00	21.60	25.20	28.80	32.40	36.00	3.30	3.60
61	3.66	7.32	10.98	14.64	18.30	21.96	25.63	29.28	32.94	36.60	3.36	3.66
62	3.72	7.44	11.16	14.88	18.60	22.32	26.04	29.76	33.48	37.20	3.41	3.72
63	3.78	7.56	11.34	15.12	18.90	22.68	26.46	30.24	34.02	37.80	3.47	3.78
64	3.84	7.68	11.52	15.36	19.20	23.04	26.88	30.72	34.56	38.40	3.52	3.84
65	3.90	7.80	11.70	15.60	19.50	23.40	27.30	31.20	35.10	39.00	3.58	3.90
66	3.96	7.92	11.88	15.84	19.80	23.76	27.72	31.68	35.64	39.60	3.63	3.96
67	4.02	8.04	12.06	16.08	20.10	24.12	28.14	32.16	36.18	40.20	3.69	4.02



68	4.08	8.16	12.24	16.32	20.40	24.48	28.56	32.64	36.72	40.80	34	.68	1.02	1.36	1.70	2.04	2.38	2.72	3.06	3.40	3.74	4.08
69	4.14	8.28	12.42	16.56	20.70	24.84	28.98	33.12	37.26	41.40	35	.69	1.04	1.38	1.73	2.07	2.42	2.76	3.11	3.45	3.80	4.14
70	4.20	8.40	12.60	16.80	21.00	25.20	29.40	33.60	37.80	42.00	36	.70	1.05	1.40	1.75	2.10	2.45	2.80	3.15	3.50	3.85	4.20
71	4.26	8.52	12.78	17.04	21.30	25.56	29.82	34.08	38.34	42.60	37	.71	1.07	1.42	1.78	2.13	2.49	2.84	3.20	3.55	3.91	4.26
72	4.32	8.64	12.96	17.28	21.60	25.92	30.24	34.56	38.88	43.20	38	.72	1.08	1.44	1.80	2.16	2.52	2.88	3.24	3.60	3.96	4.32
73	4.38	8.76	13.14	17.52	21.90	26.28	30.66	35.04	39.42	43.80	39	.73	1.10	1.46	1.83	2.19	2.56	2.92	3.29	3.65	4.02	4.38
74	4.44	8.88	13.32	17.76	22.20	26.64	31.08	35.52	39.96	44.40	40	.74	1.11	1.48	1.85	2.22	2.59	2.96	3.33	3.70	4.07	4.44
75	4.50	9.00	13.50	18.00	22.50	27.00	31.50	36.00	40.50	45.00	41	.75	1.13	1.50	1.88	2.25	2.63	3.00	3.38	3.75	4.13	4.50
76	4.56	9.12	13.68	18.24	22.80	27.36	31.92	36.48	41.04	45.60	42	.76	1.14	1.52	1.90	2.28	2.66	3.04	3.42	3.80	4.18	4.56
77	4.62	9.24	13.86	18.48	23.10	27.72	32.34	36.96	41.58	46.20	43	.77	1.16	1.54	1.93	2.31	2.70	3.08	3.47	3.85	4.24	4.62
78	4.68	9.36	14.04	18.72	23.40	28.08	32.76	37.44	42.12	46.80	44	.78	1.17	1.56	1.95	2.34	2.73	3.12	3.51	3.90	4.29	4.68
79	4.74	9.48	14.22	18.96	23.70	28.44	33.18	37.92	42.66	47.40	45	.79	1.19	1.58	1.98	2.37	2.77	3.16	3.56	3.95	4.35	4.74
80	4.80	9.60	14.40	19.20	24.00	28.80	33.60	38.40	43.20	48.00	46	.80	1.20	1.60	2.00	2.40	2.80	3.20	3.60	4.00	4.40	4.80
81	4.86	9.72	14.58	19.44	24.30	29.16	34.02	38.88	43.74	48.60	47	.81	1.22	1.62	2.03	2.43	2.84	3.24	3.65	4.05	4.46	4.86
82	4.92	9.84	14.76	19.68	24.60	29.52	34.44	39.36	44.28	49.20	48	.82	1.23	1.64	2.05	2.46	2.87	3.28	3.69	4.10	4.51	4.92
83	4.98	9.96	14.94	19.92	24.90	29.88	34.86	39.84	44.82	49.80	49	.83	1.25	1.66	2.08	2.49	2.91	3.32	3.74	4.15	4.57	4.98
84	5.04	10.08	15.12	20.16	25.20	30.24	35.28	40.32	45.36	50.40	50	.84	1.26	1.68	2.10	2.52	2.94	3.36	3.78	4.20	4.62	5.04
85	5.10	10.20	15.30	20.40	25.50	30.60	35.70	40.80	45.90	51.00	51	.85	1.28	1.70	2.13	2.55	2.98	3.40	3.83	4.25	4.68	5.10
86	5.16	10.32	15.48	20.64	25.80	30.96	36.12	41.28	46.44	51.60	52	.86	1.29	1.72	2.15	2.58	3.01	3.44	3.87	4.30	4.73	5.16
87	5.22	10.44	15.66	20.88	26.10	31.32	36.54	41.76	46.98	52.20	53	.87	1.31	1.74	2.18	2.61	3.05	3.48	3.92	4.35	4.79	5.22
88	5.28	10.56	15.84	21.12	26.40	31.68	36.96	42.24	47.52	52.80	54	.88	1.32	1.76	2.20	2.64	3.08	3.52	3.96	4.40	4.84	5.28
89	5.34	10.68	16.02	21.36	26.70	32.04	37.38	42.72	48.06	53.40	55	.89	1.34	1.78	2.23	2.67	3.12	3.56	4.01	4.45	4.90	5.34
90	5.40	10.80	16.20	21.60	27.00	32.40	37.80	43.20	48.60	54.00	56	.90	1.35	1.80	2.25	2.70	3.15	3.60	4.05	4.50	4.95	5.40
91	5.46	10.92	16.38	21.84	27.30	32.76	38.22	43.68	49.14	54.60	57	.91	1.37	1.82	2.28	2.73	3.19	3.64	4.10	4.55	5.01	5.46
92	5.52	11.04	16.56	22.08	27.60	33.12	38.64	44.16	49.68	55.20	58	.92	1.38	1.84	2.30	2.76	3.22	3.68	4.14	4.60	5.06	5.52
93	5.58	11.16	16.74	22.32	27.90	33.48	39.06	44.64	50.22	55.80	59	.93	1.40	1.86	2.33	2.79	3.26	3.72	4.19	4.65	5.12	5.58
94	5.64	11.28	16.92	22.56	28.20	33.84	39.48	45.12	50.76	56.40	60	.94	1.41	1.88	2.35	2.82	3.29	3.76	4.23	4.70	5.17	5.64
95	5.70	11.40	17.10	22.80	28.50	34.20	39.90	45.60	51.30	57.00	61	.95	1.43	1.90	2.38	2.85	3.33	3.80	4.28	4.75	5.23	5.70
96	5.76	11.52	17.28	23.04	28.80	34.56	40.32	46.08	51.84	57.60	62	.96	1.44	1.92	2.40	2.88	3.36	3.84	4.32	4.80	5.28	5.76
97	5.82	11.64	17.46	23.28	29.10	34.92	40.74	46.56	52.38	58.20	63	.97	1.46	1.94	2.43	2.91	3.40	3.88	4.37	4.85	5.34	5.82
98	5.88	11.76	17.64	23.52	29.40	35.28	41.16	47.04	52.92	58.80	64	.98	1.47	1.96	2.45	2.94	3.43	3.92	4.41	4.90	5.39	5.88
99	5.94	11.88	17.82	23.76	29.70	35.64	41.58	47.52	53.46	59.40	65	.99	1.49	1.98	2.48	2.97	3.47	3.96	4.46	4.95	5.45	5.94
100	6.00	12.00	18.00	24.00	30.00	36.00	42.00	48.00	54.00	60.00	66	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00
200	12.00	24.00	36.00	48.00	60.00	72.00	84.00	96.00	108.00	120.00	101	1.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00
300	18.00	36.00	54.00	72.00	90.00	108.00	126.00	144.00	162.00	180.00	102	1.50	4.50	6.00	7.50	9.00	10.50	12.00	13.50	15.00	16.50	18.00
400	24.00	48.00	72.00	96.00	120.00	144.00	168.00	192.00	216.00	240.00	103	2.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00	22.00	24.00
500	30.00	60.00	90.00	120.00	150.00	180.00	210.00	240.00	270.00	300.00	104	2.50	7.50	10.00	12.50	15.00	17.50	20.00	22.50	25.00	27.50	30.00
600	36.00	72.00	108.00	144.00	180.00	216.00	252.00	288.00	324.00	360.00	105	3.00	9.00	12.00	15.00	18.00	21.00	24.00	27.00	30.00	33.00	36.00
700	42.00	84.00	126.00	168.00	210.00	252.00	294.00	336.00	378.00	420.00	106	3.50	10.50	14.00	17.50	21.00	24.50	28.00	31.50	35.00	38.50	42.00
800	48.00	96.00	144.00	192.00	240.00	288.00	336.00	384.00	432.00	480.00	107	4.00	12.00	16.00	20.00	24.00	28.00	32.00	36.00	40.00	44.00	48.00
900	54.00	108.00	162.00	216.00	270.00	324.00	378.00	432.00	486.00	540.00	108	4.50	13.50	18.00	22.50	27.00	31.50	36.00	40.50	45.00	49.50	54.00
1000	60.00	120.00	180.00	240.00	300.00	360.00	420.00	480.00	540.00	600.00	109	5.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00	55.00	60.00



DAYS.

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1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
4	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2
5	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	3
6	0	0	0	0	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3
7	0	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	4
8	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	4	4	4
9	0	0	1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	4	5
10	0	0	1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	3	3	4	4	4	4	4	4	4	5	5	5
11	0	0	1	1	1	1	1	1	2	2	2	2	3	3	3	3	3	3	3	4	4	4	4	4	4	5	5	5	5	6
12	0	0	1	1	1	1	1	2	2	2	2	3	3	3	3	3	4	4	4	4	4	4	4	4	4	5	5	5	5	6
13	0	0	1	1	1	1	1	2	2	2	3	3	3	3	3	4	4	4	4	5	5	5	5	5	6	6	6	6	6	7
14	0	0	1	1	1	1	2	2	2	3	3	3	3	4	4	4	4	4	5	5	5	6	6	6	6	6	6	6	7	7
15	0	1	1	1	1	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	6	6	6	6	6	6	6	7	7
16	0	1	1	1	1	2	2	2	3	3	3	3	3	4	4	4	5	5	5	5	6	6	6	6	6	6	6	6	7	7
17	0	1	1	1	1	2	2	2	3	3	3	3	4	4	4	5	5	5	5	6	6	6	6	6	6	6	6	6	7	7
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19	0	1	1	1	2	2	2	3	3	3	3	4	4	4	5	5	5	5	6	6	6	6	6	6	6	6	6	6	7	7
20	0	1	1	1	2	2	2	3	3	3	4	4	4	4	5	5	6	6	6	6	6	6	6	6	6	6	6	6	7	7
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23	0	1	1	2	2	2	3	3	3	3	4	4	4	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	7	7
24	0	1	1	2	2	2	3	3	3	4	4	4	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	7	7
25	0	1	1	2	2	3	3	3	3	4	4	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	7	7
26	0	1	1	2	2	3	3	3	4	4	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	7	7
27	0	1	1	2	2	3	3	3	4	4	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	7	7
28	0	1	1	2	2	3	3	3	4	4	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	7	7
29	0	1	1	2	2	3	3	3	4	4	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	7	7
30	1	1	2	2	3	3	4	4	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	7	7
31	1	1	2	2	3	3	4	4	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	7	7
32	1	1	2	2	3	3	4	4	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	7	7
33	1	1	2	2	3	3	4	4	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	7	7
34	1	1	2	2	3	3	4	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	7	7
35	1	1	2	2	3	4	4	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	7	7
36	1	1	2	2	3	4	4	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	7	7
37	1	1	2	2	3	4	4	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	7	7



38	1	1	2	3	3	4	4	5	6	6	7	8	8	9	10	11	11	12	13	14	15	15	16	16	17	18	18	19
39	1	1	2	3	3	4	5	5	6	7	7	8	8	9	10	10	11	12	13	14	15	16	16	17	18	18	19	20
40	1	1	2	3	3	4	5	5	6	7	7	8	9	9	10	11	11	12	13	14	15	16	17	17	18	19	19	20
41	1	1	2	3	3	4	5	5	6	7	8	8	9	10	10	11	12	12	13	14	15	16	16	17	18	18	19	20
42	1	1	2	3	4	4	5	6	6	7	8	8	9	9	10	11	11	12	13	14	15	16	17	18	18	19	20	21
43	1	1	2	3	4	4	5	6	6	7	8	9	9	10	11	11	12	13	14	15	16	16	17	18	19	19	20	21
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46	1	2	2	3	4	5	5	6	7	8	8	9	10	11	12	12	13	14	15	16	17	18	18	19	20	21	22	23
47	1	2	2	3	4	5	6	6	7	8	9	9	10	11	12	13	14	15	16	16	17	18	19	20	21	22	23	24
48	1	2	2	3	4	5	6	6	7	8	9	10	10	11	12	13	14	15	16	17	18	19	20	21	22	22	23	24
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79	1	3	4	5	7	8	9	11	12	13	14	16	17	18	20	21	22	24	25	26	28	29	30	32	33	34	36	39
80	1	3	4	5	7	8	9	11	12	13	14	16	17	18	20	21	22	24	25	26	28	29	30	32	33	34	36	39



## DAYS.

DOLLARS  
OR  
CENTS.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	
D C B	80	1	3	4	5	7	8	9	11	12	13	15	16	17	19	20	21	23	24	25	27	28	29	31	32	33	35	36	37	39	40
	81	1	3	4	5	7	8	9	11	12	14	15	16	18	19	20	22	23	24	26	27	28	30	31	32	34	35	36	38	39	41
	82	1	3	4	5	7	8	10	11	12	14	15	16	18	19	21	22	23	25	26	27	29	30	31	33	34	36	37	38	40	41
	83	1	3	4	6	7	8	10	11	12	14	15	17	18	19	21	22	24	25	26	28	29	30	32	33	35	36	37	39	40	42
	84	1	3	4	6	7	8	10	11	13	14	15	17	18	20	21	22	24	25	27	28	29	31	32	34	35	36	38	39	41	42
	85	1	3	4	6	7	9	10	11	13	14	16	17	18	20	21	23	24	26	27	28	30	31	33	34	35	37	38	40	41	43
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	87	1	3	4	6	7	9	10	12	13	15	16	17	19	20	22	23	25	26	28	29	30	32	33	35	36	38	39	41	42	44
	88	1	3	4	6	7	9	10	12	13	15	16	18	19	21	22	23	25	26	28	29	31	32	34	35	37	38	40	41	43	44
	89	1	3	4	6	7	9	10	12	13	15	16	18	19	21	22	24	25	27	28	30	31	33	34	36	37	39	40	42	43	45
	90	2	3	5	6	8	9	11	12	14	15	17	18	20	21	23*	24	26	27	29	30	32	33	35	36	38	39	41	42	44	45
	91	2	3	5	6	8	9	11	12	14	15	17	18	20	21	23	24	26	27	29	30	32	33	35	36	38	39	41	42	44	46
	92	2	3	5	6	8	9	11	12	14	15	17	18	20	21	23	25	26	28	29	31	32	34	35	37	38	40	41	43	44	46
	93	2	3	5	6	8	9	11	12	14	16	17	19	20	22	23	25	26	28	29	31	33	34	36	37	39	40	42	43	45	47
	94	2	3	5	6	8	9	11	13	14	16	17	19	20	22	24	25	27	28	30	31	33	34	36	38	39	41	42	44	45	47
	95	2	3	5	6	8	10	11	13	14	16	17	19	21	22	24	25	27	29	30	32	33	35	36	38	40	41	43	44	46	48
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300	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	
400	7	13	20	27	33	40	47	53	60	67	73	80	87	93	100	107	113	120	127	133	140	147	153	160	167	173	180	187	193	200	
500	8	17	25	33	42	50	58	67	75	83	92	100	108	117	125	133	142	150	158	167	175	183	192	200	208	217	225	233	242	250	
600	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300	
700	12	23	35	47	58	70	82	93	105	117	128	140	152	163	175	187	198	210	222	233	245	257	268	280	292	303	315	327	338	350	
800	13	27	40	53	67	80	93	107	120	133	147	160	173	187	200	213	227	240	253	267	280	293	307	320	333	347	360	373	387	400	
900	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300	315	330	345	360	375	390	405	420	435	450	
1000	17	33	50	67	83	100	117	133	150	167	183	200	217	233	250	267	283	300	317	333	350	367	383	400	417	433	450	467	483	500	

J. H. VAN AMRINGE.



# VALUABLE LAW FORMS

FOR NOTES, DEEDS, AGREEMENTS, MORTGAGES, CONTRACTS, RECEIPTS, APPRENTICESHIP,  
LEASES, MARRIAGE, PENSIONS, WILLS, ETC., ETC.

COMPILED BY

GEORGE CHASE, LL.B.

(PROFESSOR IN COLUMBIA COLLEGE LAW SCHOOL, NEW YORK.)

**I. Apprenticeship.**—1. INDENTURE WITH CONSENT OF FATHER.—This Indenture, made this...day of..., 18..., witnesseth: That C. B., of the town of..., in the county of..., and State of..., now aged..., with the consent of A. B., his father, hereon indorsed, does hereby, of his [or, her] own free will, bind himself [or, herself] to serve Y. Z., of the town of..., in the county of..., and State of..., as apprentice [or, clerk, or, servant] in the trade of a blacksmith [or other trade, profession, or employment, according to the fact], and to learn the said trade, profession, or employment, until the said C. B. shall have attained the age of twenty-one years, which will be on the...day of..., in the year 18... [or, for the term of...years from this date], during all which time the said apprentice shall serve the said master faithfully, honestly, and industriously, his secrets keep, and lawful commands everywhere readily obey; at all times protect and preserve the goods and property of the said master; and not suffer or allow any to be injured or wasted. He [or, she] shall not buy, sell, or traffic with his [or, her] own goods or the goods of others, nor be absent from the said master's service, day or night, without leave; but in all things behave as a faithful apprentice ought to do, during the said term. And the said master shall clothe and provide for the said apprentice in sickness and in health, and supply him [or, her] with suitable food and clothing; and shall use and employ the utmost of his endeavors to teach, or cause the said apprentice to be taught or instructed in, the art, trade, or mystery of [stating trade, etc., as above]; and also cause the said apprentice, within such term, to be instructed to read and write [and, if a male, add: and in the general rules of arithmetic]; and at the expiration of the service, give the said apprentice a new Bible.

[If money is paid with the apprentice, insert here:] And the said Y. Z. acknowledges that he has received, with the said C. B., from the said A. B. [naming the father or mother], the sum of...dollars, as a compensation for his instruction, as above mentioned.

[Or, if wages are to be paid for the service of the apprentice, insert:] And the said Y. Z. further agrees to pay to the said C. B. the following sums of money—viz., for the first year of his service, ...dollars; for the second year of his service, ...dollars; and for every subsequent year, until the expiration of his term of service, ...dollars; which said payments are to be made on the...day of...in each year.

And for the true performance of all and singular the covenants and agreements aforesaid, the said parties bind themselves, each unto the other, firmly by these presents.

In witness whereof, the parties aforesaid have hereunto set their hands and seals, the day and year first above written.

[Signature and seal of apprentice.]  
[Signature and seal of master.]

**II. Arbitration at Common Law.**—2. GENERAL FORM OF AGREEMENT OF SUBMISSION.—Whereas controversies exist, and for a long time have existed, between us, A. B., of..., and Y. Z., of..., in relation to divers subjects: Now, therefore, we, the undersigned, A. B. and Y. Z., do hereby mutually covenant and agree, to and with each other, to submit all and all manner of actions, cause, and causes of actions, suits, controversies, claims and demands whatsoever, now pending, existing, or held by and between us, § to M. N., of..., as arbitrator, who shall [or, to M. N., O. P., and Q. R., all of..., as arbitrators, who, or any two of whom, shall] arbitrate, award, order, judge, and determine of and concerning the same. [Here insert, if desired, With power to award the payment of the costs [and of the expenses] incurred in such arbitration.] And we do mutually covenant and agree to and with each other that the award to be made by the said arbitrator [or, arbitrators, or any two of them] shall, in all things, by us and each of us, and by the executors, administrators, and assigns of us and each of us, be well and faithfully kept, observed, and performed. Provided, however, that such award be made in writing, under the hand of the said arbitrator [or, hands of the said arbitrators, or any two of them], ready to be delivered to us, or either of us, on or before the...day of..., 18....

Witness, our hands and seals, this...day of..., 18...  
In presence of  
[Witness's signature.] A. B. [Seal.]  
Y. Z. [Seal.]

**III. Assignments.**—3. SHORT FORM OF ASSIGNMENT, SUITABLE TO BE INDORSED ON A WRITTEN INSTRUMENT.—For value received, I hereby assign the within bond [or, contract, or, policy of insurance, etc.] unto Y. Z.  
[Date.] [Signature.]

4. ANOTHER FORM, WITH POWER TO SUE.—In consideration of the sum of...dollars, to me paid, by Y. Z., of..., the receipt whereof is hereby acknowledged, I do hereby transfer,

assign, and set over to the said Y. Z., his executors, administrators, and assigns, all my right, title, and interest in and to the within bond [or, contract, or, policy of insurance]; and I do hereby constitute the said Y. Z. my attorney, in my name, or otherwise, but at his own cost, to take all legal measures which may be proper or necessary for the complete recovery and enjoyment of the assigned premises.

Witness my hand and seal, this...day of..., 18...  
In presence of [Signature.] [Seal.]

**IV. Bills of Exchange.**—5. BILL OF EXCHANGE.  
\$1,000. NEW YORK, January 1, 18...  
At sight [or, ...days after sight; or, ...days after date; or, on the... day of..., 18...], pay to the order of [naming payee] one thousand dollars, and charge the same to account of [Signature of drawer.]

To Messrs. [naming drawee],  
Philadelphia.

6. INDORSEMENT TO ORDER.—Pay to the order of G. H.

A. B.  
7. INDORSEMENT TO AGENTS, FOR COLLECTION.—Pay to the order of the cashier of the First National Bank of New York, for collection. A. B.

8. INDORSEMENT WITHOUT RECOURSE.—Pay to the order of G. H., without recourse. A. B.

9. INDORSEMENT BY ATTORNEY IN FACT.—Pay to the order of G. H. A. B., by M. N., his attorney.

**V. Bills of Sale.**—10. BILL OF SALE, DESCRIBING THE CHATTELS.—Know all men by these presents, that I, A. B., of..., in the county of..., and State of..., farmer, party of the first part, in consideration of the sum of... dollars, to me paid by Y. Z., of...aforesaid, merchant, party of the second part, the receipt whereof I do hereby acknowledge [or state other consideration—e.g., thus: in consideration of the sum of...dollars, to me to be paid by Y. Z., of..., in equal quarterly instalments, secured by his notes at three, six, nine, and twelve months respectively], have bargained, sold, granted, and conveyed, and by these presents do bargain, sell, grant, and convey unto the said party of the second part, his executors, administrators, and assigns [here set out the chattels sold—e.g., thus:] all the hops growing on my farm in said town, one yoke of oxen, red and white, heretofore on said farm, and one bay horse, with farm-wagon and harness, now in the keeping of M. N., at.... To have and to hold the same unto the said party of the second part, his executors, administrators, and assigns, forever. And I do for myself, my heirs, executors, and administrators, covenant and agree, to and with the said party of the second part, to warrant and defend the said described goods hereby sold, unto the said party of the second part, his executors, administrators, and assigns, against all and every person and persons whatsoever.

In witness whereof, I have hereunto set my hand and seal, the...day of..., 18....

Signed, sealed, and delivered } A. B. [Seal.]  
In the presence of

[Signature of witness.]

**VI. Bonds.**—11. SHORT FORM OF BOND FOR PAYMENT OF MONEY, WITH OR WITHOUT PENALTY.—Know all men by these presents, that I, A. B., of..., in the county of..., and State of..., am bound unto Y. Z., of..., for the payment of...dollars, on the...day of..., 18..., with interest at...per cent per annum; for which I bind myself, my heirs, executors, and administrators, to the said Y. Z., his executors, administrators, and assigns [in the penal sum of...dollars.]  
Witness my hand and seal, this...day of..., 18....

A. B. [Seal.]

12. COMMON FORM OF BOND FOR PAYMENT OF MONEY.—Know all men by these presents, that I, A. B., of the town of..., in the county of..., and State of..., merchant, am held and firmly bound unto Y. Z., of the said town, farmer, in the sum of...dollars [inserting the penal sum, which is commonly double the amount of the principal sum intended to be secured, in order to cover interests, costs, expenses, and other contingencies], good and lawful money of the United States, to be paid the said Y. Z., his executors, administrators, or assigns, for which payment well and truly to be made I do bind myself, my heirs, executors, and administrators, firmly by these presents.

Sealed with my seal, and dated the...day of..., 18....

The condition of this obligation is such, that if the above-bounden A. B. his heirs, executors, and administrators, or any of them, shall well and truly pay, or cause to be paid, unto the above-named Y. Z., his executors, administrators, or assigns, the just and full sum of...dollars [inserting the principal intended to be secured], with interest at the rate of...per cent per annum [or, with legal interest] for the same,



on [or before] the....day of...., which will be in the year one thousand eight hundred and...., without fraud or other delay, then this obligation is to be void, otherwise to remain in full force.

A. B. [Seal.]

**VII. Chattel Mortgages.**—13. SHORT FORM, WITHOUT WARRANTY, OR STIPULATIONS AS TO RIGHT OF POSSESSION OR SALE OR PERSONAL LIABILITY.—Know all men by these presents, that I, A. B., of...., hereby sell and assign to Y. Z., of...., all the tools and materials now in my shop at.... This grant is intended as a security for the payment of.... dollars, with interest, on or before the expiration of.... from the date hereof; which payment, if duly made, will render this conveyance void.

In witness whereof, I have hereunto set my hand and seal, at the...., this....day of...., 18..

In presence of  
[Signature of witness.]

[Signature of mortgagor.]

14. SHORT FORM; WITH PERSONAL LIABILITY AND STIPULATION FOR SALE.—Know all men by these presents, that I, A. B., of...., acknowledge myself to be indebted to Y. Z., of said...., in the sum of.... dollars, with interest from this date [or, from the....day of...., 18..], and for the security of said sum I do hereby mortgage and sell and assign to the said Y. Z. all my property of every description, situate, lying and being in the house, corner of....street and....avenue, in the city of....; and I do hereby authorize and empower the said Y. Z. to take possession of said property and effects, he to sell the same, and appropriate the proceeds to the payment of said debt and interest.

In witness [etc., as in preceding form].

**VIII. Contracts; Powers; Covenants.**—15. GENERAL FORM OF CONTRACT, WITH PROVISION FOR LIQUIDATED DAMAGES IN CASE OF BREACH.—This agreement, made the....day of...., one thousand eight hundred and...., by and between A. B., of the town of...., in the county of...., manufacturer, of the first part, and Y. Z., of...., merchant, of the second part, witnesseth: That the said party of the second part covenants and agrees to and with the party of the first part, to [here insert the subject-matter of the agreement]. And the said party of the first part covenants and agrees to pay unto the said party of the second part, for the same, the sum of....dollars, lawful money of the United States, as follows: the sum of....dollars, on the....day of...., 18.., and the sum of....dollars, on the....day of...., 18.., with the interest on the amount due, payable at the time of each payment.

And for the true and faithful performance of all and every of the covenants and agreements above mentioned, the parties to these presents bind themselves, each unto the other, in the penal sum of....dollars, as liquidated damages, to be paid by the failing party.

In witness whereof, the parties to these presents have hereunto set their hands [and seals], the day and year first above written.

[Signatures, with or without seals.]

[If attested by witnesses, add:]

Signed, sealed, and delivered in }

the presence of  
[Signatures of witnesses.]

16. CONTRACT EXECUTED BY AGENTS OR ATTORNEYS IN FACT.—This agreement, made this....day of...., 18., between A. B., of...., farmer, of the first part, by C. D., his attorney, and Y. Z., of...., merchant, of the second part, by W. X., his attorney, witnesseth: That the said party of the first part [etc., as in other forms to the end, signing thus:]

A. B. [Seal.]

By C. D., his attorney.

Y. Z. [Seal.]

By W. X., his attorney.

17. CONTRACT WITH A CLERK OR WORKMAN.—This agreement, made this....day of...., 18., between A. B., of...., of the first part, and Y. Z., of...., of the second part, witnesseth: That the said A. B. agrees faithfully and diligently to serve the said Y. Z., as clerk, in the store of the said Y. Z. [or otherwise], at...., for the period of.... from and after the....day of....next, for the sum of....dollars per.... In consideration of which service so to be performed, the said Y. Z. agrees to pay the said A. B. the sum of....per month [payable as follows: ..on the....day of...., and ..on the....day of each month following, during said term, and at the expiration thereof, the balance of such sum as has not then been already paid].

And it is understood and agreed that the death of either of them occurring prior to the expiration of said term of.... shall terminate this agreement.

In witness [etc., as in Form 15].

18. AGREEMENT FOR A LEASE.—This memorandum of an agreement, made this....day of...., 18., between A. B., of the city of New York, merchant, and Y. Z., of said city, merchant, witnesseth: That the said A. B. agrees, by indenture, to be executed on or before the....day of....next, to demise and let to the said Y. Z., a certain house and lot in said city, now or late in the occupation of M. N., known as No...., in....street, to hold to the said Y. Z. his executors, administrators, and assigns, from the....day of....aforesaid, for and during the term of....years, at or under the clear yearly rent of....dollars, payable quarterly; in which lease there shall be contained covenants on the part of the said Y. Z., his executors, administrators, and assigns, to pay the rent [except that in case the premises are destroyed by fire, the rent is to cease until they are rebuilt by the said A. B.], and to pay all taxes and assessments [except the ground-rent]; to repair the premises [except damages by fire]; not to carry on any offensive or other business on the premises, without the written permission of the said A. B.; to deliver the same up at the end of the term, in good repair [except damages by fire, as aforesaid]; with all other usual and reasonable covenants, and a proviso for the re-entry of the said A. B., his heirs and assigns, in case of the non-payment of the rent for the space of fifteen days after either of the said rent-days, or the non-performance of any

of the covenants. And there shall also be contained covenants on the part of the said A. B., his heirs and assigns, for quiet enjoyment; to renew said lease at the expiration of said term, for a further period of....years, at the same rent, on the said Y. Z., his executors, administrators, or assigns, paying the said A. B., his executors, administrators, or assigns, the sum of....dollars, as a premium for such renewal; and that in case of an accidental fire, at any time during the term, the said A. B. will forthwith proceed to put the premises in as good repair as before such fire, the rent in the mean time to cease. And the said Y. Z. hereby agrees to accept such lease on the terms aforesaid. And it is mutually agreed that the cost of this agreement, and of making and recording said lease, and a counterpart thereof, shall be borne by the said parties equally.

In witness [etc., as in Form 15].

19. CONTRACT FOR BUILDING.—Memorandum of agreement made this....day of...., one thousand eight hundred and...., between A. B., of...., merchant, of the first part, and Y. Z., of...., builder, of the second part. The said party of the second part covenants and agrees to and with the said party of the first part, to make, erect, build and finish in a good, substantial and workmanlike manner, on the lot belonging to the party of the first part, and known as No...., in....street, one brick stable agreeable to the draft, plan and explanation hereto annexed, of good and substantial materials [or, of such materials as the party of the first part may find and provide therefor], by the....day of....next. And the said party of the first part covenants and agrees to pay unto the said party of the second part, for the same, the sum of....dollars, lawful money of the United States, as follows: the sum of [here state terms of payment].

[If the owner is to furnish materials, add:] And also, that he will furnish and procure the necessary materials for the said work, in such reasonable quantities, and at such reasonable time or times, as the said party of the second part shall or may require.

And for the true and faithful performance of all and every of the covenants and agreements above mentioned, the parties to these presents bind themselves, each unto the other, in the penal sum of....dollars, as liquidated damages to be paid by the failing party.

In witness [etc., as in Form 15].

20. TRANSFER OF STOCK.—Know all men by these presents, that I, A. B., of...., for value received, have bargained, sold, assigned, and transferred, and by these presents do bargain, sell, assign, and transfer, unto Y. Z., of...., shares of capital stock, standing in my name, on the books of the Company [or....Bank, as the case may be]; and I do hereby constitute and appoint the said Y. Z., my true and lawful attorney, irrevocable, in my name or otherwise, but to his own use and benefit, and at his own costs and charges, to take all lawful ways and means for the recovery and enjoyment thereof.

Witness my hand and seal, the....day of....A.D. 18..

[Signature and seal.]

Signed, sealed, and delivered }

in the presence of }

[Signature of witness.]

21. POWER TO COLLECT DIVIDEND.—Know all men by these presents, that I, A. B., of...., do authorize, constitute, and appoint Y. Z., of...., to receive from the....Company [or Bank], of...., the dividend now due me on all stock standing in my name on the books of the said...., and receipt for the same; hereby ratifying and confirming all that may lawfully be done in the premises by virtue hereof.

Witness [etc., as in Form 20].

**IX. Deeds, etc.** [N.B. Acknowledge the execution of the deed before a notary public, commissioner of deeds, etc., who will add his certificate of the acknowledgment.]—22. FORMAL INDENTURE.—This indenture, made the....day of...., in the year one thousand eight hundred and...., between A. B., of...., in the county of...., and State of...., merchant, of the first part, and Y. Z., of...., in the said county, farmer, of the second part, witnesseth [here will follow the provisions of the instrument, concluding thus:]

In witness whereof, to one part of these presents, remaining with the said parties of the first part, the said parties of the second part have affixed their hands and seals; and to the other part thereof, remaining with the said parties of the second part, the said parties of the first part have caused the common seal of the said city of....to be affixed the day and year first above written.

[Signatures, etc., accordingly.]

Signed, sealed, and delivered }

in presence of }

[Signature of witness.]

23. QUIT-CLAIM DEED.—Know all men by these presents, that I, A. B., of the city of...., in the county of...., and State of...., farmer [or, we, A. B., of...., as above, and C. B., his wife], in consideration of....dollars to me [or us] paid by Y. Z., of...., merchant, the receipt whereof is hereby acknowledged, have remised, released, and forever quit-claimed, and by these presents do, for myself, my [or, ourselves, our] heirs, executors, and administrators, remise, release, and forever quit-claim unto the said Y. Z., his heirs and assigns, forever, all such right, title, interest [dower and right of dower], property, possession, claim, or demand as I [or, as we or either of us] have or ought to have, in or to all [here insert description of premises], to have and to hold the said premises unto the said Y. Z., his heirs and assigns, to his and their only proper use and behoof forever: so that neither I, the said A. B., nor any other person in my name and behalf [or, we, the said A. B. and C. B., or either of us, or any other person in our or either of our names and behalf] shall or will hereafter claim or demand any right or title to the premises, or any part thereof; but they, and every of them, shall by these presents be excluded and forever barred.

In witness whereof, I [or, we] have hereunto set my hand



and seal [or, our hands and seals], this....day of...., in the year one thousand eight hundred and....

[Signatures and seals of grantors.]

Signed, sealed, and delivered {  
in the presence of }

[Signature of witness.]

24. **WARRANTY DEED.**—This indenture, made this....day of...., in the year one thousand eight hundred and...., between A. B., of the city of...., and State of...., merchant [and C. B. his wife], of the first part, and Y. Z., of...., in said county, farmer, of the second part, witnesseth, that the said party [or, parties] of the first part, in consideration of the sum of....dollars, lawful money of the United States, to him [or, them] in hand paid by the said party of the second part, at or before the enrolling and delivery of these presents, the receipt whereof is hereby acknowledged, and the said party of the second part, his executors and administrators, forever released and discharged from the same, by these presents, has [or, have] granted, bargained, sold, aliened, remised, released, conveyed, and confirmed, and by these presents does [or, do] grant, bargain, sell, alien, remise, release, convey, and confirm unto the said party of the second part, and to his heirs and assigns, forever, all [here insert description], together with all and singular the tenements, hereditaments and appurtenances thereunto belonging or in any wise appertaining; and the reversion and reversions, remainder and remainders, rents, issues, and profits thereof; and also all the estate, right, title, interest [dower and right of dower], property, possession, claim, and demand whatsoever, both in law and in equity, of the said party [or, parties] of the first part, of, in, and to the above-granted premises and every part and parcel thereof, with the appurtenances. To have and to hold the above-mentioned and described premises, with the appurtenances and every part thereof, to the said party of the second part, his heirs and assigns, forever. And the said A. B. and his heirs, the above-described and hereby granted and released premises, and every part and parcel thereof, with the appurtenances, unto the said party of the second part, his heirs and assigns, against the said party [or, parties] of the first part, and his [or, their] heirs, and against all and every person and persons, whomsoever, lawfully claiming or to claim the same or any part thereof, shall and will warrant, and by these presents forever defend.

In witness whereof, the said party [or, parties] of the first part has [or, have] hereunto set his hand and seal [or, their hands and seals] the day and year first above written.

Signed, sealed, and delivered { [Signatures and seals.]  
in presence of }

[Signature of witness.]

X. **Estrays.** [N.B. These forms are adapted to the law of New York, but may be used as models in other States.]—25. **NOTICE TO BE DELIVERED TO TOWN CLERK.**—To whom it may concern: Take notice, that on the....day of...., 18.. [here describe the animal, giving the age, color, and marks, natural and artificial, as near as may be], strayed upon my inclosed lands in this town, and the owner is required to appear and claim the same.

[Date.] [Signature, designating also abode.]

26. **NOTICE OF SALE OF ESTRAY.** [As in preceding form, continuing thus:] and the same not having been redeemed by the owner thereof: Now, pursuant to the statute, I shall expose the same for sale by public auction, to the highest bidder, on the....day of...., at....o'clock in the....noon, at...., in said town of.... [Signature.]

[Date.]

XI. **Guaranties.**—27. **GUARANTY OF PAYMENT OF NOTE.**—For value received, I hereby guarantee the payment of the within note. [Signature.]

[Date.]

28. **GUARANTY OF PAYMENT OF BOND.**—In consideration of the sum of one dollar to me in hand paid by Y. Z., I hereby guarantee the payment of the foregoing bond.

Witness my hand [and seal], the....day of...., 18.. [Signature, with or without seal.]

29. **GUARANTY OF COLLECTIBILITY, ETC.**—For value received, I hereby guarantee that the within....is good [or, collectible]. [Signature.]

30. **GUARANTY OF RENT, ETC.**—In consideration of the letting of the premises above described [or, for value received], I guarantee the punctual payment of the rent [and performance of the covenants] in the above agreement mentioned to be paid and performed by said lessee, without requiring any notice of non-payment or non-performance, or proof of notice or demand being made, whereby to charge me therefor. [Signature.]

[Date.]

31. **GUARANTY GIVEN TO STOP LEGAL PROCEEDINGS.**—A. B. & Co. having, at my request, agreed to discontinue the proceedings instituted by them against Y. Z., to enforce payment of....dollars due by him to them, I hereby, in consideration thereof, guarantee the payment of that sum, and of....costs, within....days from date. [Signature.]

[Date.]

32. **GUARANTY OF PERFORMANCE OF CONTRACT.**—In consideration of the sum of one dollar to me in hand paid by Messrs. A. B. & Company, the receipt whereof is hereby acknowledged, I do hereby guarantee, promise, and agree to and with them, that the above-named M. N. will well and faithfully perform and fulfil everything by the foregoing agreement on his part and behalf to be performed and fulfilled, at the times and in the manner above provided. And I do hereby expressly waive and dispense with any demand upon the said M. N., and any notice of any non-performance on his part. [Signature.]

[Date.]

XII. **Landlord and Tenant.** [See also Form 17; Agreement for a Lease.]—33. **NOTICES: NOTICE TO TERMINATE A LEASE.**—I hereby give you notice, that in pursuance of the power for this purpose given to me by the indenture of

lease, dated the....day of...., and made between you, of the one part, and me, of the other part, it is my intention to determine the lease thereby made, on the....day of.... next, and I shall therefore quit and deliver up possession to you [or, require you to quit and deliver up possession to me] of the message [etc., here briefly describe the premises]. [Signature.]

[Date.]

[Address.]

34. **NOTICE TO QUIT BY A LANDLORD TO A TENANT FROM YEAR TO YEAR.**—I hereby give you notice to quit and deliver up, on the....day of....next [if the current year of your tenancy expires on that day, or otherwise on the day on which the current year of your tenancy will expire, next after the end of half a year [or, of a quarter year; or, of a month], from the time of your being served with this notice], the possession of the message [etc., here briefly describe the property] which you now hold of me as a yearly tenant. [Signature of landlord.]

[Date.]

[Address to tenant.]

35. **NOTICE TO QUIT, BY TENANT FROM YEAR TO YEAR, TO LANDLORD.**—I hereby give you notice, that I shall quit and deliver up, on the....day of....next [if the current year of my tenancy expires on that day, or otherwise on the day on which the current year of my tenancy will expire next after the end of half a year [or, a quarter year; or, of a month], from the time of your being served with this notice], the possession of the message [etc., here briefly describe the property] which I now hold of you as a yearly tenant. [Signature of the tenant.]

[Date.]

[Address to the landlord.]

XIII. **Leases.**—36. **SHORT FORM OF LEASE.**—This indenture, made the....day of...., in the year one thousand eight hundred and...., between A. B., of...., in the county of...., and State of...., merchant, of the first part, and Y. Z., of...., in the said county, farmer, of the second part, witnesseth: That the party of the first part has hereby let and rented to the party of the second part, and the party of the second part has hereby hired and taken from the party of the first part [here insert brief description of the premises—e. g., thus:] all those three brick warehouses and premises known as Nos. 9, 11, and 13 King Street, in the city of...., with the appurtenances, for the term of....years, to commence the....day of...., 18.., at the yearly rent of....dollars, payable in equal quarterly payments on the usual quarterly days [or, on the first days of May, August, November, and February], in each year. And it is agreed, that if any rent shall be due and unpaid, or if default shall be made in any of the covenants herein contained, then it shall be lawful for the said party of the first part to re-enter the said premises, and to remove all persons therefrom [may add, the party of the first part hereby waiving any notice to quit or of intention to re-enter, under the statute].

And the said party of the second part covenants to pay to the said party of the first part the said rent, as herein specified, and that at the expiration of the said term, or other determination of this lease, the said party of the second part will quit and surrender the premises hereby demised in as good state and condition as reasonable use and wear thereof will permit, damages by the elements excepted; and the said party of the first part covenants that the said party of the second part, on paying the said yearly rent, and performing the covenants aforesaid, shall and may peaceably and quietly have, hold, and enjoy the said demised premises for the term aforesaid.

In witness whereof, the parties hereto have hereunto interchangeably set their hands and seals this....day of...., one thousand eight hundred and....

Signed, sealed, and delivered { [Signatures and seals.]  
in the presence of }

[Signature of witness.]

37. **LANDLORD'S CERTIFICATE OF RENTING.**—This is to certify, that I have, this....day of...., 18.., let and rented unto Y. Z., of.... [here insert brief description of premises—e. g., thus:] the dwelling-house known as No....in....street, in the town of...., with the appurtenances, and the sole and uninterrupted use and occupation thereof for....year, to commence the....day of...., 18.., at the yearly rent of....dollars, payable quarterly on the usual quarterly days [or, on the first days of May, August, November, and February, in each year]—[add, if so agreed, and all taxes and assessments are to be paid by him]. [Signature of landlord.]

38. **TENANT'S CERTIFICATE OF HIRING.**—This is to certify, that I have, this....day of...., 18.., hired and taken from A. B., of...., the dwelling-house and lot known as No....in....street, in the....of...., with the appurtenances, for the term of....year, to commence the....day of....next, at the yearly rent of....dollars, payable quarterly on the usual quarterly days [or, on the first days of May, August, November, and February, in each year]. And I do hereby promise to make punctual payment of the rent in manner aforesaid [except in case the premises become untenable, from fire or any other cause, when the tenancy and the rent are to cease]; And I do further promise to quit and surrender the premises at the expiration of the term of tenancy, in as good state and condition as reasonable use and wear thereof will permit, damages by the elements excepted. [Signature of tenant.]

39. **SECURITY FOR RENT.**—In consideration of the letting of the premises above described, and for the sum of one dollar, I do hereby become surety for the punctual payment of the rent. In the above-written agreement mentioned, to be paid by Y. Z. as therein specified; and if any default shall at any time be made therein, I do hereby promise and agree to pay unto the landlord in said agreement named, the said rent, or any arrears thereof that may be due, without requiring notice or proof of demand being made.

Given under my hand and seal, the....day of...., 18.. [Signature and seal.]



40. LANDLORD'S CERTIFICATE, WHERE TENANT IS NOT TO UNDERLET NOR OCCUPY FOR CERTAIN BUSINESSES.—This is to certify, that I have, this... day of...., 18... let and rented unto Y. Z., of... [here insert brief description of premises—e. g., thus:] the dwelling-house known as No.... in... street, in the town of...., with the appurtenances, and the sole and uninterrupted use and occupation thereof for... year... to commence the... day of...., 18..., at the yearly rent of... dollars, payable quarterly on the usual quarterly days [or, on the first days of May, August, November, and February, in each year]—[add, if so agreed, and all taxes and assessments are to be paid by him]. The premises are not to be used or occupied, except as a private boarding-house [or, for any business deemed extra hazardous on account of fire, or otherwise, as may be agreed]; nor shall the same, or any part thereof, be let or underlet, except with the consent of the landlord, in writing, under the penalty of forfeiture and damages. [Signature of landlord.]

**XIV. Legislation.**—41. PETITION FOR THE ENACTMENT OF A LAW.—To the Legislature of the State of....: The petition of the undersigned, citizens [and taxpayers] of said State, respectfully shows [here state facts].

Wherefore, your petitioners ask the enactment [here state what is desired].

[Date.] [Signatures.]  
42. REMONSTRANCE AGAINST A PENDING BILL.—To the Legislature of the State of New York: The undersigned, citizens [and taxpayers] of the city of New York, respectfully remonstrate against the passage of any bills now pending before the Legislature, by which the franchise or right of constructing railroads in the city of New York is granted to private individuals.

This remonstrance is on the ground that [setting forth the reason]. [Signatures.]

**XV. Letters of Credit.**—43. GENERAL LETTER OF GUARANTY.—I hereby guarantee to any person advancing money or selling goods, to A. B., not exceeding... dollars, the payment thereof, at the expiration of the credit which shall be given. [Signature.]

[Date.] [Address] to A. B.

44. GENERAL LETTER OF CREDIT AND GUARANTY.—Sir: We hereby agree to accept, and pay at maturity, any draft or drafts on us at sixty days' sight, issued by Messrs. C. D. & Co., of your city, to the extent of \$25,000, and negotiated through your bank. We are [etc.]. [Signature.]

[Date.] I hereby guarantee the due acceptance and payment of any draft issued in pursuance of the above credit.

[Date.] [Signature of guarantor.]  
45. SPECIAL LETTER.—To A. B.—Sir: I will be responsible for goods [limiting the kind, if desired] to be sold [or, money to be lent] by you to C. D., to an amount not exceeding in the aggregate... dollars [or, if desired to give a continuing guaranty, not exceeding an indebtedness of... dollars at any one time]. [Signature.]

[Date.]  
**XVI. Marriage and Marriage Certificate.**—46. SHORT FORM OF SOLEMNIZATION OF MARRIAGE, FOR MAGISTRATES.—The magistrate may direct the parties to join their right hands, and will then say: "By this act you do take each other for husband and wife, and solemnly promise and engage, in the presence of this witness [or, these witnesses], to love, honor, comfort, and cherish each other, as such, so long as you both shall live: Therefore, in accordance with the laws of the State of..., I do hereby pronounce you husband and wife."

47. MARRIAGE CERTIFICATE.—This certifies, that, on the... day of..., in the year of our Lord one thousand eight hundred and eighty.... A. B., of..., in the State of..., and C. D., of..., in the State of..., were by me united in marriage, at... [naming the town or city], in the county of..., according to the laws of the State of..., and in presence of the witness [or, witnesses] below named. And I do further certify, that the said A. B. and C. D. are known to me [or, were satisfactorily proved, by the oath of O. P., known to me], to be the persons described in this certificate; that I ascertained, previous to the solemnization of the said marriage, that the said parties were of sufficient age to contract the same; and that, after due inquiry by me made, there appeared no lawful impediment to such marriage.

[Signatures of witnesses.] [Signature and title.]  
[If certified by minister, add acknowledgment or proof.]

**XVII. Mortgages.** [Acknowledge the execution of the mortgage before a notary public, commissioner of deeds, etc., who will add his certificate of the acknowledgment.]—

48. SHORT FORM.—This indenture, made the... day of... in the year one thousand eight hundred and..., between A. B., of..., in the county of..., and State of..., merchant, of the first part, and Y. Z., of..., in the said county, farmer, of the second part, witnesseth, that the said party of the first part, for and in consideration of the sum of... dollars, grants, bargains, sells, and confirms unto the said party of the second part, and to his heirs and assigns, all [here insert description:] together with all and singular the hereditaments and appurtenances thereunto belonging, or in any wise appertaining. This conveyance is intended as a mortgage, to secure the payment of the sum of... dollars, in [here state terms of payment], according to the condition of a certain bond, dated this day, and executed by the said party of the first part to the said party of the second part; and these presents shall be void if such payments be made. But in case default shall be made in the payment of the principal or interest, as above provided, then the party of the second part, his executors, administrators, and assigns, are hereby empowered to sell the premises above described, with all and every of the appurtenances, or any part thereof, in the manner prescribed

by law; and out of the money arising from such sale, to retain the said principal and interest, together with the costs and charges of making such sale; and the overplus, if any there be, shall be paid by the party making such sale, on demand, to the party of the first part, his heirs or assigns.

In witness whereof, the said party [or, parties] of the first part has [or, have] hereunto set his hand and seal [or, their hands and seals], the day and year first above written.

Signed, sealed, and delivered [Signature and seal.]

In the presence of [Signature of witness.]

**XVIII. Partnership.**—49. ARTICLES OF CO-PARTNERSHIP IN COMMERCIAL BUSINESS.—Articles of agreement, made the... day of..., one thousand eight hundred and..., between A. B., of..., and Y. Z., of..., witnesseth, as follows:

I. The said parties above named have agreed to become co-partners in business, and by these presents do agree to be co-partners together under and by the name or firm of B. & Z., in the business of [here designate it briefly, but accurately], in the [buying and] selling all sorts of goods, wares, and merchandise to the said business belonging. [If the location of the place of business is deemed essential, it may be here specified.] The partnership to commence on the... day of..., and to continue... years.

II. To that end and purpose the said A. B. has contributed the sum of... dollars in cash, and the said Y. Z. has contributed the lease of the store in..., to be occupied by them, and the stock of goods and good-will of the business there heretofore carried on by him, which are together estimated and valued by the parties at the like sum of... dollars, the capital stock so formed to be used and employed in common between them, for the support and management of the said business, to their mutual benefit and advantage.

III. At all times during the continuance of their co-partnership, they and each of them will give their attendance, and do their and each of their best endeavors, and to the utmost of their skill and power exert themselves for their joint interest, profit, benefit, and advantage, and truly employ [buy], sell, and merchandise with their joint stock, and the increase thereof, in the business aforesaid. And also, that they shall and will at all times during the said co-partnership, bear, pay, and discharge equally between them, all rents and other expenses of the said business; and for the support and management of the said business; and that all gains, profit, and increase that shall come, grow, or arise from or by means of their said business, shall be divided between them equally [or state other proportion]; and all loss that shall happen to their said joint business by ill commodities, bad debts, or otherwise, shall be borne and paid between them equally [or other proportion].

IV. And it is agreed by and between the said parties, that there shall be had and kept at all times during the continuance of their co-partnership, perfect, just, and true books of account, wherein each of the said co-partners shall enter and set down, as well all money by them or either of them received, paid, laid out, and expended in and about the said business, as also all goods, wares, commodities, and merchandise by them or either of them bought or sold, by reason or on account of the said business, and all other matters and things whatsoever, to the said business and the management thereof in any wise belonging; which said book shall be used in common between the said co-partners, so that either of them may have access thereto, without any interruption or hindrance of the other. And also, the said co-partners, once in... [designating the times], or oftener, if necessary, shall make, yield, and render, each to the other, a true, just, and perfect inventory and account of all profits and increase by them or either of them made, and of all losses by them or either of them sustained; and also all payments, receipts, disbursements, and all other things by them made, received, disbursed, acted, done, or suffered in this said co-partnership and business; and the same account so made, shall and will clear, adjust, pay, and deliver, each to the other, at the time, their just share of the profits, and pay and bear their just share of the expenses and losses so made as aforesaid.

V. And the said parties hereby mutually covenant and agree, to and with each other, that during the continuance of the said co-partnership neither of them shall nor will indorse any note, or otherwise become surety for any person or persons whomsoever, without the consent of the other of the said co-partners. And at the end or other sooner determination of their co-partnership, the said co-partners, each to the other, shall and will make a true, just, and final account of all things relating to their said business, and in all things truly adjust the same; and all and every the stock and stocks, as well as the gains and increase thereof, which shall appear to be remaining, either in money, goods, wares, fixtures, debts, or otherwise, shall be divided between them [here add any other special stipulations which may be desired].

In witness whereof, the parties hereto have hereunto interchangeably set their hands and seals, the day and year first above written. [Signatures and seals.]

Signed, sealed, and delivered [Signature of witness.]

**XIX. Pensions.**—50. DECLARATION FOR ORIGINAL INVALID PENSION.—State of... county of..., ss.:—On this... day of..., A. D. one thousand eight hundred and..., personally appeared before me, ..., of the..., a court of record within and for the county and State aforesaid, ..., aged... years, a resident of the... of..., county of..., State of..., who, being duly sworn according to law, declares that he is the identical... who was enrolled on the... day of..., 18..., in company..., of the... regiment of..., commanded by... and was



honorably discharged at...., on the...day of...., 18...; that his personal description is as follows: Age, ...years; height, ...feet ...inches; complexion, ....; hair, ....; eyes, .... That while a member of the organization aforesaid, in the service and in the line of his duty, at...., in the State of...., on or about the...day of...., 18... he [here state name or nature of disease, or the location of wound or injury. If disabled by disease, state fully its causes; if by wound or injury, the precise manner in which received.] That he was treated in hospitals as follows: [here state the names or numbers and localities of all hospitals in which treated, and the dates of treatment.] That he has... been employed in the military or naval service otherwise than as stated above [here state what the service was, whether prior or subsequent to that stated above, and the dates at which it began and ended.] That since leaving the service this applicant has resided in the...of...., in the State of...., and his occupation has been that of a.... That prior to his entry into the service above named he was a man of good, sound, physical health, being when enrolled a.... That he is now...disabled from obtaining his subsistence by manual labor, by reason of his injuries above described, received in the service of the United States; and he therefore makes this declaration for the purpose of being placed on the invalid-pension roll of the United States.

He hereby appoints, with full power of substitution and revocation, ...., of...., State of...., his true and lawful attorney to prosecute his claim. That he has...received...applied for a pension. That his post-office address is...., county of...., State of....

Attest:

[Claimant's signature.]

Also personally appeared...., residing at...., and...., residing at...., persons whom I certify to be respectable and entitled to credit, and who, being by me duly sworn, say they were present and saw...., the claimant, sign his name (or make his mark) to the foregoing declaration; that they have every reason to believe, from the appearance of said claimant and their acquaintance with him, that he is the identical person he represents himself to be, and that they have no interest in the prosecution of this claim.

[Signatures of witnesses.]

Sworn to and subscribed before me this...day of...., A. D. 18...; and I hereby certify that the contents of the above declaration, etc., were fully made known and explained to the applicant and witnesses before swearing, including the words...erased, and the words...added; and that I have no interest, direct or indirect, in the prosecution of this claim.

[L.S.]

[Signature.]

[Official character.]

51. DECLARATION FOR THE INCREASE OF AN INVALID PENSION.—State of...., county of...., ss.—On this...day of...., A. D. one thousand eight hundred and...., personally appeared before me,...., the same being a court of record within and for the county and State aforesaid,...., aged...., years, a resident of...., county of...., State of...., who, being duly sworn according to law, declares that he is a pensioner of the United States, duly enrolled at the... pension agency, at the rate of....dollars per month, by reason of disability incurred in the service of the United States while....; that his present physical condition is such that he believes himself entitled to receive an increased pension, and that he herewith returns his present pension-certificate.

He further declares that he is disabled in the following manner, to wit:....; that he appoints.... his true and lawful attorney to prosecute his claim; that his residence is No...., in...street, of...., county of...., and State of....; and his post-office address is....

Attest:

[Claimant's signature.]

Also personally appeared, etc., etc. (as in Form 50).

Sworn to, etc. (as in Form 50).

XX. PETITIONS.—52. PETITION TO THE CONGRESS OF THE UNITED STATES.—To the Honorable the Senate and House of Representatives of the United States of America, in Congress assembled: The petition of the subscribers, citizens of...., respectfully shows [here state the request and the facts upon which it is urged].

And your petitioners will ever pray, etc. [Signatures.]

53. PETITION TO THE GOVERNOR OF A STATE.—To his Excellency [naming him] the Governor of the State of....: The petition of [etc., continuing as above].

54. CAPTION OF A PRELIMINARY PETITION TO THE COURT.—To the Supreme Court of the State of New York [or other court, giving its full official designation]: The petition of...., of the city of...., shows.

55. CAPTION OF A PRELIMINARY PETITION TO A JUDGE.—To Hon. James Kent, one of the Justices of the Supreme Court [or other court or magistrate, as above]: The petition of [etc., as above].

XXI. POWERS OF ATTORNEY.—56. SHORT FORM.—Know all men by these presents, that I, A. B., of the town of...., in the county of...., and State of...., do hereby make, constitute, and appoint Y. Z., of the town of...., in the county of...., and State of...., my true, sufficient, and lawful attorney, for me and in my name to [here state subject-matter of power; see forms below], and to do and perform all necessary acts in the execution and prosecution of the

aforesaid business in as full and ample a manner as I might do if I were personally present.

In witness [etc., as in following form].

57. GENERAL FORM, WITH POWER OF SUBSTITUTION AND REVOCATION.—Know all men by these presents, that I, A. B., of...., in the county of...., and State of...., have made, constituted, and appointed, and by these presents do make, constitute, and appoint Y. Z., of...., my true and lawful attorney, for me, and in my name, place, and stead, and to my use [here state the subject-matter of the power; see forms below], giving my said attorney full power to do everything whatsoever, requisite and necessary to be done in the premises, as fully as I could do if personally present, with full power of substitution and revocation, hereby ratifying and confirming all that my said attorney, or his substitute, shall lawfully do, or cause to be done, by virtue hereof.

In witness whereof, I have hereunto set my hand and seal, the...day of...., in the year one thousand eight hundred and.... [Signature of constituent.]

Signed, sealed, and delivered }  
in presence of

[Signature of witness.]

58. POWER TO COLLECT DEBTS.—[As in either preceding form;] to ask, demand, sue for, collect, receive, and give acquittance for all sums of money, debts, and demands whatsoever, which are or shall be due, owing and belonging to me, or detained from me, by C. D., of...., his heirs, executors, and administrators, or any of them [or, by any person or persons residing or being in....].

59. POWER TO COLLECT RENTS.—[As in Form 56 or 57:] to ask, demand, distrain for, collect, and receive, all such rents, and arrears of rent, as now are or may hereafter be due, or owing to me, from...., of...., or any of them, as tenants or occupants of any lands, tenements or hereditaments, belonging to or claimed by me, situate in...., in the State of...., or which may be due from, or payable by, any other person or persons whomsoever, as tenants, occupiers, lessees or assignees, of any term or terms, of such lands, tenements, or hereditaments, or any part of them; and upon receipt thereof, to give proper acquittances and discharges thereof.

60. POWER TO RECEIVE DIVIDENDS, ETC.—[As in Form 56 or 57:] to receive the dividends which are or shall be payable, on all the stock standing in my name on the books of the treasury of the United States [or, on the books of the Bank of...., as the case may be], and give receipt therefor.

61. POWER TO TRANSFER STOCK.—[As in Form 56 or 57:] to sell, transfer, and assign, all stock [or, ...shares of stock] of the....Company standing in my name on the books of the said company.

XXII. PROMISSORY NOTES.—62. NEGOTIABLE PROMISSORY NOTE.

\$1000.

NEW YORK, January 1, 18...

Sixty days after date [or, on the...day of...., 18...or, on demand], I promise [or, we promise—or, we jointly and severally promise] to pay to A. B. or order [or, to A. B. or bearer], one thousand dollars [with interest], for value received.

[Signature of maker.]

63. NON-NEGOTIABLE NOTE.

\$1000.

NEW YORK, January 1, 18...

Sixty days after date [or otherwise, as above], I promise to pay to A. B. one thousand dollars, for value received [with interest].

[Signature of maker.]

[Indorsements as in Forms 5-8.]

64. STOCK NOTE.—[As in Form 62, adding at the end:] having deposited with him, as collateral security, with authority to sell the same at public or private sale, on the non-performance of this promise and without notice [here designate the collaterals].

[Signature of maker.]

XXIII. RECEIPTS.—65. GENERAL RECEIPT FOR MONEY.—\$.... Received from Y. Z. the sum of....dollars.

[Date.]

A. B.

66. FOR CHATTELS.—Received from Y. Z. one cart, one wagon, one plough, one harrow, one black horse five years old, known as Jack, and a yoke of oxen, heretofore kept by said Y. Z., on his farm in....

A. B.

[Date.]

67. FOR PAPERS.—I hereby acknowledge that I have received from Y. Z. the several notes [or, deeds, or, contracts], and other papers, which are enumerated and described in the schedule annexed.

A. B.

[Date.]

[Annex list, identifying papers by dates, parties' names, etc.]

68. RECEIPT FOR MONEY PAID BY A THIRD PERSON.—\$.... Received from Y. Z., by the hand of M. N.,...., the sum of....dollars.

A. B.

[Date.]

69. RECEIPT FOR MONEY ON BEHALF OF A THIRD PERSON.—\$.... Received from Y. Z. the sum of....dollars.

A. B. per M. N.

70. FORM FOR INDORSING A RECEIPT ON A WRITTEN INSTRUMENT.—\$.... Received from Y. Z. the sum of....dollars, being [a part of] the amount due upon the written bond [or, contract, or, policy of insurance, etc.].

A. B.

[Date.]

71. RECEIPT ON ACCOUNT GENERALLY.—\$.... Received from Y. Z. the sum of....dollars on account.

A. B.

[Date.]

72. RECEIPT FOR A QUARTER'S RENT.—\$.... Received of Y. Z. the sum of....dollars, being one quarter's rent, due this day, for my dwelling-house and estate, No....street, now occupied by said Y. Z.

A. B.

[Date.]

73. FOR INTEREST ON A BOND.—\$.... Received of Y. Z. the sum of....dollars, being the annual interest due on his bond, dated the...day of...., 18..., given to me [or, to M. N.], and conditioned for the payment of the sum of two thousand dollars, in three years from date, with annual interest [which payment, herein acknowledged, I promise to indorse on said bond].

A. B.

[Date.]

\* Company and regiment, if in the army; and vessel, etc., if in the navy.

† Set forth extent of present disability as sequence of disability for which pension was originally allowed; how far incapacitated for manual labor, or dependent upon the personal aid or attendance of others.



74. FOR PART OF THE PRINCIPAL OF A BOND.—\$... Received of Y. Z. the sum of ...dollars, to apply on his bond, dated the...day of..., 18..., given to me [or, to M. N.], being the same payment which I have this day indorsed on said bond. A. B.

[Date.]  
75. FOR PAYMENT FOR PROFESSIONAL SERVICES.—\$... Received from Y. Z. the sum of ...dollars, for professional services rendered by me in [state the nature of the services]. A. B.

[Date.]  
76. FOR MONEY TO BE PAID OVER.—\$... Received from Y. Z. the sum of ...dollars, to be paid to the Bank of..., on their surrendering a note which they hold, made by said Y. Z., dated the...day of..., 18..., for...dollars, payable ...days after date. A. B.

77. FOR MONEY TO BE DISBURSED.—\$... Received from Y. Z. the sum of ...dollars, to be expended in necessary travelling expenses and disbursements in going to Washington for him to obtain letters patent [or otherwise state the nature of the disbursements intended]. A. B.

[Date.]  
78. FOR MONEY TO BE REPAYED.—\$... Received from Y. Z., of ..., the sum of ...dollars, which I promise to repay to him on demand [or, in...days, or, months; or, on the ...day of..., 18...]. A. B.

[Date.]  
79. FOR PAPERS TO BE SAFELY KEPT AND RESTORED.—I hereby acknowledge that the several deeds and writings contained in the schedule annexed were this day delivered to me by Y. Z., of, etc., and I hereby undertake to keep them with the same degree of care, as I keep my own deeds, writings, and papers, or other valuable effects, and to restore them to the said Y. Z., his heirs, or assigns, on his or their, etc. [state the condition, or say, upon request], uninjured and undamaged, inevitable casualty excepted. A. B.

[Date.] [Annex Schedule, as in Form 67.]  
80. IN FULL OF A PARTICULAR DEMAND.—\$... Received from Y. Z. the sum of ...dollars, in full of all demands for printing up to date [or, to the ...day of..., 18...]. A. B.

[Date.]  
81. IN FULL OF ALL DEMANDS.—\$... Received of Y. Z. the sum of ...dollars, in full of all demands against him. A. B.

**XXIV. Releases.**—§2. GENERAL RELEASE OF ALL DEMANDS.—Know all men by these presents, that I, A. B., of the city of..., for and in consideration of the sum of one dollar to me in hand paid by Y. Z., of..., do hereby release and forever discharge the said Y. Z., his heirs, executors, and administrators, of and from all actions, causes of action, suits, controversies, claims, and demands whatsoever, for or by reason of any matter, cause, or thing, from the beginning of the world down to the...day of..., 18...

In witness whereof, I have hereunto set my hand and seal, this...day of..., one thousand eight hundred and .... [Signature and seal.]

In presence of [Witness's signature.]

**XXV. Subscription Paper.**—§3. SUBSCRIPTION FOR A BUILDING.—We, the subscribers, agree to pay the sums set opposite our respective names, for the purpose of building a Presbyterian church at Glen's Falls; said church to be built on the lot now occupied by the old Presbyterian church in said village. The amount to be subscribed, in cash, is to be \$5000; the money to be paid to the trustees of said church, or to a building committee to be appointed by the undersigned subscribers. The body of the church to be finished and furnished uniformly; the pews or slips are

to be equally assessed, and rented annually; and said assessments and rents to be paid and applied by said trustees in payment for the stated preaching of the gospel in said church and congregation, and expenses of said church. [Signatures and sums.]

[Date.]  
**XXVI. Wills.**—§4. SHORT FORM.—The will of A. B., of ... [merchant].

1. I give, devise, and bequeath all my property, both real and personal, to C. D. [revoking all former wills].

2. I appoint E. F. the executor of this will. [Signature.]

[Date.] [Signatures of witnesses, with or without attestation clause, for which see Form 86.]

§5. A WILL OF REAL AND PERSONAL ESTATE.—I, A. B., of the town of..., in the county of..., and State of..., [merchant], declare this to be my last will and testament:

1. I give and bequeath to my wife, C. B., ...dollars, to be received by her in lieu of dower.

2. To my son, E. B., ...dollars [which said several legacies I direct to be paid within...after my decease].

3. I give and devise to my son, E. B. aforesaid, his heirs and assigns, all [here designate the property], together with all the hereditaments and appurtenances thereunto belonging or in any wise appertaining; to have and to hold the premises above described to the said E. B., his heirs and assigns, forever.

4. I give and devise all the rest, residue, and remainder of my real property, of every name and nature whatsoever, to my said daughter, M. B. [and my daughter, O. B., to be divided equally between them, share and share alike].

5. I give and bequeath all the rest, residue, and remainder of my personal property, of what nature or kind soever, to my said wife, C. B.

6. I hereby appoint E. B. the sole executor of this will, revoking all former wills by me made.

In witness [etc., as in Form 86].

§6. ATTESTATION CLAUSE, DESCRIBING EXECUTION ACCORDING TO THE LAWS OF NEW YORK.—In witness whereof, I [name of testator] have to this my last will and testament, consisting of ...sheets of paper, subscribed my name [and set my seal] this...day of..., 18...

[Signature, with or without seal.]

Subscribed by the testator in the presence of each of us [or, Acknowledged by the testator to each of us to have been subscribed by him], and at the same time declared by him to us to be his last will and testament, and thereupon we, at the request of the testator, sign our names hereto as witnesses, this...day of..., 18..., at...

[Signatures and addresses of witnesses.]

§7. ATTESTATION OF WILL ACCORDING TO THE LAWS OF ENGLAND.—In witness whereof, I, the said A. B., have hereunder set my hand, this...day of..., 18...

[Signature of testator.]

Signed and declared by the said A. B., as, and for his last will and testament in the presence of us (both being present at the same time), who, at his request, in his presence, and in the presence of each other, have hereunto subscribed our names as witnesses.

[Signatures of witnesses.]



RULERS, POPULATION, RELIGION AND AREAS OF THE PRINCIPAL NATIONS OF THE WORLD.

COUNTRIES.				RULERS.			
NAME.	RELIGION.	AREA IN SQ. M.	POPULATION.	NAME.	TITLE.	BIRTH.	ACCESSION.
Abyssinia.....	Coptic Chr. and Mohammedan.	128,646	3,000,000	Johannes II.	King.		1872.
Afghanistan.....	Mohammedan.	278,562	4,000,000	Abdurrahman.	Ameer.		1880.
Andorra.....	R. Cath.	143	12,000	A Council-General of Twenty-four.			
Anhalt.....	Prot.	869	232,747	Leopold Friedrich.	Duke.	Apr. 29, 1831.	May 22, 1871.
Argentine Republic.....	R. Cath.	1,300,000	2,942,000	Julio A. Roca.	President.		Oct. 12, 1880.
Austria-Hungary.....	R. Cath.	240,942	37,754,972	Franz Joseph I.	Emperor.	Aug. 18, 1830.	Dec. 2, 1848.
Baden.....	R. Cath.	5,851	1,570,254	Friedrich I.	Grand Duke.	Sept. 9, 1826.	Apr. 24, 1852.
Bavaria.....	R. Cath.	29,292	5,254,778	Ludwig II.	King.	Aug. 25, 1845.	Mar. 10, 1864.
Belgium.....	R. Cath.	11,373	5,519,844	Leopold II.	King.	Apr. 9, 1835.	Dec. 10, 1865.
Beloochistan.....	Mohammedan.	106,725	350,000	Mir Khodádak.	Khan.		1856.
Bolivia.....	R. Cath.	842,725	1,957,352	Noriego Campero.	President.		June 1, 1880.
Bolivia.....	R. Cath.	3,218,166	10,108,291	Dom Pedro II.	Emperor.	Dec. 2, 1825.	Apr. 7, 1891.
Brunswick.....	Prot.	1,526	349,429	A Regency Council			Oct. 18, 1884.
Bulgaria.....	Gr. Cath.	24,360	1,998,983	Alexander I.	Prince.	Apr. 5, 1857.	Apr. 29, 1879.
Chili.....	R. Cath.	218,925	2,400,396	Domíngos Santa María.	President.		Sept. 18, 1881.
Chinese Empire.....	Buddhist.	4,000,000	400,000,000	Kwang-Su.	Emperor.	1871.	Jan. 22, 1875.
Colombia, United States of.....	R. Cath.	320,698	2,951,323	R. Nuñez.	President.		Apr. 1, 1884.
Costa Rica.....	R. Cath.	19,979	185,000	Don Prospero Fernandez.	President.	July 18, 1834.	Aug. 10, 1882.
Denmark.....	Prot.	14,753	1,969,099	Christian IX.	King.	Apr. 8, 1818.	Nov. 15, 1863.
Ecuador.....	R. Cath.	251,322	1,066,137	J. M. P. Caamaño.	President.		Oct. 23, 1883.
Egypt.....	Mohammedan.	210,000	5,517,000	Tewfik.	Khedive.	Nov. 19, 1852.	Aug. 8, 1879.
France.....	R. Cath.	204,028	37,672,048	Jules Grévy.	President.	Aug. 15, 1813.	Jan. 30, 1879.
German Empire.....	Prot. & R. Cath.	212,091	45,234,061	Wilhelm I.	Emperor.	Mar. 22, 1797.	Jan. 18, 1871.
Great Britain & Ireland.....	Prot. & R. Cath.	121,764	35,262,762	Victoria.	Queen.	May 24, 1819.	June 20, 1837.
Greece.....	Gr. Cath.	25,041	1,979,423	Georg I.	King.	Dec. 24, 1845.	June 6, 1863.
Guatemala.....	R. Cath.	44,800	1,252,497	Rufino Barrios.	President.		May 9, 1873.
Hawaiian Islands.....	Prot.	6,400	57,985	David Kalakaua.	King.	Nov. 16, 1836.	Feb. 12, 1874.
Hayti.....	R. Cath.	10,000	550,000	Salomon.	President.		Oct. 22, 1879.
Hesse-Darmstadt.....	Prot.	2,964	936,944	Ludwig IV.	Grand Duke.	Sept. 12, 1837.	June 13, 1877.
Holland. See Netherlands, The.....							
Honduras.....	R. Cath.	50,000	400,000	Louis Bogran.	President.		Nov. 27, 1883.
Italy.....	R. Cath.	114,300	28,459,451	Humbert I.	King.	Mar. 14, 1844.	Jan. 9, 1878.
Japan.....	Buddhist.	150,000	37,011,964	Mikado.	King.	Nov. 3, 1852.	Feb. 13, 1867.
Liberia.....	Prot.	14,300	1,050,000	H. R. W. Johnson.	President.		Jan. 7, 1884.
Lippe.....	Prot.	445	120,246	Waldemar.	Prince.	Apr. 18, 1824.	Dec. 8, 1875.
Mecklenburg-Schwerin.....	Prot.	4,834	577,055	Friedrich Frantz III.	Grand Duke.	Mar. 19, 1851.	Apr. 15, 1883.
Mecklenburg-Strelitz.....	Prot.	997	100,269	Friedrich Wilhelm.	Grand Duke.	Oct. 17, 1819.	Sept. 6, 1860.
Mexico.....	R. Cath.	743,948	10,046,872	Porfirio Diaz.	President.		Dec. 1, 1884.
Monaco.....	R. Cath.	6	7,049	Charles III.	Prince.	Dec. 8, 1818.	June 20, 1856.
Montenegro.....	Gr. Cath.	3,550	236,000	Nicholas I.	Prince.	Oct. 7, 1841.	Aug. 14, 1860.
Morocco.....	Mohammedan.	313,560	6,370,000	Muley Hassan.	Sultan.		Sept. 25, 1873.
Netherlands, The.....	Prot.	12,648	4,012,693	William III.	King.	Feb. 19, 1817.	Mar. 17, 1849.
Nicaragua.....	R. Cath.	49,500	275,815	Dr. Adam Cardenas	President.		Mar. 1, 1883.
Norway.....	Prot.	122,869	1,806,900	See Sweden.			
Oldenburg.....	Prot.	2,417	337,478	Peter I.	Grand Duke.	July 8, 1827.	Feb. 27, 1853.
Paraguay.....	R. Cath.	56,700	346,048	Caaballero.	President.		Nov. 25, 1882.
Persia.....	Mohammedan.	610,000	7,653,000	Nassr-ed-Din.	Shah.	Apr. 24, 1829.	Sept. 19, 1848.
Peru.....	R. Cath.	500,000	2,600,000	Caceres.	President.		1884.
Portugal.....	R. Cath.	36,510	4,160,315	Dom Luis I.	King.	Oct. 31, 1838.	Nov. 11, 1861.
Prussia.....	Prot.	137,066	27,279,111	Wilhelm.	King.	Mar. 22, 1797.	Jan. 2, 1861.
Reuss-Greiz.....	Prot.	148	50,782	Heinrich XXII.	Prince.	Mar. 28, 1846.	Nov. 8, 1859.
Reuss-Schleiz.....	Prot.	297	101,390	Heinrich XIV.	Prince.	May 23, 1832.	July 11, 1867.
Roumania.....	Gr. Cath.	48,307	5,300,000	Charles I.	King.	Apr. 20, 1839.	Apr. 20, 1866.
Russia.....	Gr. Cath.	8,387,816	100,372,553	Alexander III.	Czar.	Mar. 10, 1845.	Mar. 13, 1881.
Sandwich Islands. See Hawaiian Islands.....							
San Marino.....	R. Cath.	30	8,000	Two Captains, changing every six months.			
San Salvador.....	R. Cath.	7,225	554,785	Rafael Zaldivar y Lazo.	President.		Apr. 30, 1876.
Santo Domingo.....	R. Cath.	18,000	200,000	General Bellini.	President.		July 20, 1884.
Saxe-Altenburg.....	Prot.	509	155,036	Ernst.	Duke.	Sept. 16, 1826.	Aug. 3, 1853.
Saxe-Coburg-Gotha.....	Prot.	816	194,716	Ernst II.	Duke.	June 21, 1818.	Jan. 29, 1844.
Saxe-Meiningen.....	Prot.	933	207,075	Georg II.	Duke.	Apr. 2, 1826.	Sept. 20, 1866.
Saxe-Weimar-Eisenach.....	Prot.	1,421	309,577	Charles Auguste.	Grand Duke.	June 24, 1818.	July 8, 1853.
Saxony.....	Prot.	6,777	2,972,805	Albert.	King.	Apr. 23, 1823.	Oct. 29, 1873.
Schaumburg-Lippe.....	Prot.	212	35,374	Adolph Georg.	Prince.	Aug. 1, 1817.	Nov. 21, 1860.
Schwartzburg-Rudolstadt.....	Prot.	340	80,296	Georg Albert.	Prince.	Nov. 23, 1838.	Nov. 26, 1869.
Schwartzburg-Sonderhausen.....	Prot.	318	71,107	Charles Günther.	Prince.	Aug. 7, 1830.	July 17, 1880.
Servia.....	Gr. Cath.	18,800	1,826,000	Milan I.	King.	Aug. 22, 1854.	July 2, 1868.
Spain.....	R. Cath.	195,767	16,634,345	Alfonso XII.	King.	Nov. 28, 1857.	Dec. 30, 1874.
Sweden.....	Prot.	170,979	4,565,668	Oscar II.	King.	Jan. 21, 1829.	Sept. 18, 1872.
Switzerland.....	Prot.	15,992	2,846,102	Dr. K. Schenk.	President.		Jan. 1, 1885.
Transvaal.....	Prot. & Pagan.	115,000	800,000	S. J. P. Krüger.	President.		May 9, 1883.
Tripoli.....	Mohammedan.	398,873	1,010,000	Ahmed Rassim Pasha.	Bey.		Nov., 1881.
Tunis.....	Mohammedan.	45,716	2,100,000	Sidi Ali Pasha.	Bey.	Oct. 5, 1817.	Oct. 28, 1881.
Turkish Empire.....	Mohammedan.	2,396,692	42,214,350	Abdul Hamid II.	Sultan.	Sept. 22, 1842.	Aug. 31, 1876.
United States of America.....	Prot.	3,602,990	50,155,783	Grover Cleveland.	President.	Mar. 18, 1837.	Mar. 4, 1885.
Uruguay.....	R. Cath.	72,000	432,000	Maximo Santos.	President.		Mar. 1, 1882.
Venezuela.....	R. Cath.	439,120	2,075,245	Joaquin Crespo.	President.		Feb. 20, 1884.
Waldeck.....	Prot.	466	56,522	Georg Victor.	Prince.	Jan. 14, 1831.	May 15, 1845.
Württemberg.....	Prot.	7,675	1,971,118	Charles I.	King.	Mar. 6, 1823.	June 25, 1864.



## CORN.

	1884.			1883.			1882.			1881.			1880.			1879.		
	Production in Bushels.	Value in Dollars.	Production in Bushels.	Value in Dollars.	Production in Bushels.	Value in Dollars.	Production in Bushels.	Value in Dollars.	Production in Bushels.	Value in Dollars.	Production in Bushels.	Value in Dollars.	Production in Bushels.	Value in Dollars.	Production in Bushels.	Value in Dollars.	Production in Bushels.	Value in Dollars.
Alabama.....	30,197,000	\$18,490,170	26,189,300	\$16,761,152	31,982,500	\$19,189,510	20,350,000	\$19,642,500	23,679,352	\$15,186,166	25,451,276	\$16,766,178	25,451,276	\$15,186,166	25,451,276	\$16,766,178	25,451,276	\$16,766,178
Arizona.....	40,300	17,531,100	20,450,700	16,141,945	34,457,900	15,863,514	21,028,000	19,766,320	32,350,250	15,851,622	34,746	13,011,024	34,746	15,851,622	34,746	13,011,024	34,746	15,851,622
Arkansas.....	32,463,000	2,860,000	2,664,800	2,095,080	2,990,400	2,373,205	2,638,000	2,053,740	2,550,800	1,961,408	1,993,408	2,223,000	1,993,408	1,961,408	1,993,408	2,223,000	1,993,408	2,223,000
California.....	4,900,000	2,860,000	2,664,800	2,095,080	2,990,400	2,373,205	2,638,000	2,053,740	2,550,800	1,961,408	1,993,408	2,223,000	1,993,408	1,961,408	1,993,408	2,223,000	1,993,408	2,223,000
Colorado.....	1,700,000	1,140,500	1,700,000	1,140,500	1,700,000	1,140,500	1,700,000	1,140,500	1,700,000	1,140,500	1,700,000	1,140,500	1,700,000	1,140,500	1,700,000	1,140,500	1,700,000	1,140,500
Connecticut.....	1,700,000	1,140,500	1,700,000	1,140,500	1,700,000	1,140,500	1,700,000	1,140,500	1,700,000	1,140,500	1,700,000	1,140,500	1,700,000	1,140,500	1,700,000	1,140,500	1,700,000	1,140,500
Delaware.....	13,092,000	4,193,000	3,822,200	2,911,775	3,986,600	2,922,594	2,940,000	2,764,000	6,407,840	3,238,920	3,894,264	2,673,000	3,894,264	3,238,920	3,894,264	2,673,000	3,894,264	2,673,000
District of Columbia.....	3,827,000	3,709,200	3,827,000	3,709,200	3,827,000	3,709,200	3,827,000	3,709,200	3,827,000	3,709,200	3,827,000	3,709,200	3,827,000	3,709,200	3,827,000	3,709,200	3,827,000	3,709,200
Florida.....	30,023,000	21,647,500	24,515,500	16,493,653	36,617,500	23,901,375	19,745,000	19,182,650	21,930,240	15,188,076	23,202,018	14,430,180	23,202,018	15,188,076	23,202,018	14,430,180	23,202,018	14,430,180
Georgia.....	36,400	75,805,600	93,780,500	81,514,600	182,386,900	85,698,248	176,733,000	102,505,140	240,452,886	86,563,043	325,792,481	96,788,510	325,792,481	86,563,043	325,792,481	96,788,510	325,792,481	96,788,510
Illinois.....	244,544,000	83,617,380	95,620,000	107,484,300	17,904,700	10,884,736	16,277,000	10,497,280	21,702,080	10,634,019	15,968,533	7,134,491	15,968,533	10,634,019	15,968,533	7,134,491	15,968,533	7,134,491
Indiana.....	293,500,000	27,098,000	169,620,000	175,457,600	69,685,288	173,289,000	76,347,180	76,347,180	290,192,840	67,650,138	275,482,970	44,445,408	275,482,970	67,650,138	275,482,970	44,445,408	275,482,970	44,445,408
Iowa.....	108,500,000	30,700,000	172,800,000	44,692,324	144,452,600	89,417,462	76,377,000	44,298,680	100,218,360	30,803,324	105,726,265	24,224,508	105,726,265	30,803,324	105,726,265	24,224,508	105,726,265	24,224,508
Kansas.....	171,890,000	30,700,000	172,800,000	44,692,324	144,452,600	89,417,462	76,377,000	44,298,680	100,218,360	30,803,324	105,726,265	24,224,508	105,726,265	30,803,324	105,726,265	24,224,508	105,726,265	24,224,508
Kentucky.....	11,097,000	7,574,660	13,102,800	8,696,406	14,636,400	8,781,840	9,098,000	9,490,140	14,912,720	82,095,180	9,906,189	9,570,300	9,906,189	82,095,180	9,906,189	9,570,300	9,906,189	9,570,300
Louisiana.....	1,092,000	7,313,700	1,092,000	8,671,406	14,636,400	8,781,840	9,098,000	9,490,140	14,912,720	82,095,180	9,906,189	9,570,300	9,906,189	82,095,180	9,906,189	9,570,300	9,906,189	9,570,300
Maine.....	15,237,000	1,367,950	2,000,100	1,631,360	1,237,200	1,175,340	1,005,000	1,237,200	1,875,380	1,406,407	1,797,563	1,087,080	1,797,563	1,406,407	1,797,563	1,087,080	1,797,563	1,087,080
Maryland.....	26,022,000	10,408,600	13,132,800	11,134,306	9,597,600	16,893,144	9,058,000	15,792,840	34,816,000	16,015,360	32,401,462	13,911,075	32,401,462	16,015,360	32,401,462	13,911,075	32,401,462	13,911,075
Massachusetts.....	32,630,000	7,797,000	23,257,100	6,668,064	30,137,600	9,507,480	16,252,000	8,613,560	15,478,000	5,572,068	14,891,741	4,213,050	14,891,741	5,572,068	14,891,741	4,213,050	14,891,741	4,213,050
Michigan.....	35,510,000	15,816,200	23,257,100	13,911,973	30,137,600	9,507,480	16,252,000	8,613,560	15,478,000	5,572,068	14,891,741	4,213,050	14,891,741	5,572,068	14,891,741	4,213,050	14,891,741	4,213,050
Minnesota.....	197,820,000	51,441,600	161,655,000	56,573,230	170,000,000	66,314,400	93,009,000	60,494,850	160,463,408	57,766,827	202,485,723	35,484,880	202,485,723	57,766,827	202,485,723	35,484,880	202,485,723	35,484,880
Mississippi.....	192,400,000	21,978,000	101,278,900	24,306,306	82,478,200	27,217,806	58,913,000	22,976,070	59,507,600	14,867,900	65,400,135	13,116,474	65,400,135	14,867,900	65,400,135	13,116,474	65,400,135	13,116,474
Montana.....	2,000,000	977,300	1,200,000	8,440	18,000	16,200	13,000	13,000	9,740	7,792	12,891	7,792	12,891	9,740	12,891	7,792	12,891	7,792
Nebraska.....	1,282,000	9,773,000	1,282,000	1,922,170	876,700	825,572	1,922,000	1,097,940	1,401,820	1,028,329	1,150,705	5,202,136	1,150,705	1,028,329	1,150,705	5,202,136	1,150,705	5,202,136
New Hampshire.....	10,092,000	5,935,607	9,710,100	6,314,815	9,649,000	7,710,500	7,710,500	6,028,350	14,285,900	8,256,416	683,796	13,849,440	683,796	8,256,416	683,796	13,849,440	683,796	13,849,440
New Jersey.....	22,674,300	13,646,580	17,313,700	12,764,271	21,157,500	16,814,375	20,685,000	15,000,538	27,895,680	15,000,538	25,875,480	13,849,440	25,875,480	15,000,538	25,875,480	13,849,440	25,875,480	13,849,440
New York.....	31,409,000	18,894,000	28,692,200	18,648,900	34,260,700	18,158,171	26,977,000	21,311,880	36,954,120	19,216,142	38,019,889	14,603,530	38,019,889	19,216,142	38,019,889	14,603,530	38,019,889	14,603,530
North Carolina.....	85,393,000	35,011,130	73,120,300	34,573,200	98,310,300	57,857,904	79,700,000	48,633,600	119,940,000	49,175,400	111,877,421	14,217,540	111,877,421	49,175,400	111,877,421	14,217,540	111,877,421	14,217,540
Ohio.....	14,000,000	22,692,320	37,357,000	25,364,458	43,518,800	30,643,100	34,599,000	25,940,250	53,804,700	29,576,401	45,881,531	24,033,492	45,881,531	29,576,401	45,881,531	24,033,492	45,881,531	24,033,492
Pennsylvania.....	43,400,000	22,692,320	37,357,000	25,364,458	43,518,800	30,643,100	34,599,000	25,940,250	53,804,700	29,576,401	45,881,531	24,033,492	45,881,531	29,576,401	45,881,531	24,033,492	45,881,531	24,033,492
Rhode Island.....	13,300,000	9,067,300	11,107,800	8,108,064	16,326,200	11,121,262	8,609,000	8,720,910	11,745,900	9,044,343	11,707,069	7,276,500	11,707,069	9,044,343	11,707,069	7,276,500	11,707,069	7,276,500
South Carolina.....	63,723,000	29,573,300	44,233,000	28,523,300	75,188,600	31,579,212	98,232,000	22,489,125	62,469,792	22,489,125	62,469,792	18,832,075	62,469,792	22,489,125	62,469,792	18,832,075	62,469,792	18,832,075
Tennessee.....	60,200,000	37,573,800	63,140,300	37,887,780	63,140,300	37,887,780	92,377,000	33,043,220	66,754,500	35,370,885	39,065,172	30,073,940	39,065,172	35,370,885	39,065,172	30,073,940	39,065,172	30,073,940
Texas.....	2,000,000	1,040,400	2,000,000	1,040,400	2,000,000	1,040,400	2,000,000	1,040,400	2,000,000	1,040,400	2,000,000	1,040,400	2,000,000	1,040,400	2,000,000	1,040,400	2,000,000	1,040,400
Utah.....	1,000,000	1,268,000	1,000,000	1,435,667	1,000,000	1,814,482	1,000,000	1,711,400	1,801,000	1,270,136	2,014,371	1,487,448	2,014,371	1,270,136	2,014,371	1,487,448	2,014,371	1,487,448
Vermont.....	20,482,000	16,508,000	20,482,000	16,508,000	20,482,000	16,508,000	20,482,000	16,508,000	20,482,000	16,508,000	20,482,000	16,508,000	20,482,000	16,508,000	20,482,000	16,508,000	20,482,000	16,508,000
Virginia.....	11,000,000	6,604,000	14,234,000	7,375,230	14,927,000	8,657,000	12,980,000	9,605,200	17,307,000	8,134,200	14,000,000	5,100,196	14,000,000	9,605,200	14,000,000	5,100,196	14,000,000	5,100,196
West Virginia.....	26,200,000	8,908,000	26,200,000	8,908,000	26,200,000	8,908,000	26,200,000	8,908,000	26,200,000	8,908,000	26,200,000	8,908,000	26,200,000	8,908,000	26,200,000	8,908,000	26,200,000	8,908,000
Wisconsin.....	1,705,538,432	\$640,735,859	1,551,066,895	\$658,051,485	1,617,025,100	\$783,867,175	1,194,916,000	\$759,482,170	1,717,434,543	\$679,714,499	1,754,861,535	\$580,408,217	1,754,861,535	\$679,714,499	1,754,861,535	\$580,408,217	1,754,861,535	\$580,408,217
Wyoming.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Grand Total.....	1,705,538,432	\$640,735,859	1,551,066,895	\$658,051,485	1,617,025,100	\$783,867,175	1,194,916,000	\$759,482,170	1,717,434,543	\$679,714,499	1,754,861,535	\$580,408,217	1,754,861,535	\$679,714,499	1,754,861,535	\$580,408,217	1,754,861,535	\$580,408,217

\* Territories in 1881, 5,761,000 bushels; value, \$5,472,950.

† Territories in 1880, 5,010,000 bushels; value, \$3,607,200.

‡ Nevada, Colorado, and Territories in 1879, \$3,475,900.



Oats.	1884.			1883.			1882.			1881.			1880.			1879.		
	Production in Bushels.	Value in Dollars.		Production in Bushels.	Value in Dollars.		Production in Bushels.	Value in Dollars.		Production in Bushels.	Value in Dollars.		Production in Bushels.	Value in Dollars.		Production in Bushels.	Value in Dollars.	
Alabama.....	5,015,000	\$2,758,250		4,517,900	\$2,574,861		4,302,200	\$2,281,320		3,073,000	\$2,734,970		1,373,118	\$1,002,276		3,039,639	\$1,739,270	
Arizona.....	.....	.....		6,000	3,720		.....	.....		*	.....		.....	.....		.....	.....	
Arkansas.....	3,542,000	1,593,900		3,225,000	1,612,700		3,131,500	1,597,065		2,397,000	1,659,270		1,156,734	613,069		2,219,822	737,435	
California.....	2,149,000	1,849,620		1,826,000	1,548,000		1,548,000	897,840		1,548,000	928,800		4,518,780	2,237,207		1,341,271	3,398,307	
Colorado.....	1,516,000	696,400		1,309,000	725,400		780,000	507,000		1,771,000	634,510		.....	.....		640,900	.....	
Connecticut.....	1,112,000	497,040		1,000,700	528,236		1,048,300	545,116		1,038,000	581,280		1,197,000	634,458		1,049,700	418,347	
Dakota.....	11,812,000	2,716,700		9,000,000	2,520,000		3,680,000	1,368,000		*	.....		.....	.....		2,217,132	.....	
Delaware.....	482,000	168,700		517,000	207,040		410,800	184,860		316,000	142,300		397,440	116,827		378,508	129,300	
Florida.....	484,000	296,400		504,500	398,555		509,600	382,900		392,000	300,640		118,085	142,883		468,112	150,000	
Georgia.....	6,270,000	3,573,900		7,018,700	3,990,472		7,225,800	3,970,600		5,566,000	4,842,430		4,592,980	3,407,235		5,548,743	3,845,700	
Idaho.....	1,012,000	435,160		1,140,000	649,800		760,000	570,000		*	.....		.....	.....		462,236	.....	
Illinois.....	98,153,000	22,575,180		102,780,000	27,750,600		99,141,000	31,725,120		66,094,000	28,420,430		49,651,701	14,398,993		63,189,230	12,871,008	
Indiana.....	21,742,000	5,870,340		21,304,100	6,817,312		18,833,200	6,598,620		15,711,000	6,598,620		4,121,250	1,599,518		15,509,518	3,927,937	
Iowa.....	78,650,000	15,730,800		68,408,600	17,784,936		52,618,160	14,733,085		42,434,000	14,437,560		38,394,700	8,390,802		50,610,501	8,368,972	
Kansas.....	27,419,000	6,032,180		27,560,000	5,767,600		12,780,000	3,834,240		8,754,000	3,501,600		10,058,958	3,218,267		8,100,285	3,123,900	
Kentucky.....	7,805,000	2,552,963		6,899,900	2,552,963		7,187,400	2,816,400		3,654,000	3,070,980		4,871,340	1,802,396		4,380,788	1,687,392	
Louisiana.....	404,000	284,320		475,000	308,750		527,800	316,600		364,000	323,960		16,480	9,538		239,840	9,380	
Maine.....	2,428,000	1,044,040		2,665,000	1,199,250		1,776,700	997,185		2,369,000	1,291,880		2,676,429	1,284,686		2,265,575	1,327,410	
Maryland.....	1,980,000	724,000		2,023,800	789,282		1,658,900	729,916		1,823,000	875,040		3,451,880	1,312,854		1,794,872	1,455,440	
Massachusetts.....	717,000	322,650		724,000	354,760		703,000	414,770		703,000	456,950		591,448	313,407		645,150	254,300	
Michigan.....	19,990,000	5,737,100		20,061,300	7,021,455		18,237,570	6,747,901		18,057,000	8,396,920		12,647,400	4,436,690		18,190,793	4,440,380	
Minnesota.....	36,100,000	7,220,000		31,447,500	8,805,300		20,950,000	8,985,000		23,760,000	10,216,800		17,273,088	5,009,195		23,382,158	3,941,280	
Mississippi.....	3,048,000	1,737,360		3,142,400	1,885,440		3,080,800	1,756,056		2,185,000	1,857,250		956,310	631,105		1,950,630	401,000	
Missouri.....	30,774,000	7,693,500		30,374,200	7,593,550		30,073,500	9,022,520		22,783,000	10,252,350		18,360,652	5,324,589		20,070,958	4,011,571	
Montana.....	1,740,000	699,000		1,310,000	701,800		1,100,000	825,000		*	.....		.....	.....		900,915	.....	
Nebraska.....	21,844,000	4,150,360		21,630,000	4,326,000		9,417,600	2,354,000		6,976,000	2,581,120		4,173,593	1,085,134		6,556,875	1,416,800	
Nevada.....	251,000	145,580		212,000	127,200		221,000	165,750		190,000	171,000		.....	.....		186,800	.....	
New Hampshire.....	993,000	446,850		1,033,000	485,510		1,030,000	566,300		1,030,000	535,600		1,131,200	542,976		1,017,620	588,000	
New Jersey.....	2,735,000	1,011,950		4,265,800	1,706,320		3,808,800	1,790,136		4,052,000	1,985,480		4,180,950	1,714,789		3,710,573	2,080,400	
New Mexico.....	252,000	105,840		199,800	119,880		185,000	166,500		*	.....		.....	.....		156,527	.....	
New York.....	41,145,000	14,400,750		42,071,400	16,828,560		40,068,000	18,039,000		38,160,000	18,316,800		44,304,160	19,440,890		37,575,506	15,971,200	
North Carolina.....	4,632,000	2,130,720		5,142,000	2,632,420		5,713,400	2,742,432		4,081,000	2,530,220		2,965,259	1,512,282		3,838,008	1,921,680	
Ohio.....	23,419,000	6,791,510		29,560,000	10,346,000		18,400,000	8,461,900		25,000,000	11,093,800		24,340,530	8,975,882		28,664,605	7,715,097	
Oregon.....	5,470,000	1,641,000		4,211,800	2,292,254		4,433,500	2,305,420		5,278,000	2,980,540		31,502,988	11,937,707		4,865,616	1,383,400	
Pennsylvania.....	35,027,000	12,259,450		38,192,200	15,277,280		34,721,100	15,624,450		38,570,000	18,517,000		90,000	11,636,106		33,841,439	11,711,304	
Rhode Island.....	161,000	75,670		179,100	85,908		155,800	90,364		164,000	100,880		14,000	47,700		159,339	31,680	
South Carolina.....	3,645,000	1,772,500		3,844,000	2,292,720		4,430,100	2,215,050		3,098,000	3,005,000		1,406,592	998,680		2,715,505	1,921,680	
Tennessee.....	7,680,000	3,225,900		6,997,700	2,650,126		6,860,520	2,812,813		6,726,000	3,766,500		3,456,900	1,382,784		4,222,130	1,745,100	
Texas.....	10,527,000	4,421,340		9,489,800	4,859,543		9,988,500	5,393,952		8,324,000	5,077,640		6,240,145	2,870,467		4,893,359	2,456,750	
Utah.....	625,000	227,500		546,000	311,220		530,000	317,300		*	.....		.....	.....		418,082	.....	
Vermont.....	3,625,000	1,450,000		3,548,000	1,561,384		3,445,200	1,722,650		3,845,000	1,672,500		3,933,800	1,770,210		3,742,282	1,527,240	
Virginia.....	6,418,000	2,695,560		6,275,600	2,949,532		5,137,000	2,654,818		4,331,000	2,295,430		5,011,977	2,054,787		5,333,181	2,233,914	
Washington.....	2,623,000	918,050		2,460,100	1,034,800		2,130,000	1,034,800		*	.....		.....	.....		1,571,706	.....	
West Virginia.....	2,212,000	882,680		2,020,300	1,888,200		1,888,200	1,888,200		2,098,000	986,060		2,638,454	870,690		2,905,320	900,125	
Wisconsin.....	45,940,000	11,025,600		40,502,700	12,555,837		34,324,400	10,983,908		31,304,000	12,481,600		30,125,345	11,748,885		28,905,390	10,398,960	
Wyoming.....	75,000	30,000		63,000	37,800		47,000	23,500		*	.....		.....	.....		22,512	.....	
Grand Total.....	583,628,000	\$161,533,070		571,392,400	\$187,040,264		488,250,610	\$182,978,622		416,461,000	\$103,198,970		355,553,684	\$128,107,333		407,860,999	\$120,533,294	

\* Territories in 1881, 7,224,000 bushels; value, \$4,478,880.

† Nevada, Colorado, and Territories in 1880, 2,901,096 bushels; value, \$1,450,548.

‡ Nevada, Colorado, and Territories in 1879, \$1,197,900.



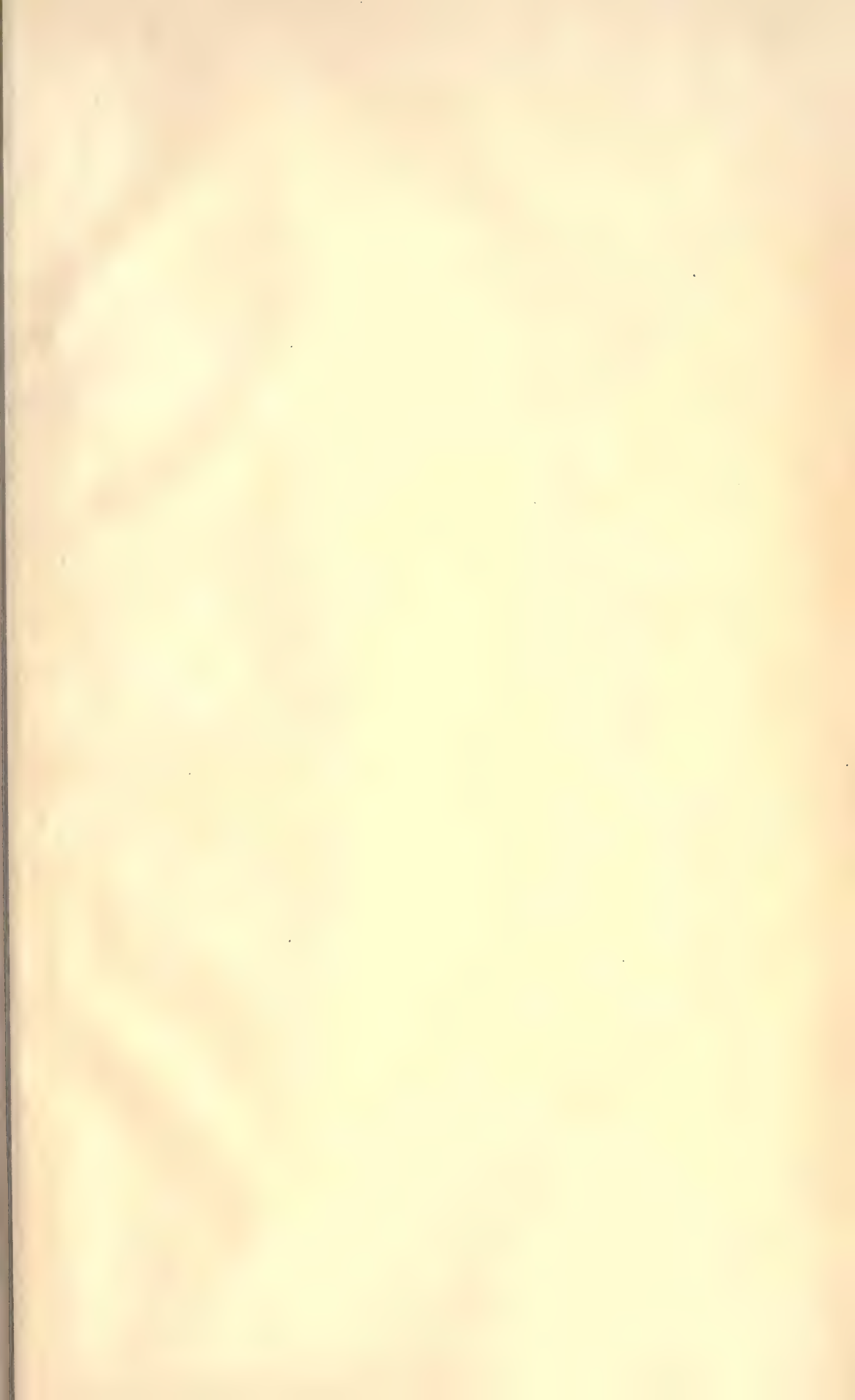
WHEAT.	1884.			1883.			1882.			1881.			1880.			1879.		
	Production in Bushels.	Value in Dollars.	Production in Bushels.	Value in Dollars.	Production in Bushels.	Value in Dollars.	Production in Bushels.	Value in Dollars.	Production in Bushels.	Value in Dollars.	Production in Bushels.	Value in Dollars.	Production in Bushels.	Value in Dollars.	Production in Bushels.	Value in Dollars.	Production in Bushels.	Value in Dollars.
Alabama.....	1,675,000	\$1,675,000	1,437,500	\$1,653,125	1,700,800	\$1,904,800	1,479,000	\$2,336,800	946,630	\$3,145,410	1,502,760	\$1,983,643	1,502,760	\$1,983,643	1,502,760	\$1,983,643	1,502,760	\$1,983,643
Arizona.....	295,000	295,000	295,000	295,000	295,000	295,000	295,000	295,000	295,000	295,000	295,000	295,000	295,000	295,000	295,000	295,000	295,000	295,000
Arkansas.....	222,300	222,300	222,300	222,300	222,300	222,300	222,300	222,300	222,300	222,300	222,300	222,300	222,300	222,300	222,300	222,300	222,300	222,300
California.....	1,885,000	1,885,000	1,416,000	1,458,862	1,566,100	1,550,430	1,017,000	1,190,952	1,107,000	43,920,000	1,384,000	1,480,880	1,384,000	1,480,880	1,384,000	1,480,880	1,384,000	1,480,880
Colorado.....	44,320,000	36,322,000	36,322,000	86,322,000	96,046,600	82,441,940	81,406,000	82,441,940	45,700,000	43,920,000	35,000,000	43,080,000	35,000,000	43,080,000	35,000,000	43,080,000	35,000,000	43,080,000
Connecticut.....	2,348,000	2,348,000	2,348,000	2,348,000	2,348,000	2,348,000	2,348,000	2,348,000	2,348,000	2,348,000	2,348,000	2,348,000	2,348,000	2,348,000	2,348,000	2,348,000	2,348,000	2,348,000
Dakota.....	36,200	36,200	36,200	42,875	43,600	52,350	39,000	55,380	43,730	61,208	59,400	59,400	59,400	59,400	59,400	59,400	59,400	59,400
Delaware.....	22,330,000	10,371,000	16,128,000	11,612,160	11,600,000	9,108,000	1,044,000	1,461,000	1,360,040	1,574,306	2,830,280	1,307,536	2,830,280	1,307,536	2,830,280	1,307,536	2,830,280	1,307,536
Florida.....	1,097,000	855,950	966,700	1,073,637	1,200,600	1,284,642	480	792	2,582,370	3,511,023	1,012,710	730	1,012,710	730	1,012,710	730	1,012,710	730
Georgia.....	3,130,000	3,286,500	2,574,000	3,080,880	3,812,900	4,117,492	2,933,000	4,780,700	5,582,370	3,511,023	3,617,100	4,537,546	3,617,100	4,537,546	3,617,100	4,537,546	3,617,100	4,537,546
Idaho.....	1,120,000	806,400	682,500	614,250	650,000	910,000	480	792	2,582,370	3,511,023	1,012,710	730	1,012,710	730	1,012,710	730	1,012,710	730
Illinois.....	82,971,000	21,025,620	22,150,000	20,378,000	52,302,900	44,960,494	26,822,000	32,722,840	33,707,200	51,078,840	44,896,880	48,030,008	44,896,880	48,030,008	44,896,880	48,030,008	44,896,880	48,030,008
Indiana.....	33,745,000	22,609,150	26,447,800	27,025,410	45,461,800	40,915,620	31,353,000	37,958,570	38,311,990	37,958,570	43,709,860	51,140,553	43,709,860	51,140,553	43,709,860	51,140,553	43,709,860	51,140,553
Iowa.....	31,270,000	17,198,500	27,518,800	22,015,000	25,487,200	17,841,040	18,248,000	19,842,880	30,008,400	29,000,688	32,786,380	30,163,490	32,786,380	30,163,490	32,786,380	30,163,490	32,786,380	30,163,490
Kansas.....	34,690,000	15,745,500	30,945,888	20,945,888	31,248,000	30,936,160	19,909,000	20,904,451	19,892,000	13,892,000	18,086,200	16,099,455	18,086,200	16,099,455	18,086,200	16,099,455	18,086,200	16,099,455
Kentucky.....	13,425,000	9,934,500	9,612,900	9,131,970	17,258,000	15,525,000	5,350	8,025	5,347,130	4,972,822	7,081,400	8,206,344	7,081,400	8,206,344	7,081,400	8,206,344	7,081,400	8,206,344
Louisiana.....	620,400	786,750	614,300	860,020	512,100	716,940	617,000	902,520	383,145	563,223	488,400	702,730	488,400	702,730	488,400	702,730	488,400	702,730
Maryland.....	8,290,000	6,855,800	7,577,000	8,031,620	8,055,600	9,261,492	7,213,000	9,737,550	7,485,800	8,533,802	6,099,240	1,030,773	6,099,240	1,030,773	6,099,240	1,030,773	6,099,240	1,030,773
Massachusetts.....	19,000	21,280	19,700	28,545	30,110	20,145	19,000	28,545	15,006	20,288	13,300	22,450	13,300	22,450	13,300	22,450	13,300	22,450
Michigan.....	29,773,200	22,031,280	25,011,000	24,010,560	32,315,400	29,083,800	21,220,000	26,525,000	30,705,000	29,783,850	28,773,120	33,064,550	28,773,120	33,064,550	28,773,120	33,064,550	28,773,120	33,064,550
Minnesota.....	41,307,000	20,653,500	33,773,200	27,915,560	33,080,500	27,085,010	35,052,000	38,100,120	40,732,000	35,454,240	31,846,620	30,973,320	31,846,620	30,973,320	31,846,620	30,973,320	31,846,620	30,973,320
Mississippi.....	287,000	237,000	247,500	267,000	250,100	307,623	197,000	315,240	374,000	483,400	417,000	507,496	417,000	507,496	417,000	507,496	417,000	507,496
Missouri.....	27,500,000	17,050,000	23,819,300	20,940,984	27,538,600	23,407,810	20,399,000	24,274,810	30,688,000	27,312,330	26,801,000	27,000,016	26,801,000	27,000,016	26,801,000	27,000,016	26,801,000	27,000,016
Montana.....	1,372,000	969,400	942,000	866,640	685,000	963,250	13,840,000	13,424,800	10,208,000	7,451,840	13,043,500	10,956,616	13,043,500	10,956,616	13,043,500	10,956,616	13,043,500	10,956,616
Nebraska.....	26,325,000	11,896,500	27,481,300	19,236,910	18,300,000	12,261,000	48,000	57,000	204,525	286,335	150,120	288,680	150,120	288,680	150,120	288,680	150,120	288,680
Nevada.....	104,000	104,000	90,200	109,120	95,000	114,000	48,000	57,000	2,473,974	2,804,550	706,641	2,461,290	706,641	2,461,290	706,641	2,461,290	706,641	2,461,290
New Hampshire.....	204,000	204,000	181,700	250,746	148,700	200,745	175,000	230,544	304,525	286,335	150,120	288,680	150,120	288,680	150,120	288,680	150,120	288,680
New Jersey.....	1,819,800	1,819,800	2,063,900	2,269,960	2,068,700	2,350,544	2,018,000	2,885,740	2,473,974	2,804,550	1,783,500	2,461,290	1,783,500	2,461,290	1,783,500	2,461,290	1,783,500	2,461,290
New Mexico.....	980,000	1,897,000	977,000	1,928,705	767,000	1,150,000	10,844,000	14,856,360	12,961,297	15,120,547	10,736,500	15,044,400	10,736,500	15,044,400	10,736,500	15,044,400	10,736,500	15,044,400
New York.....	19,729,000	10,819,650	8,959,072	8,919,072	12,145,200	13,330,730	10,844,000	14,856,360	12,961,297	15,120,547	10,736,500	15,044,400	10,736,500	15,044,400	10,736,500	15,044,400	10,736,500	15,044,400
North Carolina.....	4,650,000	4,138,500	4,290,800	4,950,081	5,494,800	5,824,488	3,478,000	3,990,792	3,990,792	4,136,880	3,223,200	4,136,880	3,223,200	4,136,880	3,223,200	4,136,880	3,223,200	4,136,880
Ohio.....	41,186,000	25,884,000	25,884,000	25,825,100	43,458,600	41,290,920	38,220,000	49,600,800	37,792,800	38,548,656	36,501,750	43,910,100	36,501,750	43,910,100	36,501,750	43,910,100	36,501,750	43,910,100
Oregon.....	15,462,000	13,121,760	13,122,000	11,810,100	12,630,000	10,293,405	12,670,000	10,293,405	11,152,240	10,077,600	8,188,000	8,025,024	8,188,000	8,025,024	8,188,000	8,025,024	8,188,000	8,025,024
Pennsylvania.....	20,820,000	17,280,900	20,043,800	21,547,394	20,300,700	21,815,725	18,737,000	25,187,900	22,269,000	24,306,008	22,307,000	20,445,708	22,307,000	20,445,708	22,307,000	20,445,708	22,307,000	20,445,708
Rhode Island.....	644	644	644	644	644	644	644	644	644	644	644	644	644	644	644	644	644	644
South Carolina.....	1,410,000	1,480,500	1,135,200	1,477,000	1,720,000	2,074,800	988,000	1,089,200	690,730	904,037	1,140,730	1,790,390	1,140,730	1,790,390	1,140,730	1,790,390	1,140,730	1,790,390
Tennessee.....	9,320,000	6,600,000	7,408,800	6,516,060	9,971,200	9,073,792	6,008,000	8,714,800	9,300,000	9,128,408	11,852,800	12,919,592	11,852,800	12,919,592	11,852,800	12,919,592	11,852,800	12,919,592
Texas.....	5,500,600	4,897,200	4,301,000	4,301,000	4,173,700	4,000,256	3,339,000	4,074,000	3,901,500	4,096,575	3,454,200	3,972,390	3,454,200	3,972,390	3,454,200	3,972,390	3,454,200	3,972,390
Utah.....	1,675,000	1,375,000	1,575,400	1,453,048	1,250,000	1,160,500	1,160,500	1,160,500	1,160,500	1,160,500	1,160,500	1,160,500	1,160,500	1,160,500	1,160,500	1,160,500	1,160,500	1,160,500
Vermont.....	384,500	382,725	382,725	382,725	378,000	480,000	378,000	480,000	530,066	691,727	494,000	686,660	494,000	686,660	494,000	686,660	494,000	686,660
Virginia.....	7,455,000	5,964,000	8,332,800	8,770,440	8,811,400	8,810,084	7,105,010	9,539,450	9,322,350	9,788,407	8,851,320	11,241,176	8,851,320	11,241,176	8,851,320	11,241,176	8,851,320	11,241,176
Washington.....	3,118,000	2,457,560	2,457,560	2,457,560	2,440,000	2,025,200	4,419,100	5,516,285	4,651,140	4,292,537	1,921,322	4,689,188	1,921,322	4,689,188	1,921,322	4,689,188	1,921,322	4,689,188
West Virginia.....	3,318,000	2,654,400	4,297,000	4,597,560	4,854,300	4,611,585	4,419,100	5,516,285	4,651,140	4,292,537	1,921,322	4,689,188	1,921,322	4,689,188	1,921,322	4,689,188	1,921,322	4,689,188
Wisconsin.....	20,604,000	12,049,800	13,604,900	17,252,312	23,145,400	20,870,800	17,087,000	21,404,590	16,464,000	16,464,000	20,565,720	21,388,349	20,565,720	21,388,349	20,565,720	21,388,349	20,565,720	21,388,349
Wyoming.....	33,900	25,085	20,540	25,970	23,145,400	20,870,800	17,087,000	21,404,590	16,464,000	16,464,000	20,565,720	21,388,349	20,565,720	21,388,349	20,565,720	21,388,349	20,565,720	21,388,349
Grand Total.....	512,793,900	\$330,865,031	421,086,160	\$983,640,272	504,185,470	\$445,602,125	383,240,000	\$456,880,427	480,849,723	\$453,558,371	459,479,505	\$407,030,132	459,479,505	\$407,030,132	459,479,505	\$407,030,132		



PETROLEUM.				EXPORTED			COTTON.	
				Hog Products.				
Production in Bbls.	Consumption in Bbls.	Average Price.		Bacon and Hams. Lbs.	Pork. Lbs.	Lard. Lbs.	Total Lbs.	Production in Bales.
								Value of Exports in Dollars.
1870.....	4,562,642	\$3.86		.....	.....	.....	.....	3,154,946
1871.....	5,178,038	4.42		.....	.....	.....	.....	4,352,317
1872.....	5,954,742	3.68		.....	.....	.....	.....	2,874,351
1873.....	7,847,953	1.84		.....	.....	.....	.....	3,980,508
1874.....	7,875,945	1.37		.....	.....	.....	.....	690,683,605
1875.....	9,256,416	1.33		.....	.....	.....	.....	623,415,255
1876.....	10,414,877	2.37		.....	.....	.....	.....	473,308,273
1877.....	11,977,107	2.37		.....	.....	.....	.....	166,869,393
1878.....	13,940,171	1.66		.....	.....	.....	.....	188,252,248
1879.....	15,765,900	1.37		.....	.....	.....	.....	550,831,129
1880.....	18,164,662	1.37		.....	.....	.....	.....	4,669,288
1881.....	24,235,061	1.37		.....	.....	.....	.....	764,470,273
1882.....	28,447,115	1.37		.....	.....	.....	.....	4,485,423
1883.....	31,079,165	1.37		.....	.....	.....	.....	1,007,460,860
1884.....	32,671,093	1.084		.....	.....	.....	.....	1,143,303,993
1885.....	33,706,900	.834		.....	.....	.....	.....	5,073,531

ADDITIONAL PETROLEUM STATISTICS.				COTTON CONSUMPTION IN THE UNITED STATES.				COTTON STATISTICS.							
* Produced in the United States—Census of 1880.				Exports of Petroleum and Petroleum Products from the United States.				From Sec. Nat'l Cotton Exchange, New Orleans, La.							
	Barrels.			YEARS.	GALLONS.	VALUE.	In 1882-83.	By Northern Spinners.		By Southern Spinners.		YEARS.	Bales.	Average weight.	Gross weight of crop in pounds.
Northwestern Pennsylvania.....	23,915,446			1881.....	514,561,544	\$48,586,103	" 1883-84.	1,759,703 Bales.		1,337,166 "		Ending Sept. 1.			
West Virginia and Washington County, O.,	219,354			1882.....	508,501,128	44,623,024		1882-83		1883-84		1876-77.....	4,474,069	468.45	2,086,801,397
Beaver County, Pa.....	96,803			1883.....	532,736,948	47,762,039		Bales.		Bales.		1877-78.....	4,773,875	473.47	2,360,285,666
Glasgow, Ky.....	5,376			1884.....	538,480,157	49,455,419		1881-82		1882-83		1878-79.....	5,074,135	473.15	2,404,410,373
Grafton, O.....	4,159			1885.....	112,287,450	9,921,087		1883-84		1884-85		1879-80.....	5,761,252	481.11	2,771,737,156
Greene County, Pa.....	3,118			3 months.				Alabama.		Alabama.		1880-81.....	6,005,750	484.38	3,199,882,082
Mecca, O.....	900							Kansas.		Kansas.		1881-82.....	5,456,048	474.38	2,588,236,036
Eric, Pa.....	25							Florida.		Florida.		1882-83.....	6,949,756	489.95	3,405,070,410
Total.....	24,235,081							Georgia.		Georgia.		1883-84.....	5,713,200	482.66	2,797,574,422
				Daily Product, July 1885.											
				Allegheny, N. Y. field.....				1,500 bbls.							
				Macdonough, O., field.....				7,250 "							
				Mississippi, field.....				9,443 "							
				Louisiana, field.....				14,388 "							
				Census of 1880.)											
Statistics of Petroleum Refining—United States				Cotton Production in the United States.											

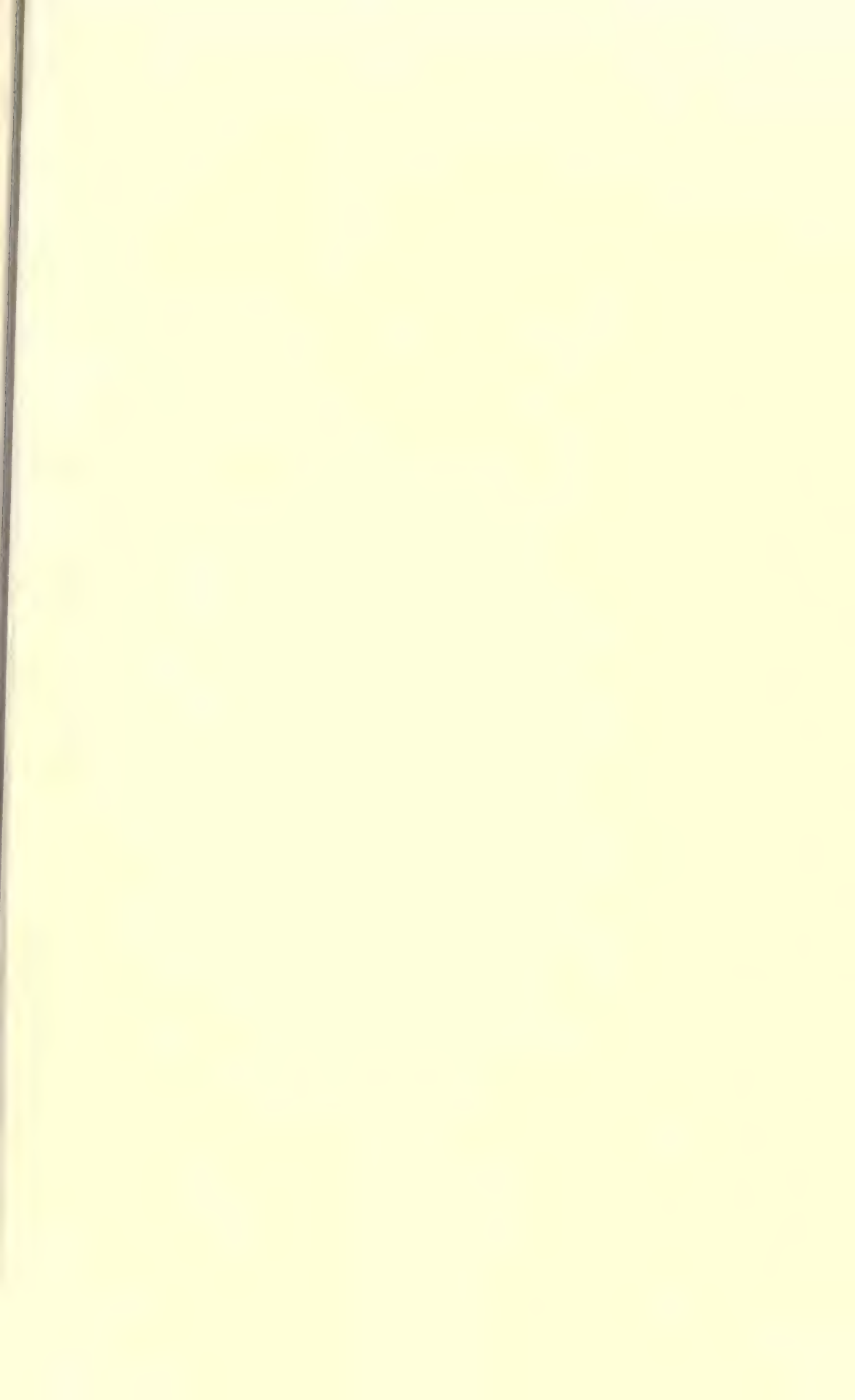


























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